

**PERC REPORTING STANDARD 2017**  
**PAN-EUROPEAN STANDARD FOR REPORTING OF**  
**EXPLORATION RESULTS, MINERAL RESOURCES AND RESERVES**  
**("THE PERC REPORTING STANDARD")**

The Pan-European Reserves and Resources Reporting Committee (PERC asbl)  
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**Table of contents**

1	Foreword .....	2
2	Introduction .....	2
3	Competence and Responsibility .....	8
4	Reporting Terminology.....	13
5	Reporting General.....	14
6	Reporting of Exploration Results .....	18
7	Reporting of Mineral Resources .....	23
8	Reporting of Mineral Reserves .....	31
9	Reporting of Mineralised Fill, Pillars, Low Grade Mineralisation, Stockpiles, Dumps and Tailings.....	40
10	Reporting of Exploration Results, Resources and Reserves for Coal .....	41
11	Reporting of Exploration Results, Mineral Resources and Mineral Reserves for Diamonds .....	43
12	Reporting of Exploration Results, Mineral Resources and Mineral Reserves for Industrial Minerals, Cement Feed Materials and Construction Raw Materials .....	46
13	Reporting of Exploration Results, Mineral Resources and Mineral Reserves for Oil Shales, Oil Sands, and other energy minerals extracted by mining methods .....	48
14	Reporting of Exploration Results, Mineral Resources and Mineral Reserves for Metallic or Non-Metallic Minerals extracted by solution mining methods .....	49
15	Disclosure of Exploration Results, Mineral Resources and Mineral Reserves for Dimension Stone, Ornamental and Decorative Stone .....	51
16	Disclosure of Estimates of Mining and Other Waste Materials of Potential Economic Value .....	54
17	Disclosure of Previously Reported Estimates.....	56
18	Aggregation of estimates from multiple deposits .....	56
19	Non-Public Reporting.....	57
	TABLE 1 - CHECK LIST OF ASSESSMENT AND REPORTING CRITERIA .....	59
	APPENDIX 1 - GENERIC TERMS AND EQUIVALENTS.....	83
	APPENDIX 2 - RULES OF CONDUCT AND GUIDELINES .....	85
	APPENDIX 3 - HISTORICAL NOTES.....	87
	APPENDIX 4 - COMPETENT PERSON'S CONSENT STATEMENT .....	88
	APPENDIX 5 - RECOGNISED PROFESSIONAL ORGANISATIONS (RPOs) .....	91
	APPENDIX 6 - NON-PUBLIC REPORTING .....	92

# 1 Foreword

- 1.1 The Pan European Reserves and Resources Reporting Committee (PERC) Standard for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (further referred to as 'the Standard') sets out minimum standards, recommendations and guidelines for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves in Europe. The history of development of this standard is summarised in Appendix 3.
- 1.2 Compliance in reporting with this Standard is part of the code of conduct of each Participating Organization as listed in Appendix 5.
- 1.3 This 2017 edition of the PERC Reporting Standard supersedes all previous editions and standards (including The Reporting Code, the IMM Reporting Code, the PERC Code, the PERC Standard 2013, and the Recommended Rules for Public Reporting of Exploration Results, Surveys, Feasibility Studies and Estimates of Mineral Resources and Mineral Reserves in Sweden, Finland and Norway).

# 2 Introduction

- 2.1 In this edition of the PERC Reporting Standard, definitions are provided in numbered highlighted boxes. The definitions are a core element of the PERC Reporting Standard and are consistent with the definitions contained in the CRIRSCO Template<sup>1</sup>.
- 2.2 Normal text contains other mandatory elements of the Standard, in numbered paragraphs.
- 2.3 Guidance and further interpretation are placed after the respective Standard paragraphs in boxes. They are intended to provide assistance and guidance to users in interpreting the application of the paragraphs in the Standard.
- 2.4 Table 1, and Appendices 1, 2 and 6 provide additional guidance.
- 2.5 The PERC Reporting Standard has been adopted by the Participating Organisations that comprise PERC (and as defined in the PERC Statutes), to be applied within the respective member countries of these organisations. The Standard is binding on the individual members of the Participating Organisations. These rules are subject to national laws and regulations and to laws and regulations of the European Union as and when appropriate.

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<sup>1</sup> The Committee for Mineral Reserves International Reporting Standards, or CRIRSCO, published an International Reporting Template which integrates the minimum standards being adopted in national reporting standards and codes worldwide with recommendations and interpretive guidelines for the Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves

<b>Guidance</b>	<p><i>The PERC Standard relates to the Public Reporting of Exploration Results, Mineral Resources or Mineral Reserves. Such Public Reports are typically released by the directors of the reporting company and must be based on the work of a Competent Person. The Competent Person (or persons) will prepare the supporting documentation on which the Public Report is based and confirm that the Public Report released by the company for which they are working (either as an employee, contractor or advisor) is approved by them as indicated in paragraph 3.2 below.</i></p> <p><i>Consequently, the Competent Person should use the definitions, instructions and guidelines in the Standard to guide the work done, and the documentation prepared to support the Public Report. In circumstances where it is necessary to use non-Standard terminology or approaches not otherwise in accordance with the Standard (e.g. for internal reports, reports to government agencies, etc. as considered in Appendix 6) this must be clearly indicated in the supporting documents so as to avoid non-compliant Public Reporting.</i></p>
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- 2.6 Throughout the Standard, 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, the generic terms are listed in Appendix1 together with other terms that may be regarded as synonymous for the purposes of this Standard.

<b>Guidance</b>	<p><i>The use of a particular term throughout this document does not signify that it is preferred or necessarily the ideal term in all circumstances. A typical example is where mining is referred to as quarrying when stone and aggregates and mineral raw materials are involved. Competent Persons would be expected to select and use the most appropriate terminology for the commodity or activity being reported.</i></p>
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- 2.7 Appendix 2 provides Rules of Conduct for Mineral Resource and Mineral Reserve estimators that should be considered in addition to the Codes of Ethics normally applying to members of professional institutions.

## Public Reports

2.8	<p><b>Definition</b></p> <p><b>Public Reports are reports prepared for the purpose of informing investors or potential investors and their advisers on <u>Exploration Results</u>, <u>Mineral Resources</u> or <u>Mineral Reserves</u>.</b></p> <p><b>They include, but are not limited to annual and quarterly company reports, press releases, information memoranda, technical papers, website postings and public presentations.</b></p>
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- 2.9 The intent of the Standard 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 Public Report, for the purpose of making of a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Mineral Reserves being reported.

## Principles of PERC

- 2.10 The main principles governing the operation and application of the Standard are transparency, materiality, competence, and impartiality.
- 2.11 Transparency requires that the reader of a Public Report is provided with sufficient information, the presentation of which is clear and unambiguous.
- 2.12 Materiality requires that a Public Report contains all the relevant information available at the date of disclosure, which investors and their professional advisers would reasonably require, and reasonably expect to find in a Public Report, for the purpose of making a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Mineral Reserves being reported.
- 2.13 Competence 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 and rules of conduct.
- 2.14 Impartiality requires that the author of the Public Report is satisfied and able to state without any qualifications that his work has not been unduly influenced by the organisation, company or person commissioning a Public Report or a report that may become a Public Report; that all assumptions are documented; and that adequate disclosure is made of all material aspects, including any relevant direct or indirect relationship (such as employment or ownership of shares) between the Competent Person and the owners of the project on which he or she is reporting, that the informed reader may require to make a reasonable and balanced judgement thereof.

## Public Reports and the PERC Standard

- 2.15 Companies are encouraged to provide information in their Public Reports, which is as comprehensive as possible. A company's economic interest in the project must be declared. Previously reported information does not need to be repeated in new reports but the earlier published information must be clearly referred to, and must be available on the company website or in other easily accessible form.
- 2.16 The Standard also applies to the following reports if they have been prepared for the purpose of Public Reporting of, or if they include, Exploration Results, Mineral Resources estimates, or Mineral Reserves estimates:
- environmental statements;

- information memoranda;
- expert reports; and,
- technical papers referring to Exploration Results, Mineral Resources or Mineral Reserves.

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

2.18 The technical and scientific basis for the estimates of mineral resources and mineral reserves (as defined below) shall be well-documented and organised in a satisfactory manner so as to ensure that the estimates can be clearly understood.

<b>Guidance</b>	<p><i>It is recognised that companies can be required to issue reports in more than one regulatory jurisdiction, with compliance standards that may differ from this Standard. It is recommended that such reports include a statement alerting the reader to this situation. Where members of Participating Organisations are required to report in other jurisdictions, they are obliged to comply with the requirements of those jurisdictions, as well as complying with the minimum standards set out in this Standard if those minimum standards differ from those in the local code or standard.</i></p> <p><i>Reference in the Standard to 'documentation' is to internal company documents prepared as a basis for, or to support, a Public Report.</i></p> <p><i>Any results published should also be made available on the company's website immediately after their being made public in any other form.</i></p> <p><i>All press releases should always be available on the company website as long as the project is being worked on but is not in production.</i></p> <p><i>All public information should include clear reference to the company website.</i></p> <p><i>It is recognised that situations may arise where documentation prepared by Competent Persons (refer to the definition at paragraph 3.1 below) for internal company or similar non-public purposes does not comply with the Standard. In such situations it is recommended that any such 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 the Standard requires Public Reports to fairly reflect Exploration Results, Mineral Resource and/or Mineral Reserve estimates, and supporting documentation, prepared by a Competent Person.</i></p> <p><i>While every effort has been made within the Standard to cover most situations likely to be encountered in Public Reporting, there may be</i></p>
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*occasions when doubt exists as to the appropriate form of disclosure. On such occasions, users of the Standard and those compiling reports to comply with the Standard 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 of a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Mineral Reserves being reported.*

*Estimation of Mineral Resources and Mineral Reserves is inherently subject to some level of uncertainty and inaccuracy. Considerable skill and experience may be needed to interpret pieces of information, such as geological maps and analytical results, based on samples that commonly only represent a small part of a mineral deposit. The uncertainty in the estimates should be discussed in documentation and, where material, in Public Reports, and reflected in the appropriate choice of Mineral Reserve and Mineral Resource categories.*

## Application of the PERC Standard

2.19 The Standard is applicable to all solid mineral raw materials for which Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves is required by the relevant regulatory authorities. Solid raw materials include (but are not limited to:

- diamonds and other gemstones;
- metalliferous minerals
- industrial minerals;
- cement feed materials and construction raw materials;
- other mineral raw materials; and,
- coal.

2.20 Mineral-specific guidelines may be developed from time to time and read in conjunction with the Standard to assist in its interpretation. Such guidelines will not take precedence over the Standard.

## Matters to be considered in reporting

2.21 Table 1, included at the end of the Standard, supplies an outline of items that should be considered when evaluating a minerals project. The importance of each item will vary with the specific project and it is recognised that, for some projects, other items may be relevant which are not included on the list.

2.22 Table 1 should be considered as a guide to facilitate a reasoned and balanced approach to reporting. However, many decisions, such as the classification of

material as a Mineral Resource or a Mineral Reserve, remain a matter of professional judgement based on knowledge, experience and industry practices.

- 2.23 Public disclosure is required of those items in Table 1 most likely to affect the accuracy of estimates made in the report. The authors of reports should both identify and evaluate these important factors in their reports.
- 2.24 The technical and scientific information and supporting documentation shall be prepared in accordance with the content of this Standard and the guidelines in Table 1. Reporting in accordance with this Standard does not absolve the company issuing the report from its responsibility for the information published.
- 2.25 The compilation, assessment, and Public Reporting of Table 1 must be undertaken for (i) the first-time declaration of Exploration Results, a Mineral Resource or a Mineral Reserve, and (ii) in instances where these items have materially changed from when they were last Publicly Reported for significant projects.
- 2.26 In the context of complying with the principles of the PERC Standard, the Competent Person should consider all of the items in the relevant sections of Table 1 on an ‘if not, why not’ basis within the supporting documentation. The Competent Person should complete an overall assessment of the relative importance of the Table 1 items in terms of their possible impact on the future development of the mineral project and the results of this assessment should be presented in the Public Report.

<b>Guidance</b>	<p><i>For the purposes of the PERC Standard the phrase ‘if not, why not’ means that each item listed in the relevant section of Table 1 should be discussed in the supporting documentation, and if it is not discussed then the Competent Person should explain why it has been omitted from the documentation. Reporting on an ‘if not, why not’ basis ensures that it is clear to readers as to whether items have been considered and deemed of low consequence or are not yet addressed or resolved.</i></p> <p><i>A material change could be a change in the estimated tonnage or grade or in the classification of the Mineral Resource or Mineral Reserve. A material change in relation to a significant project should be considered by taking into account all of the relevant circumstances, including the understanding of the deposit and the style of mineralisation, Modifying Factors, etc. This includes considering whether the change in estimates is likely to have a material effect on the price or value of the mineral asset or of the company.</i></p> <p><i>Additional disclosure is particularly important where inadequate or uncertain data affect the reliability of, or confidence in, a statement of Exploration Results (for example, poor sample recovery, poor repeatability of assay or laboratory results, etc.).</i></p> <p><i>By reporting Exploration Results, Mineral Resources and/or Mineral Reserves in terms of the guidelines of the Standard or where reference is made to the Standard, whether reported publicly or not, the Competent</i></p>
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	<p><i>Person takes full responsibility for the declaration. In these instances, a report detailing all aspects of the work shall be prepared that should be available, if requested. The report cannot be reasonably withheld and should be made available within a timeframe relevant to the immediate situation.</i></p>
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## 3 Competence and Responsibility

### Competent Persons

3.1	<b>Definition</b>	<p><b>A Competent Person is a minerals industry professional, defined as a corporate member, registrant or licensee of a recognised professional body (including mutually recognised international professional organisations) with enforceable disciplinary processes including the powers to suspend or expel a member.</b></p> <p><b>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. Acceptable professional bodies and classes of membership under the Standard, which meet these requirements, within Europe or elsewhere (Recognised Professional Organisations - 'RPOs') are listed separately in documents which are specified in Appendix 5 and updated lists which may be published from time to time.</b></p> <p><b>This definition of 'Competent Person' is subject to any additional restrictions or conditions which may be required by the appropriate stock exchange or regulatory authority.</b></p>
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- 3.2 Documentation detailing Exploration Results, Mineral Resource and Mineral Reserve estimates, from which a Public Report is produced, must be prepared by or under the direction of, and signed by, a Competent Person or Persons.

<b>Guidance</b>	<p><i>The terms "Competent Person" and "Qualified Person" are considered synonymous, and wherever the term "Competent Person" is used in this Standard, it is to be understood that "Qualified Person" is an acceptable alternative term.</i></p>
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### Competent Person's Report

3.3	<b>Definition</b>	<p><b>A Competent Person's Report is any report prepared by a Competent Person for a company, and may contain Exploration Results, or estimates of Mineral Resources and/or Mineral Reserves.</b></p>
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- 3.4 A Public Report concerning a company's Exploration Results, Mineral Resources and/or Mineral Reserves is the responsibility of the company acting through its Board of Directors. Any such report must be based on, and fairly reflect the documentation which has been prepared by, a Competent Person or Persons.
- 3.5 A company issuing a Public Report shall disclose the name(s), qualifications, professional affiliation(s), and relevant experience 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, including the effective date, in which it appears.
- 3.6 If there is any direct or indirect relationship between the Company and the Competent Person, for example shares, bonds, or options issued by the Company held by the Competent Person or by members of his or her close family, then this must be disclosed. Such disclosure should be made in the same section of any report as the Competent Person's consent statement.
- 3.7 Where all or part of another Public Report is included in a Public Report, the written approval of that Report's author should be obtained as to the form and context in which that report is to be included.
- 3.8 A standard consent form is provided for the use of Competent Persons in Appendix 4. The structure and wording of this form, or equivalent statement as specified in Appendix 4, is the only acceptable form of Competent Person consent and is to be retained and made available if required by regulatory bodies.

### Competent Person's experience

- 3.9 If the Competent Person is preparing a report on Exploration Targets or on Exploration Results, the relevant experience must be in exploration.
- 3.10 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.
- 3.11 If the Competent Person is estimating, or supervising the estimation of Mineral Reserves, the relevant experience must be in the estimation, assessment, evaluation and economic extraction of Mineral Reserves.
- 3.12 The relevant experience of the Competent Person must also be current and, where practical, continuous within the industry.

**Guidance**

*It is expected that the Competent Person will usually be a geoscientist for reporting Exploration Results or Mineral Resources, but for reporting Mineral Reserves may be qualified in other fields such as mining*

*engineering or mineral processing.*

*Paragraph 5.9 of the PERC Reporting Standard requires that reporting of Mineral Reserves is supported by a study to at least the level of a Pre-Feasibility feasibility study. It is understood that the estimation and reporting of Mineral Reserves is a sub-set of the activities completed in the course of such studies and the Competent Person is not expected to be an expert in, or report in detail on, all of the aspects covered. Nevertheless, the Competent Person involved in estimating Mineral Reserves relies on information generated by other specialists about aspects such as geotechnical and hydrogeological conditions, operating and capital costs, etc., in order to apply the Modifying Factors for conversion of Mineral Resources to Mineral Reserves. As such the Mineral Reserves Competent Person must have sufficient experience to make a judgement as to whether the information provided is acceptable.*

*The Competent Person may of course have relevant qualifications or experience in more than one field or type of work.*

*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 relevant.*

*As a second example, to qualify as a Competent Person in the estimation of Mineral 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.*

*Similarly, sulphidic nickel deposits form a type of their own with nickel being distributed between silicate and sulphide minerals, only the latter being economically extractable. Experience with other types of sulphide deposits may not have given sufficient background in evaluating nickel deposits.*

*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 as much as 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*

	<p><i>count towards the experience in relation to porphyry copper deposits.</i></p> <p><i>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. Appropriate appreciation of extraction and processing techniques applicable to that deposit type may also be important.</i></p> <p><i>Those 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.</i></p> <p><i>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 Mineral Reserves is very commonly a team effort involving several technical disciplines.</i></p> <p><i>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 Mineral Reserve documentation, that person is responsible and accountable for the whole of the documentation under the Standard. It is important in this situation that the Competent Person accepting overall responsibility for a Mineral Resource or Mineral Reserve estimate and supporting documentation prepared in whole or in part by others, is satisfied that the work of the other contributors is acceptable.</i></p> <p><i>In particular, if the Competent Person is not fully responsible for the production of the resource and reserve estimates, he or she should take reasonable steps to ensure that he or she fully understands all of the estimation work, including visits to site and personal verification of the data. The Competent Person should not rely implicitly on the word of others.</i></p>
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## Complaints

- 3.13 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.

<b>Guidance</b>	<i>When a European Stock Exchange listed company with interests outside Europe wishes to report Exploration Results, Mineral Resources or</i>
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*Mineral Reserve estimates for such interests that are prepared by a person who is not a member of a recognised professional organisation (as defined in definition paragraph 3.1 above), it is necessary for the company to nominate a Competent Person or Persons to take responsibility for the Exploration Results, Mineral Resource or Mineral 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 the Stock Exchange's listing rules and should not treat the procedure merely as a 'rubber-stamping' exercise.*

*Rules, regulations or guidelines concerning the Competent Person differ from one jurisdiction to another. It is the responsibility of the Competent Person and the entity making a public report to ensure that the applicable rules, regulations and guidelines are followed.*

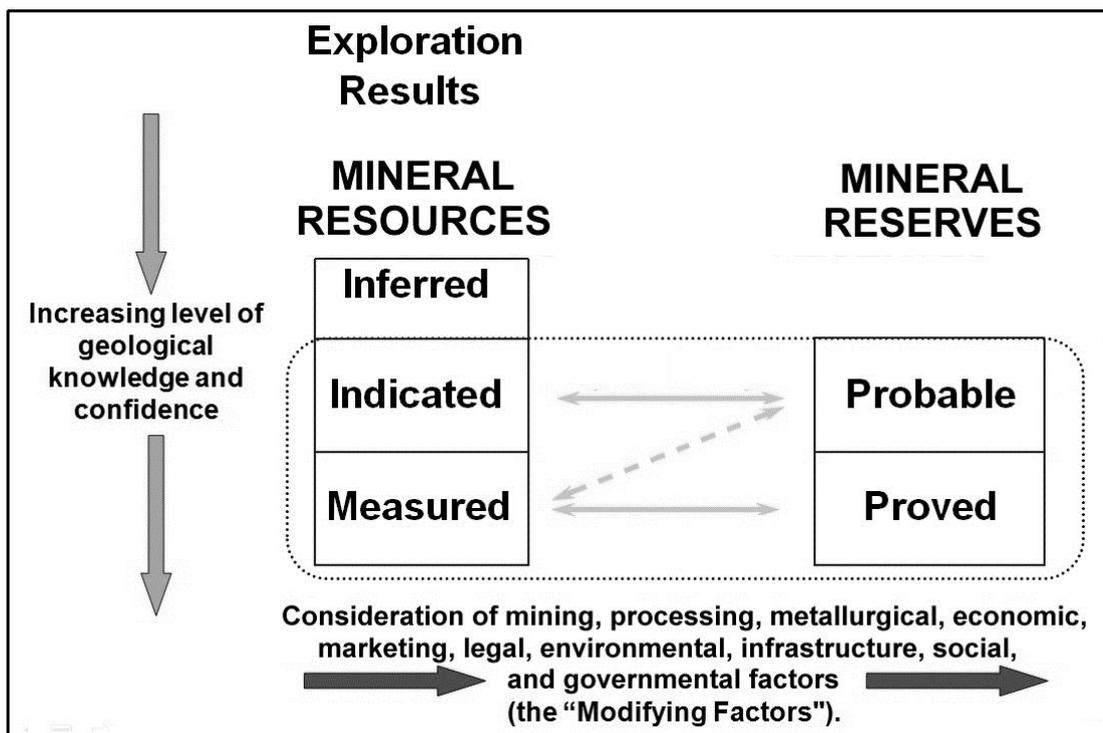
*Failure to adhere to the standards of professional conduct set out in the relevant Professional Codes of Ethics or Rules of Conduct and Guidelines can lead to disciplinary action and, in certain circumstances, to expulsion from the institution concerned. Complaints made in respect of the professional work of a Competent Person will be considered in terms of the Professional Code of Ethics or Rules of Conduct and Guidelines of the institution of which the Competent Person is a member, and will be dealt with by the relevant disciplinary procedures.*

*When the company does not have any production history and a Public Report concerns a significant proportion of the company's total assets such that its contents are likely to have a major impact on the market valuation of the company, the Competent Person preparing the report should be independent of the company.*

## 4 Reporting Terminology

### Defined terms

- 4.1 Public Reports dealing with Exploration Results, Mineral Resources and/or Mineral Reserves must only use the terms set out in Figure 1 below:



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

<b>Guidance</b>	<p><i>Figure 1 sets out the framework for classifying tonnage and grade or quality estimates in order to reflect different levels of geological confidence and different degrees of technical and economic evaluation.</i></p> <p><i>Mineral Resources can be estimated on the basis of geological information with some input from other relevant disciplines.</i></p> <p><i>Mineral Reserves are a modified sub-set of the Indicated and Measured Mineral Resources (shown in the dashed outline in Figure 1).</i></p> <p><i>The conversion of Mineral Resources to Mineral Reserves requires consideration of factors affecting extraction ('Modifying Factors'), and should generally be estimated with input from a range of disciplines, and always with consideration of the range of factors.</i></p> <p><i>In certain situations, Measured Mineral Resources could convert to Probable Mineral Reserves because of uncertainties associated with</i></p>
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<p><i>modifying factors that are taken into account in the conversion from Mineral Resources to Mineral Reserves. This relationship is shown by the broken arrow in Figure 1. <b>Although the trend of the broken arrow includes a vertical component, it does not imply a reduction in the level of geological knowledge or confidence.</b> In such a situation the changes in modifying factors should be fully explained. Refer also to the guidelines to section 7 below.</i></p> <p><i>It is possible that previously reported Mineral Reserves could convert back to Mineral Resources because of new information affecting the Modifying Factors. This two-way relationship is indicated by two-headed arrows in Figure 1.</i></p> <p><i>The changes in the Modifying Factors that cause such a conversion should be fully explained. Refer further to the guidelines to section 8 below.</i></p> <p><i>An exception to the guidance in this clause is allowed for when reporting an Exploration Target in the context of Public Reporting of Exploration Results as explained in Section 6 below. It is important to make clear in any Public Reports that Exploration Targets are conceptual in nature and are not directly comparable with estimates of Mineral Resources or Mineral Reserves.</i></p>
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- 4.2 Definitions and guidance on reporting of Exploration Results, Mineral Resources and Mineral Reserves are provided in Sections 6, 7 and 8 respectively.

## Modifying Factors

4.3	<b>Definition</b>	<b>'Modifying Factors' are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.</b>
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- 4.4 Modifying Factors also include any other factors which impact on the feasibility of the project.

## 5 Reporting General

- 5.1 Public Reports may be issued at various stages of the development of a mining project. Irrespective of the stage of development, all Public Reports concerning a company's Exploration Results, Mineral Resources or Mineral Reserves must include a description of the style and nature of mineralisation.
- 5.2 Public Reports may include, but not be limited to, information included in or supported by:

- Scoping studies
- Pre-feasibility studies
- Feasibility studies

## Scoping Study

5.3	<b>Definition</b>	<b>A Scoping Study is an order of magnitude technical and economic study of the potential viability of Mineral Resources 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.</b>
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- 5.4 If a Scoping Study is partially supported by Inferred Mineral Resources, the Competent Person must declare what proportion of the Scoping Study is supported by Inferred Resources. For all Scoping Studies, the report must also include a cautionary statement in the same paragraph as, or immediately following, the disclosure of the Scoping Study, such as in the following example:

*“The Scoping Study referred to in this report is based on low confidence level technical and economic assessments, and is insufficient to support estimation of Mineral 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.”*

## Pre-feasibility Study

5.5	<b>Definition</b>	<p><b>A Pre-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 open pit, is established and an effective method of mineral processing is determined.</b></p> <p><b>A Pre-feasibility Study is at a lower confidence level than a Feasibility Study.</b></p>
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- 5.6 A Pre-feasibility Study should include a financial analysis based on reasonable assumptions of 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 Mineral Reserve at the time of reporting.

## Feasibility Study

5.7	<p><b>Definition</b></p> <p><b>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).</b></p> <p><b>The confidence level of a Feasibility Study will be higher than that of a Pre-Feasibility Study.</b></p>
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- 5.8 The results of a Feasibility Study should be prepared to a sufficient level of confidence to 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.

### Level of study necessary and disclosure

- 5.9 The PERC Reporting Standard does not require that a full Feasibility Study has been undertaken to convert Mineral Resources to Mineral Reserves, but it does require that at least a Pre-feasibility study will have been carried out that will have included a mine plan that is technically achievable and economically viable, and demonstrates that all Modifying Factors have been considered.

<b>Guidance</b>	<p><i>Mineral Reserves can be reported for operating mines provided that they are supported by a mine plan that is technically achievable and economically viable, and that the Modifying Factors used are supported by recent operational experience and outcomes.</i></p>
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- 5.10 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 Mineral Reserves.

<b>Guidance</b>	<p><i>Public Reports are prepared for different reasons and may contain more or less detail according to their intended purpose and readership. The contents of a Public Report should be determined by the Competent Person to be appropriate for its use on the basis of relevance (materiality) and, where appropriate, backup documentation (such as audit reports) should be referred to or made available.</i></p>
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- 5.11 As part of the disclosures and preparation of Public Reports in line with the requirements of paragraphs 2.21 to 2.25 above, reports should consider an assessment of the critical risks to geometry, grade/quality, tonnage, or contained metal or product in the estimated Mineral Resources or Mineral Reserves. Risks associated with uncertainties in the Modifying Factors should be identified. Opportunities for expanding the Mineral Resource or Mineral Reserves or for reducing the uncertainty of the Modifying Factors should also be discussed where relevant.
- 5.12 Public Reports should discuss environmental, social (sustainability), and health and safety impacts that are expected during development, operation and after closure. These impacts will affect employees, contractors, neighbouring communities, and customers. Past achievements should be used to engage all stakeholders and to plan for continued benefits for all concerned parties.

<b>Guidance</b>	<p><i>The Competent Person should ensure the report discusses reasonably available information on environmental, permitting, and social or community factors related to the project. Consideration should be given to include, where relevant:</i></p> <ul style="list-style-type: none"> <li>• <i>a summary of the results of any environmental studies and a discussion of any known environmental issues that could materially impact the issuer's ability to extract the mineral resources or mineral reserves;</i></li> <li>• <i>requirements and plans for waste and tailings disposal, site monitoring, and water management both during operations and post mine closure;</i></li> <li>• <i>project permitting requirements, the status of any permit applications, and any known requirements to post performance or reclamation bonds;</i></li> <li>• <i>a discussion of any potential social or community related requirements and plans for the project and the status of any negotiations or agreements with local communities;</i></li> <li>• <i>a discussion of mine closure (remediation and reclamation) requirements and costs; and,</i></li> <li>• <i>"Conflict Minerals" should be considered and addressed.</i></li> </ul>
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- 5.13 Companies must review and publicly report on their Exploration Results, Mineral Resources and/or Mineral Reserves at least annually, and the effective date of each Mineral Resource and Mineral Reserve statement must be stated.
- 5.14 Companies which are producing minerals must also report on annual reconciliation of estimates of Mineral Resources and Mineral Reserves against actual production from the same volume of ground. This should enable quantification of the actual conversion rate of reported Mineral Resources and Mineral Reserves into saleable mineral products.

<b>Guidance</b>	<p><i>Reviews of Mineral Resources and Mineral Reserves should include the relevance of current technical and economic conditions compared to those which may have been applied when the Mineral Resources and Reserves were estimated.</i></p> <p><i>If necessary, technical and economic studies including Pre-feasibility and Feasibility studies should be updated. Pre-feasibility and Feasibility studies are defined in paragraphs 5.5 and 5.7 respectively.</i></p> <p><i>Reporting reconciliations of estimates against actual production provides the most accurate measure of the accuracy of resource and reserve estimation procedures and the effectiveness of a minerals company's estimating, planning, and production procedures.</i></p> <p><i>For mines that are already in production, information on the project or the deposit being investigated shall be reported in such a way as not to give cause to erroneous conclusions that the development is in a start-up phase.</i></p> <p><i>Companies engaged in mine development should avoid information that can lead to erroneous conclusions that the project is actually in operation. It is very important to state clearly what is in operation at the time of reporting and what is in the planning stage for the project.</i></p>
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## 6 Reporting of Exploration Results

6.1	<p><b>Definition</b></p> <p><b>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 Mineral Reserves.</b></p>
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6.2 Exploration Results may not be part of a formal declaration of Mineral Resources or Mineral Reserves, and must not be presented in a way that unreasonably implies the discovery of potentially economic mineralisation.

<b>Guidance</b>	<p><i>Reporting of Exploration Results is common in the early stages of exploration when the quantity of data available is generally not sufficient to allow any reasonable estimates of tonnage and grade or quality to be made. Examples include discovery outcrops, single drill hole intercepts or the results of geophysical or geochemical surveys.</i></p> <p><i>Descriptions of Exploration Results or exploration potential given in Public Reports should be expressed so as not to misrepresent them as an estimate of Mineral Resources or Mineral Reserves.</i></p> <p><i>It should be made clear in Public Reports that contain Exploration Results</i></p>
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	<p><i>that it is inappropriate to use such information to derive estimates of tonnage and grade or quality (because if there were sufficient information to do so, the resulting estimates would have been quoted).</i></p> <p><i>It is recommended that such reports carry a continuing statement along the following lines:</i></p> <p><i>"The information provided in this report/statement/release constitutes Exploration Results as defined in the PERC Reporting Standard, paragraph 6.1. It is inappropriate for the reader to use the information presented for deriving estimates of tonnage and grade or quality".</i></p>
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6.3 Public Reports of Exploration Results relating to mineralisation not classified as a Mineral Resource or Mineral Reserve must contain sufficient information to allow a considered and balanced judgement of the significance of the results and should include both positive and negative findings.

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

<b>Guidance</b>	<p><i>If true widths of mineralisation are not reported, an appropriate qualification must be included in the Public Report.</i></p> <p><i>Exploration Results should include an explanation of sampling techniques and data, land tenure status, geology and mineralisation and other relevant information.</i></p> <p><i>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:</i></p> <ul style="list-style-type: none"> <li>• <i>either by listing all results, along with sample intervals (or size, in the case of bulk samples); or,</i></li> <li>• <i>by reporting weighted average grades or qualities of mineralised zones, indicating clearly how the grades or qualities were calculated.</i></li> </ul> <p><i>When reporting assay results the analytical technique used should be indicated with discussion of its relevance to assessment of the extractability of the element concerned.</i></p> <p><i>Exploration data and information may include survey, geological, geophysical, geochemical, sampling, drilling, trenching, analytical testing, assaying, mineralogical, metallurgical and other information, where available. At least some physical evidence of assumed continuity of the Mineralisation on the property of interest must be presented by the Competent Person.</i></p> <p><i>Whenever possible, information shall be presented in tables together with</i></p>
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	<i>maps, profiles, long sections and estimated true width of the mineralized zones, as well as information on the current stage of development of the project.</i>
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- 6.5 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.

<b>Guidance</b>	<i>Table 1 is a check list and guideline to which those preparing reports on Exploration Results, Mineral Resources and Mineral 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.</i>
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- 6.6 Public Reports concerning a company's exploration results must disclose the source of the results if these results were not generated by the company itself.

<b>Guidance</b>	<p><i>Historical data and information may also be included if, in the considered opinion of the Competent Person, it is relevant and reliable, giving reasons for such conclusions.</i></p> <p><i>The data and information may be derived from adjacent or nearby properties if the Competent Person can provide justification of continuity for such an association. The actual data and/or information must be appropriately described and presented where not already in the public domain.</i></p> <p><i>Apart from reporting the results of exploration activities, described in more detail below, Public Reports must always include a description of the geological setting of the mineralisation. Such a description shall include information on potential problems with sampling or analytical results such as nugget effects or anticipated metallurgical problems.</i></p>
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- 6.7 When a company publishes information concerning projects that will be quoted as Exploration Results, these shall include a detailed description of the work completed, e.g. sampling and measuring techniques and spacing between data points.

<b>Guidance</b>	<p><i>Whenever possible, there shall be a complete description of drill hole intersections and of the true widths of the mineralized zones. If grades have been corrected using statistical methods, the report shall contain information on the motive for such a procedure and a description of it.</i></p> <p><i>The company shall report if independent samples have been/will be taken or if a review has been/will be carried out. In such cases, the report must contain the name of the person in charge of the procedure and the</i></p>
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	<p><i>person's qualifications.</i></p> <p><i>Details of such a verification program shall be made public and contain information about sampling techniques, location and number of samples taken, including any deviations from results that have been published earlier. Reference to a recognised Quality Assurance/Quality Control protocol or standard is essential.</i></p> <p><i>The name of the laboratory responsible for analysing samples, the assay methods used, and the laboratory's level of accreditation for the assay method used must be reported. If the assay methods used are not generally established, an explanation shall be given. Quality Control procedures and Quality Assurance for the assays shall be described.</i></p>
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## Exploration Targets

- 6.8 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.

<b>Definition</b>	<b>An Exploration Target is a statement or estimate of the exploration potential of a mineral deposit in a defined geological setting where the statement or estimate, quoted as a range of tonnes and a range of grade or quality, relates to mineralisation for which there has been insufficient exploration to estimate Mineral Resources.</b>
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- 6.9 An Exploration Target is a conceptual estimate with respect to type, quantity and quality of mineralisation, which would be of interest to an exploration or mining company. There must be a reasonable expectation that this exploration target occurs in an area of geological prospectivity for the commodity and mineralisation type of interest.
- 6.10 An Exploration Target need not represent any discovered Mineralisation, nor does it imply reasonable prospects for eventual economic extraction. Exploration Targets are therefore not included in Figure 1, and are considered a sub-set of Exploration Results.
- 6.11 Any 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 Mineral Reserve. The terms Resource or Reserve must not be used in this context.
- 6.12 Any statement referring to potential quantity, quality and content, as appropriate, must be substantiated and include a detailed explanation of the basis for the statement and a proximate statement, with the same prominence, that the potential quantity, quality and content, as appropriate, are conceptual in nature, that there has

been insufficient exploration to define a Mineral Resource and that it is uncertain if further exploration could result in the determination of a Mineral Resource.

- 6.13 A cautionary statement may not be by way of a footnote and a general disclaimer elsewhere in the disclosure document will not satisfy this requirement.

<b>Guidance</b>	<i>'Same prominence' is defined as the same font type and size, and 'proximate location' is defined as the cautionary statement being included in the same paragraph as or immediately following the reported Exploration Target details.</i>
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- 6.14 Given the level of uncertainty surrounding the supporting data, an Exploration Target tonnage or grade or quality must not be reported as a 'headline statement' in a Public Report.
- 6.15 If a Public Report includes an Exploration Target, it is a 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.
- 6.16 If an Exploration Target is shown pictorially or with a graph, it must be accompanied by text which meets the requirements above.
- 6.17 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 information relating to the Exploration Target appears.

<b>Guidance</b>	<p><i>All disclosures of an Exploration Target should clarify whether the target is based on actual exploration completed or on proposed exploration programs yet to commence.</i></p> <p><i>Where the Exploration Target statement includes information relating to ranges of tonnages and grades or qualities these should be represented as approximations.</i></p> <p><i>The explanatory text paragraphs should include a brief description of the process used to determine the grade or quality and tonnage ranges used to describe the Exploration Target.</i></p> <p><i>For an Exploration Target based on completed exploration activities, 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 relevant plans or sections.</i></p> <p><i>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>
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- 6.18 Visual assessments of grade and quantity of a mineralisation shall never be reported.
- 6.19 Observations concerning mineralisation from outcrops, trenching or drill samples shall be described in a clear and careful manner, using such wording as to avoid the uninitiated reader and investor being misled into thinking that the results can be interpreted with the same confidence as assay results.
- 6.20 If independent samples or reviews show results deviating from earlier published results, these results shall be published. Details of such a verification program shall be published, describing sampling techniques, location and number of samples taken, and a comparison with previously presented results.

## 7 Reporting of Mineral Resources

7.1

### **Definition**

**A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction.**

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

7.2 Mineral Resources are subdivided, in order of increasing geological confidence, into the following categories as indicated in Figure 1:

- Inferred Mineral Resources;
- Indicated Mineral Resources; and,
- Measured Mineral Resources.

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

7.4 The Mineral Resource definition and guidelines take precedence over those for the Inferred, Indicated and Measured categories, in that estimates must first satisfy the criteria required for classification as a Mineral Resource before consideration is given to the criteria applicable to each category of Mineral Resource.

### **Guidance**

*The term 'Mineral Resource' covers mineralisation, including dumps and tailings, which has been identified and estimated through exploration and sampling and within which Mineral Reserves may be defined by the consideration and application of Modifying Factors.*

*"Evidence and knowledge" includes sampling of a type and at a spacing appropriate to the geological, chemical, physical, and mineralogical*

*complexity of the mineral occurrence.*

*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 and beneficiation parameters. In other words, a Mineral Resource is not an inventory of all mineralisation drilled or sampled, regardless of cut-off grades, likely mining dimensions, location or continuity, and the useful constituents of a Mineral Resource can be recovered with available mineral processing technology.*

*A Mineral Resource is a realistic inventory of mineralisation, which, under assumed and justifiable technical and economic conditions, might, in whole or in part, become economically extractable.*

*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 many gold deposits, application of the concept would normally be restricted to perhaps 10 to 15 years, and frequently to 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 (e.g. 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 occurrences of the mineral(s) of potential economic interest, including some material that does not have reasonable prospects for eventual economic extraction. Such estimates of mineralisation would not qualify as Mineral Resources or Mineral Reserves under the PERC Reporting Standard and should be accompanied by the appropriate statement to this effect.*

*Where considered appropriate by the Competent Person, Mineral Resource estimates may include material below the selected cut-off grade or quality 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.*

## Inferred Mineral Resource

7.5

### **Definition**

**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 or quality continuity.**

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

7.6

Where Inferred Mineral Resources are extrapolated beyond any sampled region containing data points, the proportion extrapolated must be described and disclosed.

### **Guidance**

*The 'Inferred' category is intended to cover situations where a mineral concentration or occurrence has been identified and limited measurements and sampling have been completed, but where the data are insufficient to allow the geological and/or grade or quality continuity to be confidently interpreted.*

*Due to the uncertainty which may be attached to some Inferred Mineral Resources, it cannot be assumed, but normally would be expected, that a major 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 a reliable evaluation of economic viability. For this reason, there is no direct link from an Inferred Resource to any category of Mineral Reserves (see Figure 1).*

*It is accepted that mine design and mine planning may include a proportion of Inferred Mineral Resources, as described in paragraphs 7.7 to 7.9 below.*

7.7

If the Inferred Mineral Resources category is considered in mine design, planning and/or economic studies, the results of which are publicly reported, full disclosure and the effect on the results of the studies must be stated.

7.8

Inferred Mineral Resources may only be included in mine design, mine planning, and/or economic studies provided that there exists a mine plan and a statement of Mineral Reserves, which states that Inferred Mineral Resources have been used.

Where a material amount of mining in the mine plan includes Inferred Mineral Resources, a comparison of the results with and without these Inferred Mineral Resources must be shown, and the rationale behind their inclusion must be explained.

- 7.9 Modifying factors and assumptions that were applied to the Indicated and Measured Mineral Resources to determine the Mineral Reserves must be equally applied to the Inferred Mineral Resources if these are included within a mine plan, but the Inferred Resource must nevertheless be reported as such, and not as a reserve.

<b>Guidance</b>	<i>For the avoidance, of doubt, it is reiterated that caution should be exercised if this category is considered in technical and economic studies. At the discretion of the Competent Person, a Company may include all or part of its Inferred Mineral Resource for the purpose of internal planning, scoping or strategic studies. Any such reliance on Inferred Resources should be made clear in the report. In such circumstances, the results are not considered to be sufficiently reliable to ensure that all of the Inferred Mineral Resource will eventually become a Mineral Reserve. Any such reliance on Inferred Resources in a mine plan should be made clear in the report. Inferred Mineral Resources cannot be converted to Mineral Reserves, and must not be stated as part of the Mineral Reserve.</i>
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## Indicated Mineral Resource

7.10

<b>Definition</b>	<p><b>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.</b></p> <p><b>Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation.</b></p> <p><b>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 Mineral Reserve.</b></p>
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- 7.11 The Indicated Mineral Resource has sufficient confidence to support, at a Pre-feasibility or more advanced level, mine design, mine planning, and/or economic studies.

<b>Guidance</b>	<i>An Indicated Mineral Resource requires that the nature, quality, amount and distribution of data are such as to allow the Competent Person to confidently interpret the geological framework and to assume geological</i>
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	<p><i>continuity of mineralisation, with sampling at a pattern and spacing appropriate to the geological characteristics and complexity of mineralisation.</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. 'Grade or quality' is to be interpreted broadly, to include all relevant chemical and mineralogical characteristics.</i></p>
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## Measured Mineral Resource

7.12	<b>Definition</b>	<p><b>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.</b></p> <p><b>Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation.</b></p> <p><b>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 Mineral Reserve or to a Probable Mineral Reserve.</b></p>
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- 7.13 A Measured Mineral Resource requires the highest level of confidence in, and understanding of, the geology, mineralogy, mineability and amenability to processing of the mineral deposit.

<b>Guidance</b>	<p><i>The occurrence of mineral(s) of economic interest 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, mineralogy, and grade or quality can be estimated to within close limits, and that any variation from the estimate would be unlikely to significantly affect potential economic viability.</i></p> <p><i>Confidence in the estimate is sufficient to allow the appropriate application of technical and economic parameters and to enable an evaluation of economic viability with a high level of confidence.</i></p>
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## Selection of Mineral Resource reporting category

- 7.14 The choice of the appropriate category of Mineral Resource depends upon the quantity, distribution and quality of data available and the level of confidence attached to the data. The appropriate Mineral Resource category must be determined by a Competent Person.

<b>Guidance</b>	<p><i>Mineral Resource classification is a matter for skilled judgement, and the Competent Person should take into account those items in Table 1 which relate to confidence, accuracy (i.e. lack of bias) and precision (i.e. repeatability) in Mineral Resource estimation.</i></p> <p><i>In deciding between Measured Mineral Resources and Indicated Mineral Resources, the Competent Person may find it useful to consider, in addition to the phrases in the two definitions relating to geological and grade or quality continuity in paragraphs 7.10 and 7.12, 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’.</i></p> <p><i>In many cases it will be understood that overall tonnages, densities, shapes, physical characteristics, grades or qualities and mineral contents can be estimated with higher levels of confidence, and local tonnages, densities, shapes, physical characteristics, grades or qualities and mineral contents can be estimated only with lower levels of confidence, insufficient for detailed mine planning.</i></p> <p><i>‘Overall’ is defined as that part of the deposit for which Measured, Indicated and Inferred Resources are reported. The term ‘local’ means selected parts of the deposit related to mining increments which are suitable for development of mine plans and financial analysis.</i></p> <p><i>In deciding between Indicated Mineral Resources and Inferred Mineral Resources, the Competent Person may wish to take into account, in addition to the phrases in the two definitions in paragraphs 7.10 and 7.12 relating to geological and grade or quality continuity, and the guideline to the definition for Indicated Mineral Resources:</i></p> <p style="padding-left: 40px;"><i>“Confidence in the estimate is sufficient to allow the application of technical and economic parameters and to enable an evaluation of economic viability”.</i></p> <p><i>This contrasts with the guideline to the definition of Inferred Mineral Resources:</i></p> <p style="padding-left: 40px;"><i>“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</i></p>
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	<i>considered in technical and economic studies".</i>
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- 7.15 The Competent Person should also take into consideration issues of mineralisation, style, cut-off grade or quality and scale when assessing geological and grade or quality continuity.
- 7.16 Mineral Resource estimates are not precise calculations, being dependent on the interpretation of limited information relating to the location, shape and continuity of the occurrence and on the available sampling results. Reporting of tonnage and grade or quality 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'.

<b>Guidance</b>	<p><i>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, when rounding to the first significant figure may be necessary to convey properly the uncertainties in estimation. This would usually be the case with Inferred Mineral Resources.</i></p> <p><i>To emphasise the imprecise nature of a Mineral Resource estimate, the final result should always be referred to as an estimate not a calculation.</i></p> <p><i>Competent Persons should, where appropriate, discuss the relative accuracy and/or confidence of the Mineral Resource estimates. The statement should specify whether it relates to global (whole of resource) or local estimates (a subset of the resource for which the accuracy and/or confidence might differ), and, if local, state the relevant tonnage or volume.</i></p> <p><i>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>
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- 7.17 Public Reports of Mineral Resources must specify one or more of the categories of 'Inferred', 'Indicated' or 'Measured'.
- 7.18 Reports must not contain Mineral Resource figures combining two or more of the categories unless figures for the individual categories are also provided.
- 7.19 A Mineral Resource must not be reported in terms of contained mineral content unless corresponding tonnage and grade or quality figures are also presented.
- 7.20 Mineral Resources must not be combined with Mineral Reserves.
- 7.21 Public Reporting of Mineral Resource tonnage and grade or quality outside the categories covered by the Standard is not permitted.

<b>Guidance</b>	<p><i>Often, exploration results will be communicated privately (such as to a landowner or their advisers) in less technical phraseology that does not necessarily reflect the wording in the Standard.</i></p> <p><i>It is recommended that authors of such communications should explain the link between any common usage terms and the definitions in the Standard.</i></p>
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- 7.22 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 Mineral Reserves. These criteria need not be discussed in a Public Report unless they materially affect estimation or classification of the Mineral Resources.
- 7.23 The report must also describe the reason for the assumed continuity, discuss sample type and sample spacing and other relevant items as listed in Table 1.

<b>Guidance</b>	<p><i>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.</i></p> <p><i>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; for example, poor sample recovery, poor repeatability of assay or laboratory results, and other deficiencies (such as inadequate mineralogical studies, limited information on bulk densities, deleterious elements/minerals that may affect processing efficiency or value, etc.) should be reported.</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>
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- 7.24 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 modifying factors have been considered.
- 7.25 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 any part of the Mineral Reserves is no longer viable, such Mineral Reserves must be re-classified as Mineral Resources or removed from the Mineral Resource/Mineral Reserve statements.

<b>Guidance</b>	<p><i>It is not intended that re-classification from Mineral 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.</i></p> <p><i>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.</i></p>
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## 8 Reporting of Mineral Reserves

8.1	<p><b>Definition</b></p> <p><b>A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource.</b></p> <p><b>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.</b></p> <p><b>Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.</b></p>
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8.2 Mineral Reserves are sub-divided in order of increasing confidence into Probably Mineral Reserves and Proved Mineral Reserves, as indicated in Figure 1. The categorisation of a Mineral Reserve is governed by the relevant level of confidence of the Mineral Resource and the Modifying Factors, and must be made by the Competent Person.

8.3 The reference point at which Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated when reporting Mineral Reserves. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.

<b>Guidance</b>	<p><i>A Mineral Reserve normally does not include allowances for losses that occur during beneficiation. If the Reserves are a saleable product without needing any processing, then by definition 'losses' during processing etc. have already been excluded and the Reserves are reported at the Reference Point as a Net Saleable Tonnage.</i></p> <p><i>Mineral Reserves are those portions of Mineral Resources which, after the application of the Modifying Factors, result in an estimated tonnage and grade or quality, that in the opinion of the Competent Person making the estimates can be the basis of a viable project. Mineral Reserves are</i></p>
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*reported as inclusive of marginally economic material and diluting material delivered for treatment or dispatched from the mine without treatment. To avoid confusion in reporting Mineral Reserves the definition of treatment is taken to include any beneficiation of the mined product that might take place prior to, or during, the metallurgical process (if any).*

*In reporting Mineral Reserves, information on the upgrading and recovery factors used for processing the ore, material, or mineral, is very important, and should always be included in Public Reports.*

*The evaluation techniques used (including, where relevant, the block sizes) and the key assumptions made in arriving at the estimate should be disclosed.*

*The term 'economically mineable' implies that extraction of the Mineral Reserve has been demonstrated to be viable based on technical, economic and other relevant assumptions which should be stated. These assumptions 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'. However, it is expected that companies will attempt to achieve an acceptable return on capital invested, and that returns to investors in the project will be competitive with alternative investments of comparable risk.*

*In order to achieve the required level of confidence in the Mineral Resources and all of the modifying factors it is required that studies to at least a Pre-Feasibility level will have been carried out prior to determination of the Mineral Reserves. The study will have considered a mine plan and process flowsheet that is technically achievable, environmentally acceptable and economically viable and from which the Mineral Reserves can be derived.*

*The term 'Mineral 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 that there are reasonable expectations that these facilities can be installed and operated profitably and that approvals and/or contracts will be obtained.*

*In certain cases, it may be impossible or unreasonable to hold such 'reasonable expectations' before actual granting of approvals or signing of contracts. The Competent Person should in all cases consider the materiality of any unresolved matter that is dependent on a third party on which extraction is contingent.*

*If zones of radically different characteristics in terms of mineral processing treatment or recoveries are present then these should be reported individually as well as jointly*

*Mineral Reserve estimates are sometimes reported after cutting or capping of high grades or qualities or the application of mine or mill 'call*

	<p><i>factors' that reflect historical experience of the reconciliation between Mineral Reserve estimates and actual production. If any of the data used in the Mineral Reserve estimate are materially adjusted or modified for the purpose of making the estimate, this should be clearly stated in a Public Report and the nature of the adjustment or modification should be described.</i></p> <p><i>Where companies prefer to use the term 'Ore Reserves' in their Public Reports, they should state clearly that this is being used with the same meaning as 'Mineral Reserves', as defined in this Standard.</i></p> <p><i>It should be noted that the Standard does not imply that an economic operation must have Mineral Reserves whether Proved or Probable. It is not the function of this Standard for reporting to define the parameters necessary to justify economic decision-making.</i></p>
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- 8.4 The Competent Person should wherever possible disclose commodity prices and exchange rates used for Mineral Reserve estimation. If commodity prices are not disclosed the reasons for this should be given; e.g. where disclosure of a specific price may put a company at a competitive disadvantage. In such cases where possible, reference should be made to "current or anticipated prices" or "prices known to apply in the area".

<b>Guidance</b>	<p><i>Commodity prices should be based on supportable forward looking estimates, short term and long term as appropriate. Overly optimistic or pessimistic price forecasts could result in significant over or under estimates.</i></p> <p><i>Where commodities are sold under existing contracts, reserves should be determined using these contract prices.</i></p> <p><i>When commodity prices are disclosed, disclosure can be as a single price estimate equal to that used for reserve determination, or as a range of prices within which no material change in reserves would occur.</i></p> <p><i>Whether or not the commodity prices used to estimate reserves are published, the overall methodology used to determine those prices should be disclosed. Such disclosure should be in a manner which helps investors determine whether, in their own opinion, prices used represent reasonable views of future prices.</i></p> <p><i>Documentation supporting price forecasts might include comparisons with historical and current prices, forward projections, market considerations, exchange rates or any other relevant information.</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>
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- 8.5 For a mineral deposit to be considered a Mineral Reserve, it is required that legally enforceable mineral title sufficient to have access to the mineral rights for exploration, development and extraction, is controlled by the reporting entity at the time of determination.
- 8.6 If the reporting entity is leasing or sub-leasing the mineral, the lease or sub-lease should be from an entity which has control of the necessary mineral titles.
- 8.7 There must be no known material obstacles to mining, such as those which could cause shut down of mines or processing plants, or failure to get permits or social license to operate.
- 8.8 There must be a reasonable expectation by the Competent Person, often through reliance on legal and permitting experts that all permits, ancillary rights (including water rights) and authorizations required for mining, and to the extent applicable, processing and marketing, can be obtained in a timely fashion, and maintained for ongoing operations.

<b>Guidance</b>	<p><i>The reporting entity must complete a review of all legal and permitting requirements and document the results of this review. Local environmental laws and processes must be taken into account.</i></p> <p><i>To demonstrate reasonable expectation that all permits, ancillary rights and authorizations can be obtained, the reporting entity must show understanding of the procedures to be followed to obtain such permits, ancillary rights and authorizations. Demonstrating earlier success in obtaining the necessary permits can be used to document the likelihood of future success.</i></p> <p><i>If permits are required, but there is no defined procedure to obtain such permits, reasonable expectation of success may be difficult to support.</i></p> <p><i>Information that materially increases or decreases the risk that the necessary legal rights or permits will be obtained must be publicly disclosed. It is recognized that the legal and permitting environment may change over time and that such changes could have an impact on Mineral Reserve estimation. If it is determined that obstacles arise or are eliminated, the Mineral Reserve estimates must be adjusted accordingly.</i></p> <p><i>It is recognized that some permits cannot be obtained until after a Mineral Reserve has been declared. There might be sound business reasons why obtaining some permits should be postponed. It is also recognized that waiting for all permits to be on hand could result in critical information not being released to the investors in a timely fashion, and therefore it is recommended that disclosure of material information occur prior to obtaining permits as appropriate.</i></p> <p><i>Documentation should include a brief description of the title, claim, lease or option under which the reporting entity has the right to hold or operate the property, indicating any conditions that the registrant must meet in</i></p>
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	<p><i>order to obtain or retain the property.</i></p> <p><i>Royalty terms and clawback rights of former claim holders also must be disclosed. If held by leases or options, the expiration dates of such leases or options should be stated. If extension of leases or options will be needed to mine the Mineral Reserves, there should be reasonable expectation that such extension will be granted.</i></p> <p><i>Information relating to this review of legal and permitting issues must be documented either in full or by reference. The information may remain confidential to the reporting entity. However, when required, it may be released to regulators or auditors on a confidential basis.</i></p>
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- 8.9 If the reporting entity has title to a mineral deposit that meets all the Mineral Reserve criteria, and the reporting entity licenses, leases, or subleases the Mineral Reserves to another entity for economic consideration, the Mineral Reserves that have been licensed, leased, or subleased, must be reported by the reporting entity (the lessor) as a subset of the entity's total Mineral Reserves.

<b>Guidance</b>	<p><i>This requirement for additional disclosure is particularly relevant to mineral holding companies whose business is leasing mineral properties, acquiring royalty streams, or production sharing.</i></p>
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- 8.10 If the reporting entity has licensed, leased, or subleased Mineral Reserves from another entity, the Mineral Reserves that have been licensed, leased, or subleased, must be reported by the reporting entity (the lessee) as a subset of the entity's total Mineral Reserves.

## Probable Mineral Reserve

<b>8.11</b>	<p><b>Definition</b></p> <p><b>A Probable Mineral 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 Mineral Reserve is lower than that applying to a Proved Mineral Reserve.</b></p>
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- 8.12 A Probable Mineral Reserve has a lower level of confidence than a Proved Mineral Reserve but is of sufficient quality to serve as the basis for an internal decision on the development of the deposit taking full account of the risk factors involved.

## Proved Mineral Reserve

8.13	<b>Definition</b>	<p><b>A Proved Mineral Reserve is the economically mineable part of a Measured Mineral Resource.</b></p> <p><b>A Proved Mineral Reserve implies a high degree of confidence in the Modifying Factors.</b></p>
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- 8.14 A Proved Mineral Reserve represents the highest confidence category of material available to a company both technically and economically.

<b>Guidance</b>	<p><i>As noted in the guidance to paragraph 8.2, there are many factors that could mean that Proved Mineral Reserves are not achievable in some deposits.</i></p> <p><i>Care should be taken to avoid declaring Proved Mineral Reserves too early in the life of a project when subsequent data might show that this decision has been over optimistic, and that the reserves have then to be downgraded or removed.</i></p> <p><i>It is generally better to maintain preliminary estimates as Probable Reserves or to defer reporting than to be forced to retract statements at a later date.</i></p>
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## Selection of Mineral Reserve reporting category

- 8.15 As noted in paragraph 7.14, the choice of the appropriate category of Mineral 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 the Competent Person.

<b>Guidance</b>	<p><i>The Standard provides for a direct relationship between Indicated Mineral Resources and Probable Mineral Reserves and between Measured Mineral Resources and Proved Mineral Reserves. In other words, the level of geological confidence for Probable Mineral Reserves is similar to that required for the determination of Indicated Mineral Resources.</i></p> <p><i>The level of geological confidence for Proved Mineral Reserves is similar to that required for the determination of Measured Mineral Resources. Inferred Mineral Resources are always additional to Mineral Reserves.</i></p> <p><i>The Standard also provides for a two-way relationship between Measured Mineral Resources and Probable Mineral Reserves. This is to cover a situation where uncertainties associated with any of the Modifying Factors considered when converting Resources to Reserves may result in there being a lower degree of confidence in the Mineral Reserves than in the</i></p>
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	<p><i>corresponding Mineral Resources. Such a conversion would not imply a reduction in the level of geological knowledge or confidence.</i></p> <p><i>A Probable Mineral Reserve derived from a Measured Mineral Resource may be converted to a Proved Mineral Reserve if the uncertainties in the Modifying Factors are removed.</i></p> <p><i>No amount of confidence in the Modifying Factors for conversion of a Mineral Resource to a Mineral 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 Mineral Reserve (see Figure 1).</i></p> <p><i>Application of the category of Proved Mineral Reserves 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.</i></p> <p><i>Refer also to the guidelines in paragraph 7.14 regarding classification of Mineral Resources.</i></p>
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- 8.16 Mineral Reserve estimates are not precise calculations. Reporting of tonnage and grade or quality figures should reflect the relative uncertainty of the estimate by rounding off to appropriately significant figures.

<b>Guidance</b>	<p><i>Refer to the guidelines to paragraph 7.16 regarding rounding of Mineral Resource estimates.</i></p> <p><i>To emphasise the imprecise nature of a Mineral Reserve, the final result should always be referred to as an estimate not a calculation.</i></p> <p><i>Competent Persons should discuss the relative accuracy and/or confidence of the Mineral Reserve estimates. The statement should specify whether it relates to global (whole of reserve) or local (a subset of the reserve for which the accuracy and/or confidence might differ from the whole of the reserve) estimates, and, if local, state the relevant tonnage or volume.</i></p> <p><i>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>
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- 8.17 Public Reports of Mineral Reserves must specify one or both of the categories of 'Proved' and 'Probable'.
- 8.18 Reports must not contain combined Proved and Probable Mineral Reserve figures unless the relevant figures for each of the categories are also provided.

- 8.19 Reports must not present metal or mineral content figures unless corresponding tonnage and grade or quality figures are also given.

<b>Guidance</b>	<i>When contained metal or mineral figures are quoted then the forecast metal or mineral recovery factor and 'Recoverable Metal' or 'Recoverable Mineral' should also be reported.</i>
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- 8.20 Public Reporting of tonnage and grade or quality estimates outside the categories covered by the Standard is not permitted. While these may be useful for a company in its internal calculations and evaluation processes, their inclusion in Public Reports would cause confusion.

<b>Guidance</b>	<p><i>Mineral 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 Mineral Reserves is borne in mind and caution exercised if attempting to draw conclusions from a comparison of the two.</i></p> <p><i>When revised Mineral 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 the causes of significant variances to be understood by the reader.</i></p> <p><i>Estimates of Mineral Reserves are normally reported on the basis of mineral which can be mined and delivered to a processing facility. Any consideration or estimation of losses during processing may be reported separately (for example as a percentage recovery factor) but should not be applied as a Modifying Factor to the reported Mineral Reserves.</i></p>
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- 8.21 In situations where figures for both Mineral Resources and Mineral 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 Mineral Reserves.

<b>Guidance</b>	<i>Where Mineral Resources are reported as inclusive of Mineral Reserves it is advisable to indicate separately the tonnage and grade of the Mineral Resources which correspond with the volume(s) within which the Mineral Reserves have been defined.</i>
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- 8.22 Mineral Reserve estimates must not be added to Mineral Resource estimates to report a single combined figure.

<b>Guidance</b>	<i>In some situations there are reasons for reporting Mineral Resources inclusive of Mineral Reserves and in other situations for reporting Mineral</i>
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	<p><i>Resources additional to Mineral Reserves. It must be made clear which form of reporting has been adopted.</i></p> <p><i>Appropriate forms of clarifying statements may be:</i></p> <p><i>"The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce the Mineral Reserves."</i></p> <p><i>or</i></p> <p><i>"The Measured and Indicated Mineral Resources are additional to the Mineral Reserves." (or in many circumstances "The Mineral Resources are additional to the Mineral Reserves" will be sufficient).</i></p> <p><i>In the former case, if any Measured and Indicated Mineral Resources have not been modified (by the application of the set of Modifying Factors) to produce Mineral 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 Mineral Reserves.</i></p>
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8.23 Inferred Mineral Resources are by definition always additional to Mineral Reserves.

<b>Guidance</b>	<p><i>For reasons stated in paragraphs 8.17 to 8.19 and in paragraph 8.23, the reported Mineral Reserve figures cannot be added to the reported Mineral Resource figures.</i></p> <p><i>The resulting total is misleading and is capable of being misunderstood or, more seriously, of being misused to give a false impression of a company's prospects.</i></p>
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8.24 When reporting Mineral Reserves, a sensitivity analysis should be conducted and a summary of the results obtained included in the Public Report. The disclosure of commodity price and other financial assumptions used for this analysis is recommended.

<b>Guidance</b>	<p><i>The objective of such a sensitivity analysis is to evaluate the economics of a project under various levels of sensitivity for the key project drivers such as commodity price, head grade, recoveries, operating cost, capital cost, etc.</i></p>
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8.25 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 Mineral Reserves. These criteria need not be discussed in a Public Report unless they materially affect estimation or classification of the Mineral Resources and Mineral Reserves. However, changes in economic or political factors alone may be the basis for significant changes in Mineral Reserves and should be reported accordingly.

## 9 Reporting of Mineralised Fill, Pillars, Low Grade Mineralisation, Stockpiles, Dumps and Tailings

9.1 The Standard applies to the reporting of all potentially economic mineralised material at a mine site. 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 Mineral Reserves.

9.2 Unless otherwise stated, Sections 1 to 8 of the Standard (including Figure 1) apply to the reporting of mineralised fill, pillars, low grade mineralisation, stockpiles, dumps and tailings.

<b>Guidance</b>	<p><i>Any mineralised material as described in this paragraph can be considered to be similar to in situ mineralisation for the purposes of reporting Mineral Resources and Mineral Reserves. Judgements about the mineability of such mineralised material should be made by professionals with relevant experience.</i></p> <p><i>If there are no reasonable prospects for the eventual economic extraction of all or part of the mineralised material as described in this paragraph, then this material cannot be classified as either Mineral Resources or Mineral Reserves.</i></p> <p><i>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 may be classified as a Mineral Resource.</i></p> <p><i>If technical and economic studies have demonstrated that economic extraction could reasonably be justified at the time of reporting under realistically assumed conditions, then the material may be classified as a Mineral Reserve.</i></p> <p><i>The above guidance applies 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</i></p>
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	<p><i>life.</i></p> <p><i>For clarity of understanding, it is recommended that tonnage and grade or quality estimates of such material be itemised separately in Public Reports, although they may also be combined with total Mineral Resource or total Mineral Reserve figures as appropriate.</i></p>
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- 9.3 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) should not normally be included within reserves, but if reported, should be reported separately.
- 9.4 If stockpiled material is already accounted for elsewhere (using other reporting systems) by the company, then to avoid double counting it must not also be reported under the PERC Standard.

<b>Guidance</b>	<p><i>This situation may arise, for example, with construction raw materials where they have been delivered to stockpiles close to the site at which they are intended to be used, and may have been recorded as assets of a different division of the company.</i></p> <p><i>Similarly, part processed materials or materials in stockpiles awaiting despatch from a site are typically accounted for as Work in Progress or Inventory and therefore should not be included in Mineral Reserves or Resources.</i></p>
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## 10 Reporting of Exploration Results, Resources and Reserves for Coal

- 10.1 Paragraphs 10.1 to 10.8 of the Standard address matters that relate specifically to the Public Reporting of Coal Exploration Results, Coal Resources and Coal Reserves.
- 10.2 Unless otherwise stated, Sections 1 to 9 of this Standard (including Figure 1) apply. Table 1, as part of the guidelines, should be considered when reporting on Coal Resources and Reserves.

<b>Guidance</b>	<p><i>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'.</i></p>
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- 10.3 The terms 'Mineral Resource(s)' and 'Mineral 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.

- 10.4 When reporting Coal Reserves, a clear distinction must be made between reserves where mining losses have been taken into account (sometimes described as recoverable or run of mine) and saleable product where both mining and processing losses have been included (sometimes referred to as marketable reserves).
- 10.5 All Mineral Reserves, by definition, include mining losses and dilution and the use of superfluous description is discouraged. In situ coal is, also by definition, a Mineral Resource.
- 10.6 Reports must not contain combined Proved and Probable Coal Reserve figures unless the relevant figures for each of the individual categories are also provided.
- 10.7 Saleable product (or marketable Coal Reserves), representing beneficiated or otherwise enhanced coal, may be publicly reported. Where this is the case, the equivalent Proved and/or Probable Coal Reserves should be shown and the basis of the predicted yield to achieve saleable product should be stated.
- 10.8 Relevant coal quality information should be reported for all Coal Resource and Coal Reserve categories including the basis on which the quality parameters are derived. Where applicable, Marketable Coal Reserves should be subdivided into the relevant coal product types.

<b>Guidance</b>	<p><i>The parameters used to measure coal quality, for example on an 'As Received' or 'Air Dried' moisture basis should be reported.</i></p> <p><i>The quality of coal should be expressed according to parameters relevant to specific applications e.g. steam coal, metallurgical coal etc.</i></p> <p><i>The selection of the relevant quality parameters is the responsibility of the Competent Person and might include ash, volatile matter, sulphur, coking properties, calorific value etc. and will include also bulk density as one of the most important parameters.</i></p> <p><i>Resource classification should take into consideration both continuity and reliability of thickness measurements and continuity, reliability and confidence in quality parameters, recognising that variability in seam thickness and quality are not necessarily interdependent.</i></p> <p><i>Continuity of seams, partings and their termination by faults and channels should be considered both horizontally and vertically, with attention paid to the ability of the likely mining method to cope with discontinuities and displacements.</i></p>
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## 11 Reporting of Exploration Results, Mineral Resources and Mineral Reserves for Diamonds

- 11.1 Paragraphs 11.1 to 11.9 of the Standard address matters that relate specifically to the Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves for diamonds.
- 11.2 Unless otherwise stated, Sections 1 to 9 of this Standard (including Figure 1) apply. Table 1, as part of the guidelines, should be considered when reporting Exploration Results, Mineral Resources and Mineral Reserves for diamonds. Table 1 Part 5 provides specific reporting matters for diamond deposits.
- 11.3 Diamond deposits can be subdivided into igneous-hosted deposits on the one hand (primary diamond deposits), and into marine and alluvial placers (secondary diamond deposits) on the other.
- 11.4 The particulate nature of diamonds and generally low grade nature of diamond deposits presents specific problems in sampling, estimation and development of such deposits which are discussed in the following sections and in Table 1. The points discussed in the guidelines are not equally applicable to primary and secondary diamond deposits. For example, the use of micro-diamonds for grade estimation is not relevant in the placer environment.

<b>Guidance</b>	<p><i>For the purposes of Public Reporting, the requirements for diamonds have some similarity to those of other commodities with the replacement of terms such as 'mineral' by 'diamond'.</i></p> <p><i>The term grade refers specifically to diamond content and should be always be quoted in conjunction with a bottom cut-off for diamond size expressed in mm or equivalent diamond sieve. (See table 1. for detailed guidance).</i></p> <p><i>It is recommended that information on diamond value is quoted in conjunction with grade estimates at the same bottom cut-off. A grade estimate may be disclosed in early stage sampling using micro-macro diamond estimation to give a global estimate of grade before an estimate of average diamond value can be made. Diamond grade is generally quoted in carats per tonne (cpt), carats per hundred tonnes (cpht); or in the case of offshore and some onshore alluvial deposits carats per cubic metre, or the term 'planar grade' in carats per square metre may be used.</i></p> <p><i>The term 'quality' should not be substituted for 'grade,' since in diamond deposits these have distinctly separate meanings.</i></p> <p><i>Several characteristics of diamond deposits are different from those of, for example, typical metalliferous and coal deposits and require special</i></p>
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	<p><i>consideration. These include the generally very low mineral content and high variability in diamond grade and diamond quality of primary and placer deposits, the particulate nature of diamonds and dependence of diamond value on diamond size, quality, colour and shape, the specialised requirement for diamond valuation and the inherent difficulties and uncertainties in the estimation of diamond resources and reserves.</i></p> <p><i>As a result, diamond deposits rarely achieve Measured status. The sampling and estimation of marine placer deposits is particularly difficult and expensive and thus even the assignment of Indicated status may prove difficult.</i></p>
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- 11.5 For Public Reports dealing with diamonds it is a requirement that any reported valuation of a parcel of diamonds be accompanied by a statement verifying the independence of the valuation which must be based on a report from a demonstrably reputable and qualified expert. It must be clearly stated whether the reported value is actual or modelled and, in the latter case, how the modelling was carried out and by whom.
- 11.6 Reports of diamonds recovered from sampling programs must provide material information relating to the basis on which the sample is taken and the method of recovery of the diamonds.

<b>Guidance</b>	<p><i>Such information would include full details of the sample processing methods used including crusher gap sizes used, the method of crushing and the screen sizes.</i></p> <p><i>When estimating an Inferred Resource, it is necessary to identify preliminary geological domains, each of which should have at least an initial indication of area (for planar secondary deposits) or volume, density (for primary deposits), stone size distribution, grade and average diamond value. Such information should be obtained from bulk samples. Where bulk samples have not been used, the Competent Person should provide an explanation why they have not been used</i></p> <p><i>In order to progress to an Indicated Resource, and from there to a Probable Reserve, it is likely that much more extensive, representative bulk sampling (and/or trial mining) would be needed to determine fully the stone size distribution and value. Commonly, such bulk samples would be obtained by opencast or underground development designed to obtain sufficient diamonds to enable a confident estimate of price or, in the marine environment, by deploying a vessel equipped for mining the deposit to undertake extended sampling. In the case of a marine placer (or certain alluvial deposits) where the assortment is well understood through mining or sampling and where it can be demonstrated that the average diamond mass is well correlated with average diamond value, knowledge of the average diamond mass may be sufficient to derive an</i></p>
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	<p><i>average diamond value.</i></p> <p><i>In complex deposits, however, it may be very difficult to ensure that the bulk samples taken are truly representative of the whole deposit. The CP shall provide an opinion on the representativeness of the bulk sampling and on the validity of the conclusions drawn from this information.</i></p> <p><i>The stone size distribution and price of diamonds are critical components of the Resource and Reserve estimates. At an early exploration stage, reconnaissance, sampling and delineation drilling will not usually provide this information, which relies on bulk sampling through pitting, trenching, or large diameter drilling. In the case of Inferred Resources, it is expected that the available data will be limited, but sufficient to imply, but not to verify, geology, grade and value.</i></p>
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- 11.7 The valuation of diamonds must state if the average diamond value includes all categories of diamonds recovered above a bottom cut-off size. The bottom cut-off should coincide with that used to disclose diamond grade values.

<b>Guidance</b>	<p><i>The method used to determine the bottom cut-off size, and the units in which it is expressed (e.g. mm, carats or diamond sieve size) should be clearly stated.</i></p> <p><i>The bottom cut-off screen size should be the same for both grade and value estimations. If they are different, then the CP shall include a full description of the difference and the reasons for such.</i></p>
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- 11.8 Diamond valuations based on micro-diamond samples obtained using total liberation methods should not be reported.
- 11.9 Sampling in diamonds does not provide an assay as with other mineral commodities. Conventional macro-diamond sample processing will not liberate or recover all the contained diamonds. The relative efficiencies of micro-diamond sampling, macro-diamond sampling and full-scale treatment and recovery technologies must be considered through granulometry and ore dressing studies to derive appropriate mineral resource to reserve modifying factors in the estimation of Mineral Reserves.

<b>Guidance</b>	<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 Mineral Reserves for diamonds.</i></p>
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## 12 Reporting of Exploration Results, Mineral Resources and Mineral Reserves for Industrial Minerals, Cement Feed Materials and Construction Raw Materials

- 12.1 Paragraphs 12.1 to 12.7 of the Standard address matters that relate to the Public Reporting of industrial minerals, cement feed materials and construction raw materials of all forms that are generally sold on the basis of their product specifications and market acceptance.
- 12.2 Unless otherwise stated, Sections 1 to 9 of this Standard (including Figure 1) apply. Table 1, as part of the guidelines, should be considered when reporting Exploration Results, Mineral Resources and Mineral Reserves for Industrial Minerals, Cement Feed Materials and Construction Raw Materials, except from guidelines that may be inappropriate when Mineral Resources and Reserves estimates are presented on an aggregated basis as described in paragraph 18.2.
- 12.3 When reporting information and estimates for industrial minerals, cement feed materials and construction raw materials, all of the key principles and purpose of the Standard apply. Chemical analyses may not always be relevant and other quality and performance characteristics may be more applicable and acceptable as the basis of the reporting.
- 12.4 Some industrial mineral, cement feed materials and construction raw material deposits may be capable of yielding products suitable for more than one application and/or specification. If considered material by the Competent Person, such multiple products should be quantified either separately or as a percentage of the bulk the deposit.

<b>Guidance</b>	<p><i>Unless it is a specific aspect of his or her instructions to reflect the range of product mixes and target markets for the deposit, the Competent Person should normally report the reserves and resources within the framework of an existing mining plan or established set of product and market assumptions and objectives.</i></p> <p><i>If there is potential for ancillary products, or mining or process waste, to be sold off-site for subsidiary uses in addition to the planned sales of primary products (i.e. other uses for non-saleable quarry production, such as secondary aggregate or engineering or other fill), the Competent Person should reflect this in his report and comment on any significant implications (e.g. reductions in the amount of non-saleable material that could otherwise be used as a restoration material).</i></p> <p><i>The factors underpinning the estimation of Mineral Resources and Mineral Reserves for industrial minerals, cement feed materials and construction raw materials are the same as those for other deposit types covered by</i></p>
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	<p><i>the Standard. It may be necessary, prior to the reporting of a Mineral Resource or Mineral Reserve, to take particular account of certain key characteristics or qualities such as likely product specifications, proximity to markets and general product marketability.</i></p> <p><i>For industrial minerals, cement feed materials and construction raw materials, it is common practice to report the saleable (or useable) product rather than the 'as mined' product as it is recognised that commercial sensitivities may not permit the publication of Mineral Resources and Reserves in the latter format which is the preferred style of reporting within the Standard.</i></p> <p><i>It is important that, in all situations where the saleable or usable product is reported, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.</i></p>
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- 12.5 Other industry guidelines on the estimation and reporting of industrial minerals, cement feed materials and construction raw materials Resources and Reserves may be useful but will under no circumstances override the provisions and intention of this Standard for public reporting.

<b>Guidance</b>	<p><i>Reports should make clear the 'permitted' or 'non-permitted' status of the resources and reserves, and in addition reserves particularly should only be quoted where the operator has legal control.</i></p> <p><i>It should be noted that many of the Modifying Factors are more relevant or specific to industrial minerals, cement feed materials and construction raw materials than to metalliferous minerals. Specifically the legal control may be more important, as well as the permitting or consenting status, due to the local nature of the planning process for non - strategic and non - government owned minerals.</i></p>
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- 12.6 Mineral Reserves and Resources of industrial minerals, cement feed materials and construction raw materials serving localised or regional markets may be reported on an aggregated basis on an appropriately defined geographical basis to reflect the particular economic constraints of the deposits being reported without divulging commercially sensitive information.

<b>Guidance</b>	<i>Further instructions and guidance are provided in Section 18.</i>
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- 12.7 In certain cases commercial sensitivity may prevent the publication of detailed information associated with Mineral Resources and Reserves, and in such cases this should be clearly justified in the report (either prepared for an individual site or on an aggregated basis).

## 13 Reporting of Exploration Results, Mineral Resources and Mineral Reserves for Oil Shales, Oil Sands, and other energy minerals extracted by mining methods

- 13.1 Paragraphs 13.1 to 13.7 of the Standard addresses matters which relate to the Public Reporting of oil shales, oil sands, and other hydrocarbon minerals where the hydrocarbons are extracted by processing of mined rock.
- 13.2 Unless otherwise stated, Sections 1 to 9 of the Standard (including Figure 1) apply. Table 1, as part of the guidelines, should also be considered when reporting on Resources and Reserves of oil shales, oil sands, and similar minerals.
- 13.3 When reporting information and estimates for oil shales, oil sands, and other hydrocarbon minerals where the hydrocarbons are extracted by processing of mined rock, the key principles and purpose of the Standard apply.
- 13.4 Chemical analyses may not always be relevant and other quality and performance characteristics may be more applicable and acceptable as the basis of the reporting. Some deposits of such minerals may be capable of yielding products suitable for more than one application and/or specification. If considered material by the Competent Person, such multiple products should be quantified either separately or as a percentage of the bulk deposit.

<b>Guidance</b>	<p><i>Unless it is a specific aspect of his or her instructions to reflect the range of product mixes and target markets for the deposit, the Competent Person should normally report the reserves and resources within the framework of an existing mining plan or established set of product and market assumptions and objectives.</i></p> <p><i>If there is potential for ancillary products, or mining or process waste, to be sold off-site for subsidiary uses in addition to the planned sales of primary products, the Competent Person should reflect this in his report and comment on any significant implications (e.g. reductions in the amount of non-saleable material that could otherwise be used as a restoration material).</i></p> <p><i>The factors underpinning the estimation of Mineral Resources and Mineral Reserves for oil shales, oil sands, and similar minerals are the same as those for other deposit types covered by the Standard.</i></p> <p><i>It may be necessary, prior to the reporting of a Mineral Resource or Mineral Reserve, to take particular account of certain key characteristics or qualities such as likely hydrocarbon product specifications, proximity to markets and general product marketability.</i></p>
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	<p><i>For hydrocarbon products, it is common practice to report the saleable product after extraction from the host rock matrix, rather than the 'as mined' product, as it is recognised that commercial sensitivities may not permit the publication of Mineral Resources and Reserves in the latter format which is the preferred style of reporting within the Standard.</i></p> <p><i>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.</i></p>
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- 13.5 In some jurisdictions, it may be required, or it may be normal practice, to report Exploration Results, Mineral Resources and Mineral Reserves for oil shales, oil sands, and other similar energy minerals using other reporting standards and under different market regulations from those which apply to solid minerals. In such circumstances, the other reporting standards will generally take precedence and the choice of appropriate reporting standard to be used will in general not be a matter for decision by the Competent Person.
- 13.6 Where this is not the case, even though other industry guidelines on the estimation and reporting of Resources and Reserves of oil shales, oil sands, and similar products may be useful, where such materials are solid minerals they fall within the scope of the PERC Standard, so other reporting standards will not override the provisions and intention of this Standard for public reporting.

<b>Guidance</b>	<p><i>Reports should make clear the 'permitted' or 'non-permitted' status of the resources and reserves, and in addition reserves particularly should only be quoted where the operator has legal control.</i></p>
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- 13.7 In certain cases commercial sensitivity may prevent the publication of detailed quality parameters, but in such cases this should be clearly justified in the report.

## 14 Reporting of Exploration Results, Mineral Resources and Mineral Reserves for Metallic or Non-Metallic Minerals extracted by solution mining methods

- 14.1 Paragraphs 14.1 to 14.7 of the Standard addresses matters which relate to the Public Reporting of any solid minerals which are extracted by in-situ dissolution and transfer to the surface in solution in water, steam, or other solvent.
- 14.2 Unless otherwise stated, Sections 1 to 9 of the Standard (including Figure 1) apply. Table 1, as part of the guidelines, should also be considered when reporting on minerals produced by solution mining.

- 14.3 When reporting information and estimates for solution mined minerals, the key principles and purpose of the Standard apply.
- 14.4 Mineral Resources and Mineral Reserves as for all other minerals are expressed in terms of the in-situ rock quantities and the quality parameters representing the proportion and quality of economic mineral product.
- 14.5 If Mineral Resources and Mineral Reserves are estimated at a stage after production has already started, then the methods and assumptions of such estimation must be stated.

<b>Guidance</b>	<p><i>As with all other minerals reported under the Standard, the Competent Person should normally report the reserves and resources within the framework of an existing production plan and an established set of product and market assumptions and objectives.</i></p> <p><i>The factors underpinning the estimation of Mineral Resources and Mineral Reserves for solution-mined minerals are the same as those for other deposit types covered by the Standard.</i></p> <p><i>The 'as mined' product for solution-mined minerals will normally be the solid material remaining after crystallisation, and removal, or recycling of the solvent.</i></p> <p><i>The quantities of solvent itself should not be reported as part of the Resources or Reserves, but are relevant only insofar as the related costs must be taken into consideration along with all other Modifying Factors.</i></p> <p><i>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 and what processing steps have been required to obtain this saleable product.</i></p>
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- 14.6 Other industry guidelines on the estimation and reporting of Mineral Resources and Mineral Reserves of solution-mined minerals may be useful but will under no circumstances override the provisions and intention of this Standard for public reporting.

<b>Guidance</b>	<p><i>Reports should make clear the 'permitted' or 'non-permitted' status of the resources and reserves, and in addition reserves particularly should only be quoted where the operator has legal control.</i></p>
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- 14.7 In certain cases commercial sensitivity may prevent the publication of detailed quality parameters, but in such cases this should be clearly justified in the report.

## 15 Disclosure of Exploration Results, Mineral Resources and Mineral Reserves for Dimension Stone, Ornamental and Decorative Stone

- 15.1 Paragraphs 15.1 to 15.15 of the Standard address matters which relate to the Public Reporting of Exploration Results, Mineral Resources, and Mineral Reserves for Dimension Stones of all forms and similar products that are generally sold on the basis of their technical (geological/mining) product specifications, quality and market acceptance.
- 15.2 Unless otherwise stated Sections 1 to 9 of the Standard (including Figure 1) apply. The contents of Table 1, as part of the guidelines, should also be considered when reporting on dimension stones.

<b>Guidance</b>	<p><i>"Dimension stone" is a technical/commercial term that includes all natural stones that can be quarried in blocks of different dimensions and processed by cutting or splitting, and that possess the technical and aesthetic properties required for their use in the building and construction industries.</i></p> <p><i>In both mining methods and fields of application, dimension stone is distinct from any other material derived from natural rocks (such as. Aggregates, cement materials, crushed stone, etc.) Whilst other materials are almost exclusively used for load bearing and filling functions and are largely utilised in public works, dimension stone materials offer special qualitative features which mean they can be used for different purposes and they can perform both structural and decorative architectural functions.</i></p> <p><i>In general, dimension stones can be quarried in regular and/or unshaped blocks by using different mining methods (drilling &amp; splitting, diamond wire and diamond chain-saw cutting) and processed (cut, polished, and subjected to other surface treatments) to produce semi-finished products (slabs) and finished products (tiles and cut-to-size products).</i></p>
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- 15.3 Chemical analyses may not always be relevant for material evaluation, at least during the exploration-evaluation phases. Where necessary, chemical analysis is used to verify the presence of possible minerals and related alteration that could produce important quality defects on finished products. Chemical/compositional analysis may also identify mineral components and/or assemblages and is used to predict the future technical requirements of the quarrying-processing equipment and related tools.

- 15.4 Qualitative and aesthetic qualities (colour, grain, texture and their regularity in distribution) and/or their structural performance characteristics (compression and flexural strength, abrasion resistance, porosity, ability to be polished, radioactivity content, etc.) may be more important for the market and applicable and acceptable as the basis of the reporting.
- 15.5 Many dimension stone deposits are capable of yielding different products (different materials and/or different market grades within the same material), suitable for the production of more than one finished or semi-finished product, and for more than one final application and/or specification. These may then be sold in the market with different prices.
- 15.6 If considered material by the Competent Person, estimates for such multiple products should be included either separately or as percentages of the bulk of the deposit.
- 15.7 Unless it is a specific aspect of his/her instructions to reflect the range of products mixes and target markets for the deposit, the Competent Person should normally report the Resources and Reserves within the framework of an existing mining plan and/or feasibility study or established set of products and market assumptions and objectives.
- 15.8 If there is potential for ancillary products or by-products, or for quarrying or processing waste to be re-utilised or to be sold off-site for subsidiary uses, in addition to the planned sales of the primary products as described above (e.g. aggregate, sand and powder as industrial mineral, building and paving stone, etc.), the Competent Person should reflect this in his report and comment on any significant implications (e.g. reduction in the amount of non-saleable material, minimization of waste and related lower waste management costs and environmental impact).

**Guidance**

*The factors underpinning the estimation of Mineral Resources and Mineral Reserves for dimension stones are often not the same as those for other deposit types covered by the Standard. I*

*t may be necessary, prior to the reporting of Mineral Resources and Mineral Reserves, to take particular account of certain particular key characteristics/features of the target material specific to dimension stone. These may include final product specifications, proximity to markets, type, structure and demand of the market (very different area by area and, excluding some very well established materials, possible changes in market requirements, and general product marketability.*

*These may depend mainly on the market quality of the target material (colour, grain, texture and their regularity in distribution). A correct professional evaluation of the Market Quality, made by the Competent Person in different ways, is the key to evaluating the final product marketability and is a key Modifying Factor in definition of Mineral Reserves for dimension stone.*

*The Competent Person should explain in detail in the report, the method*

	<p><i>utilised for the Market Quality evaluation of the target dimension stones, and in case of the market the references cited, together with documents referenced or used.</i></p> <p><i>Where non-saleable materials are sent off-site as Mining Waste or as other Waste Materials of Potential Economic Value, these non-saleable materials should be considered in the context of Section 16.</i></p> <p><i>Care should be taken to ensure that such materials are not 'double-counted' by being included as Mineral Reserves and Resources at both the site of production and at the site of reception.</i></p>
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- 15.9 In contrast with industrial minerals, cement feed materials and construction raw materials (Section 12), for which it is common practice to report the saleable (or useable) product rather than the “as mined” product, for dimension stones production the raw block or “as mined” product is usually reported in all its forms, shapes and dimensions. These are also factors that drive the market and then the success of a dimension stone project.
- 15.10 The Public Report may contain either the geological or commercial names of target dimension stones. In any case an explanation of these terms should be included in the report.
- 15.11 Other industry guidelines on the estimation and reporting of dimension stones may be useful but will under no circumstances override the provisions and intention of this Standard for public reporting.
- 15.12 For deposits of dimension stones within member states of the European Union there is a requirement that saleable products should comply with standards specified for the CE Trademark, and this must be taken into account as a Modifying Factor when deriving estimates of Mineral Reserves.
- 15.13 Many of the Modifying Factors are more relevant and specific to dimension stones than to metalliferous minerals. In particular, the legal control of Resources and Reserves may be very important, as well the permitting or consenting status, due to the local nature and often simple structure of the planning process for non-strategic and non-government owned minerals.

<b>Guidance</b>	<p><i>Reports should make clear the 'permitted' or 'non-permitted' status of the resources and reserves, and in addition reserves particularly should only be quoted where the operator has legal control.</i></p>
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- 15.14 Mineral Resources and Mineral Reserves of dimension stones deposits with the same material and owned by the same company, potentially serving localised/domestic or regional markets, may be reported on an aggregated basis on an appropriately defined geographical area in accordance with the Guidance in

Section 18. Such reporting may be necessary to reflect the particular local economic constraints of the deposits being reported without divulging particular commercial sensitive information that could affect the local business.

- 15.15 In certain cases commercial sensitivity may prevent the publication of detailed information and data associated with Mineral Resources and Mineral Reserves, and in such cases this should be clearly justified in the report (either prepared for an individual site or on an aggregated basis).

## 16 Disclosure of Estimates of Mining and Other Waste Materials of Potential Economic Value

- 16.1 Waste is Mineral material which at the time of extraction from the ground was not considered to have any saleable value. Paragraphs 16.1 to 16.9 of the Standard addresses matters which relate to the Public Reporting of Mineral Resources and Mineral Reserves for Waste Materials of Potential Economic Value.

- 16.2 Unless otherwise stated, Sections 1 to 9 of the Standard (including Figure 1) apply. The contents of Table 1, as part of the guidelines, should also be considered when reporting on Waste Materials.

- 16.3 Three categories of Waste are considered within the scope of this section of the Standard:

- Materials supplied on an 'ad-hoc' basis from another site under third party control;
- Materials supplied under the terms of a defined supply agreement from another site under third party control; and,
- Materials supplied from another operating site in the reporting company's control.

- 16.4 Specific considerations must be taken into account for any 'Waste', imported for processing and sale, but generated at another site under third party control.

<b>Guidance</b>	<p><i>Waste attracts a specific definition in some jurisdictions (for example, in the European Union, where it is defined in the context of the Waste Directive 75/442/EEC, and further covered in the Mining Waste Directive 2006/21/EC) and once defined as waste cannot be 'undefined' as such until it is processed and sold.</i></p> <p><i>Any processing and sale is considered as a waste recovery/recycling operation and not a mining activity.</i></p>
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- 16.5 For the purposes of reporting, any importation of such materials is therefore a waste management activity and the materials do not comprise Mineral Reserves and Mineral Resources, even though their eventual processing and sale may be complementary to and an integral part of the normal mine or quarry operation.
- 16.6 Materials extracted from another mine or quarry site under third party control and supplied to the reporting company's site on an 'ad hoc basis should not be reported as Mineral Reserves and Mineral Resources at the receiving site. Since their supply is variable and not guaranteed there is no 'reasonable expectation' of eventual sale for reporting purposes.

<b>Guidance</b>	<p><i>In any event, if the materials are extracted from the third party site and then sold to the reporting company, at the very least this represents the extraction of Reserves and Resources from the supply site and the purchase of stock or raw feed for the reporting company.</i></p> <p><i>As such this would place it outside the scope of reporting of Reserves and Resources since the purchased materials will appear in the reporting company's financial reporting as inventory under current assets.</i></p>
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- 16.7 For materials which are supplied under the terms of a defined supply agreement from another site under third party control, similar conditions apply as to the supply of materials on an 'ad hoc' basis (see paragraph 16.6 above). However, one notable difference is the element of 'certainty' provided through the supply agreement. There is a case for the purchase of such materials through the supply agreement to be treated as inventory and therefore not reportable as Reserves and Resources, but where materials are supplied 'free of charge' the situation could be viewed differently.

<b>Guidance</b>	<p><i>If there is no charge for the materials from the producing site then it is reasonable to assume that they would not have been reported at the producing site as Mineral Reserves or Resources.</i></p> <p><i>Such a situation could arise where the materials received are not the target minerals at the site of production and the supply to the reporting company is an expedient means of removing a burden at the producing site.</i></p>
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- 16.8 The guaranteed supply of these materials comprises a 'reasonable expectation' for the tonnage which is the subject of the agreement and could therefore be considered as Reserves and Resources for the receiving company. At the time of reporting, the total Reserves and Resources would represent the future guaranteed tonnage deliverable under the agreement.

<b>Guidance</b>	<p><i>This is different to the concept of inventory – since the materials have not yet been received they do not comprise current assets.</i></p>
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- 16.9 The supply of materials from one site to another under the control of the reporting company is effectively the supply of raw feed and the relevant tonnage would be reportable as Mineral Resources and Mineral Reserves at the site of production and not at the receiving site.

## 17 Disclosure of Previously Reported Estimates

- 17.1 A company may disclose an estimate previously reported under a classification system other than PERC or by a person or persons other than the Competent Person approving the new disclosure, using the previously used terminology, if the disclosure:

- identifies the source and date of the previously reported estimate;
- comments on the relevance and reliability of the previously reported estimate;
- states whether the previously reported estimate uses categories other than the ones set out in Sections 0 to 8 inclusive of this Standard and, if so, includes an explanation of the differences;
- includes a proximate cautionary statement making clear that such an estimate cannot be combined with any other estimates and cannot be accorded the status of approval by the Competent Person; and,
- includes any more recent estimates or data available to the company.

<b>Guidance</b>	<p><i>All of the requirements listed must be satisfied if disclosures are to be made by reference to other classification systems.</i></p> <p><i>This provision allows for the disclosure of estimates produced by the same or a different company, using the same or other reporting codes or standards, and including the situation where the previous Competent Person (if any) is no longer available to authorise the new disclosure.</i></p>
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- 17.2 The company must also include within the disclosure a statement describing the actions proposed to make the estimate compliant with the PERC Reporting Standard.

## 18 Aggregation of estimates from multiple deposits

- 18.1 Companies may have large numbers of separate minerals exploration and/or extraction projects, such that it may be impracticable for them to commission or prepare separate Competent Person reports on each project separately.
- 18.2 In such circumstances it is recommended that a Competent Person should examine a company's minerals assets and provide an assessment of the appropriate level of

aggregation, or 'accounting unit', to be used in all subsequent reporting of the company's Mineral Resources and Mineral Reserves.

- 18.3 When examining mineral assets in the context of determining materiality, the Competent Person should consider both the size and number of individual assets in establishing the appropriate level of aggregation.
- 18.4 Individual mineral assets that have a disproportionate contribution to the overall Mineral Resource or Reserve available to the company may be 'material' and should be considered for separate reporting by the Competent Person.

<b>Guidance</b>	<p><i>This guidance is of particular relevance to cement companies and other companies producing industrial and construction raw materials where the value of individual mineral projects is not paramount to the overall value of the business, compared to other mineral companies, and the obligation to produce a Competent Person's Report on each separate mineral asset would be disproportionate in contributing to effective protection for investors.</i></p> <p><i>Aggregation in reporting may be on the basis of geographical region or business unit. For example, a multinational company may have operations on several continents and may therefore wish to report Mineral Resources and Reserves based primarily on geographical region reflecting the regional structure of the company.</i></p> <p><i>A company with multiple business lines (cement, aggregates, clay building products) may prefer to report relevant Mineral Resources and Reserves by reference to commodities relevant to those business lines, subdivided by geographical regions.</i></p> <p><i>Where Mineral Resources and Reserves are reported on an aggregated basis, a statement to the effect that the estimation and reporting criteria for each individual site included in the aggregation is PERC compliant should be provided.</i></p> <p><i>Confirmation that the determination of materiality and establishment of the appropriate level of aggregation has been made by a Competent Person should also be provided.</i></p>
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## 19 Non-Public Reporting

- 19.1 There are circumstances in which a company may be required to record estimates of mineral quantities which may not be reported publicly using the PERC Reporting Standard.
- 19.2 These circumstances may include requirements such as submitting to government authorities statements as to the mineral potential of land within their ownership or

control in connection with national mineral inventory or spatial planning (prevention of sterilisation).

- 19.3 In such circumstances, this may involve making estimates of mineral which may or may not exist or which the company may consider, at the time of making the statement, to be uneconomic or unrecoverable. A set of categories for such purposes is defined in Appendix 6.
- 19.4 It is emphasised that estimated mineral quantities assessed to lie within these categories must not be included in Public Reports. Where statements in these categories are required by public authorities as a matter of law, they must be provided only accompanied by a statement that they are strictly confidential and not for publication and limiting their use to incorporation in national or regional mineral statistics or 'land bank' calculations without attribution to a particular company or land holding. Detailed guidance is presented in Appendix 6.

## TABLE 1 - CHECK LIST OF ASSESSMENT AND REPORTING CRITERIA

Table 1 is a high level checklist of assessment criteria and a guideline to be used as a reference by those preparing reports on Exploration Results, Mineral Resources and Mineral Reserves.

The checklist is not prescriptive and, as always, relevance and materiality are the overriding principles that determine what information should be publicly reported. It is, however, important to report 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 and/or Mineral Reserves. It is strongly recommended that an 'If not-why not' approach is adopted as described in paragraph 2.26 of the PERC Standard.

It is the responsibility of the Competent Person to consider all the criteria listed in Table 1 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.

The order and grouping of criteria in Table 1 reflect the normal systematic approach to exploration and evaluation.

The table should be approached from left to right. Criteria in the first column, Exploration Results, should be considered to apply also when reporting Mineral Resources and Mineral Reserves. Similarly, additional criteria in the Mineral Resources column apply also to Mineral Reserves reporting.

The evaluation and reporting of mineral projects and forward looking mine plans or statements from ongoing operations are expressions of judgement predicated on knowledge and experience.

Such evaluations and reports are more than arbitrary determinations; they seek to facilitate valuations as a consequence of method. The methods employed should be scientifically valid, tested, use accepted scientific definitions of terms and procedures and best suited to the making of reliable estimates for the project in question.

ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
<b>Table 1 Part 1 - General</b>			
<b>Purpose of Report</b>	<p>(i) The report should include a title page and Table of Contents, including figures and tables.</p> <p>(ii) State for whom the report was prepared, whether it was intended as a full or partial evaluation or other purpose, what work was conducted, effective date of report, and what work remains to be done.</p> <p>(iii) The Competent Person should state whether the document is PERC compliant. If a reporting standard or code, other than PERC has been used, The Competent Person should include an explanation of the difference.</p>		
<b>Project Outline</b>	<p>Brief description of scope of project (i.e. whether in preliminary sampling, advanced exploration, conceptual, pre-feasibility, or feasibility phase, Life of Mine plan for an ongoing mining operation or closure). This should include a description of the geological setting, deposit type, commodity, project area, background, and business arrangement.</p>	<p>Brief description of key technical factors that have been considered</p>	<p>Brief description of mining, processing and other key technical factors</p>
<b>History</b>	<p>(i) State historical background to the project and/or adjacent areas concerned, including known results of previous exploration and/or mining</p>	<p>(i) Discuss known or existing historical Mineral Resource estimates and , reconciliations of reported resources/reserves and actual</p>	<p>(i) Discuss known or existing historical Mineral Reserve estimates and performance statistics to actual production for past and current</p>

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
	<p><i>activities (type, quantity and development work), prior ownership and changes thereto.</i></p> <p><i>(ii) Reference all information used from other sources.</i></p>	<p><i>production for past and current operations, including the reliability of these and how they relate to the PERC Standard.</i></p> <p><i>(ii) Previous successes or failures should be referred to transparently with reasons why the project should now be considered potentially economic.</i></p>	<p><i>operations, including the reliability of these and how they relate to the PERC Standard.</i></p>
<p><b>Key Plan, Maps and Diagrams</b></p>	<p><i>(i) Include and reference a location or index map and more detailed maps showing all important features described in the text, including all relevant cadastral and other infrastructure features. If adjacent or nearby properties have an important bearing to the report, then their location and common mineralised structures should be included on the maps. Reference all information used from other sources. All maps, plans and sections noted in this checklist, should be legible, and include a legend, coordinates, coordinate system,, scale bar and north arrow.</i></p> <p><i>(ii) Diagrams or illustrations should be legible, annotated and explained where necessary</i></p>		
<p><b>Project Location and Description</b></p>	<p><i>(i) Description of location (country, province, and closest town/city, coordinate systems and ranges, etc.).</i></p> <p><i>(ii) In respect of each property, diagrams, maps and plans should be supplied demonstrating the location of prospecting/mining rights, any historical and current workings, any exploration, and all principal geological features.</i></p>		
<p><b>Topography and Climate</b></p>	<p><i>(i) All relevant issues relating to the mineral project, such as the topography and climate, noting any conditions that</i></p>	<p><i>(i) Topo-cadastral map in sufficient detail to support the assessment of eventual economics. Known associated</i></p>	<p><i>(i) Detailed topo-cadastral map. Where applicable aerial surveys should be checked with ground controls and</i></p>

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
	<p><i>may affect possible mining activities should be stated.</i></p> <p><i>(ii) A general topo-cadastral map should be available to support the above statement</i></p>	<p><i>climatic risks should be stated.</i></p>	<p><i>surveys, particularly in areas of rugged terrain, dense vegetation and/or high altitude.</i></p>
<b>Geology</b>	<p><i>Description of the nature, detail, and reliability of geological information (rock types, structure, alteration, mineralisation, and relation to known mineralised zones, etc.). Description of geophysical and geochemical data. Reliable geological maps and cross sections should exist to support interpretations.</i></p>		
<b>Mineralogy</b>	<p><i>Describe the mineralogy of the deposit including the distribution, quantity and other characteristics of the important minerals. Includes minor and gangue minerals where these will have an effect on the processing steps. Should indicate the variability of each important mineral within the deposit.</i></p>		
<b>Mineral rights and land ownership</b>	<p><i>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, 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. Location plans of mineral rights and titles. It is not expected that the description of mineral title in a technical report should be a legal opinion, but should be a brief and clear description of such title as understood by the author.</i></p>		
<b>Legal Aspects and Tenure</b>	<p><i>The legal tenure should be verified to the satisfaction of the Competent Person, including a description of:</i></p> <p><i>(i) The nature of the issuer's rights (e.g. prospecting and/or mining) and the right to use the surface of the properties to which these rights relate;</i></p>		

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
	<p><i>(ii) The principal terms and conditions of all existing agreements, and details of those still to be obtained, (such as, but not limited to, concessions, partnerships, joint ventures, access rights, leases, historical and cultural sites, wilderness or national park and environmental settings, royalties, consents, permission, permits or authorizations)</i></p> <p><i>(iii) The security of the tenure held at the time of reporting or which is reasonably expected to be granted in the future along with any known impediments to obtaining the right to operate in the area; and</i></p> <p><i>(iv) A statement of any legal proceedings that may have an influence on the rights to prospect for minerals, or an appropriate negative statement.</i></p>		
<b>Licences and Permits</b>	<p><i>The status of titles and approvals critical to the economic viability of the project, such as mining leases, development permits, discharge permits and governmental approval. Description of the environment and of anticipated liabilities. Location plans for mineral rights and titles.</i></p>		
<b>Personal introduction into projects and verification of the data</b>	<p><i>(i) Date of visit(s)</i></p> <p><i>(i) Meetings with key persons responsible for the project which is being reported upon, defining their responsible fields and experience relevant to the project.</i></p> <p><i>(ii) Visit to project area resulting in a report itemising significant observations</i></p> <p><i>(iv) What parts of the project were available for personal verification</i></p> <p><i>(v) List of data used or cited in preparation of the Public Report</i></p>		

ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
<b>Table 1 Part 2 - Sampling Techniques and Data</b>			
<b>Type(s) of sampling</b>	<i>The type of sampling and its location, which will give rise to the results being reported, should be stated. Types of sampling include stream sediment, soil and heavy mineral concentrate samples, trenching and pitting, rock chip and channel sampling, drilling, auger etc. Examples of locations include old workings, mine dumps etc. Wherever possible the spacing of such samples should be stated, and locations shown on coordinated maps, plans and sections at suitable scales.</i>		
<b>Drilling techniques</b>	<i>Drilling techniques may include core, reverse circulation, percussion, rotary auger, down-the-hole hammer, etc. These should be stated and details (e.g. core diameter) provided. Measures taken to maximise sample recovery and ensure representative nature of the samples should be stated.</i>		
<b>Drill sample recovery</b>	<i>Whether sample recoveries have been properly recorded and results assessed should be disclosed. In particular the report should state whether a relationship exists between sample recovery and grade or quality and sample bias (e.g. preferential loss/gain of fine/coarse material).</i>		
<b>Logging</b>	<i>Whether samples have been logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies should be confirmed, and whether logging is qualitative or quantitative in nature should be stated. Core (or trench, channel etc.) photography should be included.</i>		
<b>Other sampling techniques</b>	<i>Nature and quality of sampling (e.g. cut channels, random chips etc.) and measures taken to ensure sample representativity should be stated. The precise location and unique numbering of each sample should be provided by reference to a coordinate system (which should be stated).</i>		

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
<b>Sub-sampling techniques and sample preparation</b>	<p><i>For sampling from core, whether cut or sawn or whether quarter, half or all core has been taken in the course of sampling should be stated. If non-core, whether riffled, tube sampled, rotary split etc. and whether split wet or dry. For all sample types, the nature, quality and appropriateness of the sample preparation technique should be described, together with quality control procedures adopted for all sub-sampling stages to maximise representativity of samples.</i></p> <p><i>Measures taken to ensure that the sampling is representative of the in situ material collected should be stated. Whether sample sizes are appropriate to the grain size of the material being sampled should be described. A statement as to the security measures taken to ensure sample integrity is recommended</i></p>		
<b>Assay data and laboratory investigation</b>	<p><i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total should be stated. Attention should also be given to how presented assay results express the assumed extractable content of the element.</i></p> <p><i>Sample preparation and assaying may be carried out by internal or independent laboratories. The laboratories actually used for this work should be identified in any report. In any case, there should be consideration given to the accreditation of the laboratory (e.g. ISO standards awarded such as ISO 9000:2001 and ISO 17025) and to the actual procedures used at all stages of sample preparation and analysis, including the use of randomisation, internal and external standard samples, and blanks, as well as monitoring procedures for systematic bias. In particular, it should be noted whether analyses of samples within the set used to support the resource estimate have been replicated independently in other laboratories.</i></p> <p><i>For assaying on large sample sets for mineral resource estimation, it is often appropriate to use 5 – 10 % of the samples for control purposes, depending on the circumstances. Report the methods of verification of assaying.</i></p>		
<b>Verification of results</b>	<p><i>The verification of selected intersections by either independent or alternative personnel is recommended as is the use of twinned holes (a hole as near as possible to a pre-existing hole to make sure that it has the correct position and geological interpretation), deflections or duplicate samples.</i></p>		

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
<b>Data location</b>	<i>A statement is required regarding the accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations. Quality and adequacy of topographic control should be described and locality plans provided.</i>		
<b>Data density and distribution</b>	<i>Data density for reporting of Exploration Results should be described.</i>	<i>A statement should be included as to whether the data density and distribution are sufficient to establish the degree of geological and grade or quality continuity appropriate for the Mineral Resource and Mineral Reserve estimation procedure and classifications applied, and whether sample compositing has been applied.  Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type should be stated</i>	
<b>Reporting Archives</b>	<i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) for preparing the report should be provided.</i>		
<b>Audits or reviews</b>	<i>The results of any audits or reviews of sampling techniques and data should be presented and discussed.</i>		

ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
<b>Table 1 Part 3 - Reporting of Exploration Results</b>			
<b>Exploration work carried out by other parties</b>	<i>Acknowledgement and appraisal of exploration by other parties.</i>		
<b>Data compositing (aggregation) methods.</b>	<i>In reporting Exploration Results, weighted 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. Where composite intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such compositing should be stated and some typical examples of such composites should be shown in detail. The assumptions used for any reporting of metal equivalent values should be clearly stated.</i>		

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
<b>Relationship between mineralisation widths and intercept lengths</b>	<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 (e.g. 'down-hole length, true width not known').</i>		
<b>Diagrams</b>	<i>Where possible, maps, plans and sections (with scales) and tabulations of intercepts should be included for any material discovery being reported in order to increase the clarity of the reports</i>		
<b>Balanced reporting</b>	<i>Where comprehensive reporting of all Exploration Results is not practicable, the summary description must include representative reporting of both low and high grades and intersections in order to avoid creating unrealistic expectations.</i>		

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
<b>Other substantive exploration data</b>	<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; moisture content; potential deleterious or contaminating substances.</i>		
<b>Further work</b>	<i>The nature and scale of planned further work (e.g. additional exploration). Environmental descriptions of anticipated liabilities.</i>		

ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
<b>Table 1 Part 4 - Estimation and Reporting of Mineral Resources and Mineral Reserves</b>			
<b>Database integrity</b>		<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 verification and/or validation procedures used.</i>	
<b>Geological interpretation</b>		<i>Description of geological model and inferences made from this model. Discussion of sufficiency of data density to assure continuity of mineralisation and provide an adequate database for the estimation procedure used. Discussion of alternative interpretations and their potential impact on the estimation</i>	
<b>Estimation and modelling techniques</b>		<i>The nature and appropriateness of the estimation techniques applied and key assumptions, including treatment of extreme grade values, domaining, compositing (including by length and/or density), interpolation parameters, maximum distance of projection from data points, and the proportion of the estimate that is extrapolated. Interpolation means estimation which is supported by surrounding sample data. Extrapolation means estimation which extends beyond the spatial limits of the sample data. . The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data. The assumptions made regarding recovery of by-products and other minerals that will affect processing of the ore. 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 (e.g. non-linear kriging). The process of validation, the checking process used, the comparison of model data</i>	

ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
		<p><i>to drill hole data, and use of reconciliation data if available.</i></p> <p><i>Detailed description of the method used and the assumptions made to estimate tonnages and grades (section, polygon, inverse distance, geostatistical, or other method). Description of how the geological interpretation was used to control the resource estimates. Discussion of basis for using or not using grade cutting or capping. If a computer method was chosen, description of programmes and parameters used. Geostatistical methods are extremely varied and should be described in detail. The method chosen should be justified. The geostatistical parameters, including the variogram, and their compatibility with the geological interpretation should be discussed. Experience gained in applying geostatistics to similar deposits should be taken into account.</i></p> <p><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></p> <p><i>All metals (or other components) to be treated should be shown, even those rejected as waste. A statement that there are no other deleterious elements requiring removal should be included.</i></p>	

ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
<p><b><i>Metal equivalents or other combined representation of multiple components</i></b></p>		<p><i>The following minimum information should accompany any report which includes reference to metal equivalents (or other component equivalents) in order to conform with these principles. It is necessary to identify:</i></p> <ul style="list-style-type: none"> <li>• <i>individual assays for all metals included in the metal equivalent calculation;</i></li> <li>• <i>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);</i></li> <li>• <i>assumed metallurgical recoveries for all metals and the basis on which the assumed recoveries are derived (metallurgical test work, detailed mineralogy, similar deposits, etc.);</i></li> <li>• <i>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,</i></li> <li>• <i>the calculation formula.</i></li> </ul> <p><i>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.</i></p> <p><i>Estimates of metallurgical recoveries for each metal are particularly important. For many projects at the Exploration Results stage, metallurgical recovery information may not be available or able to be estimated with reasonable confidence.</i></p> <p><i>Overall metal recoveries are usually calculated from a mass balance based on the flowsheet. This should have been demonstrated by the testwork and shown to be relevant to the ore body under consideration and not just the sample treated.</i></p>	

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
<b><i>Cut-off grades or parameters</i></b>		<i>The basis of the cut-off grades or quality parameters applied, including the basis, if appropriate, of equivalent metal formulae. The cut-off parameter may be economic value per block rather than grade.</i>	
<b><i>Tonnage Factor/In-situ Bulk Density</i></b>		<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>	
<b><i>Mining factors or assumptions</i></b>		<i>The mining method proposed and its suitability for the style of mineralisation, including minimum mining dimensions and internal (or, if applicable, external) mining dilution by waste rock. It may not always be possible to make detailed assumptions regarding mining factors when estimating Mineral Resources. In order to demonstrate realistic prospects for eventual economic extraction, basic assumptions are necessary. Examples include access issues (shafts, declines etc.), geotechnical parameters (pit slopes, stope dimensions etc.), infrastructure requirements and estimated mining costs.  <i>All assumptions should be clearly stated.</i></i>	<i>The method and assumptions used to convert the Mineral Resource to a Mineral Reserve (i.e. 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 methods and other mining parameters including associated design issues such as pre-strip, access, etc. The assumptions made regarding geotechnical parameters and hydrogeological regime (e.g. pit slopes, stope sizes, dewatering methods and requirements, 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</i>

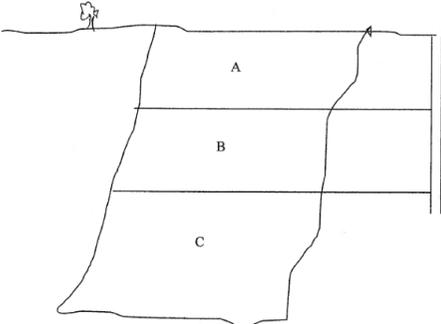
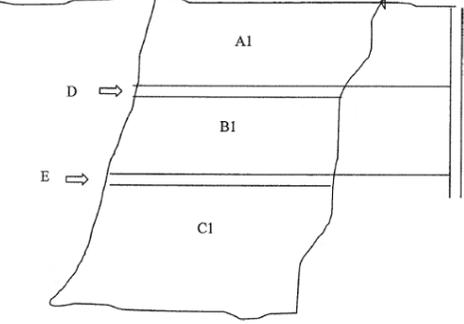
ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
			<p><i>widths used and the infrastructure requirements of the selected mining methods. Where available, the historic reliability of the performance parameters.</i></p>
<p><b>Metallurgical factors or assumptions</b></p>		<p><i>The metallurgical process proposed and the appropriateness of that process to the style of mineralisation. It may not always be possible to make detailed assumptions regarding metallurgical treatment processes when reporting Mineral Resources. In order to demonstrate realistic prospects for eventual economic extraction, basic assumptions are necessary. Examples include the extent of metallurgical test work, recovery factors, allowances for by-product credits or deleterious elements, infrastructure requirements and estimated processing costs. All assumptions should be clearly stated. A full definition of the minerals or at least the assays is required to ensure that the process is suitable and that any contaminants / pollutants / possible by-products are recognised and suitable process steps included in the flowsheet.</i></p>	<p><i>The flowsheet proposed and the appropriateness of these processes to the mineralisation of the deposit. Whether the process is well-tested technology used on minerals of this type before or novel in nature. The nature, amount and representativeness of test work undertaken. The existence of any bulk sample or pilot scale test work and the degree to which such samples and test results are representative of the ore body as a whole. The metallurgical recovery and upgrading factors used and how these relate to those determined in the test work. Any assumptions or allowances made for deleterious elements or variability in the ore feed to the process should be stated. The environmental and health and safety risks associated with each section of the flowsheet should be noted with those sections dealing with hazardous materials or operations covered in more detail. The tonnages and grades reported for Mineral</i></p>

ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
			<p><i>Reserves should state clearly whether these are in respect of material delivered to the plant or after recovery. Comment on suitability of existing plant and equipment for use in the proposed process.</i></p>
<p><b><i>Mineral Resource estimate for conversion to Mineral Reserves</i></b></p>			<p><i>Description of the Mineral Resource estimate used as a basis for the conversion to a Mineral Reserve. Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Mineral Reserves.</i></p> <p><i>Explain the type and level of study to be undertaken to enable mineral resources to be converted to mineral reserves. The standards do not require the reporting of a final or 'bankable' feasibility study, but they require studies to at least a 'pre-feasibility' level, including a mine plan that is technically achievable and that all the relevant parameters for an assessment of the project's financial viability have been considered. The conversion of mineral resources of operating mines to mineral reserves requires less complex calculations.</i></p>

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
<b>Cost and revenue factors.</b>			<i>The derivation of assumptions made, regarding projected capital and operating costs. The assumptions made regarding revenue including head grade, metal or commodity prices, exchange rates, transportation and treatment charges, penalties, etc. The allowances made for royalties payable, both Government and private. Basic cash flow inputs for a stated period.</i>
<b>Market assessment.</b>			<i>The demand, supply and stock situation for the particular mineral, 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. The market assessment can indicate that minerals are not saleable in the proportions in which they are to be produced, and as a result the reserves estimates may need to be adjusted.</i>
<b>Others</b>		<i>Any potential impediments to mining such as land access, environmental or legal</i>	<i>The effect, if any, of natural risk, infrastructure, environmental, legal, marketing, social or</i>

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
		<i>permitting. Location plans of mineral rights and titles.</i>	<i>governmental factors on the likely viability of a project and/or on the estimation and classification of the Mineral Reserves. The status of titles and approvals critical to the viability of the project, such as mining leases, discharge permits, government and statutory approvals. Environmental descriptions of anticipated liabilities. Location plans of mineral rights and titles.</i>
<b>Classification</b>		<i>The basis for the classification of the Mineral Resources into varying confidence categories. 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. Whether the result appropriately reflects the Competent Person's view of the deposit.</i>	<i>The basis for the classification of the Mineral Reserves into varying confidence categories. Whether the result appropriately reflects the Competent Person's view of the deposit. The proportion of Probable Mineral Reserves which have been derived from Measured Mineral Resources (if any).</i>
<b>Audits or reviews</b>		<i>The results of any audits or reviews of Mineral Resource estimates.</i>	<i>The results of any audits or reviews of Mineral Reserve estimates.</i>

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
<p><b><i>Discussion of relative accuracy/confidence</i></b></p>		<p><i>If possible, there should be a statement of the relative accuracy and/or confidence in the mineral resource estimate. For example, the relative accuracy of the resource could be described within stated confidence limits, or, if this is not possible, the factors which could affect the relative accuracy and confidence of the estimate could be discussed.</i></p>	<p><i>Where appropriate a statement of the relative accuracy and/or confidence in the Mineral 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. 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. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available. Discussion of any tests of the production sequence via conditional simulation on the uncertainty of tonnage and grade of production increments.</i></p>

ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
<p><b><i>Schematic description of the principles for reporting of Mineral Resource and Mineral Reserve</i></b></p>		 <p><math>A+B+C = \text{Mineral Resource}</math></p>	 <p><math>A1+B1 = \text{Mineral Reserve}</math>  <math>C1 = \text{Mineral Resource}</math></p> <p><i>D and E are pillars and shall not be included in the reporting if it cannot be shown that their extraction is reasonably possible.</i></p> <p><b>Reporting:</b></p> <ol style="list-style-type: none"> <li>Mineral Reserves are part of the Mineral Resources.  Mineral Reserve <math>A1+B1</math>  Mineral Resource <math>A+B+C</math></li> <li>Mineral Reserves are reported separately (i.e. they are not included in the Mineral Resources)  Mineral Reserve <math>A1+B1</math>  Mineral Resource <math>C1</math></li> </ol>

ASSESSMENT CRITERIA	EXPLORATION RESULTS	MINERAL RESOURCES	MINERAL RESERVES
<b>Table 1 Part 5 - Estimation and Reporting of Diamond Mineralisation</b>			
<b>Exploration</b>	<i>Reports of collection and analysis of indicator minerals such as chemically/physically distinctive garnet, ilmenite, chrome spinel and chrome diopside which distinguish them as being sourced from potentially diamondiferous rocks should be prepared by a suitably qualified and accredited laboratory.</i>		
<b>Sample collection</b>	<i>Type of sample and purpose, e.g. core drilling for micro-diamond sampling and geology, large diameter drilling to establish stones per unit of volume and grade or bulk samples to establish average diamond value. Sample size, distribution and representativity.</i>		
<b>Sample treatment</b>	<i>Type of facility, treatment rate, and accreditation. Sample size reduction. Bottom screen size, top screen size and re-crush. Processes (dense media separation, grease, X-ray, hand-sorting etc. Process efficiency, tailings auditing and granulometry analysis. Sample head feed and tailings particle granulometry. Percent concentrate and undersize per sample. Sample density determination. Laboratory used and type of process for micro diamond recovery and accreditation i.e. caustic fusion or acidisation.</i>		
<b>Sample Grade</b>	<i>Sample grade in this section of Table 1 is used in the context of carats per units of mass, area or volume. 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 placer deposits, sample grades quoted in carats per square metre or carats per cubic metre are acceptable. In the marine placer environment reserve grades are reconciled on a per square meter basis. Volume estimates are inherently inaccurate and are used primarily to assist with estimating mining rates and costs.</i>		

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
<b>Sample characteristics</b>	<i>Micro and macro diamond sample results per facies. Bulk sampling results, global sample grade per facies and local block estimates in the case of Indicated resources. Spatial structure analysis and grade distribution. Stone size and number distribution. Effect on sample grade with change in bottom cut-off screen size. Adjustments made to size distribution for sample plant performance and performance on a commercial scale (reserve modifying factors). 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>		
<b>Grade estimation</b>	<i>Grade estimation (including geostatistical) and interpolation techniques applied. Adjustments made to size distribution for sample plant performance and performance on a commercial scale.</i>		
<b>Value estimation</b>	<i>Accreditation of Valuer. Details of parcel valued, number of stones, carats and size distribution using a standard progression of sieve sizes for each identified facies. Average valuation per sieve size. Estimation of value with size. Assessment of diamond breakage. Average \$/carat and \$/tonne value with change in bottom cut-off. Minimum parcel size for representative valuation. Has a strict bottom cut-off been applied or does the modelled value include incidental diamonds below the bottom cut-off?</i>		
<b>Security and integrity</b>	<i>Accredited process audit. Whether samples were sealed after excavation. Valuer location, escort, delivery, cleaning losses, reconciliation with recorded sample carats and number of stones. Core samples washed prior to treatment for micro diamonds. Audit samples treated at alternative facility. Results of tailings checks. Recovery of tracer monitors used in sampling and treatment. Geophysical (logged) density and particle density. Cross validation of sample weights, wet and dry, with borehole volume and density, moisture factor.</i>		

<b>ASSESSMENT CRITERIA</b>	<b>EXPLORATION RESULTS</b>	<b>MINERAL RESOURCES</b>	<b>MINERAL RESERVES</b>
<b>Classification</b>	<i>Consider the elements of uncertainty in estimates and develop classification accordingly. Key elements to consider for resource classification are the geology and estimates of volume, grade, average diamond value and density.</i>		

## APPENDIX 1 - GENERIC TERMS AND EQUIVALENTS

Throughout the Standard, 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, the generic terms are listed below together with other terms that may be regarded as synonymous for the purposes of this document.

<b>Generic Term</b>	<b>Synonyms and similar terms</b>	<b>Intended generalised meaning</b>
<b>Mining</b>	Quarrying	<i>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.)</i>
<b>Tonnage</b>	Quantity, Volume	<i>An expression of the amount of material of interest irrespective of the units of measurement (which should be stated when figures are reported)</i>
<b>Grade</b>	Quality, Assay, Analysis (Value)	<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.</i>
<b>Metallurgy</b>	Processing, Mineral Processing, Beneficiation, Preparation, Concentration	<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>
<b>Recovery</b>	Yield	<i>The percentage of material of initial interest that is extracted during mining and/or processing. A measure of mining or processing efficiency.</i>
<b>Mineralisation</b>	Mineral Deposit, Mineralised zone, Mineralised material	<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>

<b>Generic Term</b>	<b>Synonyms and similar terms</b>	<b>Intended generalised meaning</b>
<b>Mineral Reserves</b>	<i>Ore Reserves</i>	<i>'Mineral' is preferred under the PERC Reporting Standard but 'ore' is in common use and is generally acceptable. Other descriptors can be used to clarify the meaning, e.g. coal reserves, diamond reserves, etc.</i>
<b>Cut off grade</b>	<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>
<b>Diamond</b>	<i>Gemstones</i>	<i>Diamonds and other gemstones with the same characteristics.</i>

## APPENDIX 2 - RULES OF CONDUCT AND GUIDELINES

The following Rules of Conduct apply to Competent Persons engaged in the practice of preparing or contributing to public reports that include statements of Exploration Results, Mineral Resources or Mineral Reserves. These Rules are in addition to the Professional Codes of Ethics that may apply due to the Competent Person's membership of a recognised professional body.

The Rules of Conduct are listed under various areas of responsibility, highlighted in bold text.

Enforcement of these rules is not within the scope of PERC, but should be the responsibility of the relevant financial regulatory organisation or stock exchange.

### ***The Public and Society***

***Competent Persons must discharge their duties with fidelity to the public, and at all times in their professional or employed capacities carry out their work with integrity and professional responsibility.***

*In particular:*

- *Recognise at all times, that the responsibility of Competent Persons towards the Public overrides all other specific responsibilities including responsibility to professional, sectional, or private interests or to other Competent Persons.*
- *Ensure that public comments on geological, engineering and metallurgical and related matters are made with care and accuracy, without unsubstantiated, exaggerated, or premature statements; they should be made clearly and concisely.*
- *Base Public Reports on Mineral Resources and Mineral Reserves on adequately validated data, sound and relevant estimation techniques, and unbiased judgement.*
- *Note that when required to do so, Competent Persons should give evidence, express opinions or make statements in an objective and truthful manner on the basis of adequate knowledge and understanding.*
- *Recognise that where required to do so, Competent Persons should be prepared to disclose details of qualifications, professional affiliations and relevant experience in all public reports. CPD (Continuous Professional Development) records may be useful as a way of demonstrating relevant and current experience.*

### ***The Profession, Employers and Clients***

***Competent Persons must uphold the honour, integrity, reputation and dignity of their profession and maintain the highest level of conduct in all professional matters.***

*In particular they should:*

- *Act with due skill, care and diligence at all times in conducting their activities.*
- *Perform work only in their area of competence, except where training under the supervision of other Competent Persons in a new area of expertise.*
- *Never knowingly mislead or deceive others, falsify or fabricate data.*
- *Respect and safeguard confidential information.*
- *Acknowledge and avoid wherever possible both real and perceived conflicts of interest.*

- *Distinguish between fact and opinion so that it is clearly evident what is description or interpretation of fact and what is professional judgement. Competent/Qualified Persons may give a considered professional opinion based on facts, experience, interpretation, extrapolation or a combination of these.*
- *Ensure that scientific and technological contributions are thorough, accurate and unbiased in design, implementation and presentation.*
- *Ensure that sound and relevant estimation techniques, adequately validated data and unbiased judgement are applied to the documentation upon which public reports on Exploration Results, Mineral Resources and Mineral Reserves are based.*
- *Maintain documentation of all aspects of work-product in a format that facilitates review and auditing.*
- *Comply with all laws and regulations relating to the mineral industries and rules, regulations and practices as established and promulgated by the relevant regulatory authorities.*
- *Use their best endeavours to ensure that their employer or client complies with the rules and regulations and practices of the relevant regulatory authorities.*

### **Professional Bodies, Colleagues and Associates**

**Competent Persons must at all times conform to the rules of the professional bodies to which they belong and respect and acknowledge the contributions of colleagues and other experts in enabling them to conduct their work.**

*They should:*

- *Accept responsibility for their own errors.*
- *Demonstrate a willingness to be judged by their professional peers.*
- *Agree to be bound by the disciplinary code of the professional body to which they are affiliated.*
- *Encourage others to accept the same responsibilities, to join a recognised professional body and to be bound by these Rules of Conduct.*

### **The Environment, Health and Safety**

**In performing their work, Competent Persons should strive to protect the natural environment and ensure that the consequences of their work do not adversely affect the safety, health and welfare of themselves, colleagues and members of the Public.**

- *Ensure that consideration of the modifying factors used to determine Mineral Reserves fully recognises the need to provide a safe working environment.*
- *Ensure that Mineral Reserve estimates acknowledge the likely environmental impact of development and ensure that appropriate allowances are made for mitigation and remediation.*

## APPENDIX 3 - HISTORICAL NOTES

In 1991, the Council of the Institute of Mining and Metallurgy (IMM, now part of the Institute of Materials, Minerals and Mining, IoM3) approved definitions for resources that appeared in a slightly modified form in the London Stock Exchange Listing Rules.

A committee (now known as CRIRSCO) of the Council of Mining and Metallurgical Institutions ('CMMI') was established in 1994 comprising representatives from mining and metallurgical institutions from the United States (SME), Australia (AusIMM/AIG), Canada (CIM), the United Kingdom (IMM) and South Africa (SAIMM). This committee worked towards the creation of a set of standard international definitions for the public reporting of Exploration Results, Mineral Resources and Mineral Reserves, modelled on the existing (1989) JORC Code (the Australasian Code for Reporting of Mineral Resources and Ore Reserves) and reached provisional agreement on standard reporting definitions in 1997 (the Denver Accord). This was followed in 1999, in Geneva, 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 consequence of the CMMI initiative, significant developments have taken place towards producing consistent reporting standards for Mineral Resources and Mineral Reserves. These include the release of updated versions of the JORC Code in Australia in 1996 and 1999, followed by publication of similar Codes and Guidelines by the professional bodies in South Africa, the USA, Canada, UK, Ireland and Europe.

In July 2006, the former CMMI Committee, now the Committee for Mineral Reserves International Reporting Standards, or CRIRSCO, published an International Reporting Template which integrates the minimum standards being adopted in national reporting standards and codes worldwide with recommendations and interpretive guidelines for the Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves. The Template is non binding and does not account for local regulatory reporting requirements. Thus, where national reporting is concerned, national reporting standards and codes such as the PERC Standard take precedence. The CRIRSCO Template is available at [www.crirSCO.com](http://www.crirSCO.com).

PERC was set up in 2006 to replace the former IMM Reserves Committee, with broader geographic scope, and in 2012 was registered in Brussels as a not-for-profit association (asbl). The PERC Code was first published in 2008, now updated and reissued as the PERC Standard, draws from and is consistent with the CRIRSCO International Reporting Template and the national Codes and Standards from which it is derived.

As a result of the CRIRSCO/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, Chile, Peru, and the Philippines, as well as Europe. The core definitions in this edition of the PERC Standard are identical to the international definitions agreed by CRIRSCO in 2012.

## APPENDIX 4 - COMPETENT PERSON'S CONSENT STATEMENT

Appropriate forms of compliance statements are as follows.

If the required information is in the report:

*"The information in this report that relates to Exploration Results, Mineral Resources or Mineral Reserves, is based on information compiled by **[insert name of Competent Person]**, who is a professional **[Member or Fellow – delete as appropriate]** with **['Chartered' or 'European Geologist' or 'European Engineer' – delete as appropriate]** Status of **[insert name of professional institution]** which is included in the current list of recognised professional organisations or a member institution of the European Federation of Geologists, or an institution elsewhere of equivalent status (as confirmed by an adjudication by the PERC Accreditation Sub-committee on dd/mm/yyyy)."*

**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 Mineral Reserves, is based on information compiled by **[insert name of Competent Person]**, who is a professional **[Member or Fellow – delete as appropriate]** with **['Chartered' or 'European Geologist' or 'European Engineer' – delete as appropriate]** Status of **[insert name of professional institution]** which is included in the current list of recognised professional organisations or a member institution of the European Federation of Geologists, or an institution elsewhere of equivalent status (as confirmed by an adjudication by the PERC Accreditation Sub-committee on dd/mm/yyyy)."*

**and**

- 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 2017 Edition of the 'PERC Standard for Reporting of Exploration Results, Mineral Resources and 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".*

Alternatively, the following prototype form may be used:

## COMPETENT PERSON'S CONSENT STATEMENT

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

### Competent Person's Consent Statement

**Pursuant to the requirements of paragraph 3.2 of the PERC Standard**

**[report name]**

..... for

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

**[company]**.....

*(insert name of company releasing the Report and 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.

.....

Effective date of report

I, ..... confirm that:

*(insert full name)*

- I have read and understood the requirements of the PERC Standard for Reporting of Exploration Results, Mineral Resources and Mineral Reserves ("PERC Standard").
- I am a Competent Person as defined by the PERC Standard, having at least five years' relevant experience in relation 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 professional Member or otherwise registered professional, with required status (CEng, CGeol, CSci, PGeo, EurGeol, Eurlng) of
- 
- ..... being an institution which is included in the current list of recognised professional organisations or a member institution of the European Federation of Geologists, or an organisation elsewhere included in the RPO list in Appendix 5 of the PERC Standard or as subsequently updated
- *I have reviewed the Report to which this Consent Statement applies.*
- I am a full time employee of ..... *(insert company name)* OR I am a consultant working for ..... *(insert name of company)* and have been engaged by ..... *(insert name of company)* to prepare the Report for

..... *(insert deposit name)* for the period  
ended ..... *(insert effective date of resource/reserve statement)*.

- There is no other direct or indirect financial relationship between myself and the Company **OR** There is a direct or indirect financial relationship between myself and the Company as described here:

.....  
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 Mineral Reserves *(select as appropriate)*.

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

.....  
*(name of reporting company)*

Signature of Competent Person:

Date:

Professional Membership:

Membership Number:

*(Organisation)*

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

.....  
.....

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

.....  
.....

Signature of Competent Person:

Date:

Professional Membership:

Membership Number:

*(Organisation)*

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## APPENDIX 5 - RECOGNISED PROFESSIONAL ORGANISATIONS (RPOs)

A list of professional organisations (RPOs, or Recognised Professional Organisations) and required membership levels for the purpose of the definition of a Competent Person in the PERC Reporting Standard at paragraph 3.1, is maintained by PERC.

This list is updated from time to time and can be found on, and downloaded from, the PERC website at <http://www.percstandard.eu>

## APPENDIX 6 - NON-PUBLIC REPORTING

*There are circumstances in which a company or other organisation may be required to record estimates of mineral quantities which cannot be reported publicly using the PERC Reporting Standard. These circumstances may include requirements such as submitting to government authorities statements as to the mineral potential of land within their ownership or control in connection with national mineral inventory or spatial planning (prevention of sterilisation). In such cases, this may involve making estimates of mineral which has not yet been discovered or which the company may consider, at the time of making the statement, to be uneconomic or unrecoverable. This appendix is intended to provide a set of categories for such 'non-public' records.*

### Requirements for non-public reports

- A6.1 There are circumstances in which it is required that estimates of mineralised material, beyond the categories of Exploration Results, Mineral Resources, and Mineral Reserves defined for public reporting, be recorded. It should be emphasised that estimates within these categories must not be included in Public Reports by companies, as defined in paragraph 2.8 of the Standard.
- A6.2 Such information may be provided for use in compilations required by governments or non-governmental organisations for statistical or planning purposes, but only if they are provided to the appropriate authority on a strictly confidential basis, having first received legally binding assurances from the receiving authority limiting their use to incorporation in national or regional mineral statistics or 'land bank' calculations without attribution to a particular company or land area.

### Non-Recoverable Mineral

<b>Definition</b>	<b>Non-Recoverable Mineral is any material which for physical or administrative reasons is considered to be permanently inaccessible for extraction.</b>
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- A6.4 Such Non-Recoverable Mineral estimates may be qualified by the words 'Inferred', 'Indicated', or 'Measured' if required and appropriate to express different degrees of geological knowledge, in a similar way to those defined for Mineral Resources.
- A6.5 Non-Recoverable Mineral does not have reasonable prospects for eventual economic extraction and must not be aggregated with any category of Mineral Resources or Mineral Reserves.
- A6.6 The terms Resources and Reserves must not be used to refer to Non-Recoverable Mineral.

<b>Guidance</b>	<p><i>Examples of Non-Recoverable Mineral include deposits which might otherwise be economic but cannot be extracted because they are located within locally, nationally, or internationally protected areas such as National Parks, Nature Conservation Areas or World Heritage sites or below structures such as protected historic buildings which would be damaged or destroyed by mineral extraction.</i></p> <p><i>A defining characteristic for Non-Recoverable Mineral is the inability to secure a permit for extraction.</i></p>
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## Non-Economic Mineral

A6.7	<b>Definition</b>	<b>Non-Economic Mineral is material which is accessible but for which there are no reasonable prospects for eventual economic extraction.</b>
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A6.8 Such Non-Economic Mineral estimates may be qualified by the words 'Inferred', 'Indicated', or 'Measured' if required and appropriate to express different degrees of geological knowledge, in a similar way to those defined for Mineral Resources.

A6.9 Non-Economic Mineral does not have reasonable prospects for eventual economic extraction and must not be aggregated with any category of Mineral Resources or Mineral Reserves.

A6.10 The terms Resources and Reserves must not be used to refer to Non-Economic Mineral.

<b>Guidance</b>	<p><i>Examples of Non-Economic Mineral include material for which the costs of extraction and processing preclude a reasonable return on investment. Such conditions may arise inter alia due to low grade, the absence of processing methodology to extract the valuable components or to separate them from deleterious components, unrealistic costs for infrastructure and development, no market for the products, etc.</i></p> <p><i>A defining characteristic for Non-Economic Mineral is a poor or negative return on investment.</i></p>
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## Changes in conditions for Non-Recoverable or Non-Economic Minerals

A6.11 Should economic, technological, accessibility or recoverability conditions change such that there exists a reasonable prospect for eventual economic extraction of materials previously classified as Non-Economic Mineral or Non-Recoverable Mineral, these materials may (in part or in whole, depending on circumstances) then

be publicly reported as Resources or Reserves, subject to the requirements of paragraphs 2.8 to 2.24 of the Standard.

<b>Guidance</b>	<i>This category may be considered as broadly equivalent to the UNFC-2009 E-axis sub-category E3.3: "On the basis of realistic assumptions of future market conditions, it is currently considered that there are not reasonable prospects for economic extraction and sale in the foreseeable future" (UNECE Energy Series 42, 2013, page 12).</i>
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## Undiscovered Mineral

A6.12	<b>Definition</b>	<b>Undiscovered Mineral is any estimated quantity of mineral for which there is some evidence but which has not yet been discovered.</b>
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A6.13 If it is the subject of current exploration project by a company it may be expressed in Public Reports in the form of **Exploration Target**, or otherwise it may be recorded simply as an estimate, in any desired format, but which must not be included in a Public Report.

<b>Guidance</b>	<p><i>Estimates of undiscovered mineral may be supported by little or no direct or indirect evidence, and may sometimes be guesswork based upon little more than regional geological considerations. It is recommended that the extent of any supporting evidence be stated and that a summary and assessment of the quality of any such evidence should be provided.</i></p> <p><i>This category may be considered as broadly equivalent to the UNFC-2009 F-axis category F4 "Additional quantities in place associated with a known deposit that will not be recovered by an currently defined development project or mining operation". (UNECE Energy Series 42, 2013, pages 6, 10).</i></p>
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## Inclusion of information in Public Reports

A6.14 It is emphasised that under no circumstances whatsoever may any of the categories defined in this Appendix be included in Public Reports as defined in paragraph 2.8 of the Standard.