



Practice Note #2

Australasian Code for Reporting of Mineral Resources and Ore Reserves

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Qualifications

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Practice Note History

First Issued 22/10/2000

Introduction

This practice note sets out the standard for mineral resource companies in reporting their results to the NSX

Structure of Practice Note

Inclusion of the Australasian Code for reporting Mineral Resources and Ore Reserves (The JORC Code), September 1999 edition.

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9. Reporting of mineralised stope fill, stockpiles, remnants, pillars, low grade mineralisation and tailings.
10. **Table 1:** Checklist of assessment and reporting criteria.
11. **Appendix 1:** The JORC Code and Australasian Stock Exchanges

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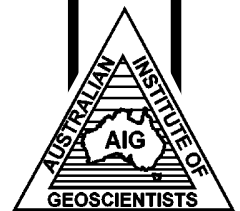


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1999 Edition

Australasian Code for Reporting of Mineral Resources and Ore Reserves

(The JORC Code)



**MINERALS
COUNCIL**
OF AUSTRALIA

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)

Effective September 1999

FOREWORD

1. The *Australasian Code for Reporting of Mineral Resources and Ore Reserves* (the 'JORC Code' or 'the Code') sets out minimum standards, recommendations and guidelines for Public Reporting of exploration results, Mineral Resources and Ore Reserves in Australasia. It has been drawn up by the Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, the Australian Institute of Geoscientists and the Minerals Council of Australia. The Joint Ore Reserves Committee was established in 1971 and published a number of reports which made recommendations on the classification and Public Reporting of Ore Reserves prior to the first release of the JORC Code in 1989.
2. In this edition of the JORC Code, the guidelines, which were previously separated from the Code, have been placed after the respective Code clauses to provide improved assistance and guidance to readers. These guidelines are indented and are in a different, smaller type face. They do not form part of the Code but should be considered persuasive when interpreting the Code. The same indented and reduced type face formatting has been applied to Appendix 1 – '*The JORC Code and Australasian Stock Exchanges*', and to Table 1 – '*Check List of Assessment and Reporting Criteria*' to emphasise that both these sections are guidelines, and that the latter is not a mandatory list of assessment and reporting criteria. Also in this edition of the Code, the first or a particularly significant mention, after Clause 2, of terms which are defined in the Code have been marked with a superscript '^{D10}', and the corresponding definitions have been highlighted in bold type. For example, Competent Person^{D10} means that this term is defined in Clause 10.
3. The Code has been adopted by The Australasian Institute of Mining and Metallurgy and the Australian Institute of Geoscientists and is therefore binding on members of those organisations. It is supported by the Minerals Council of Australia and the Securities Institute of Australia as a contribution to best practice. The Australian Stock Exchange and New Zealand Stock Exchange listing rules each incorporate the Code. See Appendix 1.
4. The main principles governing the operation and application of the JORC Code are transparency, materiality and competence. 'Transparency' requires that the reader of a Public Report^{D5} is provided with sufficient information, the presentation of which is clear and unambiguous, to understand the report and is not misled. 'Materiality' 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 mineralisation being reported. 'Competence' requires that the Public Report is based on work which is the responsibility of a suitably qualified and experienced person who is subject to an enforceable professional code of ethics.
5. The Code is a required minimum standard for Public Reporting. The committee also recommends its adoption as a minimum standard for other reporting. **Reference in the Code to a Public Report or Public Reporting is to a report or reporting on exploration results, Mineral Resources^{D20} or Ore Reserves^{D29}, prepared for the purpose of informing investors or potential investors and their advisers. This includes a report or reporting prepared to satisfy regulatory requirements.** Companies are encouraged to provide information which is as comprehensive as possible in their Public Reports.

Public Reports include, but are not limited to: company Annual Reports, quarterly reports and other reports to the Australian or New Zealand Stock Exchanges or required by corporations law. It is recommended that the Code apply to the following reports if they have been prepared for the purpose described in Clause 5: environmental statements; Information Memoranda; Expert Reports and technical papers in respect of reporting on exploration results, Mineral Resources or Ore Reserves.

The term 'regulatory requirements' as used in Clause 5 is not intended to cover reports by companies to government agencies which may be required for State Government or Federal Government inventory or planning purposes. If reports prepared for such purposes subsequently become available to the public, they would not normally be regarded as Public Reports in terms of the JORC Code (refer also to the guidelines to Clauses 20 and 37).

It is recognised that there may be situations where a Competent Person^{D10} prepares documentation for internal company purposes or similar non-public purposes that does not comply with the JORC

Code. In such circumstances, the documentation should include a statement that it does not comply with the JORC Code. This will minimise the likelihood of non-complying documentation being used as a basis for Public Reports, since Clause 8 requires Public Reports to fairly reflect Mineral Resource and/or Ore Reserve estimates and supporting documentation prepared by a Competent Person (refer to Clause 8, and also to Appendix 1 in respect of stock exchange requirements on Public Reporting).

While every effort has been made within the Code and Guidelines to cover most situations likely to be encountered in the Public Reporting of exploration results, Mineral Resources and Ore Reserves, there will inevitably be occasions when doubt exists as to the appropriate procedure to follow. In such cases, users of the Code and those

compiling reports under 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 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 mineralisation being reported.

6. The Code is applicable to all solid minerals, including diamonds, other gemstones and coal, for which Public Reporting of exploration results, Mineral Resources and Ore Reserves is required by the Australian and New Zealand Stock Exchanges.
7. The Joint Committee recognises that further review of the Code will be required from time to time.

COMPETENCE AND RESPONSIBILITY

8. A Public Report concerning a company's Mineral Resources and/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 Mineral Resource and/or Ore Reserve estimates and supporting documentation prepared by a Competent Person^{D10} or Persons.

In compiling Mineral Resource and/or Ore Reserve information in a Public Report, a company may need to edit the documentation prepared by the Competent Persons. Where such editing takes place, the Competent Persons must give their consent in writing to the company to the inclusion in the Public Report of the matters based on their information in the form and context in which it appears in the Public Report.

Refer to Appendix 1 for information on stock exchange requirements to name the Competent Person(s).

9. Documentation detailing Mineral Resource and Ore Reserve estimates from which a Public Report on Mineral Resources and Ore Reserves is prepared, must be prepared by or under the direction of, and signed by, a Competent Person or Persons.
10. **A 'Competent Person' is a person who is a Member or Fellow of The Australasian Institute of Mining and Metallurgy and/or the Australian Institute of Geoscientists with 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**

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 in (say) massive base metal deposits may not be. As a second example, for a person to qualify as a Competent Person in the estimation of Ore Reserves for alluvial gold deposits, he or she would need to have considerable (probably at least five years) experience in the evaluation and economic extraction of this type of mineralisation, 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 Mineral Resource estimation in 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 Competent Person preparing or taking responsibility for Mineral Resource estimates should have sufficient experience in the sampling and assaying techniques relevant to the deposit under consideration to be aware of problems which could affect the reliability of the data. Some appreciation of extraction and processing techniques applicable to that deposit type would 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 other colleagues or should decline to act as a Competent Person.

Estimation of Mineral Resources is often a team effort (for example, involving one person or team collecting the data and another person or team preparing the Mineral Resource estimate). Within this team, geologists usually occupy the pivotal role. Estimation of Ore Reserves is almost always a team effort involving a number of technical disciplines, and within this team, mining engineers usually occupy the pivotal role. Documentation for a Mineral Resource or Ore Reserve estimate must be compiled by, or under the supervision of, a Competent Person or Persons, whether a geologist, mining engineer or member of another discipline. However, it is recommended that, where there is a clear division of responsibilities within a team, each Competent Person should accept responsibility for his or her particular contribution. For example, one Competent Person

could accept responsibility for the collection of Mineral Resource data, another for the Mineral Resource estimation process, another for the mining study, and the project leader could accept responsibility for the overall document. It is important that the Competent Person accepting overall responsibility for a Mineral Resource or Ore Reserve estimate and supporting documentation which has been prepared in whole or in part by others is satisfied that the work of the other contributors is acceptable.

If the Competent Person is a Member or Fellow of The Australasian Institute of Mining and Metallurgy ('The AusIMM'), he or she is answerable to The AusIMM Ethics Committee if a complaint is made in respect of his or her professional work. If the Competent Person is a Member or Fellow of the Australian Institute of Geoscientists ('AIG'), the matter will be dealt with by the Ethics and Standards Committee of the AIG Council, if a complaint is made in respect of his or her professional work.

When an Australian listed or New Zealand listed company with overseas interests wishes to report an overseas Mineral Resource or Ore Reserve estimate prepared by a person who is not a member of The AusIMM or of the AIG, it is necessary for the company to nominate a Competent Person or Persons to take responsibility for the 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 ASX or NZSX listing rules and should not treat the procedure merely as a 'rubber-stamping' exercise.

11. For Public Reports dealing with diamond or other gemstone mineralisation, it is also a requirement of this Code that, if a valuation of a parcel of diamonds or gemstones is reported, the person(s) or organisations valuing the parcel must be named in the report and their professional valuation experience, competency and independence stated.

REPORTING TERMINOLOGY

12. Public Reports dealing with Mineral Resources and/or Ore Reserves must only use the terms set out in Figure 1.

Figure 1 sets out the framework for classifying tonnage and grade estimates so as 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

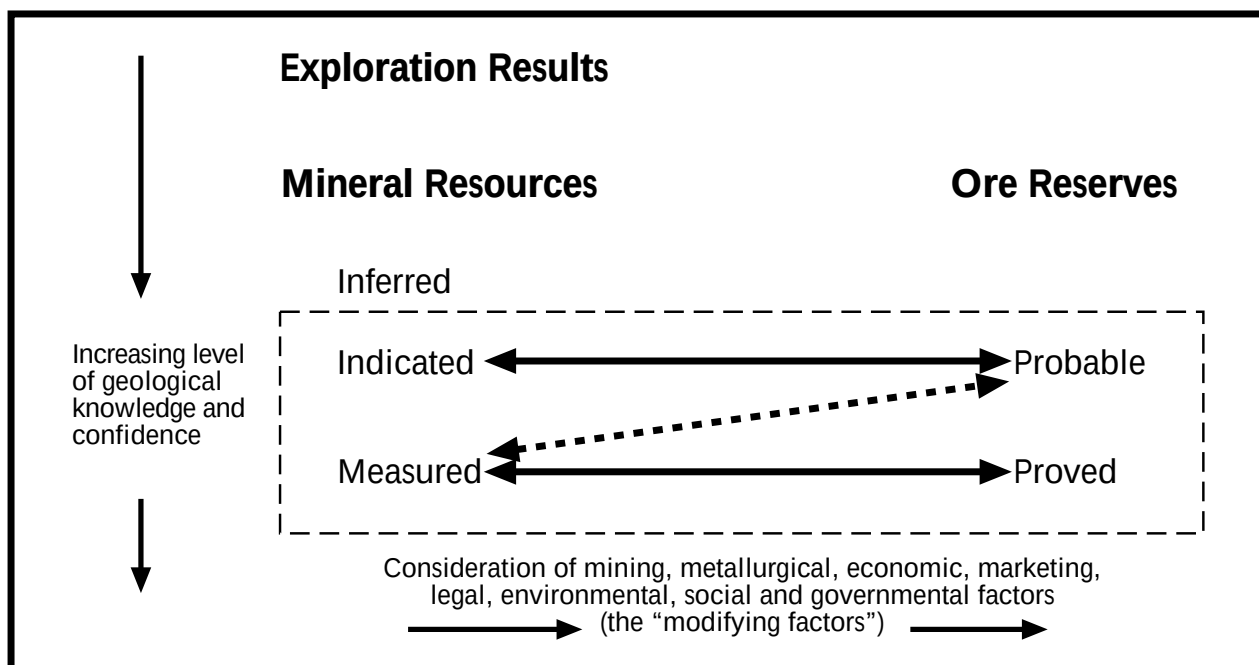
information with some input from other disciplines. Ore Reserves, which are a modified sub-set of the Indicated^{D22} and Measured Mineral Resources^{D23} (shown within the dashed outline in Figure 1), require consideration of those factors affecting extraction, including mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors, and should in most instances be estimated with input from a range of disciplines.

In certain situations, Measured Mineral Resources could convert to Probable Ore Reserves^{D30} because of uncertainties associated with 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 32.

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



REPORTING – GENERAL

13. Public Reports concerning a company's Mineral Resources or Ore Reserves should include a description of the style and nature of mineralisation.
14. A company must disclose relevant information concerning the status and characteristics of a mineral deposit which could materially influence the economic value of that deposit. A company must promptly report any material changes in its Mineral Resources or Ore Reserves.
15. Companies must review and publicly report on their Mineral Resources and Ore Reserves annually.
16. Throughout the Code, where appropriate, 'quality' may be substituted for 'grade' and 'volume' may be substituted for 'tonnage'.

REPORTING OF EXPLORATION RESULTS

17. A company may choose, or be required under stock exchange listing rules, to report exploration results. If a company reports exploration results in relation to mineralisation not classified as a Mineral Resource or an Ore Reserve, then estimates of tonnage and average grade must not be assigned to the mineralisation.

Where descriptions of exploration targets or exploration potential are given in Public Reports, any tonnage/grade figures mentioned must be clearly order-of-magnitude and conceptual in nature and expressed so as not to misrepresent them as an estimate of Mineral Resources or Ore Reserves.
18. Public Reports of exploration results relating to mineralisation not classified as Mineral Resources or Ore Reserves must contain sufficient information to allow a considered and balanced judgement of the significance of the results. This must include relevant information such as sampling intervals and methods, sample locations, assay data, laboratory analyses, data aggregation methods plus information on any of the other criteria listed in Table 1 that are material to an assessment. The reporting of exploration sampling or

geophysical results must not be presented so as to unreasonably imply that potentially economic mineralisation has been discovered.

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. Reporting of isolated assays without placing them in perspective is unacceptable.

19. Public Reports dealing with diamonds require the following additions:

- Reports of diamonds recovered from sampling programs must specify the number and total weight (in carats) of diamonds recovered. Details of the type and size of samples which produced the diamonds must also be specified including the lower cut-off sieve size used in the recovery.
- The weight of diamonds recovered may only be omitted from the report when the diamonds are less than 0.4 mm in size (ie. when the diamonds recovered are microdiamonds).

REPORTING OF MINERAL RESOURCES

20. A **'Mineral Resource'** is a concentration or occurrence of material of intrinsic economic interest in or on the Earth's crust in such form and quantity that there are 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^{D21}, Indicated^{D22} and Measured^{D23} categories.

Portions of a deposit that do not have reasonable prospects for eventual economic extraction must not be included in a Mineral Resource.

The term 'Mineral Resource' covers mineralisation which has been identified and estimated through exploration and sampling and within which Ore Reserves may be defined by the consideration and application of technical, economic, legal, environmental, social and governmental factors.

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 mineralisation which, under assumed and justifiable technical and economic conditions, might, in whole or in part, become economically extractable.

Interpretation of the word 'eventual' in this context may vary depending on the commodity or mineral

involved. For example, for many 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 20 to 30 years, and frequently to much shorter periods of time.

Certain reports (eg: coal inventory 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).

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 such inclusions, and Public Reports should include commentary on the matter if considered material.

21. 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 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 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. Due to the uncertainty which may attach to some Inferred Mineral Resources, it cannot be assumed that all or part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is usually not sufficient to allow the appropriate application of technical and economic parameters or to enable an evaluation of economic viability. Caution should be exercised if this category is considered in economic studies.

22. **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 appropriate application of technical and economic parameters and to enable an evaluation of economic viability.

23. **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/or grade continuity.

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 variation from the estimate would not significantly affect potential economic viability. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit. Confidence in the estimate is sufficient to allow the appropriate application of technical and economic parameters and to enable an evaluation of economic viability.

24. 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.

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.

In deciding between Measured Mineral Resources and 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 22 and 23, the phrase in the guideline to the definition for Measured Mineral Resources: '.... any variation from the estimate would not 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 21 and 22 relating to geological and grade continuity, the guideline to the definition for Indicated Mineral Resources: 'Confidence in the estimate is sufficient to allow the appropriate 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 is usually not sufficient to allow the appropriate application of technical and economic parameters or to enable an evaluation of economic viability. Caution should be exercised if this category is considered in economic studies'.

25. 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 order of accuracy 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 or Ore Reserve estimate, the final result should always be referred to as an estimate not a calculation.

26. 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.
27. 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.

Where diamond Mineral Resource grades are based on the correlation of macrodiamond grade with the grade of microdiamonds, this must be stated and its reliability explained.

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 and/or Ore Reserves; for example, poor sample recovery, poor repeatability of assay or laboratory results, limited information on tonnage factors etc.

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.

Mineral Resource or Ore Reserve estimates are sometimes reported after adjustment by cutting of high grades, or after the application of modifying factors arising from reconciliation with mill data. If any of the data are materially adjusted or modified for the purpose of making the estimate, or if the estimate is subsequently adjusted, this should be clearly stated in a Public Report of Mineral Resources or Ore Reserves and the nature of the adjustment or modification described.

28. The words 'ore' and 'reserves' must not be used in stating Mineral Resource estimates as the terms imply technical feasibility and economic viability and are only appropriate when all relevant technical, economic, marketing, legal, environmental, social and governmental 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 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 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 a commodity price drop expected to be of short duration, mine emergency of a non-permanent nature, transport strike etc.

REPORTING OF ORE RESERVES

29. **An 'Ore Reserve' is the economically mineable part of a Measured or Indicated Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments, which may**

include feasibility 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^{D30} and Proved Ore Reserves^{D31}.

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 the Competent Person or Persons making the estimates, can be the basis of a viable project after taking account of all relevant metallurgical, economic, marketing, legal, environmental, social and governmental factors. Ore Reserves are inclusive of diluting material which will be mined in conjunction with the Ore Reserves and delivered to the treatment plant or equivalent.

The term 'economic' implies that extraction of the Ore Reserve has been established or analytically demonstrated to be viable and justifiable under reasonable investment assumptions. The term 'Ore Reserve' need not necessarily signify that extraction facilities are in place or operative or that all governmental approvals have been received. It does signify that there are reasonable expectations of such approvals.

It should be noted that the Code does not imply that an economic operation must have Proved Ore Reserves. Situations arise where Probable Ore Reserves alone may be sufficient to justify extraction, as for example with some alluvial tin or gold deposits.

Some countries use the term 'Mineral Reserve' instead of 'Ore Reserve'. The Joint Ore Reserves Committee has retained the term 'Ore Reserve' because it assists in maintaining a clear distinction between a 'Mineral Resource' and an 'Ore Reserve', a distinction which might be less clear if 'Mineral Reserve' was substituted. However, if preferred by the reporting company, 'Ore Reserve' and 'Mineral Resource' estimates for coal may be reported as 'Coal Reserve' and 'Coal Resource' estimates.

30. **A 'Probable Ore Reserve' is the economically mineable part of an Indicated, and in some circumstances Measured Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments, which may include feasibility 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.**

A Probable Ore Reserve has a lower level of confidence than a Proved Ore Reserve.

31. **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, which may include feasibility 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.**
32. The choice of the appropriate category of Ore Reserve is determined primarily by the classification of the corresponding Mineral Resource and must be made by the Competent Person or Persons.

The Code provides for a direct relationship between Indicated Mineral Resources and Probable Ore Reserves and between Measured Mineral Resources and Proved Ore Reserves. In other words, the level of geoscientific confidence for Probable Ore Reserves is the same as that required for the in situ determination of Indicated Mineral Resources and for Proved Ore Reserves is the same as that required for the in situ determination of Measured Mineral Resources.

The 1999 edition of the Code also provides, for the first time, for a two-way relationship between Measured Mineral Resources and Probable Ore Reserves. This is to cover the situation where uncertainties associated with any of the modifying factors considered when converting Mineral Resources to Ore Reserves may result in there being a significantly lower degree of confidence in the Ore Reserves than in the corresponding Measured Mineral Resources. Such a conversion would not imply a reduction in the level of geological knowledge or confidence.

If the uncertainties in the modifying factors preventing the Measured Mineral Resource being converted to a Proved Ore Reserve are removed, the Measured Mineral Resource may be converted to a Proved Ore Reserve. However modification is only acceptable to an equivalent or lower level of confidence. 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 which exists in the Mineral Resource. Under no circumstances can an Indicated Mineral Resource be converted directly to a Proved Ore Reserve.

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

Refer also to the guidelines to Clause 24 regarding classification of Mineral Resources.

33. Ore Reserve estimates are not precise calculations and tonnage and grade figures in Public Reports should be expressed so as to convey the order of accuracy of the estimates by rounding off to appropriately significant figures.

Refer to the guidelines to Clause 25, regarding rounding of Mineral Resource estimates.

34. Except for the special provisions relating to coal (see Clause 39) Public Reports of Ore Reserves must specify one or both of the categories of 'Proved' and 'Probable'. Categories must not be reported in a combined form unless details for the individual categories are also provided. Ore Reserves must not be reported in terms of contained metal or mineral content unless corresponding tonnages and grades are also presented.

In reporting Ore Reserves, information on assumed metallurgical recovery factors is very important, and should always be included in Public Reports.

35. In situations where figures for both Mineral Resources and Ore Reserves are reported, a clarifying statement must be included in the report which clearly indicates whether the Mineral Resources are inclusive of, or additional to the Ore Reserves.

The committee recognises that there are legitimate reasons, in some situations, for reporting Mineral Resources inclusive of Ore Reserves and, in other situations, for reporting Mineral Resources additional to Ore Reserves. The committee does not express a preference but it does require that reporting companies make it clear which form of reporting has been adopted. Appropriate forms of clarifying statements may be:

'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.'

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

Where there is a substantial difference between the statement of Mineral Resources and the statement of Ore Reserves in a Public Report, an explanation of the reasons for the difference should

be included in the report. This will assist the reader of the report in making a judgement of the likelihood of the remaining Mineral Resources eventually being converted to Ore Reserves.

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.

For the same reason, Ore Reserves should not be added to Mineral Resources. The resulting total can be very misleading in economic terms and is capable of being misunderstood or, more seriously, of being misused to give a false impression of a company's mineral prospects.

Public Reporting of tonnage and grade estimates using terms other than Mineral Resources and Ore Reserves is not permitted under the Code.

In preparing the Ore Reserve statement, the relevant Mineral Resource statement on which it is based should first be developed. This can be reconciled with the Mineral Resource statement estimated for the previous comparable period and differences (due, for example, to mine production, exploration etc) identified. The application of cut-off and other criteria to the Mineral Resource can then be made to develop the Ore Reserve statement which can also be reconciled with the previous comparable statement. Companies are encouraged whenever possible to reconcile estimates in their reports. A detailed account of differences between estimates is not essential, but sufficient comment should be made to enable significant variances to be understood by the reader.

36. 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 Ore Reserves. Changes in economic or political factors alone may be the basis for significant changes in Ore Reserves and should be reported accordingly.

Where diamond Ore Reserve grades are based on the correlation of macrodiamond grade with the grade of microdiamonds, this must be stated and its reliability explained. If a valuation of a parcel of diamonds is reported, the weight in carats and size range of the contained diamonds must be stated and the value of the diamonds must be given in US dollars per carat.

Refer also to Clause 19 and to the guidelines to Clause 27.

REPORTING OF COAL RESOURCES AND RESERVES

37. Clauses 38 to 40 of the Code address matters which 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 also be considered persuasive when reporting on Coal Resources and Reserves.

For guidance on the estimation of black Coal Resources and Reserves and on statutory reporting not primarily intended for providing information to the investing public, readers are referred to the 1999 edition of the "Guidelines for the Estimation and Reporting of Australian Black Coal Resources and Reserves", a document drawn up by a committee of coal industry and government representatives and consultants from New South Wales and Queensland.

Coal is of particular interest to State and Federal Governments because of its impact on government planning and land use implications. Reports to governments may require estimates of coal resources which are not constrained by short to

medium term economic considerations. Such reports and estimates of strategic resources are not covered by the JORC Code. Refer also to the guidelines to Clauses 5 and 20.

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 appropriate subdivisions may be substituted.
39. For coal reporting only, Probable and Proved Ore (Coal) Reserves may be combined and reported as Recoverable Reserves.
40. Reports of 'Marketable Coal Reserves', representing beneficiated or otherwise enhanced coal product, may be used in Public Reports 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.

REPORTING OF MINERALISED STOPE FILL, STOCKPILES, REMNANTS, PILLARS, LOW GRADE MINERALISATION AND TAILINGS

41. The Code applies to the reporting of all potentially economic mineralised material including mineralised stope fill, stockpiles, remnants, pillars, low grade mineralisation and tailings.

For the purposes of the Code, mineralised stope fill and stockpiles of mineralised material can be considered to be similar to in situ mineralisation when reporting Mineral Resources and Ore Reserves. Consequently the Competent Person assessing the fill or stockpiles must use the bases of classification outlined in the Code. In most cases, the opinion of a relevant professional should be sought when making judgements about the mineability of fill, remnants and pillars.

If there are not reasonable prospects for the eventual economic extraction of a particular portion of the fill or stockpile, this material cannot be classified as either Mineral Resources or Ore Reserves. If some portion is currently sub-economic but there is a reasonable expectation that it will become economic, then this material may be classified as a Mineral Resource. Such stockpile material may include old dumps and tailings dam material. If technical and economic studies have demonstrated that economic extraction could reasonably be justified under realistically assumed conditions, 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 being processed (including leaching), if reported, should be reported separately.

Mineralised remnants, shaft pillars and mining pillars which are potentially mineable are in situ mineralisation and consequently are included in the Code definitions of Mineral Resources and Ore Reserves.

Mineralised remnants, shaft pillars and mining pillars which are not potentially mineable must not be included in Mineral Resource and Ore Reserve statements.

TABLE 1

CHECK LIST OF ASSESSMENT AND REPORTING CRITERIA

Table 1 is a check list and guideline which those preparing reports on exploration results, Mineral Resources and Ore Reserves should use as a reference. The check list is not prescriptive and, as always, relevance and materiality are overriding principles that determine what information should be publicly reported. It is, however, important to report any 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 and/or Ore Reserves.

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.

CRITERIA	EXPLANATION
SAMPLING TECHNIQUES AND DATA (criteria in this group apply to all succeeding groups)	
<i>Drilling techniques</i>	<i>Drill type (eg. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka etc.) and details (eg. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, etc.). Measures taken to maximise sample recovery and ensure representative nature of the samples.</i>
<i>Logging</i>	<i>Whether core and chip samples have been logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. Whether logging is qualitative or quantitative in nature. Core (or costean, channel etc.) photography.</i>
<i>Drill sample recovery</i>	<i>Whether core and chip sample recoveries have been properly recorded and results assessed. In particular 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.</i>
<i>Other sampling techniques</i>	<i>Nature and quality of sampling (eg. cut channels, random chips etc.) and measures taken to ensure sample representivity.</i>
<i>Sub-sampling techniques and sample preparation</i>	<i>If core, whether cut or sawn and whether quarter, half or all core taken. If non-core, whether riffled, tube sampled, rotary split etc. and whether sampled wet or dry. For all sample types, the nature, quality and appropriateness of the sample preparation technique. Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. Measures taken to ensure that the sampling is representative of the in situ material collected. Whether sample sizes are appropriate to the grainsize of the material being sampled.</i>
<i>Quality of assay data and laboratory tests</i>	<i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total. Nature of quality control procedures adopted (eg. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie. lack of bias) and precision have been established.</i>
<i>Verification of sampling and assaying</i>	<i>The verification of significant intersections by either independent or alternative company personnel. The use of twinned holes.</i>
<i>Location of data points</i>	<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. Quality and adequacy of topographic control.</i>
<i>Data density and distribution</i>	<i>Data density for reporting of exploration results. Whether the data density and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. Whether sample compositing has been applied.</i>
<i>Audits or reviews</i>	<i>The results of any audits or reviews of sampling techniques and data.</i>

REPORTING OF EXPLORATION RESULTS (criteria listed in the preceding group apply also to this group)	
<i>Mineral tenement and land tenure status</i>	<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. In particular 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>
<i>Exploration done by other parties</i>	<i>Acknowledgement and appraisal of exploration by other parties.</i>
<i>Geology</i>	<i>Deposit type, geological setting and style of mineralisation.</i>
<i>Data aggregation methods</i>	<i>In reporting exploration results, weighting averaging techniques, maximum and/or minimum grade truncations (eg. cutting of high grades) and cut-off grades are usually material and should be stated. Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. The assumptions used for any reporting of metal equivalent values should be clearly stated.</i>
<i>Relationship between mineralisation widths and intercept lengths</i>	<i>These relationships are particularly important in the reporting of exploration results. If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. If it is not known and only the down-hole lengths are reported, there should be a clear statement to this effect (eg. 'downhole length, true width not known').</i>
<i>Diagrams</i>	<i>Where possible, maps and sections (with scales) and tabulations of intercepts should be included for any material discovery being reported if such diagrams significantly clarify the report.</i>
<i>Balanced reporting</i>	<i>Where comprehensive reporting of all exploration results is not practicable, representative reporting of both low and high grades and/or widths should be practised to avoid misleading reporting of exploration results.</i>
<i>Other substantive exploration data</i>	<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>
<i>Further work</i>	<i>The nature and scale of planned further work (eg. tests for lateral extensions or depth extensions or large-scale step-out drilling).</i>
ESTIMATION AND REPORTING OF MINERAL RESOURCES (criteria listed in the first group, and where relevant in the second group, apply also to this group)	
<i>Database integrity</i>	<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. Data validation procedures used.</i>
<i>Geological interpretation</i>	<i>Nature of the data used and of any assumptions made. The effect, if any, of alternative interpretations on Mineral Resource estimation. The use of geology in guiding and controlling Mineral Resource estimation. The factors affecting continuity both of grade and geology.</i>
<i>Estimation and modelling techniques</i>	<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. The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data. The assumptions made regarding recovery of by-products. In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed. Any assumptions behind modelling of selective mining units (eg. non-linear kriging). The process of validation, the checking process used, the comparison of model data to drillhole data, and use of reconciliation data if available.</i>

<i>Cut-off grades or parameters</i>	<i>The basis of the cut-off grade(s) or quality parameters applied, including the basis, if appropriate, of equivalent metal formulae.</i>
<i>Mining factors or assumptions</i>	<i>Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It may not always be possible to make assumptions regarding mining methods and parameters when estimating Mineral Resources. Where no assumptions have been made, this should be reported.</i>
<i>Metallurgical factors or assumptions</i>	<i>The basis for assumptions or predictions regarding metallurgical amenability. It may not always be possible to make assumptions regarding metallurgical treatment processes and parameters when reporting Mineral Resources. Where no assumptions have been made, this should be reported.</i>
<i>Tonnage factors (in situ bulk densities)</i>	<i>Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, the frequency of the measurements, the nature, size and representativeness of the samples.</i>
<i>Classification</i>	<i>The basis for the classification of the Mineral Resources into varying confidence categories. Whether appropriate account has been taken of all relevant factors. ie. relative confidence in tonnage/grade computations, confidence in continuity of geology and metal values, quality, quantity and distribution of the data. Whether the result appropriately reflects the Competent Person(s)' view of the deposit.</i>
<i>Audits or reviews</i>	<i>The results of any audits or reviews of Mineral Resource estimates.</i>
ESTIMATION AND REPORTING OF ORE RESERVES (criteria listed in the first group, and where relevant in other preceding groups, apply also to this group)	
<i>Mineral Resource estimate for conversion to Ore Reserves</i>	<i>Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve. Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.</i>
<i>Cut-off grades or parameters</i>	<i>The basis of the cut-off grade(s) or quality parameters applied, including the basis, if appropriate, of equivalent metal formulae. The cut-off grade parameter may be economic value per block rather than metal grade.</i>
<i>Mining factors or assumptions</i>	<i>The method and assumptions used to convert the Mineral Resource to an Ore Reserve (ie either by application of appropriate factors by optimisation or by preliminary or detailed design). 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. The assumptions made regarding geotechnical parameters (eg. pit slopes, stope sizes, etc.), grade control and pre-production drilling. The major assumptions made and Mineral Resource model used for pit optimisation (if appropriate). The mining dilution factors, mining recovery factors, and minimum mining widths used and the infrastructure requirements of the selected mining methods.</i>
<i>Metallurgical factors or assumptions</i>	<i>The metallurgical process proposed and the appropriateness of that process to the style of mineralisation. Whether the metallurgical process is well-tested technology or novel in nature. The nature, amount and representativeness of metallurgical testwork undertaken and the metallurgical recovery factors applied. Any assumptions or allowances made for deleterious elements. The existence of any bulk sample or pilot scale testwork and the degree to which such samples are representative of the orebody as a whole.</i>
<i>Cost and revenue factors</i>	<i>The derivation of, or assumptions made, regarding projected capital and operating costs. The assumptions made regarding revenue including head grade, metal or commodity price(s), exchange rates, transportation and treatment charges, penalties, etc. The allowances made for royalties payable, both Government and private.</i>
<i>Market assessment</i>	<i>The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future. A customer and competitor analysis along with the identification of likely market windows for the product. Price and volume forecasts and the basis for these forecasts. For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.</i>

<i>Others</i>	<i>The effect, if any, of natural risk, infrastructure, environmental, legal, marketing, social or governmental factors on the likely viability of a project and/or on the estimation and classification of the Ore Reserves. The status of titles and approvals critical to the viability of the project, such as mining leases, discharge permits, government and statutory approvals.</i>
<i>Classification</i>	<i>The basis for the classification of the Ore Reserves into varying confidence categories. Whether the result appropriately reflects the Competent Person(s)' view of the deposit. The proportion of Probable Ore Reserves which have been derived from Measured Mineral Resources (if any).</i>
<i>Audits or reviews</i>	<i>The results of any audits or reviews of Ore Reserve estimates.</i>
ESTIMATION AND REPORTING OF DIAMOND MINERALISATION (criteria listed in the first group, and where relevant in other preceding groups, apply also to this group)	
<i>Primary rock source</i>	<i>Primary sources of diamonds in nature are variable and complex. Accordingly, information relating to primary sources should contain details of the nature of the rock type together with its form, shape and size.</i>
<i>Diamond value</i>	<i>Diamond valuation is a highly specialised process and is only possible on parcels containing appropriate numbers of macrodiamonds. It is not possible to evaluate diamond quality from microdiamonds. Classification of diamonds as, for example, gem, near gem and industrial should be made by recognised experts who should be identified in the valuation report and their independence stated. The number of stones, the total carat weight and size range for the parcel valued should be stated.</i>
<i>Secondary rock source</i>	<i>Secondary sources of diamonds in nature, including alluvial deposits, are variable and complex. Accordingly, information relating to secondary sources should contain details of the nature of the geological environment together with its form, age and size.</i>
<i>Microdiamonds</i>	<i>Current practice in Australia defines microdiamonds as diamonds which will pass through a screen with 0.4 mm aperture, ie. diamonds weighing less than 0.001 carats. Reports of microdiamond recoveries should specify both the number of stones recovered and the top and bottom screen or crushing sizes used in the recovery process.</i>
<i>Macrodiamonds</i>	<i>Macrodiamonds are defined as diamonds larger than 0.4 mm in size. Reports of macrodiamond recoveries should specify both the number of stones and the total carat weight recovered above a specified screen size.</i>
<i>Indicator minerals</i>	<i>Conventional indicator minerals include garnet, ilmenite, chrome spinel and chrome diopside having the requisite chemical and physical attributes that distinguish them from otherwise similar minerals found in non-diamond associated rock types. Reports of indicator minerals should be prepared by a suitably qualified laboratory.</i>
<i>Sampling parameters</i>	<i>Reported discoveries of diamonds or indicator minerals from all samples must be accompanied by details of the sampling parameters and sampling equipment used. Type of sample (stream sediment, soil, bulk, rock etc.) as well as sample size, sample density and screening or jigging parameters are required.</i>
<i>Cut-off grades</i>	<i>Assumptions regarding cut-off grades should specify minimum screen size.</i>
<i>Carat</i>	<i>One fifth (0.2) of a gram (often defined as a metric carat or MC).</i>
<i>Grades</i>	<i>Internationally, diamond grades for primary deposits are stated both in carats per tonne and carats per 100 tonnes. The Joint Ore Reserves Committee recommends the use of carats per tonne. In the case of alluvial deposits, industry practice is to quote grades in carats per tonne or carats per cubic metre. Volumes: state bank or loose cubic metres and basis of volume to tonnage conversions.</i>

APPENDIX 1

THE JORC CODE AND AUSTRALASIAN STOCK EXCHANGES

The Australian and New Zealand Stock Exchanges ('ASX' and 'NZSX') 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 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 NZSX. The guidelines in this section of the Code which paraphrase these requirements should not be used as a replacement for the relevant listing rules, and 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.

ASX listing rules require the Competent Person(s), on whose work the Public Report of 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 also to Clause 8 of the Code.

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 Mineral Resources or Ore Reserves is based on information compiled by (insert name of Competent Person), who is a Fellow or Member of The Australasian Institute of Mining and Metallurgy or the Australian Institute of Geoscientists (select as appropriate)": 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 Mineral Resources or Ore Reserves is based on information compiled by (insert name of Competent Person), who is a Fellow or Member of The Australasian Institute of Mining and Metallurgy or the Australian Institute of Geoscientists (select as appropriate)".

- 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)".

- For all reports:*

"(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 1999 Edition of the "Australasian Code for Reporting of Mineral Resources and Ore Reserves". (Insert name of Competent Person) consents to the inclusion in the report of the matters based on their information in the form and context in which it appears".