

April 2010

Discussion Paper DP/2010/1

Extractive Activities

Comments to be received by 30 July 2010

Prepared for the IASB by the following staff of the national accounting standard-setters in Australia, Canada, Norway and South Africa:

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The paper was prepared by a project team of staff from four national standard-setters and sets out the team's findings and recommendations.

Comments on the contents of the discussion paper should be submitted in writing so as to be received by **30 July 2010**. Respondents are asked to send their comments electronically to the IASB website (www.iasb.org), using the 'Open to Comment' page.

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ISBN: 978-1-907026-66-9

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Background

In 2004 the International Accounting Standards Board set up an international project team comprising staff from the national standard-setters in Australia, Canada, Norway and South Africa to research the accounting for extractive activities. This discussion paper presents the project team's findings and recommendations as a result of that research. The Board has discussed the project team's findings at public meetings but has not developed preliminary views on any of the project team's recommendations or made any related technical decisions.

Later in 2010, the Board will consult publicly on the composition of its technical agenda following completion in June 2011 of its Memorandum of Understanding commitments. Among other projects, that public consultation process will identify the extractive activities project as a candidate for inclusion in the Board's agenda. The comments received in relation to this discussion paper will also assist the Board in making its agenda decisions.

If the Board adds a project on extractive activities to its agenda, the Board will use the discussion paper, and the comments it receives, as the basis for its initial deliberations on the project. At that time, the Board will decide whether, in the light of the responses received, it would be appropriate to proceed to the development of an exposure draft as the next step in its due process or whether it is necessary for the Board to publish its own discussion paper.

The Board is grateful to the participating national standard-setters for supporting the research phase of this project and to the authors of the discussion paper.

Invitation to comment

The Board invites comments on all matters in this discussion paper, particularly on the questions set out below and on whether, overall, the project team's recommendations, if implemented, would improve the financial reporting of entities engaged in extractive activities. Comments are most helpful if they:

- address the questions as stated;
- indicate the specific paragraph or paragraphs to which the comments relate;
- contain a clear rationale; and
- describe any alternatives the Board should consider.

Respondents need not comment on all of the questions. Respondents are also encouraged to comment on any additional issues within the scope of the discussion paper.

The Board will consider all comments received in writing by 30 July 2010.

Question 1 – Scope of extractive activities

In Chapter 1 the project team proposes that the scope of an extractive activities IFRS should include only upstream activities for minerals, oil and natural gas. Do you agree? Are there other similar activities that should also fall within the scope of an IFRS for extractive activities? If so, please explain what other activities should be included within its scope and why.

Question 2 – Approach

Also in Chapter 1, the project team proposes that there should be a single accounting and disclosure model that applies to extractive activities in both the minerals industry and the oil and gas industry. Do you agree? If not, what requirements should be different for each industry and what is your justification for differentiating between the two industries?

Question 3 – Definitions of minerals and oil and gas reserves and resources

In Chapter 2 the project team proposes that the mineral reserve and resource definitions established by the Committee for Mineral Reserves International Reporting Standards and the oil and gas reserve and resource definitions established by the Society of Petroleum Engineers (in conjunction with other

industry bodies) should be used in an IFRS for extractive activities. Do you agree? If not, how should minerals or oil and gas reserves and resources be defined for an IFRS?

**Question 4 – Minerals or oil and gas asset recognition model—
recognition**

In Chapter 3 the project team proposes that legal rights, such as exploration rights or extraction rights, should form the basis of an asset referred to as a ‘minerals or oil and gas property’. The property is recognised when the legal rights are acquired. Information obtained from subsequent exploration and evaluation activities and development works undertaken to access the minerals or oil and gas deposit would each be treated as enhancements of the legal rights. Do you agree with this analysis for the recognition of a minerals or oil and gas property? If not, what assets should be recognised and when should they be recognised initially?

**Question 5 – Minerals or oil and gas asset recognition model—unit of
account selection**

Chapter 3 also explains that selecting the unit of account for a minerals or oil and gas property involves identifying the geographical boundaries of the unit of account and the items that should be combined with other items and recognised as a single asset.

The project team’s view is that the geographical boundary of the unit of account would be defined initially on the basis of the exploration rights held. As exploration, evaluation and development activities take place, the unit of account would contract progressively until it becomes no greater than a single area, or group of contiguous areas, for which the legal rights are held and which is managed separately and would be expected to generate largely independent cash flows.

The project team’s view is that the components approach in IAS 16 *Property, Plant and Equipment* would apply to determine the items that should be accounted for as a single asset.

Do you agree with this being the basis for selecting the unit of account of a minerals or oil and gas property? If not, what should be the unit of account and why?

Question 6 – Minerals or oil and gas asset measurement model

Chapter 4 identifies current value (such as fair value) and historical cost as potential measurement bases for minerals and oil and gas properties. The research found that, in general, users think that measuring these assets at either historical cost or current value would provide only limited relevant

information. The project team's view is that these assets should be measured at historical cost but that detailed disclosure about the entity's minerals or oil and gas properties should be provided to enhance the relevance of the financial statements (see Chapters 5 and 6).

In your view, what measurement basis should be used for minerals and oil and gas properties and why? This could include measurement bases that were not considered in the discussion paper. In your response, please explain how this measurement basis would satisfy the qualitative characteristics of useful financial information.

Question 7 – Testing exploration properties for impairment

Chapter 4 also considers various alternatives for testing exploration properties for impairment. The project team's view is that exploration properties should not be tested for impairment in accordance with IAS 36 *Impairment of Assets*. Instead, the project team recommends that an exploration property should be written down to its recoverable amount in those cases where management has enough information to make this determination. Because this information is not likely to be available for most exploration properties while exploration and evaluation activities are continuing, the project team recommends that, for those exploration properties, management should:

- (a) write down an exploration property only when, in its judgement, there is a high likelihood that the carrying amount will not be recoverable in full; and
- (b) apply a separate set of indicators to assess whether its exploration properties can continue to be recognised as assets.

Do you agree with the project team's recommendations on impairment? If not, what type of impairment test do you think should apply to exploration properties?

Question 8 – Disclosure objectives

In Chapter 5 the project team proposes that the disclosure objectives for extractive activities are to enable users of financial reports to evaluate:

- (a) the value attributable to an entity's minerals or oil and gas properties;
- (b) the contribution of those assets to current period financial performance; and
- (c) the nature and extent of risks and uncertainties associated with those assets.

Do you agree with those objectives for disclosure? If not, what should be the disclosure objectives for an IFRS for extractive activities and why?

Question 9 – Types of disclosure that would meet the disclosure objectives

Also in Chapter 5, the project team proposes that the types of information that should be disclosed include:

- (a) quantities of proved reserves and proved plus probable reserves, with the disclosure of reserve quantities presented separately by commodity and by material geographical areas;
- (b) the main assumptions used in estimating reserves quantities, and a sensitivity analysis;
- (c) a reconciliation of changes in the estimate of reserves quantities from year to year;
- (d) a current value measurement that corresponds to reserves quantities disclosed with a reconciliation of changes in the current value measurement from year to year;
- (e) separate identification of production revenues by commodity; and
- (f) separate identification of the exploration, development and production cash flows for the current period and as a time series over a defined period (such as five years).

Would disclosure of this information be relevant and sufficient for users? Are there any other types of information that should be disclosed? Should this information be required to be disclosed as part of a complete set of financial statements?

Question 10 – Publish What You Pay disclosure proposals

Chapter 6 discusses the disclosure proposals put forward by the Publish What You Pay coalition of non-governmental organisations. The project team's research found that the disclosure of payments made to governments provides information that would be of use to capital providers in making their investment and lending decisions. It also found that providing information on some categories of payments to governments might be difficult (and costly) for some entities, depending on the type of payment and their internal information systems.

In your view, is a requirement to disclose, in the notes to the financial statements, the payments made by an entity to governments on a country-by-country basis justifiable on cost-benefit grounds? In your response, please identify the benefits and the costs associated with the disclosure of payments to governments on a country-by-country basis.

Preface

- P1 Entities engaged in minerals or oil and gas extractive activities are an important part of international capital markets. However, some extractive activities—and the assets or expenditures associated with these activities—are not comprehensively addressed by International Financial Reporting Standards (IFRSs). There are scope exclusions in IFRSs that might otherwise apply to some of these activities, most notably in IAS 16 *Property, Plant and Equipment* and IAS 38 *Intangible Assets*. Furthermore, although IFRS 6 *Exploration for and Evaluation of Mineral Resources* addresses the accounting for exploration and evaluation expenditures, it was developed as an interim measure to allow (with some limitations) entities adopting IFRSs to continue to apply their existing accounting policies for these expenditures. This absence of comprehensive IFRS literature has contributed to continuing divergence in the international financial reporting of extractive activities. Concerns have also been raised that some accounting practices might not be consistent with the IASB *Framework for the Preparation and Presentation of Financial Statements*.
- P2 This discussion paper is the first step towards a possible IFRS for extractive activities that would address those concerns and replace IFRS 6.

History

- P3 The IASB's predecessor organisation, the International Accounting Standards Committee (IASC) began a project on accounting by entities in the extractive industries in 1998. The main reasons for undertaking this project were to address the divergence of views on:
- (a) the extent to which the costs of finding, acquiring and developing minerals or oil and gas reserves and resources should be capitalised;
 - (b) the methods of depreciating (or amortising) capitalised costs;
 - (c) the degree to which quantities and values of minerals or oil and gas reserves and resources, rather than costs, should affect recognition, measurement and disclosure; and
 - (d) the definition and measurement of minerals and oil and gas reserves and resources.

EXTRACTIVE ACTIVITIES

- P4 In November 2000 the IASC Steering Committee on Extractive Industries published an Issues Paper *Extractive Industries*, which attracted 52 comment letters. Where relevant, the Issues Paper and comments received in response have been considered by the project team in developing this discussion paper.
- P5 The IASB was constituted in 2001 as successor to the IASC. In July 2001 the IASB announced that it would restart the project when agenda time permitted. In September 2002 the IASB decided it was not feasible to complete a comprehensive project on accounting for extractive activities in time for the many entities that would adopt IFRSs in 2005. However, the IASB decided it was necessary to provide principles on the treatment of exploration and evaluation costs for entities applying IFRSs in 2005. Accordingly, IFRS 6 was issued in December 2004. The IASB's objectives in issuing IFRS 6 were:
- (a) to make limited improvements to accounting practices for exploration and evaluation expenditures, without requiring major changes that might be reversed when the IASB undertakes a comprehensive review of accounting practices used by entities engaged in the exploration for and evaluation of mineral resources;
 - (b) to specify the circumstances in which entities that recognise exploration and evaluation assets should test such assets for impairment in accordance with IAS 36 *Impairment of Assets*; and
 - (c) to require entities engaged in the exploration for and evaluation of mineral resources to disclose information about exploration and evaluation assets, the level at which such assets are assessed for impairment and any impairment losses recognised.
- P6 Also in 2004, the IASB initiated a research project to undertake a comprehensive assessment of accounting for extractive activities. The research project was undertaken by a project team that comprised staff from the national accounting standard-setters in Australia, Canada, Norway and South Africa. An advisory panel that included members from entities operating in the minerals and the oil and gas industries, accounting firms, users of financial reports and securities regulators from around the world assisted the project team throughout the research project. Other industry groups, including the Committee for Mineral Reserves International Reporting Standards, the Society of Petroleum

* IFRS 6 uses the term 'mineral resources' as a general reference for minerals, oil, natural gas and similar non-regenerative resources.

Engineers Oil and Gas Reserves Committee, and the United Nations Ad Hoc Group of Experts on the Harmonisation of Fossil Energy and Mineral Resources, and other industry and investment professionals were consulted at various stages throughout the project. The project team appreciates the contributions that these groups and individuals made to the research project.

- P7 This discussion paper presents the results of the research project. All the conclusions in the paper are those of the project team.

Chapter 1 – Scope and approach

Scope

- 1.1 This discussion paper addresses financial reporting issues associated with exploring for and finding minerals, oil and natural gas deposits, developing those deposits and extracting the minerals, oil and natural gas. These are referred to as extractive activities or, alternatively, as upstream activities. A brief description of these activities is provided in Appendix A.
- 1.2 Minerals, oil and natural gas are non-regenerative natural resources. In other words, they cannot be replaced in their original state after extraction. Minerals are naturally occurring materials in or on the earth's crust that include metallic ores (such as copper, gold, silver, iron, nickel, lead and zinc), other industrial minerals (non-metallic minerals and aggregates), gemstones, uranium and fossilised organic material (coal). Oil and natural gas, often referred to collectively as petroleum, can be defined as a naturally occurring mixture consisting of hydrocarbons in the gaseous, liquid or solid phase (such as tar sands or oil shale). This paper refers to these non-regenerative natural resources collectively as either minerals or oil and gas, as appropriate.
- 1.3 Extractive activities are subject to several significant uncertainties. During exploration it is common to have insufficient data to evaluate whether a deposit of minerals or oil and gas will be developed and will generate future net cash inflows from the extraction and sale of the minerals or oil and gas. These uncertainties revolve around the quantity of minerals or oil and gas that exist and can be extracted given the geological, technical and economic conditions. While such uncertainties may decrease over time as knowledge of the geology of the deposit improves and better estimates can be made about the quantity of minerals or oil and gas that can be extracted and future economic conditions, these uncertainties remain even during the development and production phases. There is also no direct relationship between the risks and rewards of a particular exploration programme. For example, a very small expenditure may result in a major find while substantially larger expenditures may result in nothing being found.

- 1.4 There are other activities that some might view as having some similar characteristics to exploring for and finding minerals or oil and gas deposits, developing those deposits and extracting the minerals or oil and gas, such as the production of geothermal energy and the extraction of minerals from seawater. These activities are not regarded as extractive activities because they either:
- (a) share a similar process to extractive activities and face similar risks, but are not strictly non-regenerative resources (eg geothermal energy projects); or
 - (b) involve a process of extracting non-regenerative resources, but face risks that are more in the nature of the risks facing manufacturing activities or other production processes (eg the extraction of minerals from seawater) and so are very different from the risks associated with exploring for, developing and extracting minerals or oil and gas.
- 1.5 Including these other activities within the scope of extractive activities:
- (a) would have implications for the design of an IFRS for extractive activities, because a separate disclosure model and/or modifications to the accounting model might need to be developed to address the different risks and characteristics of those activities. Among other things, this would include the development of definitions that are comparable to the definitions of minerals and oil and gas reserves and resources.*
 - (b) would potentially extend the project scope to related areas, and make the project open-ended and more difficult to manage and progress.

* In August 2008, the geothermal industry in Australia issued the *Australian Code for Reporting of Exploration Results, Geothermal Resources and Geothermal Reserves* (known as the Geothermal Reporting Code). If geothermal is to be included within the scope of an IFRS for extractive activities, the mapping of the CRIRSCO Template (for minerals) to the Petroleum Resource Management System (as discussed in Chapter 2) will need to be extended to include comparisons to the Geothermal Reporting Code. This is not expected to cause significant difficulty because it is modelled on the CRIRSCO Template. However, there may be different geothermal reporting systems that apply in different regions. Page 1 of the Geothermal Reporting Code notes that the methodology of the Code will 'be applicable to the type of geothermal projects that are likely to be undertaken in Australia, given that many of the Australian [projects] ... are different from most of those which have so far been commercially developed in other countries'. For these reasons, the research has not specifically included geothermal projects.

EXTRACTIVE ACTIVITIES

- 1.6 Consequently, the scope of this paper is limited to extractive activities relating to minerals, oil and natural gas. This represents a change from IFRS 6 *Exploration for and Evaluation of Mineral Resources*, which includes minerals, oil, natural gas and similar non-regenerative resources within its scope. References to similar non-regenerative resources are also present in the scope exclusions in IAS 16 *Property, Plant and Equipment* and IAS 38 *Intangible Assets*. The project team notes that, although outside the research scope, the proposals in this paper might provide insights into possible future accounting and disclosure models for other non-regenerative resources and activities with similar risks and uncertainties.

Research parameters

- 1.7 Research into the financial reporting issues relating to extractive activities has been subject to the following parameters.

Common requirements across the minerals and oil and gas industries

- 1.8 A research objective was to consider whether common requirements could be applied to minerals and oil and gas extractive activities. If so, this would be a change from existing practices, whereby the accounting and disclosure approaches often differ between entities operating in the minerals and oil and gas industries. Differences in the accounting and disclosure requirements may reflect the traditionally held view that they are separate and distinct industries. For instance, the different physical attributes of minerals and of oil and gas (ie solids versus liquids) affect the estimation process, and this has influenced the development of different reserve and resource definitions in each industry.
- 1.9 However, the main business activities (exploration, evaluation, development and production) and the geological and other risks and uncertainties are very similar. In fact, the traditional differences between the two industries are being reduced as a result of the lead times involved in moving to production and the ratio of development-to-exploration expenditures becoming more comparable as oil and gas exploration moves from onshore conventional oil and gas to more capital-intensive offshore oil and gas and non-conventional oil and gas (eg oil sands). The cash flow profile and risks and uncertainties of a non-conventional oil project may be closer to those for a minerals project than for a conventional oil and gas project.

- 1.10 Despite the differences between minerals and oil and gas extractive activities, they are sufficiently similar for a single accounting standard to apply in the same way as other accounting standards are used by multiple industries with a variety of circumstances. The project team was encouraged in this view by the analysis of reserve and resource definitions by the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) and the Society of Petroleum Engineers Oil and Gas Reserves Committee (SPE OGRC). This analysis showed substantive equivalence between the two sets of industry definitions even though there are some differences in terminology (see Chapter 2).
- 1.11 A consequence of adopting 'extractive activities' as the scope of an IFRS is that, in the project team's opinion, industry debates about whether particular non-conventional reserves and resources should be classified as minerals or as oil and gas become largely irrelevant. This is because, as explained later in the paper, the same accounting requirements and substantially the same disclosure requirements would apply regardless of whether, for example, the mining of bitumen, oil shale or coal for the purposes of generating synthetic oil or gas is classified as mineral or as oil and gas reserves and resources.

Avoid issues of general application

- 1.12 Although extractive activities may be regarded as sufficiently different from other activities to require addressing in a separate IFRS, many other financial reporting issues for entities in the extractive industries are not significantly different from those in other industries. Examples are accounting for inventory, revenue, decommissioning and restoration liabilities and joint arrangements. Existing IFRSs and standard-setting projects address these issues and consequently this paper does not address them. For similar reasons, the paper also does not address financial reporting issues relating to downstream activities, such as the refining, processing, marketing and distribution of minerals or oil and gas other than the refining or processing that is necessary to make the extracted minerals or oil and gas capable of being sold.

The Framework

- 1.13 The research presented in this paper has been undertaken in the context of the *Framework for the Preparation and Presentation of Financial Statements*, on the basis that an IFRS for extractive activities should be based on, and be consistent with, the *Framework*. However, the project team's research has not been constrained to considering only the application of existing IFRSs to extractive activities. In particular the proposals on recognition in this

paper may be viewed as inconsistent with the requirements of IAS 38 regarding intangible assets, such as those for research and development activities.

Scope of financial reporting

- 1.14 It is not possible, nor is it intended, that financial reporting would meet all the information needs of users of financial reports. Although there is no clear definition of what is within the scope of financial reports, this should become clearer as the IASB's work continues on the conceptual framework and management commentary projects. (The scope of financial reporting as it relates to the project team's recommended disclosures is discussed further in Chapter 5.) For the purposes of this paper, the project team proposes that financial reporting should include financial information that:
- (a) helps users of financial reports to make decisions;
 - (b) can reasonably be viewed as being within the scope of a complete set of financial statements; and
 - (c) meets a cost-benefit test.

Financial reporting issues

- 1.15 It is generally acknowledged that the most important information about an entity conducting extractive activities is information about the minerals or oil and gas reserves and resources under that entity's control. Economic decisions that involve investing in, and supplying and lending to, entities conducting extractive activities are dependent on an understanding of the quantity and quality of reserves and resources under the control of the entity. It is the extraction of those reserves and resources that provides the basis for the economic benefits flowing from extractive activities.
- 1.16 The financial reporting issues that are relevant to extractive activities therefore involve determining:
- (a) definitions of reserves and resources for use in the accounting for, and disclosure of, extractive activities;
 - (b) the assets related to extractive activities that should be recognised in financial statements and when they should be recognised;
 - (c) how those assets should be measured on initial recognition—alternatives include the historical cost of acquisition or discovery and fair value or some other current value basis;

- (d) how those assets should be measured in reporting periods after initial recognition, including issues such as remeasurement, impairment and depreciation; and
 - (e) the information about extractive activities, including reserves and resources information, that should be disclosed in financial statements.
- 1.17 This paper addresses each of these issues.
- 1.18 For the purposes of this discussion paper, the assets related to extractive activities are collectively referred to as 'minerals or oil and gas properties' unless otherwise indicated. As Chapter 3 explains, these assets include the legal rights either to explore for minerals or oil and gas in a specified location or to extract minerals or oil and gas from that location (ie the property) as well as information about the property and any plant and equipment that is not recognised separately.

Users' needs

- 1.19 The objective of a general purpose financial report—and therefore of an IFRS for extractive activities—is to address users' needs by providing financial information that is useful for making economic decisions.
- 1.20 A general purpose financial report is directed towards the common financial information needs of a wide variety of users. It is unlikely that the different users of the financial statements of entities in the extractive industries all share the same view of the information that would be most useful to them. In particular it is likely that users that are more sophisticated will have different information needs, and will use information differently, from less sophisticated users. This is particularly true when the information concerns complex topics such as estimating quantities of minerals or oil and gas reserves and resources and the value attributable to those reserves and resources—a value that will be the critical factor in economic decisions, such as whether to invest in an entity or to lend money or extend credit to it.
- 1.21 The needs of more sophisticated users are often the focus of standard-setters for the following reasons.
- (a) Many less sophisticated users rely on the analysis of more sophisticated users. This is true of individual investors who use professional financial advisers as well as businesses that use the services of credit-rating agencies.

EXTRACTIVE ACTIVITIES

- (b) The information needs of more sophisticated users are generally more extensive and detailed than those of less sophisticated users. Meeting the needs of the more sophisticated users should meet the needs of the less sophisticated users.
 - (c) It is generally easier to get input from more sophisticated users about their needs.
- 1.22 As part of the research for this discussion paper, detailed individual interviews were held with 34 professional users around the world who focus on entities in the extractive industries. These users comprised buy-side analysts, sell-side analysts, venture capitalists, lenders and debt-rating agencies. The survey focused on information about minerals or oil and gas reserves and resources, and not on other information in the financial statements such as cash flow, debt and exploration expenditures. (More detail on the process used is provided in Appendix C.)
- 1.23 The main survey findings from the users interviewed are as follows:
- (a) The historical cost information on minerals or oil and gas properties in the statement of financial position does not generate useful information. This is true whether the accounting method is full cost, successful efforts or area of interest. The accumulated costs incurred to find a deposit of minerals or oil and gas are not useful in predicting the future cash flows from that property. However, some historical cost information is useful. For example, the finding costs per unit of oil reserves found is useful in evaluating the entity's ability to find oil reserves efficiently. This information depends on expenditure data rather than on data in the statement of financial position that include expenditures capitalised (but not those recognised as expenses) over many years, and are net of depreciation and impairment.
 - (b) Recording minerals or oil and gas properties at fair value in the statement of financial position would not generate useful information. This response was not expected, as the value of properties, and particularly the estimates of the underlying reserves and resources, is important information for users in making economic decisions. These users explained that there are many significant variables that go into a valuation and there can be substantial subjectivity involved. They consider it important to apply their own judgement to those factors rather than relying on management's judgement, and they undertake extensive research in order to do this. As professional users, their judgement and insights are important in determining their valuation of an entity

and of its minerals or oil and gas properties. Concerns were also expressed about possible bias in fair values of minerals or oil and gas properties prepared by the entity given the extent of judgement that has to be applied. Most users interviewed said they would not rely on a fair value provided by the entity unless there was extensive disclosure of the assumptions used. Such disclosure would allow users to decide if they agreed with the assumptions, and only in that case would they use the fair value provided. Given the number of assumptions within a fair value estimate, most users thought that it would be unlikely that the fair value would be particularly useful. Some users said they might use a fair value estimate provided by the entity's management to check their own estimate. Users would, in effect, try to reconcile their estimate to management's fair value to make sure they understood the difference. This would also provide some insight into management's expectations for the future.

- (c) Users generally did not consider that a valuation prepared using specified inputs (such as price) would provide useful information. An example of this type of valuation is the standardised measure required for oil and gas reserves by the US Financial Accounting Standards Board (FASB) Accounting Standards Codification™ (ASC) section 932-235-50.* This measure is based on proved reserves, year-end prices and costs, and a 10 per cent discount rate. Users explained that such mandated values for the main variables are unlikely to be consistent with their views of the inputs relevant to the determination of value. However, some users of the financial statements of oil and gas entities find the standardised measure disclosures useful—primarily the disclosure of the main components of the measurement and the year-on-year analysis of the changes in the measure rather than in the measure itself. (This is discussed further in Chapter 5.)
- (d) Users are looking for information, either within the financial statements or elsewhere, that will be useful in estimating the value of the entity. For an entity in the extractive industries this usually means information about the reserves and resources. Much of the information will be the same whether the user is looking at a minerals entity or an oil and gas entity—for example, information on the quantities of reserves, development and production costs and how those reserve estimates and cost bases change over time.

* This disclosure requirement was introduced into US generally accepted accounting principles (GAAP) by SFAS 69 *Disclosures about Oil and Gas Producing Activities*.

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However, some of the information will differ according to the type of mineral or oil and gas—for example, information on by-products and the grades of the minerals.

- 1.24 These findings from the user survey have been considered by the project team in determining its views on asset recognition and measurement, and on the disclosure of information about an entity's minerals and oil and gas properties.

Chapter 2 – Definitions of reserves and resources

Introduction

- 2.1 Reserves and resources are either the most significant assets or amongst the most significant assets for most entities engaged in extractive activities. Assessing the financial position and performance of an entity engaged in extractive activities in order to make economic decisions therefore requires an understanding of the entity's minerals or oil and gas reserves and resources, which are the source of future cash flows. This chapter considers the definitions of reserves and resources that should be used in financial reporting in order to facilitate this assessment. Subsequent chapters of this discussion paper consider how reserve and resource information should be reflected in the financial statements and in the notes.

Reserves and resources

- 2.2 Broadly speaking, the underlying purpose of reserve and resource definitions is to communicate information about the quantity of minerals or oil and gas that is estimated to exist in a deposit and may be recoverable.* However, identifying the definitions of reserves and resources that should apply in the financial reporting of minerals and oil and gas extractive activities is not straightforward, primarily because there is no single, generally accepted definition of reserves and resources that applies both to minerals and to oil and gas.
- 2.3 Most definitions of reserves and resources share similar nomenclature and basic concepts. This is because these definitions mainly derive from a system recommended by VE McKelvey of the United States Geological Survey in the early 1970s (and commonly referred to as the 'McKelvey box' diagram).
- 2.4 The basic concepts of a 'reserve' and a 'resource' are as follows:
- (a) Reserves generally refer to the quantity of minerals or oil and gas that is estimated to be economically recoverable from the earth. In other words, reserve quantities are an estimate of the aggregate future production of minerals or oil and gas.

* In the minerals industry, reserves and resources are usually quantified in terms of tonnages. In the oil and gas industry, reserves and resources are usually expressed in terms of volumes and quantified as barrels of oil or cubic feet of gas.

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- (b) Resources generally refer to the quantity of minerals or oil and gas that has been discovered but is not yet capable of being classified as a reserve.* This may be because:
 - (i) insufficient drilling, analysis and planning have been undertaken to indicate whether the minerals or oil and gas may be economically recoverable;
 - (ii) the minerals or oil and gas are not expected to be economically recoverable under current economic conditions, but there are reasonable prospects for such economic conditions to change and thereby allow for eventual economic extraction; or
 - (iii) development and production of the minerals or oil and gas deposit are contingent on other factors that may prevent timely development of the property, such as the need to develop a market for the production or to respond to environmental concerns.
- (c) Reserves and resources are generally classified into subcategories according to the level of confidence associated with the estimate of the reserve or resource quantities.

2.5 The major differences in the various definitions of reserves and resources relate to the scope and specificity of the definitions and also to the assumptions that are to be used in estimating and classifying reserves and resources. These differences in the detail of the definitions can be explained (at least in part) by two factors. First, although many of the definitions of mineral reserves and resources and oil and gas reserves and resources have common roots in the McKelvey box diagram, they have subsequently evolved largely independently of each other. This is not surprising given the different physical properties of minerals (solid) and oil and gas (typically fluid) and the fact that the minerals and oil and gas industries are typically regarded and organised as separate and distinct industries. Secondly, definitions of reserves and resources have been developed by various organisations around the world, such as industry and professional associations, securities regulators and other government and international agencies. In some cases, the definitions differ because they were developed to meet different information needs. For instance, for some commodities, there are differences in the definitions of reserves and resources used to report information on

* Particularly in the oil and gas industry, the term 'resources' can also be used to refer to quantities that have not yet been discovered.

reserves (and sometimes resources) to investors, to the entity's management, and to governmental or international agencies for natural resource management purposes. In other cases, the definitions of reserves and resources differ between jurisdictions even though they are intended to meet the same information needs (eg to report reserve and resource information to investors).

- 2.6 Consequently, the definition of a 'reserve' and a 'resource' (or similar terms) can vary depending on the industry, the jurisdiction and the reason for preparing the estimate. This diversity in definitions can make it difficult to compare the reserve and resource information that has been reported by different entities. This is not helpful to users of financial reports.

Financial reporting needs

- 2.7 In defining reserves and resources in an IFRS for extractive activities, the project team considers that:
- (a) consistent definitions of minerals and oil and gas reserves and resources should be used; and
 - (b) these definitions should be compatible with financial reporting methodologies and requirements.
- 2.8 Consistent definitions of minerals and oil and gas reserves and resources are needed as part of developing accounting and disclosure requirements that are comparable within and across the two industries. As noted in Chapter 1, this is one of the research project's objectives.

Alternatives for defining reserves and resources

Developing new definitions

- 2.9 One alternative that would enable the use of consistent definitions of minerals and oil and gas reserves and resources in IFRSs is to develop a new set of reserves and resources definitions that could apply equally to minerals and to oil and gas. Developing new definitions poses several challenges. First, the IASB does not have the requisite technical expertise in geology and engineering disciplines to be able to develop a comprehensive set of reserve and resource definitions (and accompanying guidance). It would therefore need either to seek to have another entity develop the definitions or to acquire the necessary expertise. If the IASB itself were to develop new definitions, it would be

custodian of the definitions. The IASB would be responsible for their continuing maintenance to ensure the definitions kept pace with changes in knowledge, technology and best practices. Having definitions for financial reporting purposes that are different from those used by geologists and an entity's management also has obvious disadvantages in that it would be likely to result in confusion and a lack of understanding of the definitions. For these reasons the project team decided that other options should be considered.

Consistent definitions

2.10 The alternative to developing a new set of definitions of minerals and oil and gas reserves and resources is to identify whether there are suitable existing reserve and resource definitions in each industry. These definitions would need to be sufficiently consistent (but not necessarily identical) definitions that would be suitable for developing common accounting and disclosure requirements across the minerals and oil and gas industries. The definitions are considered to be consistent if:

- (a) the terminology is generally consistent;
- (b) where consistent terminology cannot be used, there is a one-to-one relationship between terms used in minerals and in oil and gas; and
- (c) the terminology has essentially the same meaning, even if different words are used.

This approach is pragmatic. It avoids the difficulties of the IASB developing its own definitions for accounting purposes—but it requires some deviation from a single set of definitions. The approach also depends on the co-operation of the sponsors of the definitions. The research project has focused on this alternative.

Existing reserves and resources definitions

2.11 Internationally, the most prominent definitions of minerals and oil and gas reserves and resources being used for financial reporting and other public reporting purposes are:

- (a) mineral reserve and resource definitions based on the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) *International Reporting Template for the Public Reporting of Exploration Results, Minerals Resources and Mineral Reserves*.

- (b) the *Petroleum Resource Management System* sponsored by the Society of Petroleum Engineers (SPE), the World Petroleum Council (WPC), the American Association of Petroleum Geologists (AAPG), and the Society of Petroleum Evaluation Engineers (SPEE).*
 - (c) the definitions established by the US Securities and Exchange Commission (SEC), which are located in:
 - (i) Regulation S-X, Rule 4-10 *Financial accounting and reporting for oil and gas producing activities pursuant to the Federal Securities Laws and the Energy Policy and Conservation Act of 1975*; and
 - (ii) SEC Industry Guide 7—*Description of Property by Issuers Engaged or to Be Engaged in Significant Mining Operations*.
- 2.12 Another classification system for reserves and resources is the *United Nations Framework Classification for Fossil Energy and Mineral Resources* (UNFC). The UNFC is a joint initiative incorporating the professional efforts of CRIRSCO, SPE/WPC/AAPG/SPEE and others with strong stakeholder participation. The UNFC is seeking to harmonise the classification of reserves and resources to meet four defined information needs—being financial reporting, business process management, government resource management and global energy (and mineral) studies.
- 2.13 An overview of each of these sets of minerals or oil and gas definitions is provided in Appendix B.

Comparison study

- 2.14 Following a request from the IASB as part of the research project, an expert industry working group comprising members of the CRIRSCO and the SPE Oil and Gas Reserves Committee undertook a detailed review of their respective reserve and resource definitions (a) to identify the potential for greater convergence of the definitions and (b) to consider alternative approaches that might promote a common understanding of minerals and oil and gas reserve and resource definitions.

* In a survey of oil and gas entities that prepare consolidated financial statements in accordance with IFRSs, KPMG found that of the 29 entities that presented a reserves report, ten entities prepared reserves disclosures in accordance with the SEC rules and SFAS 69, four entities used the SPE definitions (which are now known as the PRMS), two entities followed the *Statement of Recommended Practice Accounting for Oil and Gas Exploration, Development, Production and Decommissioning Activities* issued by the UK Oil Industry Accounting Committee and one entity used the requirements published by the UK Listing Authority. The remaining twelve entities did not identify the definitions they had used. See KPMG, *The Application of IFRS: Oil and Gas* (October 2008), page 69.

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Representatives from the International Organization of Securities Commissions and the United Nations Economic Commission for Europe, which sponsors the UNFC, also monitored the review and provided feedback as it progressed.

- 2.15 The focus of the research on the reserve and resource definitions in the CRIRSCO Template and in the PRMS reflects the fact that both are widely accepted and have a broad and comprehensive scope. The reasons why the research placed less focus on the SEC definitions and the UNFC is explained in paragraphs 2.18–2.23 below.

Wide acceptance

- 2.16 The CRIRSCO Template and the PRMS are widely accepted, as shown by the fact that both sets of definitions usually form the basis of the reserve and resource estimates that are disclosed to investors and/or are reported to the entity's internal management. Specifically:
- (a) the CRIRSCO Template is regarded as the dominant international classification system for mineral reserves and resources, with the national reporting codes (mentioned in Appendix B) forming the basis of market regulator disclosure requirements in most jurisdictions that have formalised mineral reserve and/or resource disclosure requirements (excluding the US SEC).
 - (b) the PRMS is regarded as the dominant international classification system for oil and gas reserves and resources, primarily because of its use in internal resource management by many oil and gas entities. The PRMS also corresponds closely to market regulator disclosure requirements in most jurisdictions that have formalised oil and gas reserve and/or resource disclosure requirements (including Canada and the US SEC following the 2008 revisions to its oil and gas reserve definitions—see paragraph 2.18 for further details).

A broad and comprehensive scope

- 2.17 Both the CRIRSCO Template and the PRMS are comprehensive classification systems that also have a broad scope in terms of coverage of types of minerals and oil and gas. A broad and comprehensive scope is important for the design of comprehensive accounting and disclosure requirements for entities engaged in extractive activities. The CRIRSCO Template includes all solid minerals, including diamonds, other gemstones, industrial minerals, stone and aggregates, and coal. The PRMS includes all types of 'conventional' and 'unconventional' petroleum, and therefore includes, among other things, crude oil,

natural gas, coalbed methane, natural bitumen (tar sands) and oil shale deposits. The definitions are also comprehensive, insofar as they both provide classifications for quantities of minerals or oil and gas that, as a minimum, are expected to have reasonable prospects for eventual economic extraction.

SEC definitions

- 2.18 The SEC's definitions of minerals and oil and gas reserves are also commonly used for financial reporting purposes. The scope of the comparison study did not extend to identifying the degree of comparability between the SEC definitions because, at the time the study was undertaken, the following reasons were considered to diminish the suitability of the SEC definitions for use in an eventual IFRS for extractive activities.
- (a) The scope of the SEC definitions was limited to proved reserves for oil and gas (it is now limited to proved, probable and possible reserves) and to proved reserves and probable reserves for minerals. The limited scope of these definitions would constrain the ability of an IFRS to provide users of financial reports with useful information, given that some of the responses to the user survey suggested that the disclosure of probable oil and gas reserves and the disclosure of mineral resources can provide useful information.
 - (b) Many industry commentators have suggested that the minerals definitions and the oil and gas definitions (until revised in December 2008) have not kept pace with industry developments and generally accepted current practices for reserve and resource assessment. Consequently, reserve and resource information prepared in accordance with those definitions may not be representative of the assumptions that market participants would use, and it might not reflect the reserve and resource position of the entity as seen through the eyes of its management.
- 2.19 The SEC's release of its revisions to its definitions of oil and gas reserves has not changed the project team's view that the PRMS and the CRIRSCO Template definitions are the definitions that should be assessed for comparability. Even though the revised SEC oil and gas definitions are broadly comparable to the PRMS, the project team regards the PRMS as more suitable for use in financial reporting because it offers a more complete classification system as a result of its comprehensive classification of resources. Similarly, the project team regards the CRIRSCO Template as more suitable for use in financial reporting because

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the SEC minerals definitions do not include resource classifications and because some in the minerals industry have expressed concern that those definitions may not be consistent with current industry practices.

- 2.20 Some oil and gas industry participants have suggested that the PRMS's reserves definitions are less prescriptive than the corresponding revised SEC reserves definitions and the Canadian Securities Administrators' National Instrument 51-101 reserves definitions. They believe there may be less consistency between reserves estimates prepared under the PRMS compared to estimates prepared under either the SEC or the Canadian definitions and that this outcome may not be compatible with setting financial reporting standards. The project team does not think that this concern should lead to the adoption of definitions other than the PRMS or, for that matter, the CRIRSCO Template. The PRMS and the CRIRSCO Template are principle-based classification systems and rely on reserves estimators to use their professional judgement rather than provide prescriptive application guidance. The project team's view is that, to the extent that there is unacceptable diversity in the application of a principle within the PRMS or the CRIRSCO Template, the diversity should be resolved by an amendment to the PRMS or the CRIRSCO Template rather than by developing a separate set of definitions (as discussed in paragraph 2.9) or by adopting existing minerals definitions and oil and gas definitions that may not be comparable.

The UNFC

- 2.21 The UNFC has a broad scope and is the only internationally recognised system that is known to have been applied to both solid minerals and oil and gas (eg for all reserves and resources in Ukraine). However, the UNFC has not been used for financial reporting purposes and, as noted in Appendix B, the detailed formulation of the UNFC is being further developed.
- 2.22 The project team therefore thinks that, at this time, the UNFC is not an alternative to the CRIRSCO Template and PRMS definitions for the purposes of establishing financial reporting requirements in an IFRS for extractive activities. A universally applicable classification system would meet the research project's objective of consistent definitions of minerals and oil and gas reserves and resources, but the project team considers that before it could be used within IFRSs it would need to be demonstrated that the UNFC:
- (a) can be consistently applied and independently verified for the purposes of disclosing reserve and resource information to capital market participants; and

- (b) is accepted for use by the minerals and oil and gas entities that are preparing the disclosures to the capital markets and by the analysts and other financial reporting users in making their investment decisions.
- 2.23 The project team recommends that further consideration should be given to the progress made on the UNFC if and when an extractive activities project is added to the IASB's active agenda.

Comparison study findings

- 2.24 In comparing the CRIRSCO Template and the PRMS, the expert industry working group found that 'there is a high degree of compatibility in the classification logic that petroleum and minerals evaluators apply in determining quantities of their respective materials that reside in a field or a deposit and can be extracted and marketed'.^{*}
- 2.25 The expert industry working group recommended that the alignment between the CRIRSCO Template and PRMS reserve and resource classification systems should be communicated by 'mapping' the classification systems and terminology rather than through amending the reserve and resource definitions directly to achieve common definitions of reserves and resources across the minerals and oil and gas industries. The working group concluded that it is not practical to seek to create a common set of definitions of minerals and oil and gas reserves and resources for a variety of technical and historical reasons. The working group explained that each industry has developed separate classification and categorisation logic and, in many cases, the logic is related to the physical in situ differences in the material, the assessment techniques, and the appropriate extraction and processing methods.[†] They also noted that moving to a common set of definitions would be extremely difficult given the long history of each industry, wherein these terms and approaches have become embedded in practice and, in some cases, in legal documents.[§]
- 2.26 The report produced by the expert industry working group in September 2007, which includes a comprehensive comparison of the classification and terminology in the PRMS and the CRIRSCO Template, is *Mapping of*

* CRIRSCO and SPE OGRC, *Mapping of Petroleum and Minerals Reserves and Resources Classification Systems* (the Mapping Report), September 2007, page 10

† Mapping Report, page 10

§ Mapping Report, page 3

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Petroleum and Minerals Reserves and Resources Classification Systems. It is available from the extractive activities research project page on the IASB website (www.iasb.org).

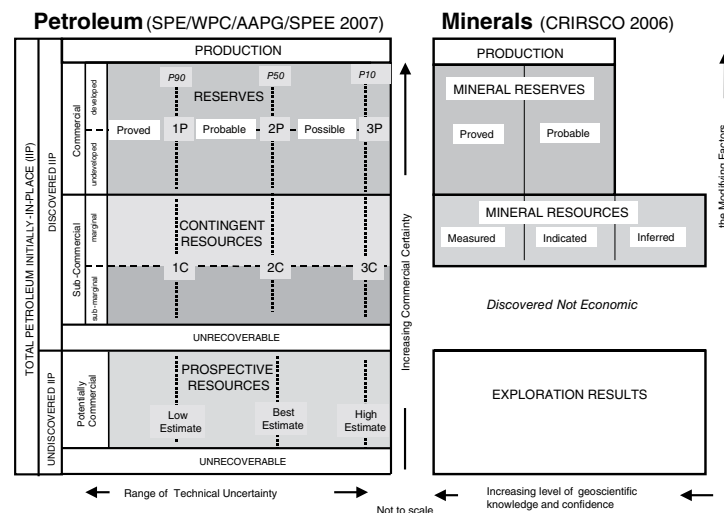
Comparable concepts

- 2.27 The expert industry working group found that in comparing the PRMS and the CRIRSCO Template reserve and resource classifications:
 - (a) there is broad equivalence between the mineral reserve and (petroleum) reserve classifications;
 - (b) the classifications of proved and probable reserves in each classification system have the same general level of confidence in the quantity of recoverable minerals or oil and gas; and
 - (c) there is broad equivalence between the mineral resource and (petroleum) marginal contingent resource classifications.

Each of these comparable concepts is discussed further in the next section.

- 2.28 Figure 2.1 below illustrates how the PRMS and CRIRSCO Template reserve and resource classifications compare.*

Figure 2.1: Mapping of the PRMS and the CRIRSCO Template



* This diagram, which is included in the Mapping Report (see figure 4), is based on a draft depiction of the PRMS. The depiction of the PRMS in *Petroleum Resource Management System* (2007) is presented at figure 1-1 of that document.

Reserves

- 2.29 Both the CRIRSCO Template and the PRMS regard reserves as being quantities of minerals or oil and gas that are:
- (a) discovered;
 - (b) available for extraction (ie not already extracted);
 - (c) recoverable, meaning that the technology is available and validated to extract the useful mineral from the ground and by subsequent processing, where necessary, to yield a marketable product; and
 - (d) economic, meaning that development and production of the mine or field can be justified.

Comparing the meaning of 'economic' and 'commercial'

- 2.30 The CRIRSCO Template requires that reserves be 'economically mineable'; the PRMS states that reserves are anticipated to be 'commercially recoverable'. Both concepts are used to indicate that development and production of the mine or field can be justified, as a result of the project being expected:
- (a) to generate a positive net present value at a defined discount rate. This discount rate will typically represent the 'hurdle rate' that must be earned in order for the entity to justify its investment in the project.
 - (b) to satisfy all of the modifying factors (as referred to in the CRIRSCO Template) or contingencies (as referred to in the PRMS) that may exist and affect the project throughout its life. The evaluation of these modifying factors/contingencies, which include economic, marketing, legal, environmental, social and governmental factors, is undertaken when preparing project development plans such as feasibility studies or development planning studies. To satisfy the reserves classification, the outcome of this evaluation should indicate that implementation of the development and production plans can proceed (or should not be prevented).
- 2.31 In addition, to be commercially recoverable and recognised as a reserve, the PRMS requires that there must be a commitment to initiate development within a reasonable time frame, noting that five years is recommended as a benchmark. The classification generally reverts to marginal contingent resources if development is no longer expected to take place within this time frame, which may be as a result of the effect of the contingencies or because of the entity's own internal prioritisation

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of projects. The PRMS allows the reserves classification to be retained when there are delays significantly longer than five years, but these cases and the rationale for retaining the reserves classification must be clearly documented.

- 2.32 A similar demonstration of the entity's intention to develop is not explicit within the CRIRSCO Template, because the completion of feasibility studies does not require a decision to mine. Although this represents a theoretical difference between what is 'economic' and 'commercial', the expert industry working group concluded that the practical application of these concepts provides for a comparable outcome. This is because the group noted that any feasibility study that has not been implemented within five years would require a reassessment of feasibility, and quantities would either be retained as mineral reserves, 'refreshed' on an annual basis, or downgraded to mineral resources as a result of that reassessment.

Comparing economic assumptions

- 2.33 Determining whether a project will be economic requires estimating the future cash flows associated with the development and production of a mine or field. Some components of the future cash flow estimates will be based primarily on project-specific factors, such as the timing of future cash flows and the production quantities. Other components of the estimate will be more directly influenced by external financial conditions, including commodity prices, costs of labour, materials and equipment, foreign exchange rates and discount rates. Both the CRIRSCO Template and the PRMS indicate that the financial assumptions used in the reserves estimates should be the entity's internal forecasts of future conditions that will exist over the life of the project, on the proviso that these assumptions are realistically assumed (as referred to in the CRIRSCO Template) or reasonable (as referred to in the PRMS).
- 2.34 The PRMS acknowledges that alternative economic scenarios may be incorporated into reserves reporting, such as a current economic conditions scenario using historical oil and gas prices and associated costs, possibly over a defined averaging period. The PRMS suggests that a one-year historical average of costs and prices should be used as the default basis for defining current conditions. The PRMS acknowledges that regulatory agencies may choose to apply alternative definitions for these conditions for the purposes of external disclosure.
- 2.35 The CRIRSCO Template does not contemplate the use of financial assumptions other than the entity's internal forecasts.

Proved and probable reserves

- 2.36 The expert industry working group found that the classifications of proved and probable mineral reserves under the CRIRSCO Template have the same general level of associated confidence as proved and probable petroleum reserves under the PRMS. Furthermore, the group noted that the sum of proved plus probable reserves is the evaluator's best estimate of the remaining recoverable quantities of minerals or oil and gas based on the information available at the time the estimate is made.
- 2.37 Although not affecting the overall conclusion, the presentation basis for proved and probable reserves for minerals and for oil and gas are different in that:
- (a) under the CRIRSCO Template, probable reserves are an incremental estimate of recoverable quantities of minerals above and beyond the quantities that are classified as proved reserves; and
 - (b) under the PRMS, probable reserves are often reported as part of a cumulative reserves (2P) estimate that also includes proved reserves.
- 2.38 Reporting reserves (and resources) estimates for minerals on an incremental basis and for oil and gas on a cumulative basis is consistent with the different physical properties of minerals and oil and gas and the resulting different methods used to estimate reserves. Because minerals are solids, extensive drilling of a minerals deposit is generally required to estimate the size of the deposit and the variability of the grade of the minerals present. The reserves estimate is constructed on a local scale, meaning that the confidence assigned to the portions of the deposit is based on the distance between drill holes and also influenced by other factors including whether the mineralisation is uniform (eg for many coal deposits) or erratic (eg for nuggetty gold deposits).
- 2.39 In contrast, with most oil and gas deposits, the oil and gas can flow towards an extraction well. Less drilling is therefore necessary to estimate the size of the reservoir and the flow rates of the oil and gas (reservoir pressure). Probability distributions can be used to estimate oil and gas reserves, and as a consequence reporting a cumulative reserves estimate is consistent with this estimation approach. In short, a 2P, or P50, reserves estimate (as shown in figure 2.1) equals the sum of proved plus probable reserves. The PRMS also allows reserves to be estimated using a deterministic method (ie qualitative thresholds, such as high confidence estimate and best estimate), which is the same basis applied under the CRIRSCO Template.

Resources

- 2.40 The expert industry working group concluded that mineral resources are essentially the same as marginal contingent resources in the PRMS in that they are contingent on further events or actions before they can be converted into reserves. This may simply mean that feasibility or other studies have not been undertaken or completed, or it may mean that economic conditions have to change to some extent to enable the resources to be reclassified as reserves. In general, there will be a realistic expectation that these conditions will eventually be met.

Differing concepts

- 2.41 The major differences between the PRMS and CRIRSCO classifications are also evident from figure 2.1 above—being the absence from the CRIRSCO Template of classifications that are equivalent to ‘possible reserves’ and ‘sub-marginal contingent resources’.
- 2.42 Possible reserves represent the potential upside relating to proved and probable oil and gas reserves. The nearest equivalent to possible reserves in the CRIRSCO Template is inferred resources. The project team considers these categories of reserves and resources sufficiently uncertain that they would not materially affect decisions on asset recognition and measurement or be the primary focus of disclosure. For this reason, direct comparability between the CRIRSCO Template and the PRMS in this classification is not considered essential for financial reporting purposes.
- 2.43 The report prepared by the expert industry working group explains that ‘Sub-Marginal Contingent Resources are those quantities associated with discoveries for which analysis indicates that technically feasible development projects would not be economic and/or other contingencies would not be satisfied under current or reasonably forecasted improvements in commercial conditions. These projects nonetheless should be retained in the inventory of discovered resources pending unforeseen major changes in commercial conditions.’* In contrast, the CRIRSCO Template does not have a comparable classification because its scope does not include the reporting of mineralisation that does not have reasonable prospects for eventual economic extraction, even though it may be discovered. The project team considers that if a minerals or oil and gas discovery is not considered to have reasonable prospects for eventual economic extraction, the disclosure of this resources

* Mapping Report, page 5

classification is unlikely to provide useful information or to materially affect the recognition and measurement of the asset in the statement of financial position.

- 2.44 Other differences that have been identified between the PRMS and the CRIRSCO Template classifications relate to how the estimate is quantified and presented.
- (a) The measurement of reserves and resources under the PRMS is presented in terms of the 'sales quantity' delivered at a custody transfer point according to product delivery specifications, whereas under the CRIRSCO Template, the measurement is presented in terms of tonnage of ore and mineral grade (ie the percentage of the contained mineral). The CRIRSCO Template then requires disclosure of recovery factors that enable the 'sales quantities' to be computed. Some entities also disclose the sale quantities of product in addition to disclosing quantities in terms of tonnes and grade.
 - (b) In terms of an entity's interest in reserves and resources, oil and gas reserves and resources estimates are typically expressed on a net working interest or net entitlement basis after reduction for royalties and production owing to others. However, mineral reserve and resource estimates are typically reported in total with the share attributable to the entity shown separately.*
- 2.45 These differences, however, do not make the reserve and resource classifications incompatible. Rather, the differences are a disclosure issue, and are related to how minerals and oil and gas reserve and resource disclosures are typically presented. The disclosure of minerals and oil and gas reserve and resource information is considered in Chapter 5 of this discussion paper.

Comparability of definitions to accounting principles

- 2.46 For the purposes of reporting on the financial position and performance of an entity in the financial statements, the definitions of reserves and resources can be useful for:
- (a) the measurement of the minerals or oil and gas property (eg if the property is measured at current value; in a business combination or impairment assessment if the property is measured at historical cost); and

* Mapping Report, page 8, items 3 and 8

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- (b) the expected lives of mines or oil and gas fields, which influence the calculation of:
 - (i) depreciation for assets that have the same useful lives as a mine or field; and
 - (ii) rehabilitation liabilities, by outlining when future cash outflows associated with the rehabilitation are expected to be made.
- 2.47 As reserve and resource estimates can therefore influence the calculation of an entity's financial performance and position, it follows that the reserve and resource definitions (and the assumptions underpinning the estimates) should be compatible with generally accepted accounting principles. Otherwise, there may not be consistency between the reserve and resource estimates and the items in the financial statements that either represent reserves and resources (ie minerals or oil and gas properties) or are impacted by reserves and resources estimates (eg restoration liabilities, which are estimated on the basis of the life of the mine or field). Such an outcome would fail to meet the qualitative characteristics of useful financial information, as defined by the *Framework*.
- 2.48 In comparing the CRIRSCO Template and PRMS definitions with generally accepted accounting principles, the project team found two features of the definitions that could cause reserve and resource estimates to be prepared on a basis that, in some instances, could be inconsistent with generally accepted accounting principles. These relate to:
- (a) the economic assumptions that are applied to derive a reserve estimate; and
 - (b) the conditions that must exist before a resource can be converted into a reserve.

Economic assumptions

- 2.49 As noted above, the CRIRSCO Template and the PRMS both indicate that the economic assumptions used in reserves and resources estimation should be based on the entity's internal forecasts of future conditions. The notion of using internal forecasts of economic assumptions in financial reporting without also having to refer to market-based evidence is generally not supported in IFRSs, although measuring the recoverable amount of an asset at its value in use in accordance with IAS 36 *Impairment of Assets* involves internal forecasts and segment disclosures in IFRS 8

Operating Segments are measured at amounts reported to the chief operating decision maker, and this may include internal assumptions.

- 2.50 More typically, IFRSs require that estimates should use economic assumptions that reflect market-based evidence where available. The proposals in the exposure draft *Fair Value Measurement*⁷ define fair value and establish a hierarchy for selecting the most relevant inputs to be used in estimating fair value for financial reporting purposes. Broadly speaking, the fair value hierarchy requires market-based assumptions to be used where possible, and restricts the use of internal forecasts to situations where market-based assumptions are not available. The hierarchy prioritises the inputs as follows:
- (a) Level 1 inputs—observable inputs that reflect quoted prices (unadjusted) for identical assets in active markets that the reporting entity has the ability to access at the measurement date.
 - (b) Level 2 inputs—these include:
 - (i) quoted prices for similar assets in active markets;
 - (ii) quoted prices for identical or similar assets in markets that are not active;
 - (iii) inputs other than quoted prices that are observable for the asset (eg interest rates, yield curves, volatilities that are observable at the commonly quoted intervals, and default rates);
 - (iv) inputs that are derived principally from or corroborated by observable market data through correlation or by other means (market-corroborated inputs).
 - (c) Level 3 inputs—unobservable inputs, to be used only to the extent that observable inputs are not available. This allows for situations where there is little, if any, market activity in respect of the asset at measurement date.
- 2.51 Although the exposure draft addresses the fair value of an asset, the project team thinks that the proposed guidance on estimating fair value is also relevant to estimating quantities of reserves and resources for financial reporting purposes. In both cases the objective is an unbiased

* The IASB published the exposure draft in May 2009. The proposals in the exposure draft are based on SFAS 157 *Fair Value Measurements*. The main differences between the exposure draft and SFAS 157 are identified in paragraph BC110 of the Basis for Conclusions accompanying the exposure draft.

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measurement of an asset—in one case of quantity and, in the other case, of value. This unbiased measure is achieved by using, to the extent possible, market inputs. Both the estimate of reserves and resources quantities and the estimate of the value of those quantities depend on similar economic assumptions. Accordingly, in the project team's opinion, the economic assumptions used to estimate reserve and resource quantities should be consistent with those used to estimate the fair value of the minerals or oil and gas properties.

Applying fair value measurement principles to reserve and resource estimation

- 2.52 The following paragraphs consider the application of fair value measurement principles to the main economic assumptions that are incorporated into reserve and resource estimation.

Commodity price assumptions

- 2.53 Commodity price assumptions need to take account of the following variables:
- (a) the expected prevailing market price for the commodity when it is produced and is ready for sale (which for some mines and oil and gas fields may extend well beyond 20 years into the future);
 - (b) any pricing differential based on expected quality of the produced commodity; and
 - (c) the location of the commodity.
- 2.54 Although spot and future prices may be quoted in active markets for some commodities (ie Level 1 inputs), valuing recoverable quantities of minerals or oil and gas would need to take into account the variables above. For this reason, the price assumptions used in measuring fair value of a mineral or oil and gas property are expected to be based on Level 2 or Level 3 inputs.
- 2.55 For some homogeneous commodities, long-term views on commodity prices might be capable of being either directly observed or extrapolated and corroborated by other observable market transactions. In those cases, the price assumptions to be used could be a Level 2 (market-based) input rather than a Level 3 (entity-specific) input. However, the use of market-based forecast prices is generally expected to be available only for those commodities where a futures market exists and then only when the futures market provides a forecast of spot prices in the future rather than representing the current spot price plus carrying costs. Futures prices do

not represent a forecasting tool for commodities that are storable and where large inventories of that commodity already exist. Economists have observed that in these situations, arbitrageurs or market participants with existing inventory will ensure that the difference between the current spot price and the future price will be the carrying costs of interest and storage costs that would be incurred until the maturity of the futures contract. Therefore, whether futures prices provide a forecast of spot prices in the future will depend on the characteristics of individual commodities markets. It might mean that the only observable market participant pricing outlook for many traded commodities will be the current spot price, although the current spot price may also be responding to short-term supply and demand factors rather than to longer-term factors.

- 2.56 The quality or location of the commodity may have an influence on the commodity price, which may necessitate adjusting any market-based long-term view on commodity prices that is capable of being observed or extrapolated. In those circumstances, factoring the quality and location of the commodity into a pricing assumption would presumably involve unobservable market inputs (most likely entity-specific inputs).

Exchange rate assumptions

- 2.57 Exchange rate assumptions must be made when commodity prices and capital, operating and refining costs involve more than one currency. Like commodity prices, some spot and future exchange rates will be quoted in active markets (ie a Level 1 input). Other exchange rates may be quoted in markets that are not active (ie a Level 2 input). However, because the foreign currency prices and/or costs generated by the mine or oil and gas field may extend well beyond the period that quoted or observable exchange rates are available, the exchange rate used may be largely based on the entity-specific view on long-term exchange rates (ie a Level 3 input).

Capital, operating and refining cost assumptions

- 2.58 Capital, operating and processing costs are expected to be influenced by the characteristics of the property (eg the type, quality and location of the mineral, oil or gas) and of the entity operating the property. Because each property is unique, the cost assumptions are expected to be based on Level 3 inputs but adjusted to exclude entity-specific cost drivers if market participant estimates would use different cost drivers.

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Discount rates

- 2.59 The exposure draft *Fair Value Measurement*, at paragraph C3, proposes the following general principles for the selection and use of discount rates in estimating fair values, noting that these principles apply equally to assumptions about discount rates and future cash flows:
- (a) Cash flows and discount rates should reflect assumptions that market participants would use when pricing the asset or liability.
 - (b) Cash flows and discount rates should consider only the features of the asset or liability being measured.
 - (c) To avoid double-counting or omitting the effects of risk factors, discount rates should reflect assumptions that are consistent with those inherent in the cash flows.
 - (d) Assumptions about cash flows and discount rates should be internally consistent. For example:
 - (i) nominal cash flows should be discounted at a rate that includes the effect of inflation and real cash flows should be discounted at a rate that excludes the effect of inflation; and
 - (ii) after-tax cash flows should be discounted using an after-tax discount rate and pre-tax cash flows should be discounted using a pre-tax discount rate.
 - (e) Discount rates should be consistent with the underlying economic factors of the currency in which the cash flows are denominated.
- 2.60 In contrast, the discount rates used in reserves estimation under the CRIRSCO Template and the PRMS tend to be discount rates that are based on the entity's cost of capital (ie focusing on the risks at the entity level), although these may be adjusted to reflect asset-specific risks such as political, economic, fiscal, market and technical risk factors.

Project team's view on economic assumptions

- 2.61 This analysis highlights that the CRIRSCO Template and the PRMS use economic assumptions for classifying reserve and resource quantities that may be different from the assumptions that the exposure draft proposes should be used for preparing fair value measurement estimates for financial reporting purposes. The CRIRSCO Template and the PRMS use entity-specific assumptions. In contrast, financial reporting uses market participant assumptions when they are available. However, as discussed, many of the assumptions used in estimating quantities of

reserves and resources would be considered Level 3 inputs in the exposure draft. Level 3 inputs 'shall be developed using the best information available in the circumstances, which might include an entity's own data.' The exposure draft goes on to say:

In developing unobservable inputs, an entity may begin with its own data, which shall be adjusted if reasonably available information indicates that (a) other market participants would use different data or (b) there is something particular to the entity that is not available to other market participants (eg an entity-specific synergy), and the entity is able to quantify these adjustments. An entity need not undertake exhaustive efforts to obtain information about market participant assumptions. However, an entity shall not ignore information about market participant assumptions that is reasonably available.

- 2.62 The project team considers that this difference in perspective between the reserves classification systems and financial reporting will generally not lead to materially different assumptions being selected in practice. An entity's internal management would normally consider the same types of available market-based information as other market participants before reaching their own views on future conditions. Unless observable and directly relevant market data are available, different market participants will have different views on the future. Therefore, in those circumstances, and provided the entity's own assumptions are reasonably expected to fall within the range of market participant views, the project team considers that, in practice, the use of entity-specific forecast assumptions are suitable when estimating reserves and resources for use in financial statements. However, the project team recommends that the fair value hierarchy should be applied to determine what assumptions are relevant to the individual facts and circumstances of the entity and the location and type of minerals or oil and gas involved.
- 2.63 The selection and disclosure of economic assumptions used in classifying reserve and resource quantities are considered further in Chapter 5.

Conditions to be satisfied before a reserve is recognised

- 2.64 Under the CRIRSCO Template or the PRMS, there may be instances when a reserve cannot be recognised even though a project to develop or expand a mine or field would generate a positive net present value using market discount rates. Applying the definitions strictly, this could occur when:
- (a) the cost of capital that the entity uses in making a decision on whether to invest in a project exceeds the market discount rate; or

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- (b) the entity chooses to defer investing in a new project or expanding an existing project, even though it will generate a positive net present value, because it has other projects that are assigned a higher priority to receive the investment first.

2.65 This shows that management's intentions are incorporated into the CRIRSCO Template and PRMS reserve definitions. In contrast, management's intentions are not a feature of the *Framework's* definition of an asset. The consequence of this difference is that an entity's reserve quantity disclosures may not always represent the total quantity of minerals or oil and gas that the entity may be able to recover economically at market discount rates. The SEC, in revising its oil and gas reserves definition, made a similar observation, which was that:

One notable difference between our final definition of "reserves" and the PRMS definition is that our definition is based on "economic producibility" rather than "commerciality." One commenter believed that reserves must be "commercial," as stated in the PRMS definition. However, commerciality introduces a subjective aspect to the price used to establish existing economic conditions by factoring in the rate of return required by a particular company before it will commit resources to the project. This rate of return will vary among companies, reducing the comparability among disclosures. Therefore, the adopted definition of the term "reserves" relies on economic producibility, as proposed.*

2.66 The project team considers that this use of management's intentions should not affect the recognition of the minerals or oil and gas property as per the project team's view on asset recognition that is presented in Chapter 3. Similarly, fair value measurements of minerals and oil and gas properties would take into account the value attributable to the resources that cannot be classified as reserves in the scenarios outlined above. For these reasons, this difference is not considered to diminish the usefulness of the CRIRSCO Template and PRMS definitions for asset recognition and measurement purposes. The project team considers that the use of management's intentions in the CRIRSCO Template and the PRMS definitions of reserves are appropriate for disclosure purposes. Incorporating management's intentions into reserves disclosures provides useful information to users of financial reports because the disclosure shows the estimated quantities of minerals or oil and gas that the entity expects to develop and produce from its operations, and therefore it provides an insight into the future cash flows that the entity might generate from those operations. The project team's view is that these reserves should be disclosed separately from other quantities of minerals

* SEC Final Rule *Modernization of Oil and Gas Reporting* (Release No 33-8995), page 41

or oil and gas that would have a positive net present value (at market discount rates) if they were developed and produced, but which are not currently planned to be developed and produced by the entity. Separate disclosure is preferred because these other quantities of minerals or oil and gas are subject to additional uncertainties regarding if and when they will be developed and produced. The CRIRSCO Template and the PRMS include these quantities within their classification of mineral resources and marginal contingent resources (for oil and gas). The disclosure of reserve and resource quantities is considered further in Chapter 5.

Project team's view on definitions

- 2.67 The project team recommends that the CRIRSCO Template and PRMS definitions of reserves and resources are suitable for use in a future IFRS for extractive activities. In the project team's view, the nature and extent of the similarities that exist between the CRIRSCO Template and the PRMS reserve and resource definitions indicates that these definitions are capable of providing a platform for setting comparable accounting and disclosure requirements for both minerals and oil and gas properties.
- 2.68 The project team acknowledges that the report prepared by the expert industry working group as part of the comparison study will be an important reference for the IASB during the standard-setting phase of the extractive activities project. Following the release of an IFRS, the mapping report could be useful as an educational reference for users of the financial reports of entities engaged in extractive activities.

Chapter 3 – Asset recognition

Introduction

- 3.1 An important aspect of accounting for extractive activities is to identify whether and when to recognise the assets that arise as extractive activities are being undertaken. If no asset is recognised, then the statement of comprehensive income will show the costs relating to extractive activities as an expense in the period in which the costs are incurred. On the other hand, if there is an asset that meets the recognition criteria, under historical cost accounting, the costs incurred are capitalised (subject to impairment) and there is no current impact on reported income. The net impact on the statement of comprehensive income under a current value accounting model (such as fair value) would be similar in that the current value of the asset would be credited to income, directionally offsetting current period expenses which would be debited to income.
- 3.2 This chapter considers the initial recognition of assets relating to extractive activities from the perspective of:
- (a) identifying the point during the extractive activity process when there is an asset that should be recognised; and
 - (b) determining the unit of account for these assets (ie what should be accounted for as a single asset).

Asset recognition—current practice

- 3.3 It is common for entities in the minerals and oil and gas industries to capitalise costs or recognise them as expenses according to the different phases of extractive activities in which they occur, such as exploration and evaluation, development and production. Accounting standard-setters have also addressed accounting for extractive activities in terms of the phases of activity. For example, IFRS 6 *Exploration for and Evaluation of Mineral Resources* focuses on two specific phases and FASB ASC section 932-360-25^{*} separately addresses accounting for the acquisition of properties, exploration, development and production as well as for support equipment and facilities.

* These requirements were introduced into US GAAP by SFAS 19 *Financial Accounting and Reporting by Oil and Gas Producing Companies*.

- 3.4 Given the widespread acceptance of the different phases of extractive activities, the treatment of costs could be based on the nature of each phase. Under this approach, specific activities (eg exploration) would be prescribed as being either recognised as an asset or alternatively recognised as an expense. Focusing on phases has the benefit of using language that industry participants commonly use to describe their business. This alignment between accounting and business operations may help make the accounting policies understandable.
- 3.5 However, there are challenges with developing a comprehensive accounting model based on phases. It would involve identifying the relevant activities and costs for each phase and determining whether the costs qualify for recognition as an asset or should be recognised as expenses. One difficulty with this approach is that undertaking an activity or incurring a cost does not, in itself, determine whether an entity has something of positive economic value. For instance, the activity may or may not have been successful or the cost incurred may or may not result in a benefit to the entity. Consequently, an accounting model that sets a rule, say, to capitalise costs on the basis of the specific phase will be consistent with the definition of an asset only when the facts and circumstances indicate that the costs incurred are generating a benefit to the entity that meets the definition of an asset. This suggests that it is likely to be difficult to develop reporting requirements that result in comparable information (rather than simply being uniform requirements) on the basis of definitions of phases.
- 3.6 Another difficulty is that each phase would need to be defined in a clear and coherent manner if different accounting treatments are to apply to individual phases. The difficulty arises because the precise activities undertaken in each phase can vary between the minerals and oil and gas industries and even within the same industry. Furthermore, the phases can overlap, sometimes with several phases being progressed at the same time. This can make it difficult to attribute costs clearly to individual phases.[†]

* The *Conceptual Framework for Financial Reporting* explains, at paragraph QC27, that: 'Comparability is not uniformity. For information to be comparable, like things must look alike and different things must look different. An overemphasis on uniformity may reduce comparability by making unlike things look alike. Comparability of financial reporting information is not enhanced by making unlike things look alike any more than it is by making like things look different.' (All references in this discussion paper to the revised *Framework* are based on the most recent working draft of that document. The revised *Framework* will be published shortly after the publication of this discussion paper.)

† This has been acknowledged by PricewaterhouseCoopers in *Financial Reporting in the Mining Industry for the 21st Century* (1999), paragraph 1.2, and KPMG's *Global Mining Reporting Survey 2006*, section 2.4.1.

Asset recognition—using the *Framework*

- 3.7 For these reasons, an accounting model for extractive activities that focuses on phases of activities is not recommended. Instead, the approach the project team recommends is to apply the asset definition and recognition criteria in the *Framework* to determine when, during the extractive activity process, there is an asset that can be recognised in the financial statements.
- 3.8 To determine at what point during the extractive activity process there is an asset that should be recognised, it is necessary to consider that activity in the context of the *Framework*'s definition of an asset and the asset recognition criteria.
- 3.9 An asset is something that:
- (a) has enforceable rights that enable an entity to access or deny (or limit) the access of others to the economic resource (in other words, the economic resource can be controlled);
 - (b) has positive economic value (in other words, future economic benefits are expected); and
 - (c) currently exists.
- These are the core components of the conceptual definition of an asset. This is apparent from both the *Framework*'s definition of an asset and the proposed revised definition being considered as part of the IASB/FASB conceptual framework project.*
- 3.10 An asset is recognised when:
- (a) it is probable that the future economic benefits will flow to the entity; and
 - (b) the asset has a cost or value that can be measured reliably.
- 3.11 These are the existing asset recognition criteria (as per paragraph 89 of the *Framework*). However, the asset recognition criteria are under review as part of the IASB/FASB conceptual framework project. Furthermore, in IFRS 3 *Business Combinations* and as part of the redeliberations on IAS 37 *Provisions, Contingent Liabilities and Contingent Assets*, the IASB has decided to include probability assessments in the measurement of an asset or

* The revised definition of an 'asset', as tentatively adopted by the IASB and FASB, is 'An asset of an entity is a present economic resource to which the entity has a right or other access that others do not have.'

liability rather than in determining whether that asset or liability should be recognised. Consequently, both the existing asset recognition criteria and the implications of removing probability from asset recognition are considered in this analysis for completeness.

Applying the *Framework* to extractive activities

- 3.12 There is a common sequence of activities undertaken by entities engaged in extractive activities. These activities usually start with the acquisition of *legal rights* to explore a defined area. Exploration and evaluation activities produce *information* about the geology and the presence and extent of any mineral or oil and gas deposit. Over time, the exploration will increase the understanding of the deposit to the point where an assessment can be made of whether there is a *mineral or oil and gas deposit that can be economically developed*. Assuming the deposit is developed and production begins, the development and production activities will continue to generate information that will improve the entity's understanding of the deposit.

Legal rights

- 3.13 Various types of legal instruments convey the legal rights to permit an entity to undertake extractive activities. These include:
- (a) property titles that provide outright ownership of the mineral or oil and gas property associated with it.
 - (b) lease or concession arrangements that are granted by the owner of the rights (usually a government) and, in general terms, provide the entity holding the lease or concession with the right to explore for, develop and extract minerals or oil and gas from the property. The terms of the lease or concession will vary in different jurisdictions.
 - (c) production sharing contracts (PSCs) with governments.*

The legal rights may be held by the entity alone or as part of a joint arrangement to which the entity is a party. Some arrangements provide the entity with the right to future cash flows only (and not to the minerals or oil and gas that will be produced).

* PSCs are common in the oil and gas industry. Although the form and content of individual PSCs vary, the basic premise of a PSC is that it is a contract between a national oil company of a host government and a contracting entity to carry out oil and gas exploration and production activities in accordance with the terms of the contract, with the two parties sharing the oil and gas produced.

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- 3.14 Legal rights to explore a defined area meet the definition of an asset.* They currently exist and are enforceable rights that have a positive economic value at the date of acquisition. They have value because they enable the entity to explore for the unexpired duration of time that the legal rights remain in existence and then to apply for other legal rights, if necessary, to extract any minerals or oil and gas that are found. The rights also have value because they preclude other entities from commencing those activities.
- 3.15 The legal rights also meet the asset recognition criteria when they are initially acquired. The probability criterion is met for the reasons outlined in paragraph 25 of IAS 38 *Intangible Assets*, which states:
- Normally, the price an entity pays to acquire separately an intangible asset will reflect expectations about the probability that the expected future economic benefits embodied in the asset will flow to the entity. In other words, the entity expects there to be an inflow of economic benefits, even if there is uncertainty about the timing or the amount of the inflow. Therefore, the probability recognition criterion in paragraph 21(a) is always considered to be satisfied for separately acquired intangible assets.
- 3.16 The criterion that an asset can be recognised only if it can be reliably measured must be considered separately for the different measurement bases that might be used. The legal rights asset will be capable of being measured reliably at initial recognition if a historical cost measurement basis applies to the asset. IAS 38 paragraph 26 notes that ‘the cost of a separately acquired intangible asset can usually be measured reliably’. The project team believes that the view expressed in IAS 38 is appropriate for legal rights such as exploration rights and extraction rights. The cost of acquiring legal rights such as exploration rights and extraction rights can differ substantially depending on the nature of the transaction and the jurisdiction in which those rights are acquired. For instance, in Australia, a mineral exploration right may be acquired by the physical act of ‘pegging’ an exploration area (ie staking a claim) and then applying for an exploration permit through the local jurisdiction’s mining authority. The cost of acquiring this exploration permit may be a nominal amount that broadly corresponds to the cost to the mining authority of processing the entity’s application for the exploration permit. Another process for acquiring exploration rights in some jurisdictions, especially in the oil and gas industry, is to auction new exploration blocks to the highest bidder. In this case, the amount paid by the winning bidder

* This is consistent with the IASB’s and FASB’s tentative conclusion that the right to use a leased item meets the definition of an asset. See paragraphs 3.16 and 3.17 of the discussion paper *Leases* (March 2009).

would represent an initial assessment of the likelihood that economically recoverable quantities of oil and gas exist on that property. In both of these examples, there is a cost to acquire the rights and this cost is capable of being measured reliably.

- 3.17 If the measurement basis at initial recognition of the asset is a current value (such as fair value) then the legal rights asset will be capable of being measured reliably if the acquisition of the rights is the result of an arm's length transaction that takes into account the likelihood that economically recoverable quantities of minerals or oil and gas will be found. Examples would include rights obtained in a government auction of exploration rights or through negotiation with the current holder of the rights. In these cases, the cost of acquiring the rights should be equal to their current value. However, as noted in the previous paragraph with respect to the 'pegging' or 'staking' process, it is not uncommon for governments to grant rights on the basis of an application and payment of a fee that does not relate to expectations about the economic value of the property. In those circumstances, the cost of acquiring the rights (ie the fee paid to the government) may not represent current value and it may be more difficult to measure reliably the current value of the legal rights. However, a decision to measure exploration properties, including legal rights, at fair value would be dependent on the determination that these assets could be reliably measured at fair value. The question of the measurement basis to be used for these assets is addressed in Chapter 4.

Information

- 3.18 Legal rights do not exist in isolation. Associated with legal rights is information about the property. This may include information about the existence (or possible existence) of minerals or oil and gas, the extent and characteristics of the deposit, and the economics of their extraction. Often when exploration rights to a property are first acquired this information is very limited and there are significant uncertainties. Nevertheless the decision to acquire the legal rights for a particular property implies some degree of information, however limited. Thus, information about a property does not represent a separate asset but is an integral part of the legal right asset, being the right to explore for and extract minerals or oil and gas.
- 3.19 To illustrate this point, assume that Property A and Property B are neighbouring exploration properties and that exploration rights have been granted only for Property A. A significant oilfield is subsequently discovered on Property A. Information that a significant discovery has been made on Property A provides new information about the probability

of finding oil on Property B and would be expected to increase the purchase price of the exploration rights for that property. The entity that subsequently acquires the exploration rights to Property B would not recognise the information as a separate asset—the information about the property is an integral part of the exploration rights asset and cannot be separated from it.

- 3.20 Detailed exploration and evaluation activities usually begin after the legal rights have been obtained. The information gained from these activities generates a better understanding of whether a minerals or oil and gas deposit exists and, if so, the characteristics of that deposit and the prospects for economically extracting minerals or oil and gas from the deposit. Over time, exploration and evaluation will provide more information, thereby reducing geological and economic uncertainty. Information that is generated during development and production will reduce this uncertainty further. Thus, the information attribute of the legal rights asset will continue to be modified.
- 3.21 New information may—or may not—add value to the legal rights asset. For example, exploration results may either increase or reduce the probability that there are economically producible reserves. Additional information about the underlying reserves and resources may affect the measurement of the asset. (Measurement is discussed in Chapter 4.) It may also lead to the asset being derecognised (see paragraphs 3.30 and 3.31).

Additional rights and approvals

- 3.22 In many circumstances, even though an entity may hold all relevant rights (eg exploration rights or extraction rights), the entity may not be legally entitled to start exploration drilling or the extraction of minerals or oil and gas until it has obtained various approvals. These approvals usually need to be obtained from governments (or their agencies), and include environmental and workplace health and safety approvals. They are not recognised as separate assets because the future economic benefits arising from the receipt of the approvals cannot be obtained unless the entity also holds the relevant rights to the minerals or oil and gas property. They can be viewed as improvements or enhancements of the rights that are held because the receipt of the approval would remove an explicit or implicit condition or restriction on the ability of the holder of the rights to utilise the rights. Another view is that obtaining the further rights and approvals reduces the legal uncertainty of eventually extracting the mineral or oil and gas from the ground, and therefore increases the value of the rights that are held.

Properties in the development or production phases

- 3.23 As a property enters the development stage various activities are necessary to gain access to the minerals or oil and gas deposit so that production can begin. In general terms, these development works may be described as a betterment of the legal rights as a result of completing work such as:
- (a) for mineral properties: sinking shafts and underground drifts, making permanent excavations, building roads and tunnels, and removing overburden and waste rock in order to gain access and be able to produce the minerals.
 - (b) for oil and gas properties: gaining access to and preparing a well location for drilling, preparing drill sites from which to drill wells, and drilling wells to gain access and be able to produce the oil and gas.
- 3.24 A characteristic of such development works is that they are integral to and inseparable from the legal rights. Development works enable cash flows to be generated from the rights rather than generate future economic benefits separate from the rights. This is also the case if the legal rights are sold or otherwise transferred to another entity, as the development works would be sold or transferred with the legal rights. It would not be possible for the vendor to retain and use the development works without also possessing legal rights to the minerals or oil and gas properties. Consequently, development works are an improvement or enhancement of the rights rather than a separate asset.
- 3.25 Many mines are developed in stages, with the result that production may take place in one area while development continues elsewhere in the mine. The project team's view is that these development costs should be recognised as part of the legal rights asset to the extent that they have a future economic benefit beyond the current reporting period. Where development costs benefit only the current reporting period, they are a component of the cost of inventory produced in the current period and should be accounted for in accordance with IAS 2 *Inventories*.
- 3.26 The development and production phases will also require plant and equipment assets. Although not part of the legal rights asset, they may form part of the same unit of account. This is discussed in paragraphs 3.60–3.64.

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- 3.27 The minerals or oil and gas deposit (which is often described in terms of reserves and resources) associated with the legal rights is therefore not regarded as a separate asset from those rights. Only when the minerals or oil and gas are extracted does the entity have a tangible mineral or oil and gas asset that is separate from the legal rights asset and is accounted for in accordance with IAS 2.
- 3.28 This analysis shows that there is a continuum of activities from the acquisition of the exploration rights through exploration, development and production. Throughout this continuum the underlying asset remains the same—the right to explore for and extract minerals or oil and gas.

Prospecting activities

- 3.29 Prospecting activities that are conducted before the acquisition of legal rights generally would not be recognised as an asset because of a lack of enforceable rights associated with the information generated from those activities. The costs of these prospecting activities should therefore be recognised as expenses as incurred and would not form part of the asset that consists of the rights to explore for and extract minerals or oil and gas. However, costs incurred during the prospecting phase should not be recognised as expenses as incurred if they led to the creation or acquisition of an intangible asset that can be recognised in accordance with IAS 38 (eg a prospecting permit).

Derecognition

- 3.30 An asset should be derecognised when it no longer meets the criteria to be recognised as an asset. Both IAS 16 and IAS 38 state that an asset shall be derecognised:
- (a) on disposal; or
 - (b) when no future economic benefits are expected from its use or disposal.

Exploration is not always successful and this may lead to the realisation that the legal rights should no longer be classified as an asset. This would clearly be the case if the legal rights expire or are forfeited. No future economic benefits might be expected when exploration is discontinued because of a lack of success, no further exploration is contemplated and there are no reasonable prospects for sale of the legal rights.

- 3.31 In particular situations, future economic benefits may be unlikely but not sufficiently certain as to require derecognition of the asset. For example, the legal rights might extend for several years and a rise in the commodity price that is not beyond realistic expectations would make the resource economic to develop. In this situation, if the measurement basis is historical cost, the asset might be subjected to an impairment test and written down. Impairment is a measurement issue and is addressed in Chapter 4. Alternatively, if the measurement basis is a current value, that value would reflect the expectation of future economic benefits or the lack thereof.

Plant and equipment

- 3.32 Property, plant and equipment relating to extractive activities and within the scope of IAS 16 would be recognised in accordance with that IFRS. The question of whether some plant and equipment assets should be recognised separately in accordance with IAS 16, or whether they should form part of a larger unit of account that also includes the rights associated with mineral and oil and gas properties, is considered later in this chapter.

Project team's view on recognition of assets

- 3.33 The project team's view is that rights and information associated with minerals or oil and gas properties satisfy the asset recognition criteria.
- 3.34 Recognising information as part of the minerals or oil and gas property—particularly during the exploration and evaluation phases—would lead to a change in existing accounting policies for many minerals entities that recognise all exploration costs as expenses when incurred and for those oil and gas entities that use successful efforts accounting. For example, under successful efforts accounting, unsuccessful drilling and seismic surveying costs incurred during exploration and evaluation are not recognised as assets and are therefore recognised as expenses. Viewing the information gained from exploration as part of the minerals or oil and gas property results in it being recognised as part of that asset. On a historical cost basis of accounting, those costs would be capitalised as part of the minerals or oil and gas property, unless the legal rights meet the criteria to be derecognised. (The measurement basis of the minerals or oil and gas property, including impairment if historical cost is the measurement basis, is discussed in Chapter 4.)

- 3.35 This treatment of costs associated with unsuccessful exploration and evaluation activities can be contrasted with the requirements in IAS 2 and IAS 16 for measuring the cost of inventories and self-constructed plant and equipment. Both IFRSs state that abnormal amounts of wasted materials, labour or other resources are not included in the cost of these assets. The focus in IAS 2 and IAS 16 on *abnormal* amounts of waste presumes a normal amount of waste that can be identified and is capitalised—only *abnormal* amounts are required to be recognised as expenses. This concept of ‘normal’ and ‘abnormal’ amounts cannot be applied to exploration activities. Also, abnormal amounts of wasted material, labour and other resources have no information content and consequently bring no benefit to the inventory or self-constructed asset. In contrast, unsuccessful exploration can improve the understanding of the geology of the minerals or oil and gas property and therefore can represent an enhancement to the legal right asset.

Presentation of the legal rights

- 3.36 The minerals or oil and gas associated with a property do not change during exploration and development, but the uncertainties about the quantities and other attributes of the minerals or oil and gas that exist and can be economically extracted change significantly. Although uncertainty remains even in the production phase, the uncertainty during early stage exploration is much greater than during development and production. Accordingly, some distinction in presentation and/or disclosure might be helpful to users of financial reports to differentiate the assets about which there is more uncertainty from the assets about which there is less uncertainty. For example, the rights during the early stages of the continuum might be called exploration rights and those at a later stage might be called extraction rights. This differentiation may provide useful information about the degree of certainty associated with the likelihood of future production cash flows from the assets. The project team’s view is that presenting the asset that exists across the continuum as being of the same ‘quality’, and reporting it as such, would not constitute faithful representation.
- 3.37 If rights to mineral or oil and gas properties are to be divided into two (or more) classes, the challenge is to determine a meaningful classification for users of financial reports. Current practice in presenting or describing these assets varies. The KPMG 2009 survey^{*} found that entities use a variety of different captions in the statement of financial position or in notes to describe their minerals assets, including development costs,

* KPMG, *The Application of IFRS: Mining* (September 2009), page 31

mining property, mining assets and property, plant and equipment. In the oil and gas industry, FASB ASC section 932-360-25,^{*} for example, refers to assets such as mineral interests in properties; uncompleted wells and related equipment and facilities; and wells and related equipment and facilities. The project team does not think that this range of different captions to describe similar items is helpful to users of financial reports.

- 3.38 Industry has resolved this in reporting quantities of minerals or oil and gas as reserves and resources (in accordance with definitions such as the CRIRSCO Template and the PRMS). There is an obvious advantage in establishing a linkage between quantitative disclosures of reserves and resources and the financial statements. For instance, increases in certainty about the future cash inflows that may be generated from minerals or oil and gas production along the continuum from exploration to production can be reflected in the related reserves and resources disclosure. Consistency of quantitative and financial information between properties that have been or will be developed (reserves or extraction rights) and those that may (or may not) be developed (resources or exploration rights) is critical for the purposes of communicating useful information to users. An illustration of this presentation is provided at Exhibit 3.1, which contains extracts from Newmont Mining Corporation's 2008 annual report. The second table in Note 19 Property, Plant and Mine Development shows minerals interests in each of the exploration, development and production phases. An alternative presentation might show the following:
- (a) exploration properties (ie properties in the exploration or evaluation phase, which would include properties without a discovered minerals or oil and gas deposit and properties with a deposit that is classified as a resource);
 - (b) properties with reserves that are not in production; and
 - (c) properties in production.

* This section was introduced into US GAAP by SFAS 19 *Financial Accounting and Reporting by Oil and Gas Producing Companies*.

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Exhibit 3.1

NOTE 19 PROPERTY, PLANT AND MINE DEVELOPMENT				
At December 31, 2008				
	Depreciable Life (In Years)	Cost	Accumulated Amortization	Net Book Value
Land	-	\$ 105	\$ -	\$ 105
Facilities and equipment	1 - 25	9,158	(4,411)	4,747
Mine development	1 - 25	2,063	(933)	1,130
Mineral interests	1 - 25	2,767	(563)	2,204
Asset retirement cost	1 - 25	384	(191)	193
Construction-in-progress	-	1,753	-	1,753
		<u>\$ 16,230</u>	<u>\$ (6,098)</u>	<u>\$ 10,132</u>
Leased assets included above in facilities and equipment	2 - 18	<u>\$ 425</u>	<u>\$ (268)</u>	<u>\$ 157</u>
		At December 31, 2008		
	Amortization Period (in years)	Gross Carrying Value	Accumulated Amortization	Net Book Value
Mineral Interests				
Production stage	1 - 25	\$ 804	\$ (556)	\$ 248
Development stage	—	372	—	372
Exploration stage	—	1,591	(7)	1,584
		<u>\$ 2,767</u>	<u>\$ (563)</u>	<u>\$ 2,204</u>

Source: Edited extract from Newmont Mining Corporation 2008 annual report, Note 19 Property, Plant and Mine Development, page 131

Mineral Interests

Mineral interests include acquired interests in production, development and exploration stage properties. The mineral interests are capitalized at their fair value at the acquisition date, either as an individual asset purchase or as part of a business combination.

The value of such assets is primarily driven by the nature and amount of mineralized material believed to be contained in such properties. Production stage mineral interests represent interests in operating properties that contain proven and probable reserves. Development stage mineral interests represent interests in properties under development that contain proven and probable reserves. Exploration stage mineral interests represent interests in properties that are believed to potentially contain mineralized material consisting of (i) mineralized material such as inferred material within pits; measured, indicated and inferred material with insufficient drill spacing to qualify as proven and probable reserves; and inferred material in close proximity to proven and probable reserves; (ii) around-mine exploration potential such as inferred material not immediately adjacent to existing reserves and mineralization, but located within the immediate mine area; (iii) other mine-related exploration potential that is not part of measured, indicated or inferred material and is comprised mainly of material outside of the immediate mine area; (iv) greenfields exploration potential that is not associated with any other production, development or exploration stage property, as described above; or (v) any acquired right to explore or extract a potential mineral deposit. The Company's mineral rights generally are enforceable regardless of whether proven and probable reserves have been established. In certain limited situations, the nature of a mineral right changes from an exploration right to a mining right upon the establishment of proven and probable reserves. The Company has the ability and intent to renew mineral interests where the existing term is not sufficient to recover all identified and valued proven and probable reserves and/or undeveloped mineralized material.

Source: Edited extract from Newmont Mining Corporation 2008 annual report, Note 2 Summary of Significant Accounting Policies, page 99.

Unit of account selection

3.39 The unit of account determines the level of detail/aggregation at which assets and liabilities are recognised and presented in the financial statements. The selection of a unit of account for a particular asset or liability is influenced by factors such as:

- (a) adherence to generally accepted accounting principles so that the unit of account fits within the broader accounting system; and

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- (b) meeting the information needs of users of financial reports, which might include the provision of information that is sufficiently granular to identify separately assets that generate independent cash flows or are subject to particular risks.
- 3.40 Paragraph 82 of the *Framework* states that 'Recognition is the process of incorporating in the balance sheet or income statement an item that meets the definition of an element ...' but it does not provide guidance that assists with the identification and selection of particular units of account. The current IASB/FASB conceptual framework project has identified unit of account as an important issue, but this has not yet been addressed.
- 3.41 The following principles, derived from IFRSs, may be relevant in selecting a unit of account for minerals or oil and gas properties.
- (a) If an item's cash flows are largely independent of the cash flows of other items, this indicates that the item should be a separate unit of account (see IAS 36 *Impairment of Assets* paragraph 68).
 - (b) The unit of account should include items that are integral to, and are not separable from, the associated rights (see IAS 17 *Leases* paragraph 17 and IAS 40 *Investment Property* paragraph 50).
 - (c) Separate units of account are required when the subsequent accounting is different—for instance, when different items have different useful lives (see IAS 16 paragraph 43).
 - (d) Like items may be aggregated provided the aggregation is based on significant common attributes, such as the items being subject to common risks (see IAS 41 *Agriculture* paragraph 15).
 - (e) Individually insignificant items may be aggregated (see IAS 16 paragraphs 9 and 46).

Unit of account considerations for extractive activities

- 3.42 There are two dimensions to consider in selecting a unit of account for minerals or oil and gas properties:
- (a) the geographical boundaries of the asset—possible boundaries include individual mine or field, individual geological area (eg a sedimentary basin) or individual country or continent; and
 - (b) the components of the unit of account that are to be recognised as a single asset—possible components include the legal rights and information asset (the property asset) or the property plus any associated plant and equipment assets.

- 3.43 The classification of reserves and resources (eg proved reserves, probable reserves) to be accounted for is not considered to be a unit of account issue. This is because the reserve and resource disclosure classifications do not represent different 'items'—they are different estimates of the same item, being the recoverable minerals or oil and gas associated with the property.

Geographical dimensions

- 3.44 There is a range of possible geographical boundaries that could be applied to define the unit of account for minerals or oil and gas properties. The possible boundaries could be set by reference to one or more of the following attributes:
- (a) geopolitical characteristics, such as each country or group of countries in which the entity operates (full cost accounting is an example of this).
 - (b) geological characteristics, such as:
 - (i) if a wider unit of account is preferred, a basin or a geological province; or
 - (ii) if a narrower unit of account is preferred, an area of interest.
 - (c) legal characteristics, eg a single area, or group of contiguous areas, for which the relevant rights are held through property rights such as a lease or contract.
 - (d) economic characteristics, eg an area that is managed separately or has independent cash flows.

Assessment of geopolitical and geological characteristics

- 3.45 Defining the geographical boundaries of the unit of account solely according to geopolitical or geographical attributes would be inconsistent with the principle expressed in paragraph 3.41. Aggregating assets that share the same geopolitical risks into a single unit of account (eg a country-based unit of account) would ignore the fact that assets in different locations (eg different mines in a country) may be subject to very different geological risks, may have different subsequent accounting in terms of useful lives and impairment, and may have largely independent cash flows. Similarly, aggregating assets that belong to a defined geological region into a single unit of account ignores the fact that the geological region may extend across a number of jurisdictions that are subject to different political risks, such as government regulations and

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taxation and royalty regimes. Assets (eg mines or oil and gas fields) in a single geological region may also have different subsequent accounting and largely independent cash flows. Risk is important to users in analysing an entity and therefore it is particularly important to report on, and account for separately, assets with significantly different risks. For these reasons, defining the individual unit of account for a minerals or oil and gas property according to geopolitical or geological attributes alone is not proposed.

Assessment of economic and legal characteristics

- 3.46 Defining the unit of account boundaries solely according to legal or economic characteristics may not be a suitable alternative either. In some jurisdictions, the legal rights—especially for exploration rights—may extend across a wide area. In those cases, a unit of account defined according to legal attributes could aggregate assets that are subject to different geological risks or assets that have largely independent cash flows (which may be managed as independent operations). Similarly, if an entity has separate sets of legal rights in an area it may manage those separate properties as a single operation. This may occur, for example, where an entity has exploration rights that cover related areas and are managed as a single programme or where an entity has separate legal rights to adjacent lands and develops a single mine to extract the minerals.

Geographical considerations for unit of account selection

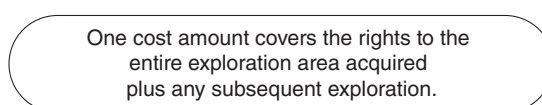
- 3.47 Although none of the characteristics above is individually adequate for defining the geographical dimension of the unit of account, they are all relevant to determining the unit of account that applies to:
- (a) exploration rights (also referred to as exploration properties); and
 - (b) extraction rights (also referred to as minerals or oil and gas properties).

Geographical dimensions of a unit of account for exploration rights

- 3.48 Exploration programmes for a geographical area covered by a single set of rights or by rights for adjacent areas are also usually managed as a single exploration programme. Although rights for exploration often cover a large geographical area, the project team thinks that it is appropriate to treat an exploration right as a single unit of account

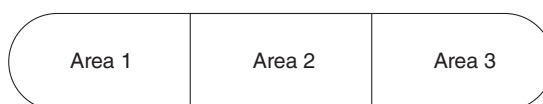
during the early stages of exploration activities (see Figure 3.1). At this time, the exploration activities may include obtaining general seismic data and other work to gain knowledge about the area and identify prospective areas where detailed exploration is warranted.

Figure 3.1—acquisition/initial exploration when area is considered a single exploration area



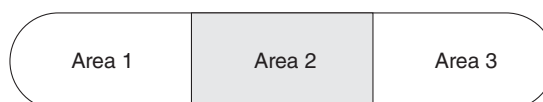
- 3.49 After these initial exploration activities, drilling or other more detailed exploration will take place in the specific area or areas (within the overall area of the exploration right) that have been identified as having the necessary exploration potential. If two or more areas are identified for separate exploration programmes, these areas represent separate assets and the size of the unit of account should be redefined to be consistent with those specific areas. Figure 3.2 illustrates this subdivision of the exploration property into separate units of account.

Figure 3.2—exploration is subdivided into separate exploration sub-areas



- 3.50 Identifying separate units of account is important if historical cost is the measurement basis for these assets. Costs incurred in Area 2 should be depreciated against production from the minerals or oil and gas property in that area and not against production from Area 1 or 3. On the other hand, if exploration activities are discontinued in Area 2 or there is another reason to test that asset for impairment, the derecognition of Area 2 or the impairment write-down should result in the write-off of the costs incurred in Area 2. This is because the information obtained from exploration and evaluation activities in that area would not (materially) improve the understanding of the geology in the other areas being explored. This is illustrated in Figure 3.3.

Figure 3.3—exploration in area 2 (shaded) is discontinued because of poor results



- 3.51 No portion of the acquisition cost of the exploration rights would be allocated to Area 2 or written off as part of that derecognition. Those costs are necessarily incurred regardless of the number of separate exploration activities that are undertaken within the property. They should be written off only if Areas 1, 2 and 3 are all derecognised. The total amount of the acquisition cost of the exploration rights should be included in the cost of any mine or field that is subsequently developed.
- 3.52 Ultimately this process of redefining the unit of account will evolve into the unit of account used for extraction rights (as discussed in the next section). This is illustrated in Figure 3.4. All the costs of the unit of account for the exploration area where a mine or oil and gas field is being developed become the costs of the minerals or oil and gas property, even if the rights to other parts of that area are given up or lost. If more than one mine or oil and gas field is developed then it may be necessary to allocate certain costs, for example the acquisition costs of the exploration rights. The allocation principle should be similar to that in IAS 2 *Inventories*, which requires allocations to be on a rational and consistent basis.

Figure 3.4—mine is developed in area 1



- 3.53 The description above of the unit of account is intended to set an upper limit. Entities with extractive activities could choose a smaller unit of account, just as entities in other industries choose different units of account according to their specific circumstances.

Geographical dimensions of the unit of account for extraction rights

- 3.54 The above characteristics indicate that legal rights to minerals or oil and gas properties that have significantly different geological, political or other risks or generate largely independent cash flows should be accounted for separately (ie as separate units of account). The project team therefore proposes that the unit of account for an extraction right should be no greater than a single area, or group of contiguous areas, for which the rights are held, which is managed separately, and which has largely independent cash flows. This will typically consist of a single geological structure in a single political jurisdiction; hence the unit of account is unlikely to include areas with very different geological or political risks. In some cases, a mine or field that is managed as a single operation may extend across jurisdictional borders. In those cases, the project team thinks that the mine or field could still be treated as a single unit of account.
- 3.55 The project team's proposal would require physically separate locations (ie ones for which the rights held are not contiguous) to be separate units of account even if they are managed as a single unit. Because they are physically separate they are likely to have different lives and other economic characteristics. Although they may be aggregated for impairment testing in accordance with IAS 36 if their cash inflows are not independent, they nevertheless represent separate units of account.
- 3.56 Similarly, there might be a single large property (ie defined according to a single set of rights) for which two different areas are managed separately and have independent cash flows. These represent two units of account, as they are separate cash-generating units and accordingly IAS 36 would require them to be treated separately in testing for impairment. The cash-generating unit provides a ceiling for unit of account selection because a unit of account for initial recognition and measurement purposes should not exceed the unit of account that would otherwise apply for subsequent measurement purposes.
- 3.57 The project team considers that, in practice, the geographical dimension of a unit of account for extraction rights would usually be expected to be a single mine or field.

Asset components

- 3.58 Identifying the components of a unit of account involves considering, from a functional perspective, which assets are integral to and inseparable from other assets within that unit of account.

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Exploration

- 3.59 As discussed in paragraph 3.48, the exploration right will represent the unit of account initially. Other assets used during exploration (eg vehicles, drilling rigs, site offices) are not expected to be integral to the exploration rights. Consequently, those assets would be recognised as separate units of account from the exploration property.

Development and production

- 3.60 The assets that are potential candidates for collectively forming a single unit of account are those assets that are used in upstream minerals or oil and gas operations to produce the minerals or oil and gas. Those assets fall into two main groupings:

- (a) legal rights to extract the minerals or oil and gas; and
- (b) plant and equipment assets.

- 3.61 Legal rights to extract minerals or oil and gas have been discussed in paragraphs 3.13–3.22. They include the original acquisition of the legal rights, additional information associated with the legal rights gained through exploration and other means as well as development works.

- 3.62 Plant and equipment assets include equipment, machinery and facilities that are used to extract, store, treat and transport the minerals or oil and gas. An entity may have plant and equipment assets that are dedicated to a single minerals or oil and gas property, or alternatively the plant and equipment may be linked to several properties. For instance, an entity may own the extraction rights for two mines on separate properties that share a treatment plant. Therefore, the composition of assets that make up the unit of account can also have a geographical dimension.

Possible units of account

- 3.63 The legal rights to extract minerals or oil and gas are the foundation of the unit of account. In considering the extent to which plant and equipment assets should also be included within this unit of account, the following possible dimensions of the unit of account have been identified:

- (a) the rights associated with a specific property including any development works to access the deposit *plus* any plant and equipment used to produce the deposit; or
- (b) the rights associated with a specific property including any development works to access the deposit but *excluding* plant and

equipment assets that are physically and commercially separable from the property rights. Consequently, any plant and equipment assets that are used to gain access to or to produce the minerals or oil and gas and are separable from the property rights are treated as separate assets.

Considerations

- 3.64 Factors that would influence the selection of a unit of account for the legal rights to extract minerals or oil and gas include the following:
- (a) The carrying amount of some individual assets may have information value, which might suggest that they should be separately disclosed. Although many users interviewed for the research project's user survey indicated that they generally consider the legal rights, development and associated plant and equipment to be a single asset for analytical purposes, some users saw merit in separately recognising and measuring plant and equipment in the following circumstances:
 - (i) when those assets generated separate—and material—cash flows, such as a treatment plant that processes material from properties owned by other entities as part of a commercial arrangement;
 - (ii) if the plant and equipment is a material asset (eg a dragline for a coal mine) and potentially could be used elsewhere;
 - (iii) when predicting the future cash flows relating to taxation obligations, the separate recognition of plant and equipment can provide useful information because these assets can have implications for royalty or other obligations; and
 - (iv) lenders indicated that separate recognition of separable plant and equipment assets (eg vehicles) would be useful because it identifies the various types of assets that could be sold separately by the lender if the need arose. Unlike other users, however, lenders would be able to obtain this information directly from management if it is not available from the financial statements.
 - (b) If the measurement basis is historical cost, the impact on depreciation if the individual items have different lives. In a historical cost measurement environment, many assets associated with the legal rights to extract minerals or oil and gas are amortised over the quantity of reserves to reflect the depletion

(ie extraction) of the mineral or oil and gas from the ground. However, this depreciation/amortisation basis is not suitable for all of these assets. Some items (eg mine vehicles) may have a shorter life; while others may have a longer physical life and are able to be redeployed for use in other locations. The components accounting approach in IAS 16 paragraph 44 indicates that if components of an asset have different useful lives, they should be accounted for, and depreciated, separately.

- (c) If the measurement basis is historical cost, some assets associated with the legal rights may become impaired or may be disposed of separately from the other assets within the property. If this were to happen and if the asset had not been separately identified, the unit of account might not facilitate recognition of the impact of the impairment or disposal event. The cash-generating unit concept in IAS 36 also provides a constraint on the assets that can be included in the unit of account. Although it is possible that, depending on the facts and circumstances, the cash-generating unit may include more than one minerals or oil and gas property (eg because a plant and equipment asset is shared), it is also possible that there may be more than one cash-generating unit associated with one minerals or oil and gas property (eg if a mine and a treatment plant are located on the same property and the treatment plant also processes ore from other mines on commercial terms).

Project team's view on unit of account

- 3.65 For exploration rights, the unit of account would initially be defined according to the exploration rights held. As exploration and evaluation takes place, the size of the unit of account would contract so that by the time of development and production the geographical dimension of the unit of account would ultimately be no greater than a single area, or group of contiguous areas, for which the rights are held, which is managed separately, and which would generate largely independent cash flows.
- 3.66 The components approach in IAS 16 may be useful in considering which assets should be recognised separately from the legal rights to extract minerals or oil and gas. The blanket inclusion of all plant and equipment assets associated with a legal right to extract minerals or oil and gas is inconsistent with the abovementioned principles and constraints. The question is which plant and equipment assets should be included in the same unit of account as the legal rights—and which should not. The project team notes that the extent to which plant and equipment assets are interrelated to the legal rights will depend on the specific facts

and circumstances. It would therefore be difficult, and undesirable, for an IFRS to prejudge which assets can and cannot form part of the same unit of account as the legal rights. Professional judgement will need to be exercised if an entity's minerals or oil and gas properties are to be faithfully represented in the entity's financial statements. Nevertheless, an IFRS for extractive activities could set some boundaries within which professional judgement is exercised.

- 3.67 Paragraph 3.41 identified certain principles for determining the unit of account for minerals or oil and gas properties. Consistently with those principles, determining the items of plant and equipment that should be included in the same unit of account as the legal rights to a geographical area should be based on the following:
- (a) Plant and equipment assets that generate largely independent cash flows represent separate units of account—in other words, the unit of account that includes the legal rights can be no greater than a cash-generating unit, as determined in accordance with IAS 36.
 - (b) Plant and equipment assets that are physically and commercially separable should be accounted for as separate units of account—these are assets that could realistically be moved to other operations and the movement of these assets could be economically justified. In contrast, assets are regarded as commercially inseparable if it would be more economic to abandon or decommission them rather than physically move them to a new location. Examples of the latter might include assets that are dedicated to the property because:
 - (i) they are not readily movable (eg offices, concentrator, dedicated rail facilities); or
 - (ii) they are specialised so there is no other economic use for them.
 - (c) Plant and equipment assets that have different useful lives from the legal rights (including any renewal periods that are expected to be obtained) should be accounted for as separate units of account if the minerals or oil and gas properties are to be measured at historical cost.
- 3.68 In the project team's view, these factors would set an upper limit to the unit of account. Entities may decide to account for their assets using a smaller unit of account.

Chapter 4 – Asset measurement

Introduction

- 4.1 The *Framework* identifies several different measurement bases for assets and liabilities but does not provide guidance on selecting between those measurement bases. At the time this discussion paper was prepared, the joint IASB/FASB conceptual framework project had started to address this topic. However, the boards' deliberations were at an early stage and did not provide any guidance that the project team could use in addressing measurement.
- 4.2 The measurement bases used in financial reporting can be broadly categorised as either historical cost or current value. Historical cost measures are based on the amount of cash paid or other consideration and may vary depending on the cost elements included. (In addition, historical cost measurements under IFRSs are subject to impairment testing using a current value measurement.) Current value measures include, among others, fair value and value in use.
- 4.3 This chapter examines the appropriate measurement basis for minerals or oil and gas properties by considering the qualitative characteristics of relevance and faithful representation with respect to current value and historical cost measurement of these assets. This chapter also considers how well each of these measurement bases meets the objective of financial reporting, which the *Framework* explains is 'to provide financial information about the reporting entity that is useful in making decisions about providing resources to the entity and in determining whether the directors and management have made efficient and profitable use of the resources provided.' The *Framework* goes on to say 'When making those decisions, users are interested in assessing the entity's ability to generate net cash inflows and management's ability to protect and enhance their investments'.*

Existing practice

- 4.4 Historical cost is commonly used by entities in the extractive industries to measure minerals or oil and gas properties. Extensive literature has been developed for the oil and gas industry on two specific variations of historical cost—successful efforts accounting and full cost accounting.

* Paragraphs OB2 and OB10 respectively

A further variant of historical cost—area of interest accounting—is particularly prevalent in the minerals industry.

- 4.5 Most other non-financial assets are measured at historical cost under IFRSs. IAS 16 *Property, Plant and Equipment* and IAS 38 *Intangible Assets* both require assets to be measured at cost on initial recognition and permit either the cost model or the revaluation model to be used for subsequent measurement. In practice, the revaluation model is rarely used when applying those IFRSs. However, there are some other types of non-financial assets for which fair value measurement is more common. IAS 40 *Investment Property* permits investment properties to be measured using either a cost model or a fair value model, although common practice is to measure these assets at fair value.* IAS 41 *Agriculture* goes further, by requiring biological assets related to agricultural activity to be measured at fair value less costs to sell, unless they cannot be reliably measured at fair value on initial recognition.
- 4.6 Examining existing practices may provide useful insights in developing a new IFRS. It may be particularly useful to understand the accounting policy choices made by preparers under existing standards. However, existing practices may have developed for many reasons and they do not necessarily represent accounting practices that best meet the objective of financial reporting. For this reason, the project team's proposals are developed on the basis of the *Framework*, focusing on meeting the objective of financial reporting.
- 4.7 IAS 16, IAS 38 and IAS 40 provide a choice of measurement models to apply. The *Preface to International Financial Reporting Standards* explains that the IASB does not intend to permit choice in accounting treatments,† and so this choice is not being proposed for minerals or oil and gas properties.

Current value

- 4.8 The current value of an asset is based on the future cash flows that the asset is expected to generate, either from selling the asset or from using the asset in producing goods or providing services. Because users of financial reports are interested in assessing the entity's ability to generate net cash inflows, current value measurements such as fair value are often viewed as being conceptually consistent with the financial

* Ernst & Young, *Observations on the Implementation of IFRS*, 2006, page 149

† *Preface*, paragraph 13

reporting objective of providing financial information that is useful in making decisions about providing resources to the entity and in determining whether the directors and management have made efficient and profitable use of the resources provided.*

- 4.9 The conceptual benefits of current value measurements were confirmed by the users consulted throughout the research project. Equity analysts are interested in estimating the value of the entity, and the value of the properties that contain minerals or oil and gas reserves is generally the most substantial part of this estimate for upstream minerals or oil and gas entities. Lenders and creditors are interested in whether the future cash flows that are expected to be generated from these assets will be sufficient for the entity to meet its obligations.
- 4.10 However, both users and preparers identified significant concerns about whether current value estimates of minerals or oil and gas properties would possess the qualitative characteristic of faithful representation—and therefore whether, in practice, a current value would provide information that could be relied on by users. Information that cannot be relied on is not useful. These concerns focus on the methodology required to derive a current value for minerals or oil and gas properties and the number of assumptions required.

Approaches for estimating fair value

- 4.11 Fair value is one of the main forms of current value and the one that is most commonly used in IFRSs. The following paragraphs discuss the three generally accepted approaches for estimating fair value—the market approach, the cost approach and the income approach. Paragraphs 4.27–4.32 discuss other forms of current value.

Market approach

- 4.12 The market approach uses prices and other relevant information generated in market transactions involving identical or comparable assets. The uniqueness of each minerals or oil and gas property means that deriving the fair value for these properties only by reference to market transactions is rarely possible. To do so would require a recent market transaction relating to the same property or one that has very similar characteristics. This might occur, for example, if there had been a recent transaction on an adjacent property. International Valuation

* The *Framework*, paragraph OB2

Standards Council (IVSC) Guidance Note 14 *Valuation of Properties in the Extractive Industries*, at paragraph 5.3.1, makes the following comments about the use of the market approach (which it refers to as the sales comparison approach):

Each Mineral deposit, Petroleum accumulation and Exploration Property is unique. Therefore, direct comparison of Mineral or Petroleum natural resource property transactions is often difficult or inappropriate. However, sales analysis is an important valuation tool. Sales adjustments or ratio analysis can frequently be applied for indirect sales comparison purposes. Sales analysis and other market analysis can often yield market factors such as a market discount rate, a risk factor or uncertainty factor that may be used in the Income Approach.

Cost approach

4.13 The cost approach is based on the amount that would be currently required to replace the service capacity of an asset (often referred to as current replacement cost). This approach is generally not suitable for minerals or oil and gas properties because each property is unique. Accordingly, the type of activities required and the costs incurred to find and develop minerals or oil and gas reserves located at one property has no correlation to:

- (a) whether a comparable minerals or oil and gas deposit exists on another property; and if so
- (b) the activities and costs that would be necessary to find and develop those reserves on that other property (ie the replacement cost).

A cost approach such as the Multiple of Exploration Expenditure method is sometimes used in estimating the value of early stage exploration properties.^{*} However, this method would not normally be used when sufficient geological information is available to provide a basis for forecasting future cash flows.

* The Multiple of Exploration Expenditure method can be applied to exploration properties and resource properties that are considered of marginal development potential. The project team understands that this is viewed as an emerging method for valuing exploration or minerals or oil and gas properties.

Income approach

- 4.14 The income approach calculates fair value by discounting estimated future cash flows. Given the difficulties associated with the cost and market approaches, fair values of minerals or oil and gas properties are normally derived using the income approach. IVSC Guidance Note 14 notes that discounted cash flow analysis is the ‘method most commonly used by businesses for investment decision-making within the Extractive Industries’.^{*}
- 4.15 Inputs required to calculate a fair value for minerals or oil and gas assets using the income approach include estimates of:
- (a) the recoverable quantity of minerals or oil and gas. Such estimates require:
 - (i) interpretation of the geology of the deposit, including estimates of total quantity (and quality) of minerals or oil and gas contained in the deposit;
 - (ii) assumptions regarding the technical factors that determine the quantity of minerals or oil and gas that could be extracted from the deposit, which may include:
 - for oil and gas, the reservoir pressure and flow rates; and
 - for minerals, the mine design and metallurgical recovery.
 - (b) the production profile over the life of the property.
 - (c) commodity prices, exchange rates, development and operating costs,[†] taxes, royalties and other payments to governments that will apply over the life of the property.
 - (d) discount rates relating to the time value of money and risks not reflected in the estimate of future cash flows.

* Paragraph 5.3.3

† The future cash outflows attributable to closure costs, such as the dismantlement and removal of plant and equipment and the restoration of the site, will not be included in the current value measurement. Instead, under IFRSs, a liability for closure costs will be recognised and measured in accordance with IAS 37 *Provisions, Contingent Liabilities and Contingent Assets*.

- 4.16 An issue in any discussion on measuring minerals or oil and gas properties at fair value is the level of uncertainty associated with many of these inputs and the lack of observable market inputs. Those uncertainties are highest during the early stage of exploration when there is insufficient knowledge of whether there are minerals or oil and gas resources that can be economically produced, which makes any estimation of recoverable quantities of the minerals or oil and gas and the cost to produce them subjective, or indeed speculative. The uncertainty about the minerals or oil and gas resources reduces as exploration progresses but remains significant even in the production phase. This is shown by the definitions of reserves and resources classifying recoverable quantities according to different levels of confidence, such as proved, probable and possible. Another significant uncertainty is the prices of commodities, which are often extremely volatile, making them difficult to predict. Futures markets may provide a market expectation for future spot prices for some commodities but even then there is usually only a liquid market for a relatively small number of years, which is much less than the likely production life of many minerals or oil and gas properties.
- 4.17 Consequently, most inputs required for the income approach would fall into the category of Level 3 inputs in the fair value hierarchy proposed by the exposure draft *Fair Value Measurement*.^{*} This exposure draft clearly contemplates the use of fair value based on Level 3 inputs and proposes guidance for deriving unobservable market inputs, for example that they should reflect the entity's own assumptions about the assumptions that market participants would use in pricing the asset. A significant degree of subjectivity will necessarily be involved in several of the inputs. As a result, different assumptions could be selected for one or more of the unobservable market inputs, and this could materially affect the estimate of fair value.
- 4.18 Although the exposure draft contemplates the use of unobservable market inputs, it does not imply that such inputs will always provide an estimate of fair value that meets the criteria for use in financial statements. The following extract from SFAS 157 *Fair Value Measurements*, upon which the exposure draft is based, explains the FASB's view:

The Board understands that for some, a measurement using a hypothetical construct that relies on unobservable inputs raises concerns about the resulting fair value measurement. In particular, some believe that a hypothetical construct might not faithfully represent an actual economic

* Chapter 2 discusses the fair value hierarchy and applies that hierarchy to economic assumptions (eg for commodity prices) used to classify minerals or oil and gas reserves and resources.

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phenomenon and, as such, would seem to be of questionable relevance to users of financial reports. Some Board members share those concerns. However, the Board agreed that concerns about fair value measurements that are predicated on hypothetical transactions in hypothetical markets derive from a threshold issue that relates principally to the selection of the appropriate measurement attribute, an area of focus in the Board's conceptual framework project. The Board plans to continue to address the issue of which measurement attribute should be required in individual accounting pronouncements on a project-by-project basis.*

Thus, the fair value measurement guidance does not identify when fair value should be used—its focus is on how to estimate fair value when an accounting standard requires a fair value measurement.

- 4.19 The *Framework* explains that “To a significant extent, financial reports are based on estimates, judgements and models rather than exact depictions of transactions and other events and circumstances.”† An important question is whether, in a particular case such as for minerals or oil and gas properties, the use of unobservable market inputs will result in faithful representation. This is not a new issue. The use of fair value or some other form of current value as a measurement basis for minerals or oil and gas properties is discussed in the bases for conclusions on SFAS 19 *Financial Accounting and Reporting by Oil and Gas Producing Companies* and on SFAS 69 *Disclosures about Oil and Gas Producing Activities*. Both of those standards conclude that the degree of uncertainty and the subjectivity inherent in determining the inputs in order to estimate a fair value or current value would not result in information that would be of sufficient reliability and comparability to be used as the measurement basis in financial statements. However, those conclusions were reached over 25 years ago and do not necessarily remain valid given the subsequent changes in financial reporting and valuation techniques.
- 4.20 If fair value is used as the measurement basis for minerals or oil and gas properties there is a need to factor in the uncertainty associated with these Level 3 inputs. In the income method of estimating fair value, this is usually accomplished by calculating an expected value on the basis of different probabilities of different values for each of the various inputs. A probability distribution of the recoverable quantity of minerals or oil and gas would be developed, as well as probability distributions for the relevant commodity prices and any other significant inputs with

* Paragraph C87

† Paragraph OB16

significant uncertainties. Probability distributions for Level 3 inputs would reflect assumptions made by the entity in the absence of observable market inputs, including assumptions based on the extent of the knowledge about the minerals or oil and gas deposit.

- 4.21 Using the expected value approach addresses the uncertainty inherent in estimates of future cash flows. However, an estimate of fair value would also include an adjustment for risk for the potential measurement error in estimating the timing, amount or probability of future cash flows.*
- 4.22 The acquirer of a minerals or oil and gas property, in effect, also acquires an option on potential improvements to future cash flow and this option will affect the fair value. The option value would take into account the potential upside to reserves not included in the expected value approach, such as the potential that further exploration might discover additional minerals or oil and gas, or a development plan not yet considered or technology or extraction techniques not currently available might increase the quantity of minerals or oil and gas that could be extracted economically.

Users' and preparers' views on fair value measurement

- 4.23 Users consulted throughout the project expressed concern that some or all of the inputs used by an entity in deriving the fair value of minerals or an oil and gas property might be different from those that the user would wish to apply. These users noted that the independent assessment of the various uncertainties is a critical part of their role and that relying on management's assessment of these factors is inconsistent with this. For these reasons, users indicated that they would not directly use management's estimate of fair value in their own analysis. Some users noted that a fair value included in the financial statements might be useful as a cross-check with their own value estimates. This would require disclosure of the main assumptions such as future commodity prices and capital costs in order to understand the reasons for the differences between the user's valuation and the fair value measurement included in the financial statements.
- 4.24 Preparers consulted by the project team shared the users' concerns about the difficulty in estimating a current value and about the subjectivity involved. They also raised concerns about the effort involved in generating fair values, particularly for those entities with multiple

* For more detail on risk and uncertainty in accounting measurements, see paragraphs 62–71 of Statement of Financial Accounting Concepts No. 7 *Using Cash Flow Information and Present Value in Accounting Measurements*, issued by the FASB in February 2000.

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properties that might produce different commodities and be in different jurisdictions with different political and other risks. Preparers thought that this would impose significant preparation costs—either opportunity costs for entities that have to redirect technical expertise from operational activities to compliance or incremental costs to engage outside consultants. Preparers and auditors also expressed concerns about the additional time and cost to prepare and audit this information and the impact on their ability to complete the financial reporting process to meet the deadlines for regulatory reporting requirements. Preparers told the project team that the current standardised measure of oil and gas reserves required by FASB ASC paragraph 932-235-50-30*—which is limited to future cash flows attributable to proved reserves—takes four weeks or longer to prepare (depending on the specifics of the entity’s properties). A full fair value of a minerals or oil and gas property would take much longer. Some entities also claimed that disclosing inputs to a fair value might require them to disclose proprietary information (such as their future pricing outlook or their contracted prices), which could be detrimental to their competitive position.

- 4.25 Fair value measurement is used in measuring impairment for minerals or oil and gas properties and for determining the initial measurement of the properties acquired in a business combination. This raises the question of why fair value can be used for these purposes but not for the ongoing measurement of those properties. Several reasons are often put forward to explain this. An impairment or business combination will usually affect substantially less than all of an entity’s minerals or oil and gas properties. The calculations can often be done well in advance of the end of the reporting period (and, in the case of a business combination, finalised in the following period). Impairments and business combinations do not normally occur every reporting period. In a business combination the value of the properties to be acquired has normally been determined by the acquirer as part of the acquisition process. While this may include entity-specific assumptions that do not reflect the views of market participants, it would still be useful in determining the fair value of the acquired properties. These factors mitigate, but do not eliminate, the practicality and subjectivity concerns about the use of fair values in impairment testing and business combinations.
- 4.26 Preparers generally concluded that fair value measurement would be costly to implement while producing little, if any, benefit for users. Preparers noted that users do not request fair value information and rarely display interest in fair value or other current value information

* This disclosure requirement was introduced into US GAAP by SFAS 69.

about these assets that is sometimes made available in financial statements or in regulatory filings (eg business combinations disclosures, disclosure of a standardised measure of proved oil and gas reserves). Accordingly, preparers do not think that measuring minerals or oil and gas properties at fair value would meet a cost-benefit test.

Current value measurements other than fair value

- 4.27 Current value measurements other than fair value would also be estimated using the income approach. In the project team's view, a current value measurement other than fair value can be considered a substitute for fair value only if it provides some useful information about future cash flows and if it addresses some of the concerns about the preparation time and effort and subjectivity associated with estimating the fair value of minerals or oil and gas properties.
- 4.28 The concerns associated with developing a fair value measurement can be reduced by:
- (a) assigning a value to only a portion of the asset (eg proved reserves but not probable reserves or resources); or
 - (b) specifying either the values to be used for certain inputs or the method by which those inputs are to be derived.
- 4.29 A current value measurement prepared on this basis would not represent fair value. An example of such a current value measurement is the standardised measure of discounted future net cash flows relating to proved oil and gas reserve quantities that is required to be disclosed by FASB ASC paragraph 932-235-50-30. The scope of this standardised measure is limited to the future cash flows expected from the entity's proved reserves rather than future cash flows attributable to the entire property—which may also include probable and possible reserves, contingent resources and future exploration potential. Also specified, among other things, is the use of a 10 per cent discount rate, a price assumption equal to the average price of the commodity for the previous year and year-end costs. The standardised measure goes some way toward reducing the effort and limiting the need for disclosure of proprietary data and, by reducing subjectivity, it also increases consistency of the measurement between entities. However, there is a trade-off—the more the inputs are specified the less likely it is that the valuation will be relevant to a user's understanding of the net future cash inflows attributable to the entity's assets.

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- 4.30 In practice, there is a general acceptance among users and preparers that the standardised measure does not provide a faithful representation of the year-end value of the entity's oil and gas properties, or even a faithful representation of the value attributable to its proved reserves. Many preparers explicitly include a statement to this effect as part of their standardised measure disclosures. One of the reasons for this is that a historical price (such as the 31 December spot price or a twelve-month average price)^{*} may be significantly different from the long-range price outlook because of short-term supply or demand factors. Nevertheless, a standardised measure may be useful for purposes other than as a valuation of the future cash flows expected from proved reserves. Some users surveyed by the project team noted that they use the standardised measure disclosure to provide a preliminary comparison of the reserve quantities and standardised measure of different entities and to understand changes to the entity's standardised measure from one year to the next. The usefulness of a standardised measure, or similar current value measurement, as a disclosure is discussed further in Chapter 5.
- 4.31 In the project team's view, the standardised measure required by FASB ASC paragraph 932-235-50-30, or a similar current value measurement that either assigns a value to only a portion of the asset or standardises some of the valuation inputs, will not provide useful information about future cash flows. Therefore, for the purposes of presenting an entity's statement of financial position, these forms of current value measurement are not suitable alternatives to measuring minerals or oil and gas properties at fair value.
- 4.32 Another form of current value measurement, such as a value in use estimate, could be suitable as a substitute to fair value measurement. The value in use measurement would, at least conceptually, provide useful information because it would show the future cash flows that the entity expected to generate from its assets. However, the current value measurement would not address the concerns of users (see paragraph 4.23). It would also not use market-based inputs (where available) and therefore might be less useful to users than fair value. Furthermore, a value in use measurement would not address any of the concerns raised by preparers about the preparation cost and effort required and the concern that commercially sensitive information might be disclosed. For these reasons, the project team's view is that fair value is the most suitable current value measurement basis that could be applied to minerals or oil and gas properties.

* Accounting Standards Update 2010-03—*Extractive Activities—Oil and Gas (Topic 932): Oil and Gas Reserve Estimation and Disclosures* now require the standardised measure to be prepared using a 12-month average commodity price rather than a year-end price.

Fair value measurement at initial recognition

- 4.33 The initial recognition of minerals or oil and gas properties is made either when the exploration rights have been acquired or when the property is subsequently acquired by the entity through either an asset acquisition or a business combination. Paragraphs 4.24–4.26 identify issues associated with preparing current value estimates for these assets. A broader issue that may arise concerning the use of fair value at initial recognition is the potential for day 1 gains or losses to be recognised when exploration rights are acquired by staking a claim on an exploration area. As noted in Chapter 3, the purchase price of these rights is unlikely to correspond to the asset's fair value. Therefore, in these cases, it would need to be determined whether it is appropriate to recognise a gain or loss on initial recognition of these exploration rights.
- 4.34 An additional issue arises if the current value measurement basis is not fair value. As the consideration given to acquire a minerals or oil and gas property will, in many cases, be equivalent to the asset's fair value, it would need to be determined whether the initial measurement of the asset should be at current value (as defined by the future IFRS) or fair value (as would be required by, for example, IFRS 3 *Business Combinations*). If the measurement basis is a current value other than fair value, there is likely to be a gain or loss when the property is first measured at that current value.

Fair value measurement after initial recognition

- 4.35 The main issues associated with the current value measurement of minerals or oil and gas properties after initial recognition are the frequency of the remeasurement (which is discussed in the following paragraphs) and the implications of the remeasurement on the statement of comprehensive income (which is discussed later in this chapter).
- 4.36 In remeasuring other types of non-financial assets at fair value, IFRSs require the remeasurement to be performed either:
- (a) each reporting period, including interim periods—which is the approach adopted by IAS 40 and IAS 41; or
 - (b) on a periodic basis, but with sufficient regularity to ensure that, at the end of the reporting period, the asset's carrying amount does not differ materially from its fair value—which is the approach adopted by IAS 16 and IAS 38.

- 4.37 In the project team's view, this distinction between the frequencies of these remeasurements is unlikely to be relevant in practice for minerals or oil and gas properties. This is because the fair value of these assets is continually changing as more information is obtained about the property, as economic conditions change, and as the minerals or oil and gas are extracted. Therefore, if the property is not remeasured at fair value at the end of each reporting period, it is likely that its carrying amount would materially differ from its fair value. Unless fair values were determined at each reporting date, the measurement of those assets would not faithfully represent the entity's financial position or the entity's financial performance for the reporting period. For this reason, the project team thinks that if minerals or oil and gas properties are to be measured at fair value, those assets would have to be remeasured at fair value each reporting period, including interim periods. As noted in paragraph 4.24, this would have substantial preparation cost implications for minerals and oil and gas entities.

Historical cost

- 4.38 The historical cost of a minerals or oil and gas property includes the cost of acquiring the exploration and extraction rights. It also includes the cost of any activities undertaken after the acquisition that enhance the value of the exploration and extraction rights (such as exploration and evaluation activities that generate information about the minerals or oil and gas deposit and development activities that allow access to the deposit).
- 4.39 Historical cost is generally regarded as providing a verifiable measure of the cost of acquiring and developing a property. Often these costs can be observed from a transaction, which suggests that historical cost is an objective measurement. This is not always true as an asset's historical cost at initial recognition can be influenced by judgements made in, for example, cost allocation decisions relating to the unit of account (as discussed in Chapter 3) and determining the initial carrying amount of individual assets acquired in either a business combination or in a multiple asset acquisition. Provided these judgements are exercised in a manner that makes the historical cost complete, neutral and free from material error, the historical cost would be a faithful representation of the cost to acquire, explore and develop a property.

- 4.40 A historical cost measurement that is a faithful representation of the cost of acquiring, exploring and developing a property might be useful for assessing management's stewardship of the economic resources entrusted to it by investors and creditors. The assessment might involve calculating performance measures such as the return on capital, which indicates how well management has invested the funds under its control (ie in general terms, by measuring the income earned from the capital invested). Most existing historical cost measurement models are somewhat deficient when used for this purpose because they are not representative of the total capital invested. Some costs may have been recognised as expenses as incurred and other costs may have been written off subsequently either through systematic depreciation charges or impairment write-downs of unrecoverable capitalised costs. Some analysts may make adjustments for this when calculating these measures. The relevance of historical cost for measuring performance is also limited because the return is calculated by comparing revenues in current prices with costs measured in historical prices. Although this comparison provides an accurate measure of the income earned over time, it does not provide an accurate measure of management's return relative to the current value of its assets.
- 4.41 The historical cost of a minerals or oil and gas property generally provides relevant information that is useful in assessing future cash flows only when the asset's historical cost equals its fair value. This normally occurs when the rights to the property have been acquired in an exchange transaction between a willing buyer and a willing seller. Such situations include rights to the property acquired through an auction process or by negotiation (including a farm-in* or business combination). In these situations, the historical cost—being the purchase price—would take into account information about the property and expectations about future economic conditions that existed at the time of the acquisition. However, there are other situations in which the historical cost of acquiring rights does not reflect the fair value of the rights. An example is rights obtained by staking a claim to an area and then paying a fee to the government to acquire the exploration rights. This fee would not normally take into account the exploration potential of the property, and in these situations the historical cost at initial recognition would not provide information relevant for assessing future cash flows.

* A farm-in or farm-out arrangement is defined in the IASC Issues Paper *Extractive Industries* as 'an agreement by which the owner of operating rights in a mineral property (the farmor) transfers a part of that interest to a second party (the farmee) in return for the latter's paying all of the costs, or only specified costs, to explore the property and perhaps to carry out part or all of the development of the property if reserves are found'.

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- 4.42 The relevance of a property's historical cost for assessing future cash flows diminishes over time as subsequent exploration and evaluation activities generate more information about the property, including geological information and estimates of the size, quality and economic recoverability of any minerals or oil and gas discovered at the property. While a great degree of expertise and effort enters into exploration decisions, there is still significant uncertainty over the outcome of exploration. Different decisions affect the amount of exploration work required and costs incurred before a minerals or oil and gas reserve is discovered. As a result, the historical cost of exploration is not relevant for assessing future cash flows because there is no correlation with the future cash flows that may be generated from the production of minerals or oil and gas from the property.
- 4.43 The relevance of a property's historical cost for making economic decisions also diminishes as expectations about future economic conditions change. For example, the ability of the entity to generate cash inflows from a property depends on commodity prices that may change significantly over time. Prices affect not only the amount received for a given quantity of mineral or oil and gas sold, but also the quantity of the reserves that can be economically produced. A property may therefore have a very positive cash flow outlook one year and, if commodity prices fall, may change to a marginal cash flow outlook—or worse.

Historical cost measurement after initial recognition

- 4.44 The historical cost of an asset after initial recognition equals the sum of costs incurred that are attributable to the asset less accumulated depreciation (or amortisation) and impairment write-downs. The following paragraphs consider the application of depreciation and impairment requirements to the historical cost measurement of an exploration property (ie an asset in the exploration or evaluation phase) or a minerals or oil and gas property (ie an asset in the development or production phase).

Depreciation

- 4.45 Depreciation expense should be recognised for exploration properties and minerals or oil and gas properties to acknowledge that, over time, the future economic benefits embodied in those assets are being consumed. Depreciation calculations allow for a systematic recognition of the decline in value of these assets as represented by their historical cost carrying amounts. Conceptually speaking, an alternative to calculating depreciation would be to require the asset to be tested for impairment

each reporting period. This alternative to recognising depreciation is likely to require frequent recoverable amount assessments under IAS 36 *Impairment of Assets*, especially once minerals or oil and gas are being extracted. Testing exploration properties and minerals or oil and gas properties for impairment is discussed in paragraphs 4.50–4.76 below.

- 4.46 The basis for calculating depreciation (or amortisation) for exploration properties and minerals or oil and gas properties is set out in IAS 16 or IAS 38, depending on whether either the asset or its components are tangible or intangible in nature. As discussed in Chapter 3, some of the components of an exploration property or a minerals or oil and gas property may have different useful lives and so would need to be depreciated separately.
- 4.47 Current practice in calculating depreciation for these assets under existing IFRSs can be broadly summarised as follows:
- (a) for the exploration rights component of an exploration property—depreciation usually starts when the exploration rights are acquired (because this is typically when the rights are available for use) and the calculation of depreciation expense is based on the term of the right;^{*} and
 - (b) for minerals or oil and gas properties—depreciation starts when the property is ready for production and depreciation expense is usually calculated on a units of production basis to reflect the pattern in which the asset’s future economic benefits are expected to be consumed—ie by the depletion of mineral or oil and gas reserves through production.
- 4.48 The project team does not propose that the basis for calculating depreciation for these assets should be significantly different from existing IFRSs. However, the project team thinks that, if historical cost is adopted as the measurement basis for these assets, there are some practical application issues that should be considered when drafting a future IFRS for extractive activities. These issues are related to the calculation of depreciation on a units of production basis for minerals or oil and gas properties, including:
- (a) whether the units of production formula should be based on revenues (such as gross revenues) or physical units (which, particularly in the minerals industry, could be either the ore produced or the mineral contained in the ore produced);

* Depending on the entity’s accounting policy under IFRS 6, this depreciation expense may form part of the costs of its exploration and evaluation asset.

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- (b) whether the units of production formula should be calculated on proved reserves only or on the sum of proved and probable reserves (which is the best estimate of minerals or oil and gas that will be extracted), or potentially also include some resources classifications if it is expected that future development will take place at the mine or field and, as a consequence, will prolong the overall life of the mine or field; and
- (c) how to apply units of production depreciation when more than one commodity is extracted from the same property.

These application issues are discussed in Chapter 7 of the Issues Paper *Extractive Industries*, which was published by the IASC Steering Committee on Extractive Industries in November 2000.

- 4.49 To address these application issues, the project team proposes that a uniform basis for calculating depreciation expense should apply to both minerals properties and oil and gas properties. This is consistent with the research project's guiding principle that comparable accounting and disclosure requirements should be considered for the minerals and oil and gas industries.

Impairment

- 4.50 IAS 36 applies after initial recognition and measurement to ensure that an entity's assets are carried at no more than their recoverable amounts. IAS 36 requires an entity to assess at each reporting date whether there is any indication that its assets may be impaired. If any such indication exists, the entity must estimate the recoverable amount of the asset (or the cash-generating unit to which the asset belongs). IAS 36 therefore sets an upper limit on the carrying amounts of assets.
- 4.51 IAS 36 defines an impairment loss as 'the amount by which the carrying amount of an asset or a cash-generating unit exceeds its recoverable amount'. Impairment is therefore a measurement issue. Chapter 3 discusses derecognition of a minerals or oil and gas property because it no longer meets the definition of an asset or the recognition criteria—for example, when the legal rights to a property expire or no further work will be carried out on the property.
- 4.52 The specific indications identified in IAS 36, while not exhaustive, suggest that an asset does not need to undergo a recoverable amount assessment unless there has been an adverse change or if new unfavourable information becomes available after the asset was initially recognised or remeasured (ie written down as a result of a prior

impairment). The indications of impairment approach therefore acts as a filter to identify the assets that need to undergo a recoverable amount assessment. This avoids imposing on entities the cost and effort of comparing the carrying amount of each asset to its recoverable amount every period.

- 4.53 As noted in Chapter 1, the research project has not been constrained by existing IFRSs in considering how to account for exploration properties and minerals or oil and gas properties. With that in mind, the remainder of this section on impairment considers whether IAS 36 should apply to exploration properties and minerals or oil and gas properties. The analysis is presented separately for each asset because of their different characteristics, relating principally to the availability of information about the existence and quantities of minerals or oil and gas that can be extracted economically.

Applying IAS 36 to minerals or oil and gas properties

- 4.54 IAS 36 currently applies in testing minerals or oil and gas properties for impairment. With these assets, an entity is expected to have access to sufficient information about the minerals or oil and gas property to test whether the carrying amount of the asset is impaired. Typically, a detailed project cash flow model is prepared when an entity is deciding whether to develop a mine or field on the property. At that time, sufficient information is available to assess whether the carrying amount of the property is impaired and, if necessary, any impairment loss would be recognised at that time. This is consistent with the requirement in paragraph 17 of IFRS 6 *Exploration for and Evaluation of Mineral Resources* that 'exploration and evaluation assets' are to be assessed for impairment at the time when the technical feasibility and commercial viability of extracting the mineral resource are demonstrable.
- 4.55 During the development and production phases, the need to test for impairment will often be the consequence of changes in the major assumptions that were used when making the development decision. The types of changes in assumptions that may have an effect on the entity's ability to recover the carrying amount of the asset include decreases in commodity prices or increases in development or production costs, decreases in reserves estimates, delays in the development or production schedule, or legal or regulatory changes (eg changes in tax or royalty rates). Because those changes in assumptions will be considered

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when the entity revises its cash flow models and reserves and resources estimates for the property, the entity should have access to sufficient information to test for impairment in accordance with IAS 36.

- 4.56 Most of the practical issues that have arisen in applying IAS 36 to minerals or oil and gas properties are not unique to extractive activities and relate to specific requirements within IAS 36, such as:
- (a) identifying the cash-generating unit for minerals or oil and gas properties when there is an active market for intermediate products or when infrastructure is shared with other mines or fields owned by the entity or third parties; and
 - (b) the exclusion of future capital expenditures in calculating the asset's value in use.

Accordingly, the project team does not think that these issues justify applying an alternative impairment model to that in IAS 36 for minerals or oil and gas properties.

Applying IAS 36 to exploration properties

- 4.57 In most instances, exploration properties would be subject to an impairment test each reporting period if IAS 36 applied to these assets instead of IFRS 6. Even if none of the indications of impairment identified in IAS 36 are present, the fact that exploration activities have been undertaken during the reporting period would generally mean that an impairment test is necessary to determine whether the property's carrying amount is less than its recoverable amount. This is because, as noted in paragraph 4.42, there is no relationship between the cost of exploration activities and what is gained from that exploration. An exploration programme may find minerals or oil and gas worth many times the cost of the exploration—or it may find nothing. Typically, exploration results will lie somewhere between these extremes. But until sufficient information is available to evaluate the exploration results and reach a conclusion on whether economically recoverable quantities of minerals or oil and gas have been found, it is not possible to make any (reliable) judgements that the carrying amount of an exploration property (ie the cost of the exploration rights and any subsequent exploration and evaluation activities) would be less than its recoverable amount.
- 4.58 An impairment test under IAS 36 requires a current value (the higher of fair value less costs to sell and value in use) to be estimated. As noted earlier in this chapter, there are practical challenges in using current value to measure exploration properties and minerals or oil and gas

properties.* If historical cost is the basis of measurement and exploration properties are required to be measured at current value each period in order to determine if the assets are impaired, then the historical cost basis for these assets is really a current value basis—albeit one-sided in that it would generally result only in a write-down of the value of the asset; there would be no upward revaluation (unless the impairment is subsequently reversed).

- 4.59 On the basis of this analysis, the project team is proposing that the IAS 36 impairment model should not apply to exploration properties for the following two reasons:
- (a) Estimating the recoverable amount for most (or all) exploration properties each reporting period is likely to involve as much effort as adopting a current value measurement basis. Consequently, if performing a recoverable amount assessment each reporting period were feasible, there would be less reason to choose historical cost as the measurement basis for these assets. This is because, at least in conceptual terms, measuring these assets at current value provides more relevant information than if they are measured at historical cost.
 - (b) It would be difficult—if not impossible—to limit the number of properties for which an impairment test is required each reporting period through the use of indications of impairment based on adverse changes or new information. This is because there will normally be new information available each reporting period as a result of exploration and evaluation activities completed in the period that will be relevant for making judgements about the recoverability of an exploration property's carrying amount. Furthermore, the cost of those activities increases the carrying amount that is to be tested for impairment.

Alternatives to applying IAS 36 to exploration properties

- 4.60 Alternatives to applying the IAS 36 impairment model to exploration properties include:
- (a) Option A—revisiting the project team's view on initial recognition in Chapter 3 to require instead that exploration and evaluation

* Although professional valuers can be engaged to value (or provide a range of values for) an individual property, the application of IAS 36 to extractive assets would require every entity's properties to be valued every reporting period in sufficient time to meet financial reporting requirements. This is not expected to be possible without incurring significant preparation costs.

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costs are recognised as expenses as incurred until sufficient information is obtained to indicate the existence of economically recoverable reserves;

- (b) Option B—allowing entities to recognise an impairment loss for an exploration property without having to calculate recoverable amount in cases where preparing that calculation would involve undue cost or effort; or
- (c) Option C—identifying indications of impairment that are different from those in IAS 36 and apply specifically to exploration properties.

Option A—Revisiting the project team's view on initial recognition

- 4.61 The project team's view on initial recognition, as outlined in Chapter 3, is that the information obtained from both successful and unsuccessful exploration and evaluation activities improves the understanding of the geology of the exploration property. Consequently, the costs of these activities should be capitalised because they are an enhancement to the asset even though sufficient information may not yet be available to indicate the existence of economically recoverable quantities of minerals or oil and gas.* An alternative to the project team's view on initial recognition would be to recognise the asset only when sufficient information is available to indicate the existence of economically recoverable quantities of minerals or oil and gas. This alternative would result in most exploration and evaluation costs being recognised as expenses as incurred unless those costs are otherwise capable of being recognised as assets in accordance with IAS 16 or IAS 38.
- 4.62 This option would be somewhat similar to successful efforts accounting in the oil and gas industry but it would require some costs that are generally capitalised under existing practice to be recognised as expenses. For example, the cost of drilling a successful oil exploration well may need to be recognised as an expense as incurred if the cost is incurred before sufficient information is available to assess whether the reservoir that has been discovered contains economically recoverable quantities of oil or gas. Exploration properties would be recognised in the financial statements—but would be measured at the cost of acquiring the rights. This option also requires an entity to determine when there is sufficient knowledge about the property for an estimate of future cash flows to be made.

* The authors of the discussion paper *Initial Accounting for Internally Generated Intangible Assets*, published by the Office of the Australian Accounting Standards Board in 2008, reached a similar view—see, in particular, paragraphs 47, 48 and 75–87.

- 4.63 In the project team's view, this option is inconsistent with the application of the asset definition and recognition criteria (as discussed in Chapter 3), because it would lead to the recognition as expenses of costs that improve knowledge about an exploration property and therefore misstate the financial performance of an entity as reflected in the statement of comprehensive income. (This is discussed further at paragraph 4.84 below.)

Option B—Undue cost or effort exemption

- 4.64 Under this option, IAS 36 would apply to exploration properties, but entities would be provided with an 'undue cost or effort' exemption from calculating recoverable amount for an exploration property if the benefits of calculating recoverable amount did not justify the costs involved. Entities taking this option would write down the property's carrying amount to zero. The exemption would be taken property by property because there may be some properties for which a comparison can be made between its recoverable amount and its carrying amount with reasonable effort. In subsequent reporting periods, if there were sufficient information to indicate the existence of economically recoverable quantities of minerals or oil and gas, IAS 36 would require a reversal of the impairment.
- 4.65 This option has the advantage of ensuring that the entity's statement of financial position is not overstated during the early stages of exploration and that the cost of the minerals or oil and gas property is not understated when the property is likely to proceed to development, because by then the impairment would be expected to have reversed. A disadvantage of providing an 'undue cost or effort' exemption is that it could be used to facilitate the 'smoothing' of an entity's financial performance between reporting periods. Furthermore, the use of 'undue cost or effort' exemptions has previously been proposed—but not subsequently adopted—in amendments to IFRS 3 *Business Combinations* (about measuring non-controlling interests at fair value), IAS 1 *Presentation of Financial Statements* (about reclassification of comparative amounts and disclosure of key assumptions and other sources of estimation uncertainty) and IAS 8 *Accounting Policies, Changes in Accounting Estimates and Errors* (about retrospective application of voluntary changes in accounting policies and retrospective restatement for fundamental errors). In each of those cases, the IASB decided not to use an 'undue cost or effort' exemption because an exemption based on management's assessment of undue cost or effort was too subjective to be applied consistently by

different entities.* The project team agrees that the same concern would arise with the approach adopted for testing exploration properties for impairment.

Option C—Identifying other indications of impairment

- 4.66 This option involves identifying indications of impairment that apply specifically to exploration properties since, as noted in paragraphs 4.57–4.59, the indications in IAS 36 cannot be applied effectively to determine whether an exploration property should be tested for impairment. An indication of impairment would have to be able to predict whether the carrying amount of a specific exploration property is likely to be greater than its recoverable amount without requiring the asset's recoverable amount to be calculated.
- 4.67 The types of impairment indicators identified in existing standards as being appropriate for exploration properties mainly address whether there is an asset that can continue to be recognised rather than whether the carrying amount of that asset is recoverable. IFRS 6 paragraph 18 requires exploration and evaluation assets to be tested for impairment 'when facts and circumstances suggest that the carrying amount exceeds the recoverable amount'. The facts and circumstances listed in paragraph 20 of IFRS 6 are:
- (a) the period for which the entity has the right to explore in the specific area has expired during the period or will expire in the near future, and is not expected to be renewed.
 - (b) substantive expenditure on further exploration for and evaluation of mineral resources in the specific area is neither budgeted for nor planned.
 - (c) exploration for and evaluation of mineral resources in the specific area have not led to the discovery of commercially viable quantities

* IFRS 3, paragraph BC215; IAS 1 paragraph BC36 and IAS 8 paragraph BC24. The Bases for Conclusions on IAS 1 and IAS 8, in those paragraphs, also note that balancing costs and benefits is a task for the IASB when it sets accounting requirements rather than for entities when they apply those requirements. 'Undue cost or effort' exemptions were also proposed during the development of IFRS 1 *First-time Adoption of International Financial Reporting Standards*. However, the project team regards IFRS 1 as a special case that does not provide a general precedent for the development of exemptions in other IFRSs. IFRS 8 *Operating Segments* provides an exemption from some of the disclosures if the necessary information is not available and the cost to develop it would be excessive. This is also a special case: paragraph BC47 of IFRS 8 suggests that this wording was used to ensure convergence with SFAS 131 *Disclosure about Segments of an Enterprise and Related Information*.

of mineral resources and the entity has decided to discontinue such activities in the specific area.

- (d) sufficient data exist to indicate that, although a development in the specific area is likely to proceed, the carrying amount of the exploration and evaluation asset is unlikely to be recovered in full from successful development or by sale.

The first three of these four criteria address derecognition of the asset, which was discussed in Chapter 3. The fourth criterion addresses recoverability but, as previously discussed, sufficient data will not normally exist to determine that 'the carrying amount of the exploration and evaluation asset is unlikely to be recovered in full'.

4.68 In US GAAP for oil and gas extractive activities, an entity can continue to capitalise drilling costs if an exploratory well has found a sufficient quantity of oil and gas to justify its completion as a producing well and the entity is making sufficient progress assessing the reserves and the economic and operating viability of the project. FASB ASC paragraph 932-360-35-19 states that when determining whether an entity is making sufficient progress on those assessments all relevant facts and circumstances should be evaluated. The paragraph includes the following non-exhaustive list of indicators that an entity is making sufficient progress:

- a. commitment of project personnel who are at the appropriate levels and have the appropriate skills
- b. costs that are being incurred to assess the reserves and their potential development
- c. an assessment process covering the economic, legal, political, and environmental aspects of the potential development is in progress
- d. existence (or active negotiations) of sales contracts with customers for the oil and gas
- e. existence (or active negotiations) of agreements with governments, lenders and venture partners
- f. outstanding requests for proposals for development of any required facilities
- g. existence of firm plans, established timetables, or contractual commitments, which may include seismic testing and drilling of additional exploratory wells
- h. progress that is being made on contractual arrangements that will permit future development
- i. identification of existing transportation and other infrastructure that is or will be available for the project (subject to negotiations for use).

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However, these criteria all address whether there is sufficient support to continue recognising an asset. They do not address the recoverability of the asset's carrying amount.

- 4.69 The project team has not been able to identify any indications of impairment that would be useful in predicting whether and when the carrying amount of an exploration property is not recoverable. This is because if information about the presence of minerals or oil and gas on an exploration property is too limited to use for predicting future cash flows (or otherwise determining the recoverable amount), the information is likely to be equally insufficient for any objective indicators to make accurate predictions about the recoverability of a property. To make such predictions, the indicators would have to distinguish between situations where:
- (a) the information, while limited, is sufficiently positive and the carrying amount of the property sufficiently low for the likelihood of the carrying amount being recoverable to be very high;
 - (b) even though exploration will continue, the exploration results to date make it very unlikely that the carrying amount will be recovered in full; and
 - (c) most commonly, there is insufficient information to judge recoverability with any reasonable degree of confidence.
- 4.70 For this reason, testing exploration properties for impairment may need to be based largely on management's expectations of the recoverability of its properties rather than on the existence of any objective indicators that those properties are impaired. Because different managements may manage their exploration and evaluation activities differently and have different perceptions of how well those activities are progressing, the project team thinks that it would also be difficult to prescribe how management should assess the recoverability of its properties. Consequently, this option identifies the following principle for testing these assets for impairment—management should be required to write down an exploration property only when, in its judgement, there is a high likelihood that the carrying amount of the property would not be recovered in full.
- 4.71 Compared with IAS 36, this principle is intended to defer when exploration properties are tested for impairment. This is because, until an exploration programme is sufficiently advanced, it is unlikely that management would have enough information to assess whether it is highly likely that the carrying amount of the property is not recoverable. The project team thinks that how an exploration programme is managed

should provide insight as to whether management has sufficient information to make such an assessment. For instance, more information would need to be obtained and analysed before an assessment can be made about the recoverability of a property if exploration has only recently begun on the property or if exploration results to date support continuing with the exploration programme. In contrast, if management is considering significant reductions to its exploration programme, such as planning to abandon the property or wind down its exploration and evaluation activities on that property (eg by reallocating equipment and personnel to other exploration programmes), then this may indicate the need for an impairment test.

- 4.72 In addition, given the absence of objective indicators to predict whether exploration properties are impaired, this option would include a separate set of indicators to assess whether an asset can continue to be recognised. This is consistent with the approach adopted in IFRS 6 and US GAAP. These indicators would be based on the existence of evidence that the asset can continue to be recognised (ie positive indicators) rather than on the absence of evidence that would indicate that the asset is impaired or should be derecognised (ie negative indicators). Consequently, the indications may be based on facts and circumstances where:
- (a) minerals or oil and gas has been discovered on the property, but further exploration and evaluation is required to assess the size and quality of the deposit and to determine whether the minerals or oil and gas can be extracted economically; and
 - (b) minerals or oil and gas have not yet been discovered, but substantive exploration and evaluation activities in a specific location within the exploration property are continuing. This indication links to the project team's view on the unit of account of an exploration property (see Chapter 3), because an exploration property (or part thereof if there is more than one unit of account for that property) will be derecognised when exploration and evaluation activities cease or are abandoned on the property (or that part of the property).

Project team's view on impairment of exploration assets

- 4.73 The project team recommends that an exploration property should be written down to its recoverable amount in those cases where management has enough information to make this determination. However, for most exploration properties, this information is not likely to be available while exploration and evaluation activities are

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continuing, and particularly when those activities are not yet at an advanced stage. Accordingly, the project team also recommends that exploration properties should be tested for impairment on a basis that is consistent with Option C. Therefore, management would be required:

- (a) to write down an exploration property only when, in its judgement, there is a high likelihood that the carrying amount will not be recoverable in full; and
- (b) to apply a separate set of indicators to assess whether its exploration properties can continue to be recognised as assets.

4.74 Different managements may take different views on whether an exploration property should be written down—and by how much. This is unavoidable given the very limited information that exists for the typical exploration property. For this reason, the project team thinks that an entity's financial report should also include:

- (a) separate presentation of exploration properties in the financial statements (as per the project team's view in Chapter 3);
- (b) for exploration properties written down in the period, disclosure of the factors that led management to determine that the exploration properties were impaired and the remaining carrying amount of exploration properties that have been impaired; and
- (c) for exploration properties not written down in the period, disclosure of management's views on why those properties continue to be capitalised in the financial statements.

4.75 Paragraph BCZ24 of the Basis for Conclusions on IAS 36 states that the 'IASB acknowledged that an enterprise would use judgement in determining whether an impairment loss needed to be recognised. For this reason, IAS 36 included some safeguards to limit the risk that an enterprise may make an over-optimistic (pessimistic) estimate of recoverable amount'. The project team thinks that the disclosures about exploration properties, as outlined in paragraph 4.74, should provide an appropriate safeguard against an entity making any unduly optimistic or pessimistic estimates of a property's recoverable amount.

4.76 The project team thinks that an impairment assessment should be carried out separately for each exploration property (with the unit of account determined in accordance with the project team's recommendations in Chapter 3). Consistently with IAS 36, the carrying amount of an exploration property that is impaired should be written down to its recoverable amount. In some cases, this recoverable amount

assessment could be performed at a cash-generating unit level rather than at an individual property level. However, the project team is not proposing to continue the accounting policy choice permitted by IFRS 6 to allocate exploration properties to groups of cash-generating units for the purpose of assessing impairment.

A mixed measurement basis

- 4.77 Rather than treat historical cost and fair value as mutually exclusive measurement alternatives for these assets, another approach is to consider measuring the assets at historical cost until their fair values can be estimated with greater reliability. This approach would overcome some of the concerns identified earlier in this chapter about estimating the asset's fair value when there is limited information about the existence or quantity of economically recoverable minerals or oil and gas on the property. However, switching the measurement basis from historical cost to fair value at a predefined stage during the life of the asset is not being proposed, for two reasons. First, it would create a 'bright line' that might encourage management to make business decisions to achieve a desired accounting outcome (or discourage such decisions). Secondly, the shift between measurement bases would lead to changes in the measurement of the asset that are not related solely to the changes in the economic attributes of the asset. For example, if the measurement basis of an asset changed from historical cost to fair value when development starts, the change in the asset's measurement would be a combination of the value attributable to the start of development *and* the value attributable to the asset that was not previously captured in the asset's historical cost. Consequently, this would not provide a faithful representation of the entity's financial performance in the period when the measurement basis changed.
- 4.78 The project team acknowledges that a decision to apply a consistent measurement basis across all exploration properties and minerals or oil and gas properties will influence which measurement basis is selected for these assets. This is because the measurement basis would need to be capable of providing useful information for all assets, whether those assets are exploration properties or minerals or oil and gas properties.

Income recognition

- 4.79 The decision to use historical cost or current value as the measurement basis has significant implications for income recognition. The current practice of measuring mineral properties at historical cost means that income is generally recognised at the point when revenue is recognised for the sale of the extracted minerals or oil and gas to a third party. It also means that income related to a specific unit of production is generally recognised only once. (If a reserve is impaired but the minerals or oil and gas are subsequently produced and sold, then income may be affected more than once.) In contrast, a current value measurement basis means remeasuring the asset each reporting period. The difference in the current value is accounted for in income. (This might be in profit or loss, or in other comprehensive income.)
- 4.80 This has two implications for the comprehensive income statement. First, income will be recognised earlier under a current value model than under a historical cost accounting model. For example, ore containing copper is extracted from a mine and is processed through a concentrator to separate the copper from the other (mainly waste) content of the ore. The concentrate may then be stored at the mine for a period of time until it is shipped to a customer. Under a historical cost accounting model, income is generally recognised when the concentrate is shipped. Under a current value accounting model, income would be recognised initially when the current value of an exploration property or a minerals or oil and gas property exceeds its cost. Income (or losses) would be recognised in subsequent periods when the current values of those assets change because of new information or changes in economic conditions, when the ore is extracted (since the current value of the ore would be greater than that of the mineral in the ground), and when concentrate is produced. In contrast to a historical cost accounting model, the income recognised when the concentrate is shipped might be quite small, since most of the income would have been recognised earlier. (The total income recognised under each measurement basis is, of course, the same.)
- 4.81 The second implication is the potential for volatility of reported income. Over the life of a mine (or oil and gas field) the relevant commodity price may go through one or more cycles of increases and decreases. The fluctuations (together with changes in other assumptions) will cause the current value of the mine also to fluctuate, with year-on-year increases or decreases in current value reported in income. This would be similar to the impact of measuring financial instruments at fair value. The volatility resulting from measuring operating assets such as minerals or oil and gas properties at fair value is often viewed by preparers as

reducing the relevance of the statement of comprehensive income and masking current performance. Proponents of current value, on the other hand, argue that the statement of comprehensive income is reflecting the real-world volatility and thus providing a more faithful representation of the entity's financial performance. However, the faithful representation of financial performance depends on the estimate of the current value of the minerals or oil and gas properties also being representationally faithful—the current value may change because of estimation changes for the inputs used to determine the current value rather than because of changed facts and circumstances.

- 4.82 Using a different form of current value measurement such as a standardised measure would also have additional implications for the statement of comprehensive income. For example, the year-end price for oil may change significantly from one year to another and the impact of that change would be reflected in income. However, the long-term expectation for prices may not have changed as much, and so the change in value of the asset would be less than the amount recorded in income. Similarly, if only proved reserves are measured then an increase in proved reserves, and (in many cases) a corresponding reduction in probable reserves, will have a disproportionate effect on income, even though the entity's best estimate regarding the total quantity of oil that may be produced may not have changed. Furthermore, a reduction in proved reserves would have the same effect on income regardless of whether there is a corresponding increase in probable reserves (as per above) or if those reserves were no longer expected to be produced. Accordingly, the simplifications in a standardised measure may distort reported income.

Project team's view on measurement

- 4.83 The research does not provide substantive support for either historical cost or fair value as the measurement basis for exploration properties and minerals or oil and gas properties. Historical cost generally does not provide relevant information. Fair value conceptually provides relevant information. However, owing to the subjectivity and degree of estimation involved, users do not view entity-prepared current values as being representationally faithful, and therefore they would make limited use of them. In the project team's view, information that is not used is not relevant. Preparing current value estimates of these assets involves significant work effort and cost. The project team thinks that measuring these assets at current value would not meet a cost-benefit test. For the reasons discussed above, the project team also does not support measuring the assets in the financial statements at a current value similar to a standardised measure.

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- 4.84 This might suggest that all exploration, evaluation and development expenditures should be recognised as expenses. However, this would seriously misstate the statement of comprehensive income because expenditures that result in future value to the entity would negatively affect income. It would also result in not recognising assets of the entity. An entity that found and developed a minerals or oil and gas property would show negative income until production began. This cannot be considered faithfully representational. The use of historical cost as the measurement basis would address these issues. The statement of comprehensive income would not be negatively affected by expenditures that create or increase the value of assets. Assets would be recognised in the statement of financial position, although this would be at amounts that are not relevant to most users. Historical cost is also a less costly measurement basis for preparers, although existing historical cost practices have developed over many years and are sometimes more complex than they need to be. If historical cost remains the measurement basis for exploration properties and minerals or oil and gas properties, the project team believes a single approach should be developed and that, given the limited relevance of historical cost, one of the principles of that approach should be simplicity. In other words, a historical cost accounting model for these assets should not be complicated by detailed and prescriptive cost allocation and requirements to capitalise or recognise as expense. However, the project team acknowledges that the historical cost measurement of these assets would need to be subject to depreciation calculations and impairment testing.
- 4.85 The project team acknowledges that its choice of historical cost as the measurement basis is based to a large extent on doing the 'least harm', and may not meet the objective of financial reporting of providing financial information that is useful for making decisions. The one clear finding is that for financial statements to provide useful information about exploration properties and minerals or oil and gas properties—the core assets for entities engaged in extractive activities—substantive disclosures about the reserves would be required. This is true whether the measurement basis is historical cost or current value. As discussed above, the historical cost of a minerals or oil and gas property does not provide relevant information and thus would have to be supplemented by disclosures. With a current value, users would require disclosure of the main assumptions so that they could evaluate the current value or to adjust it to be consistent with their own assumptions. Disclosures are discussed in Chapter 5.

Chapter 5 – Disclosure

Introduction

- 5.1 The research project's user survey found that the primary sources of information that users rely on when analysing an entity's minerals or oil and gas properties are financial statement disclosures and other disclosures, such as management commentary or regulatory filings, rather than the statement of financial position, statement of comprehensive income or the statement of cash flows.
- 5.2 On the basis of those findings, this chapter identifies the general features of a disclosure model for extractive activities, including:
- (a) a disclosure objective for extractive activities; and
 - (b) the types of disclosure necessary to satisfy this objective over and above the disclosures required by existing IFRSs, such as the disclosure of significant accounting policies and the disclosures required by IAS 36 *Impairment of Assets*.

A disclosure objective for extractive activities

- 5.3 The objective of general purpose financial reporting is to provide external users with information that is useful in making economic decisions. Disclosure can provide such information by:
- (a) amplifying the information that is presented in the financial statements; or
 - (b) providing information additional to that contained in those statements.
- 5.4 In making informed economic decisions about entities in the extractive industries users need information about the main drivers of cash flows—the minerals or oil and gas reserves. Information about those reserves is also necessary in determining whether the directors and management have made efficient and profitable use of the financial and other resources entrusted to them. Given the limited relevance that users attach to the recognition and measurement of minerals or oil and gas properties in the statement of financial position, a disclosure objective for extractive activities should focus on providing additional information about these assets that is useful for making decisions and evaluating directors' and management's stewardship of the entity.

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- 5.5 In the project team's opinion, the disclosure objective for extractive activities should be to provide additional information that can enable users to evaluate:
- (a) the value attributable to an entity's minerals or oil and gas properties;
 - (b) the contribution of those assets to current period performance; and
 - (c) the nature and extent of the risks and uncertainties associated with those assets.

Evaluating value

- 5.6 The cash flows that will result from the extraction of the minerals or oil and gas are the most significant driver of value for upstream operations and are crucial to any evaluation of entities in the extractive industries. Disclosure of information about the quantity of the reserves is important for users to be able to estimate the value of an entity's minerals or oil and gas properties and the future cash flows that might be generated from those properties.
- 5.7 As discussed in Chapter 4, users generally do not think it useful to measure minerals or oil and gas properties at fair value or at some other form of current value for financial statement purposes. This applies whether this information is provided in the statement of financial position or in the notes to the financial statements. Rather than relying on a valuation provided by management, users view it as important to develop their own valuation based on the assumptions that they see as being most appropriate. However, some inputs to their valuation, such as the quantities of reserves and resources, can come only from the entity, and the views of the entity's management on other factors can also be very helpful. Users therefore require disclosure of information that is needed either as direct input to their valuation or to help them develop that input.
- 5.8 Some users that analyse entities in the oil and gas industry said that they find the disclosure of a current value measurement (such as the standardised measure of proved oil and gas reserves required by FASB ASC paragraph 932-235-50-30^{*}) useful in helping them develop inputs for their own valuations.

* This disclosure requirement was introduced into US GAAP by SFAS 69 *Disclosures about Oil and Gas Producing Activities*.

Evaluating performance

- 5.9 Financial statements (including disclosures such as segment disclosures) normally provide useful information for assessing current period financial performance of an entity. Information in financial statements that helps users evaluate the current period financial performance of an entity engaged in extractive activities may include:
- (a) revenues from the sale of minerals or oil and gas and the costs of production;
 - (b) exploration, evaluation and development costs that have been recognised as expenses; and
 - (c) exploration, evaluation and development costs that have been capitalised.
- 5.10 However, particularly for entities engaged in extractive activities, performance is also assessed by using non-financial information to determine how well an entity is managing its minerals or oil and gas properties. This information includes the quantity of minerals or oil and gas that has been produced, new discoveries of minerals or oil and gas, and changes in the estimate of reserve quantities.

Evaluating risk and uncertainty

- 5.11 Extractive activities are subject to significant risks and estimation uncertainties. Users should therefore be provided with sufficient information to understand the nature and extent of the main risks and estimation uncertainties associated with minerals and oil and gas properties. This includes:
- (a) expressing estimates of recoverable quantities of minerals or oil and gas at different confidence intervals (eg proved reserves, probable reserves);
 - (b) presenting these estimates separately for properties that are subject to different risks, such as market risks and political risks;
 - (c) disclosing the main assumptions associated with these estimates and sensitivity analysis of those assumptions; and
 - (d) providing explanations of changes in these estimates from year to year.

Guiding principles relevant to the disclosure objective

- 5.12 Chapter 1 sets out the parameters that were applied to the research into financial reporting issues for extractive activities. The following paragraphs consider how two of those parameters—relating to common requirements across the minerals and oil and gas industries and the scope of financial reporting—should apply to disclosures.

Common disclosure requirements

- 5.13 In developing common disclosure requirements, the objective is that the same types of information should be disclosed across the minerals and oil and gas industries in relation to extractive activities. The justification for common disclosure across the two industries is that:
- (a) users' needs in both industries are similar—the user survey found that users' information needs are driven by their interest in predicting future cash flows under conditions of geological and economic uncertainty; and
 - (b) the report prepared by the expert industry working group (as discussed in Chapter 2) indicated that geological and economic uncertainty associated with minerals or oil and gas deposits can be analysed and described in a consistent manner, as shown by the working group's conclusion that the definitions of minerals and oil and gas reserves are broadly comparable.
- 5.14 This justification for common disclosure is not meant to imply that the information that is disclosed should necessarily be identical across both industries. Rather, it means that the information that is disclosed should be the same within each industry and broadly comparable across the minerals and oil and gas industries. Specific characteristics of the different industries will, in some cases, require some variation in the form and content of the disclosures; but the type of information disclosed will be consistent across both industries.

Scope and constraints of financial reporting

- 5.15 It is not the intention of financial reporting to meet all of the information needs of users, nor would it be possible. The *Framework* acknowledges that, although financial reporting is primarily directed to meeting the needs of capital providers, it is not the only source of information that capital providers will rely on when making their investment decisions. It states at paragraph OB15 that these users 'also need to consider pertinent information from other sources, for example, information

about general economic conditions or expectations, political events and political climate, and industry and company outlooks. Users also need to be aware of the characteristics and limitations of the information provided by financial reports.’ Consequently, in the context of disclosure of information about extractive activities, consideration needs to be given to whether the proposed disclosures should be provided in the notes to the financial statements or elsewhere. This might include management commentary and other types of communication such as fact books, annual reviews, quarterly production reports. It might also include other types of reporting that address corporate social responsibility and sustainability matters.

- 5.16 Consistently with the research approach outlined in Chapter 1, the project team’s proposals include disclosures that:
- (a) help users of financial reports to make decisions;
 - (b) can reasonably be viewed as being within the scope of a complete set of financial statements; and
 - (c) meet a cost-benefit test.

Existing disclosures

- 5.17 Many entities already provide extensive disclosures about minerals or oil and gas reserves, including disclosures that are similar to proposals in this discussion paper. Those disclosures may be made as a result of regulatory requirements or on a voluntary basis because entities see them as good practice. Because of these existing disclosure practices, some may regard disclosures about minerals and oil and gas reserves as a matter for securities regulation rather than for accounting standards. The project team does not agree. As discussed earlier in this chapter, disclosure of reserve information is central to meeting the objectives of financial reporting. It can be argued that the extent of the current regulatory requirements is necessary because of the absence of any similar disclosure requirements in IFRSs. Somewhat similar disclosures are already required under IFRSs for biological assets. IAS 41 *Agriculture*, at paragraph 46, states that an entity shall describe non-financial measures or estimates of the physical quantities of its biological assets at the end of the reporting period and the output of agricultural produce during the period.
- 5.18 There is currently no single set of disclosure requirements internationally. Consequently there is wide variation in the quantity and type of information disclosed, as well as in how that information has been compiled (including the assumptions that were used in any

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estimates) and presented. This can make it difficult for users to analyse and compare entities. Including these disclosures in an IFRS is the most effective way to achieve internationally consistent reporting of information on minerals and oil and gas reserves.

Duplication of disclosures

- 5.19 There are some differences between the disclosure proposals presented in the discussion paper and existing disclosure requirements established by certain regulators. As a result, concerns have been raised that the project team's disclosure proposals could lead to an IFRS that requires the disclosure of information that is inconsistent with, or duplicates, regulatory requirements. This would impose additional preparation costs on preparers and potentially confuse users. Nevertheless, the project team is of the view that the research should not be constrained by existing regulatory requirements, just as the team is not constrained to be consistent with existing IFRSs in arriving at its proposals. The project team expects that, during the development of an IFRS, there would be discussions between the IASB and regulators about avoiding inconsistencies and duplication of disclosure requirements. A related issue is that preparers currently use established processes to comply with regulatory requirements and even subtle changes could result in significant systems changes. Thus, from a cost-benefit perspective, including some existing regulatory disclosure requirements in an IFRS may be preferable to establishing similar but different disclosures.

Audit implications

- 5.20 Information that is presented in the financial statements (including financial statement note disclosures) is generally subject to assurance processes (ie audit) and responsibility for that information is usually clearly defined (ie in terms of the relative responsibilities of directors, managers and auditors). Although IFRSs set the requirements for the content of the financial statements and the notes, the assurance of that financial reporting information is prescribed by regulatory or stock exchange listing requirements in individual jurisdictions.
- 5.21 A consequence of disclosing reserve information in the financial statements is that those disclosures would be subject to the same degree of assurance as other financial reporting information. Many industry participants are concerned that auditing the disclosure of reserves information would be very costly and that there is a lack of appropriately qualified independent consultants to perform those audits within the time frame for preparing and publishing financial reports.

- 5.22 The survey of users found that many did not think that an independent audit of the reserves information was necessary. They also suggested that the cost of the audit could be prohibitive and that the degree of imprecision and subjective assessments that are required in estimating reserves would mean that an independent review might not greatly enhance the usefulness of the information reported. Many users thought that requiring the estimates to be prepared by a suitably qualified and experienced professional would be sufficient. (This is discussed further in paragraph 5.49.)
- 5.23 On the basis of these findings, the project team thinks that requiring disclosure of audited reserves information would not meet a cost-benefit test (and might be impractical). However, information on mineral and oil and gas reserves is of great importance to users of financial reports and the project team thinks that an IFRS should require the disclosure of reserves information. Therefore, to overcome those audit concerns, the project team recommends that an IFRS should require the disclosure of this information on a basis similar to IAS 41's requirement to disclose physical quantities of biological assets. IAS 41 says that the disclosure of that information is not required in the notes to the financial statements if it is disclosed elsewhere in information published with the financial statements. The project team thinks that this approach should ease concerns about the audit implications of an IFRS requiring these types of disclosure. The FASB made a similar decision on the location of oil and gas disclosures within a financial report when setting its disclosure requirements. Paragraph 116 of the Basis for Conclusions on SFAS 69 *Disclosures about Oil and Gas Producing Activities* states:

... In addition, cost-benefit considerations (as well as reliability considerations) indicate that information about the reserve quantities, estimated discounted future net cash flows, and results of operations should be supplementary because the placement of information outside the financial statements may result in lower auditing costs.

Disclosures

- 5.24 The types of disclosure that would satisfy the disclosure objective are summarised in Table 5.1. The project team acknowledges that these proposed disclosures are extensive, but nevertheless regards them as the minimum disclosures that should be provided to enable users of financial reports to make informed investment decisions about minerals and oil and gas entities engaged in extractive activities. Entities may wish to provide further information in their financial reports beyond these disclosures proposed by the project team.

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Table 5.1 – Disclosure proposals

	Disclosure type	Information to disclose	Level of detail
1	Reserve quantities	<ul style="list-style-type: none"> • Proved reserves and proved and probable reserves • Estimation method • Main assumptions • Sensitivity analysis to main assumptions • Reconciliation of changes in reserve quantities 	<ul style="list-style-type: none"> • By commodity, and further broken down by country or project (where material)
2A	Current value measurement (if asset is measured at historical cost)	<ul style="list-style-type: none"> • Option A: Range of estimates of fair value • Option B: Standardised measure of proved and probable reserves • Preparation basis • Main assumptions • Reconciliation of changes in current value 	<ul style="list-style-type: none"> • Generally disclosure by major geographical region
2B	Fair value measurement (if asset is measured at fair value)	<ul style="list-style-type: none"> • Fair value estimate • Main assumptions • Sensitivity analysis to main assumptions • Reconciliation of changes in reserve values • Other disclosures similar to the proposals in the exposure draft <i>Fair Value Measurement</i> 	<ul style="list-style-type: none"> • Generally disclosure by major geographical region
<i>continued...</i>			

<i>...continued</i>			
	Disclosure type	Information to disclose	Level of detail
3	Production revenues	<ul style="list-style-type: none"> • Production revenues 	<ul style="list-style-type: none"> • By commodity
4	Costs	<ul style="list-style-type: none"> • Exploration costs • Development costs • Production costs 	<ul style="list-style-type: none"> • Disaggregated as per reserve quantities • Time series of disclosure over five years

- 5.25 Disclosure types 1, 3 and 4 should be provided regardless of whether the minerals or oil and gas property is measured at historical cost or at fair value. In addition to these disclosures, the project team is recommending:
- separate presentation of the carrying amounts of assets relating to properties in production, other properties with reserves that are not in production, and exploration properties (see Chapter 3); and
 - disclosure of management's views on the recoverability of its exploration properties for the purposes of impairment testing—assuming those exploration properties are measured at historical cost (see Chapter 4).

Disclosure type 1: Reserve quantities

Categories of reserves to be disclosed

- 5.26 Information about the quantities of mineral or oil and gas that an entity expects to be able to economically recover is critical to understanding that entity's financial position, and therefore its ability to generate future cash inflows. Typically these quantities of minerals or oil and gas would be classified as reserves. As discussed in Chapter 2, the project team considers that the CRIRSCO Template and the PRMS should be used to define reserves and resources for the purposes of financial reporting. Under these definition systems, the minerals and oil and gas reserves classification includes the categories of proved reserves and probable reserves.

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- 5.27 Of the users surveyed, most said that the disclosure of proved and probable reserves is the minimum level of information that should be provided on minerals or oil and gas quantities. The project team notes that proved and probable reserves is generally the focus of the management of the business of entities engaged in extractive activities.
- 5.28 The project team therefore proposes that entities should disclose proved reserves and, separately, the sum of proved and probable reserves. Those disclosures would provide users in both industries with comparable information—namely, a high confidence estimate and the best estimate of economically recoverable quantities of minerals or oil and gas. The project team acknowledges that this would represent an increase in the amount of reserve disclosure provided by many oil and gas entities. This includes all SEC registrants that, until 2009, have been prohibited from disclosing reserve quantities other than proved reserves in their annual reports. A revised SEC rule now permits, but does not require, entities to disclose probable reserves and possible reserves.*
- 5.29 Some entities may also wish to disclose information beyond proved and probable reserves. Many entities in the minerals industry currently disclose resources as well as reserves.† The disclosure of possible reserves for oil and gas or inferred resources for minerals provides users with an indication of upside potential. The disclosure of mineral resources or marginal contingent petroleum resources provides information on the quantities of minerals or oil and gas that are attributable to potential new projects or potential extensions to existing projects. How useful this information is depends in part on the size of the entity and on the maturity of its projects. For many large entities, upside potential beyond proved and probable reserve may not be the primary focus of a user of financial reporting when making an investment or lending decision about the entity. In part, this reflects a general view among many users that large minerals or oil and gas entities should usually be capable of replacing reserves through either finding and developing new properties or acquiring interests in existing properties. However, for many smaller entities, information about resources could significantly influence investment decisions because resources are their primary asset. Consequently, the disclosure of resources information by these entities would also be consistent with the disclosure objective identified in paragraph 5.5 above.

* The disclosure of oil and gas resources (referred to as contingent resources in the PRMS definitions) is still prohibited under the SEC rules.

† SEC registrants are prohibited from disclosing resource information unless it is required to be disclosed by another jurisdiction.

- 5.30 Some commentators, primarily in the oil and gas industry, do not support the disclosure of probable or possible reserves or resources. They are concerned that some users may be misled if they do not understand the risks and uncertainties associated with these reserve and resource estimates. They are also concerned that this might give rise to litigation risks. The project team does not support limiting the disclosure requirements to proved reserves in order to address these concerns. This is because users would be denied useful information that could otherwise be applied in their investment decision-making. The *Framework* assumes that users will exercise reasonable diligence when analysing financial reporting,* and the project team thinks the reserve and resource definitions are helpful in communicating to users the level of uncertainty associated with the estimate through the use of classifications such as proved reserves and probable reserves. The project team considers that concerns about uncertainties associated with reserve and resource estimates can be mitigated by including a brief definition of each reserve classification as part of the reserves quantity disclosure.

Reserves attributable to the entity

- 5.31 The reserves that are attributable to an entity are those quantities of minerals or oil and gas that an entity has the enforceable right to extract. In some jurisdictions, the taxation or royalty arrangements that apply to the production of minerals or oil and gas may be payable in cash (eg the tax or royalty may be levied on the revenue from production) or in kind (eg the entity may be required to deliver a portion of production quantities direct to the government or royalty owner). Under some other royalty arrangements, the entity may be required to purchase the royalty quantity at the point of production because the government or royalty owner does not have the ability to market the quantity. These various royalty arrangements differ in form but the underlying substance of each type of arrangement is effectively the same in that the entity is obliged by the arrangement to make a payment to the government or royalty owner in exchange for the entity's rights to extract the minerals or oil and gas. The project team thinks that, in principle, all these arrangements should be accounted for consistently. Consequently, each type of payment should be treated as an expense of the entity regardless of whether the cost is denominated in cash or in kind. As such, the financial statements

* IASB *Framework* paragraph QC35

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should present production revenues and the tax or royalty expenses separately—and consistently with this, the underlying reserve quantities that are controlled by the entity should be included in the reserve quantities disclosed by the entity.

- 5.32 An entity may have subsidiaries, interests in joint arrangements, equity accounted investments and other investments that themselves have reserves. There is a question whether some or all of those reserves should be included in an entity's required disclosures. The project team's view is that an entity should be required to disclose the minerals or oil and gas reserve quantities it controls.* The basis for disclosure of these reserve quantities should be consistent with the accounting approach used by the entity in its consolidated financial statements for the assets held through each such investment.
- 5.33 Accordingly, the reserves required to be disclosed should include reserve quantities attributable to the parent entity, to its subsidiaries, and to its interests in joint arrangements that are not equity accounted. Reserves held by equity accounted or cost accounted investees should not be included as part of those quantities (but might be separately disclosed—see paragraph 5.34). This may represent a change to existing disclosure practices, because the existing practice in identifying the reserve quantities varies depending on the jurisdiction and the industry. Current practices include identifying:
- (a) the reserve quantities that are attributable to the entity in accordance with its equity or ownership interests in the entity or assets that have the reserves (see exhibit 5.1, which shows that Lonmin plc's disclosed reserves include only the portion attributable to Lonmin);

* Control is defined in IAS 27 *Consolidated and Separate Financial Statements* as 'the power to govern the financial and operating policies of an entity so as to obtain benefits from its activities'.

Exhibit 5.1

Mineral Reserves (Total Proved & Probable)				
Area	Mt	30-Sep-2008		Pt
		3PGE+AU g/t	Moz	
Marikana	332.6	4.03	43.1	25.9
Limpopo	40.1	3.23	4.2	2.1
Limpopo Baobab shaft	9.4	3.16	1.0	0.5
Pandora JV ^c	0.46	4.28	0.06	0.04
Total	382.5	3.93	48.3	28.5
All quoted Resources and Reserves includes Lonmin's attributable portion only and the following percentages were applied to the total Mineral Resource and Reserve for each property:				
Area	Marikana	Limpopo – Dwaalkop JV	Limpopo – Doornvlei, Zebedelia, Baobab	Pandora
Lonmin Attributable	82%	41%	82%	34.85%

Edited extracts from Lonmin Plc, 2008 Annual Report and Accounts, page 11

- (b) 100 per cent of the reserves attributable to consolidated subsidiaries, with the non-controlling interests in the reserves that are attributable to partly-owned subsidiaries that form part of the consolidated group also identified where material (see exhibit 5.2); or

Exhibit 5.2

PROVED DEVELOPED AND UNDEVELOPED RESERVES 2008							million barrels
	Europe	Africa	Asia- Pacific	Middle East, Russia, CIS	USA	Other Americas	Total
Shell subsidiaries							
At January 1	615	567	158	908	375	128	2,751
Revisions and reclassifications	13	107	6	180	35	(46)	295
							<i>continued...</i>

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<i>...continued</i>							
PROVED DEVELOPED AND UNDEVELOPED RESERVES 2008							
	million barrels						
Improved recovery	-	31	-	23	-	-	54
Extensions and discoveries	9	4	6	14	7	-	40
Purchases of minerals in place	-	-	-	-	-	4	4
Sales of minerals in place	(21)	(4)	(2)	(36)	(1)	-	(64)
Production	(135)	(113)	(32)	(85)	(69)	(26)	(460)
At December 31	481	592	136	1,004	347	60	2,620
Shell share of equity-accounted investments							
At January 1	26	-	190	482	297	30	1,025
Revisions and reclassifications	(14)	-	10	(16)	(27)	(6)	(53)
Improved recovery	-	-	-	-	-	-	-
Extensions and discoveries	-	-	1	9	1	-	11
Purchases of minerals in place	-	-	-	-	-	-	-
Sales of minerals in place	-	-	(1)	-	-	-	(1)
Production	(2)	-	(43)	(80)	(30)	(4)	(159)
At December 31	10	-	157	395	241	20	823
Minority interest in reserves of Shell subsidiaries							
At December 31	-	8	-	-	-	-	8

Edited extracts from Shell Annual Report and Form 20-F 2008, page 162

- (c) 100 per cent of the reserves attributable to the property (or, possibly, a group of properties) with the share attributable to the entity shown separately (see exhibit 5.3).

Exhibit 5.3

Type of mine (a)	Proved ore reserves at end 2008		Probable ore reserves at end 2008		Total ore reserves 2008 compared with 2007				Rio Tinto share		
	Tonnage	Grade	Tonnage	Grade	Tonnage		Grade		Interest	Recoverable	
					2008	2007	2008	2007	%	mineral	
BAUXITE	millions of tonnes	%Al ₂ O ₃	millions of tonnes	%Al ₂ O ₃	millions of tonnes	millions of tonnes	%Al ₂ O ₃	%Al ₂ O ₃		millions of tonnes	
Reserves at operating mines											
Gove (Australia)	O/P	111	49.5	64	49.0	175	143	49.4	49.2	100.0	175
Porto Trombetas (MRN) (Brazil)	O/P	147	50.8	59	50.1	205	166	50.6	51.2	12.0	25
Sangaredi (Guinea)	O/P			133	52.4	133	–	52.4	–	23.0	30
Weipa (Australia)	O/P	337	51.5	1,398	52.6	1,736	1,224	52.4	53.6	100.0	1,736
Total											1,966

Edited extracts from Rio Tinto Annual Report 2008, page 112

5.34 Disclosure of reserves quantities beyond those that are controlled by the entity may be appropriate to the extent that this information is important to users in making their investment decisions. Accordingly, subject to the information being material, the reserve disclosure could extend to including the disclosure of reserves attributable to:

- (a) investments that are equity accounted, such as investments in associated entities that are under the significant influence, but not the control, of the entity and are accounted for under IAS 28 *Investments in Associates*; and
- (b) investments that are shareholdings and accounted for under IAS 39 *Financial Instruments: Recognition and Measurement*.

Any such disclosure should be separate from the disclosure of the reserves controlled by the entity and make clear the nature of the entity's interest in the reserves. This would also include the separate identification of the reserves that are attributable to non-controlling interests. Exhibit 5.2 illustrates how this distinction can be presented.

- 5.35 In accounting for joint arrangements, the IASB has tentatively decided to remove proportionate consolidation as an available accounting choice in IAS 31 *Interests in Joint Ventures*. The IASB, in its redeliberations on ED 9 *Joint Arrangements*, has tentatively decided that arrangements that are jointly controlled entities under IAS 31 should be assessed to determine whether they are joint operations or joint ventures. If the entity does not have interests in the assets and liabilities arising from the joint arrangement, then the joint arrangement is classified as a joint venture that is to be accounted for under the equity method. The IASB's proposals on accounting for joint arrangements could therefore have implications for an entity's reserves quantity disclosures under the project team's proposals (as outlined in paragraph 5.32 above) because the reserves attributable to joint ventures could not be attributed to the entity. This is because they are not reserves that are controlled by the entity. (For a joint arrangement that is not equity accounted the entity includes its share of the reserves of the joint arrangement in its reported reserves—see paragraph 5.33.)

Reserves attributable to risk-sharing arrangements

- 5.36 In some jurisdictions the legal rights that an entity holds are rights to cash flows based on the quantity of minerals or oil and gas produced rather than on rights to the actual production. Production sharing contracts (PSCs) in the oil and gas industry are common examples of these types of rights, although there are also other risk-sharing arrangements with similar features that exist in both industries.
- 5.37 Despite the nature of these contractual rights being different from leasehold or concessionary rights, there are some similarities in the economic substance of the rights. The presence and estimated quantity of economically recoverable minerals or oil and gas may be an important determinant of the future cash flows expected from either leasehold rights or PSCs. However, PSCs are commonly designed to permit the entity to recover finding, development and production costs, plus a reasonable profit, while limiting the entity's ability to benefit from increases in prices (and similarly limiting the impact of price decreases so long as development and production of the property remains economic). This is accomplished by reducing the entity's proportion of the cash flow as prices increase so that most or all of the increase in cash flow is received by the government or other leaseholder. This feature of PSCs is significantly different from most other leasehold rights that are subject to royalties or taxes based on production quantities, production revenue

or income from production. The difference is that for most other leasehold rights the benefit to the entity from the increase in prices would generally be expected to be approximately in proportion to the price increase.

- 5.38 It is common for an entity that is party to a PSC to apply its share of cash flows to the total reserves and report the resulting number as part of its reserves. This results in the seemingly anomalous situation of an entity's disclosed estimate of reserve quantities decreasing when prices go up. The price change does not change the economic substance of the arrangement—the entity is still able to recoup its costs and earn a profit, but it needs fewer barrels of oil to do so. The terms of the PSC results in the entity receiving a smaller proportion of the (increased) cash flows and consequently reporting a smaller reserves number. This outcome is acknowledged in BG Group plc's 2008 Annual Report, which states 'Increases in year end gas and oil prices in fields subject to Production Sharing Contracts (PSCs) may result in lower entitlements leading to reductions in proved reserves'.*
- 5.39 For these reasons, the project team advocates the separate identification of:
- (a) reserves attributable to PSC arrangements; and
 - (b) reserves attributable to other types of taxation or royalty regimes based on risk-sharing. This is considered further in the context of disaggregated disclosures.

Disaggregated disclosure of reserve quantities

- 5.40 Not all reserve quantities are the same. The future cash flows and the related risks and uncertainties that are attributable to a specific reserves estimate depend on the type of commodity and the location—in terms of its geological, geographical and geopolitical characteristics. Disaggregated disclosure is needed to identify the reserves quantities that are subject to different risks and uncertainties. Users may need some reserves estimates to be presented at the individual property level. For other reserves estimates that share common risks and uncertainties or are individually immaterial, presentation at a higher level such as on a country or regional basis may be sufficient to provide useful information.

* BG Group plc, Annual Report and Accounts 2008, Supplementary information—gas and oil, page 115

- 5.41 In the oil and gas industry in particular, reserve estimates are sometimes calculated using probabilistic methods with the assessment performed at the entity (ie portfolio) level or at some other level of aggregation rather than only on a property basis. Proponents of this approach to reserves estimation argue that it improves the precision of an entity-wide reserves estimate because of the 'portfolio effect'. However, estimating reserves estimates with reference to the portfolio effect is inconsistent with the objective of using disaggregated disclosure to identify the main risks and uncertainties associated with specific reserves estimates.

Disaggregation by commodity type

- 5.42 Different commodities will have different future cash flows due to differences in their prices. Different commodities will also usually have different risks associated with them. This is particularly true for price risk, with extraction and processing risks also being significant for some commodities. It is therefore important for users to know reserves quantities by commodity. As a practical matter it is normally not possible to aggregate quantities of different commodities in a meaningful way. Accordingly, reserve quantities should be disclosed separately for most types of minerals and for oil, gas and oil sands.
- 5.43 Separate disclosure by commodity type is commonplace in the minerals industry, with aggregation typically occurring only for some platinum group metals such as platinum, palladium and rhodium. However, some disclosure practices in the oil and gas industry involve aggregation by commodity type whereby some entities disclose their oil and gas reserves together on a barrel-of-oil equivalent (BOE) basis. Users have said that BOE disclosures are inferior to the separate disclosure of oil quantities and gas quantities because oil and gas are subject to different market risks. Some users have also suggested that oil sands reserves should be disclosed separately from oil reserves because the oil sands require much higher operating costs to produce the oil than do conventional oil deposits. However, some industry participants argue that separate disclosure of oil sands quantities is not warranted because the oil from oil sands is sold into the same market as oil from conventional deposits. The project team acknowledges that the operating cost structure, and the consequent financial risks of changes in costs and prices, might seem different from those for conventional oil, but this is not necessarily so. A number of offshore oilfields have significant capital costs. Other fields have major transport costs or costs of injecting water or gaseous material to increase pressure. There is thus a continuum from the traditional conventional oilfield to those with high capital and operating costs. It is not practical

to have separate disclosures about all different types of oilfields. However, oil sands operations are clearly identifiable and are high cost producers and, in the project team's opinion, separate disclosure would provide useful information if those operations were material to the entity. Reserves attributable to other high cost operations should also be disclosed separately, if material.

Disaggregation by geography

- 5.44 The disclosure of these quantities should be further disaggregated by geographical location. This disaggregation should be determined on the basis of different risks that are significant to the entity. Strictly speaking, this would generally mean that separate reserve estimates should be disclosed for each property to reflect the different geological risks that are likely to be associated with each mine (and possibly even individual pits) or field. This will not always be practical, especially in the oil and gas industry where some large entities have as many as a thousand individual properties. Consequently, some level of aggregated quantity disclosure will often be necessary, particularly in the oil and gas industry. Aggregated quantity disclosure is less relevant in the minerals industry because of the generally smaller number of properties, and so existing disclosure practice tends to be by property.
- 5.45 Geographical disaggregation of reserve quantities at a country level is regarded as providing relevant information. This is because of the significance and prevalence of risks that are country-specific (eg taxation regime, legal and regulatory framework, governmental/sovereign risk). However, country-by-country disclosure may not always be the most useful aggregation basis. Sometimes a more detailed level of disaggregation should apply—for instance, disclosure by individual properties or groups of properties within the same geological area would be particularly relevant if the reserve quantities are of high significance to the entity and if they involve substantially different geological or operating risks. In other cases, less disaggregated disclosures may be more relevant if they are based on geological boundaries rather than political boundaries. An example might be the aggregation of North Sea reserves as a single disclosure unit rather than potentially as separate country-based disclosure units for, say, the Netherlands, Norway and the United Kingdom. Furthermore, sometimes aggregation on a continental basis may be appropriate, particularly if the reserve quantities attributable to individual countries are of limited significance relative to the entity's total reserve position. The project team thinks that, within these general parameters, management should use its judgement to

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determine the level of aggregation for its reserve disclosures. The level of aggregation chosen should be treated as an accounting policy decision, and therefore applied consistently from period to period. Any change in the level of aggregation would represent a change in accounting policy and would be subject to the requirements in IAS 8 *Accounting Policies, Changes in Accounting Estimates and Errors*.

- 5.46 Many users in the minerals industry find that reserve and resource quantity disclosures disaggregated on a property-by-property basis provide useful information and so many entities in the minerals industry provide such information. Accordingly, further consideration should be given to whether property-by-property disclosure should be provided at the discretion of the entity or if it should be specifically required in the minerals industry to promote consistent and comparable disclosure in that industry.
- 5.47 Because reserve quantities disclosures in the oil and gas industry are often aggregated to a country level or higher, the disclosure may separately classify the reserve quantities as ‘developed reserves’ or ‘undeveloped reserves’ according to the funding and operational status of wells and associated facilities within the reservoir development plan. The PRMS includes definitions for developed and undeveloped reserves. Distinguishing between reserves that are developed and those that are undeveloped helps users to assess the likely time frame for production of the oil and gas reserves disclosed. In contrast, existing disclosure practice in the minerals industry typically does not divide mineral reserves into developed and undeveloped categories. It is less common in the minerals industry because reserves are generally disclosed on a property-by-property basis, and therefore users can readily see whether that property is developed or undeveloped. The project team notes that the CRIRSCO Template does not separately identify developed and undeveloped reserves, although this classification exists as part of the United Nations Framework Classification for Fossil Energy and Mineral Resources (which is discussed in Chapter 2). The project team’s view is that the reserves disclosure should be separately classified as developed reserves and undeveloped reserves if there is not separate disclosure of reserves quantities by individual property.

Basis of estimation

- 5.48 The method for estimating the reserves and resources quantities included in financial statements should be disclosed. The quantities that are disclosed should be estimated in accordance with generally accepted industry practices that are consistent with the principles of the CRIRSCO

Template and the PRMS. (One exception to this may be the selection of economic assumptions to be used in estimating reserves. This is discussed further in the section below.) Many minerals and oil and gas entities are already providing this type of disclosure in their financial statements, often in response to the requirements in paragraph 25 of IAS 1 to disclose the source of estimation uncertainty. An example is presented below at exhibit 5.4.

Exhibit 5.4

Reserve estimates

Reserves are estimates of the amount of product that can be economically and legally extracted from the Group's properties. In order to estimate reserves, assumptions are required about a range of geological, technical and economic factors, including quantities, grades, production techniques, recovery rates, production costs, transport costs, commodity demand, commodity prices and exchange rates.

Estimating the quantity and/or grade of reserves requires the size, shape and depth of orebodies or fields to be determined by analysing geological data such as drilling samples. This process may require complex and difficult geological judgements to interpret the data.

The Group determines and reports ore reserves in Australia and the UK under the principles incorporated in the Australasian Code for Reporting Exploration Results of Mineral Resources and Ore Reserves December 2004, known as the JORC Code. The JORC Code requires the use of reasonable investment assumptions when reporting reserves.

As a result, management will form a view of forecast sales prices, based on current and long-term historical average price trends. For example, if current prices remain above long-term historical averages for an extended period of time, management may assume that lower prices will prevail in the future and as a result, those lower prices are used to estimate reserves under the JORC Code. Lower price assumptions generally result in lower estimates of reserves.

continued...

...continued

Reserve reporting requirements for SEC (United States of America) filings are specified in Industry Guide 7, which requires economic assumptions to be based on current economic conditions (which may differ from assumptions based on reasonable investment assumptions). Accordingly, for SEC filings, we test our reserve estimates derived under JORC against assumed 'current economic conditions'. 'Current economic conditions' are based on the three-year historical average contract prices for commodities, such as iron ore and coal, and the three-year historical average for commodities that are traded on the London Metal Exchange, such as copper and nickel. However, we only report a different reserve in the US if, based on the US SEC pricing assumptions test, the reserve will be lower than that reported under JORC in Australia and the UK.

Oil and gas reserves reported in Australia and the UK, and the US for SEC filing purposes, are based on prices prevailing at the time of the estimates as required under Statement of Financial Accounting Standards No. 69 'Disclosures about Oil and Gas Producing Activities', issued by the US Financial Accounting Standards Board.

Because the economic assumptions used to estimate reserves change from period to period, and because additional geological data is generated during the course of operations, estimates of reserves may change from period to period. Changes in reported reserves may affect the Group's financial results and financial position in a number of ways, including the following:

- Asset carrying values may be affected due to changes in estimated future cash flows
- Depreciation, depletion and amortisation charged in the income statement may change where such charges are determined by the units of production basis, or where the useful economic lives of assets change
- Overburden removal costs recorded on the balance sheet or charged to the income statement may change due to changes in stripping ratios or the units of production basis of depreciation
- Decommissioning, site restoration and environmental provisions may change where changes in estimated reserves affect expectations about the timing or cost of these activities
- The carrying value of deferred tax assets may change due to changes in estimates of the likely recovery of the tax benefits

Edited extracts from BHP Billiton annual report 2009, Note 1 Accounting policies, page 187

- 5.49 Disclosures should also be made about the person who prepared the estimate, including their qualifications and experience as an estimator. The CRIRSCO Template requires that minerals reserve and resource estimates be prepared by a 'Competent Person'. This is a 'person who is a Member or Fellow of a recognized professional body relevant to the activity being undertaken, and with enforceable Rules of Conduct'. The Society of Petroleum Engineers' *Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserve Information* makes reference to Reserves Estimators and Reserves Auditors as being individuals with sufficient qualifications and experience to perform those activities. National regulators often determine whether reserve quantities disclosures must be prepared by a reserves estimator/reserves auditor or equivalent. Similar disclosures are required by IAS 40 *Investment Property* and IAS 16 *Property, Plant and Equipment* in relation to fair valuations of investment property and property, plant and equipment. Specifically, IAS 40 requires the disclosure of 'the extent to which the fair value of investment property (as measured or disclosed in the financial statements) is based on a valuation by an independent valuer who holds a recognised and relevant professional qualification and has recent experience in the location and category of the investment property being valued. If there has been no such valuation, that fact shall be disclosed.'

Disclosure of the main assumptions

- 5.50 Reserve estimates are based on several assumptions and will often vary widely depending on the assumptions used. It is therefore important that the main assumptions used in the estimate should be disclosed. Similar requirements exist in IAS 16, IAS 38 *Intangible Assets*, IAS 40, IAS 41 and the exposure draft *Fair Value Measurement* proposals with respect to estimates of fair value, which, if the income method is used, also involve the use of several main assumptions.

Price assumptions

- 5.51 As discussed in Chapter 2, the CRIRSCO Template and the PRMS both specify that the economic assumptions used in reserves and resources estimation should be based on the entity's internal forecasts of future conditions.[†] However, there are a variety of views on whether the economic assumptions used to estimate reserves for the purposes of

* IAS 40 paragraph 75(e)

† The PRMS indicates that management's reasonable forecast is the base case assumption for preparing reserve estimates. As an alternative to the base case, the PRMS also permits the preparation of estimates based on current conditions.

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disclosing that information to external users should be management's own expectations or some other basis. The basis to be used for selecting a commodity price assumption is particularly contentious, with the following alternatives being commonly proposed:

- (a) a market participant assumption (akin to a Level 1 or Level 2 input, as per the fair value measurement hierarchy outlined in Chapter 2);
- (b) management's own expectations (a Level 3 input); or
- (c) a historical price such as the year-end spot price or an average of past spot prices.

- 5.52 Most users surveyed want the reserve estimate to be based on a consistent and objectively determined price assumption. They indicated a preference for a historical average commodity price for a defined trailing period (eg the average price over the past 12 months). This averaging eliminates the potential for disclosed reserve quantities to be based on a single day's price, which might be an aberration. A consequence of using a standardised pricing assumption is that the disclosed reserves estimate would not be the entity's best estimate. Notwithstanding that, those users suggested that a comparable price assumption is more important as this would provide comparability for reserves data disclosed by different entities. This view is shared by Standard and Poor's in *Oil And Gas Reserve Reporting: Recommendations For Change* of 29 November 2007, which commented that:

Management should, of course, make long-term investment decisions based on its estimates of similarly long-term oil and gas prices. However, using anticipated future selling prices, rather than actual year-end amounts, would reduce comparability and consistency. Reserves will likely vary based on how bullish or bearish management is on prices. We therefore favor the use of standard prices, such as average or year-end, to make figures consistent and comparable among companies. Companies should disclose selling prices by geographic area. The use of average prices may reduce volatility caused by swings and seasonality in natural gas prices; year-end prices may be more representative of year-end values. The ultimate solution should require standardized selling prices and costs and allow additional reserve disclosures at different prices (sensitivity analyses).

- 5.53 The SEC, in its revisions to the oil and gas reserves definitions and disclosure requirements, requires the use of a 12-month average price, calculated as the unweighted arithmetic average of the price on the first day of each month within the 12-month period before the end of the reporting period, unless prices are defined by contractual arrangements, excluding escalations based upon future conditions.*

* SEC Regulation S-X, Rule 4.10(a)(22)(v)

- 5.54 The SEC noted that using expected future prices could require significant estimation that could fall into a wide, although reasonable, range. The SEC supported the use of historical prices by stating:

We believe that the purpose of disclosing reserves estimates is to provide investors with information that is both meaningful and comparable. The reserves estimates in our disclosure rules, however, are not designed to be, nor are they intended to represent, an estimation of the fair market value of the reserves. Rather, the reserves disclosures are intended to provide investors with an indication of the relative quantity of reserves that is likely to be extracted in the future using a methodology that minimizes the use of non-reserves-specific variables. By eliminating assumptions underlying the pricing variable, as any historical pricing method would do, investors are able to compare reserves estimates where the differences are driven primarily by reserves-specific information, such as the location of the reserves and the grade of the underlying resource. We recognize that energy markets are continuing to develop. Therefore, we are not adopting a rule that requires companies to use futures prices to estimate reserves at this time.

- 5.55 The use of standardised historical prices in reserves estimates prepared for disclosure is also generally supported by entities in the oil and gas industry, especially SEC registrants. This is shown by the responses made to the SEC, and also in the project team's consultations with preparers from the oil and gas industry. In contrast, the use of historical average price assumptions is not supported by most entities in the minerals industry, where there is a strong preference to use management's forecast price assumptions. Those supporting the use of forecast price assumptions note that management makes business and investment decisions using expected future prices rather than current prices. Accordingly, they argue that estimating reserves using expected future prices provides a more faithful representation of the estimate than if reserves were estimated using current prices. Many users have suggested that in order to rely on a reserves estimate prepared using expected future prices, it is important for that price forecast to be disclosed. This raises a problem because many entities seem reluctant to disclose their price assumptions, especially for commodities that are not exchange-traded, on the grounds that this information is commercially sensitive. Preparers are concerned that disclosing their forecast assumptions for commodity prices may prejudice the entity in future asset sales or acquisitions or in negotiating contracts for the sale of its production.

* SEC Final Rule *Modernization of Oil and Gas Reporting* (Release No 33-8995), page 19

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- 5.56 The project team's view is that faithful representation of reserves and resources requires the use of forecast prices. The use of historical prices risks misrepresenting the reserve quantities whenever the historical price is not consistent with expected future prices. This is common in the often volatile commodity markets. The project team accepts that the use of forecast prices may result in some lack of comparability, to the extent that different price assumptions are used by different entities. Concerns about the potential lack of comparability can be reduced by providing a consistent methodology for selecting the most relevant pricing assumptions according to the individual facts and circumstances associated with the reserves estimate. For this reason, as outlined in Chapter 2, the fair value hierarchy should be applied to determine the economic assumptions. The fair value hierarchy requires a Level 3 input to be used only when a Level 1 or Level 2 input is not available.
- 5.57 The project team proposes that the pricing assumptions used in estimating reserve quantities should be disclosed. If a price assumption is a Level 3 input that is considered commercially sensitive, an exemption from disclosing that assumption could be provided if the disclosure would be expected to prejudice seriously the position of the entity. A similar exemption is provided in IAS 37 *Provisions, Contingent Liabilities and Contingent Assets*. This exemption usually applies in relation to legal disputes and IAS 37 requires an entity making use of the exemption to disclose the general nature of the dispute and explain the reasons why it has not disclosed the information required. Therefore, if such an exemption is provided, an entity that chooses to make use of the exemption should be required to disclose the reasons why the price assumption has not been disclosed.

Other assumptions

- 5.58 In principle, the main assumptions relating to the reserve estimate such as discount rates, production profiles and cost assumptions should be quantified as part of this disclosure. However, presentation problems may make it more difficult to disclose these assumptions together with the reserves estimate. This is because, for example, the discount rate,* production profile and costs assumptions would usually be project-specific, whereas commodity price assumptions may apply equally to several or all of an entity's projects.

* The discount rate would be project-specific to the extent that it includes adjustments for risk that relate to the individual project.

- 5.59 Some oil and gas industry commentators have suggested that the disclosure of a production schedule could be a substitute for disclosing reserves quantities. The rationale is that the reserves are the quantities of future production. It is suggested that the production schedule would present annual production expectations for a defined period into the future, such as five or ten years. Beyond such a period, the effect of the discounting and the greater uncertainties with forecasting that far into the future makes the production schedules less useful. The project team is not proposing that a production schedule should be disclosed as a substitute for, or to complement, the disclosure of reserves quantities. The disclosure of annually updated production schedules was not identified by many users as an important disclosure that they expected could be justified on cost-benefit grounds. Instead, many users indicated that they prepare their own production forecasts by taking into account existing rates of production for operating mines and fields as well as information on schedules for important development and production milestones for mines or fields that are undeveloped or in development. This schedule information can usually be obtained from entity presentations and briefing updates for particular projects. Users typically regarded this type of information, together with the disclosure of reserve quantities (especially where the user can identify the quantities that are attributable to properties in production, properties in development, and undeveloped properties), as sufficient to prepare their own assessments on the timing and amount of future cash flows.

Sensitivity analysis

- 5.60 A sensitivity analysis disclosure can be useful in helping to explain the uncertainties associated with the reserves quantity estimate made as at the reporting date. The project team recommends that a sensitivity analysis disclosure should be provided to show the sensitivity of the reserves quantity estimate to changes in the main economic assumptions. The project team expects that this would usually mean that, at a minimum, the sensitivity analysis would be based on changes to the price assumption. Sometimes a reserves estimate will be more sensitive to changes in other economic assumptions, such as development or operating costs or exchange rates, in which case the sensitivity should be based on changes in those assumptions.
- 5.61 A sensitivity disclosure would often need to take into account changes in a number of economic assumptions if a complete assessment of the sensitivity of reserves quantities to changes in the main economic assumptions is to be provided. The disclosure of separate sensitivity

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analyses may be useful if changes in one of the main assumptions do not directly affect changes in another assumption. In other cases, a single sensitivity analysis may be more relevant if changes in one assumption would be expected to have a consequential impact on various other assumptions in a reserves estimate. For instance, changes in the commodity price assumptions could have an impact on the assumptions made about:

- (a) exchange rates in countries, such as Australia, where there is a well-established correlation between the exchange rate and commodity prices;*
- (b) development and production costs as a result of property-specific factors, such as the optimal mine design to extract the minerals economically or a decision to extract and process a higher (or lower) grade; and
- (c) development and production costs as a result of industry or economy-wide factors because, for instance, a high commodity price environment can create demand for labour and equipment that exceeds available supply.

Whether or not price sensitivity affects other assumptions depends partly on whether the sensitivity is for a large price change or a small price change. The following discussion assumes the price change sensitivity has a significant effect on other assumptions. The determination of the price change sensitivity is discussed in paragraphs 5.65–5.67.

- 5.62 Preparing a sensitivity analysis (eg for price) that includes the corresponding impact on other assumptions would require new reserves estimates to be developed. The project team does not think the benefits from disclosing these comprehensive reserves sensitivities each reporting period would justify the cost of preparing multiple reserves estimates for each property. Another approach is to keep the other economic assumptions constant. By keeping other assumptions constant, a reserves sensitivity should be able to be disclosed with limited additional preparation costs. However, this disclosure is less useful because it ignores the consequential impact that the changes may have on other assumptions. This is because, as noted above, there is not necessarily a linear relationship between changes in commodity prices and changes in reserve quantity estimates.

* *Hedge Funds in Emerging Markets*, Gordon De Brouwer, Cambridge University Press 2001, page 142. See also *The Relationship Between Commodity Prices and the Australian Dollar* by John I. Simpson from Curtin University of Technology - School of Economics and Finance.

- 5.63 The project team prefers a compromise between these two approaches for disclosing reserves sensitivities. The reserves sensitivity analysis should include a reasonable estimation of how other assumptions might change relative to changes in the main economic assumptions that are the primary focus of the sensitivity analysis (eg the commodity price assumption). Accordingly, the sensitivity analysis should take into account the impact of changes that the entity should be able reasonably to anticipate and quantify without requiring a detailed reassessment of all components of the reserves estimate.
- 5.64 The project team recommends that an explanation of the sensitivity analysis should accompany the disclosure. The explanation should identify which economic assumptions are subject to the sensitivity analysis, the other assumptions that change as a result of the sensitivity analysis, and the assumptions that have been kept constant.

Sensitivity to the commodity price

- 5.65 This section considers some of the issues associated with preparing an analysis of the sensitivity of the reserves quantity estimate to changes in the commodity price. The sensitivity to the price assumption could be determined in one of two ways. The sensitivity could be to an objectively determined price change—such as the year-end or historical average price, assuming that the entity’s reserves estimates are not based on these assumptions. The benefit of showing the sensitivity to an objectively determined price is that it can provide users with estimates of reserves quantities that are prepared using a standardised pricing assumption (as discussed earlier in this chapter). It would also help users to assess the sensitivity of the reserves quantities (estimated using forecast assumptions) to changes in current or recent commodity prices. A reserves sensitivity disclosure similar to this is included in *The SME Guide for Reporting Exploration Results, Mineral Resources and Mineral Reserves* (September 2007);* but, the project team is not aware of any minerals entities that are disclosing this type of reserves sensitivity.
- 5.66 Alternatively, the sensitivity could be to a percentage or incremental change in the commodity price assumption. This type of sensitivity disclosure can help users understand the potential impact on the entity’s reserves estimates if a different view on commodity prices were adopted. This type of sensitivity disclosure is provided by some gold mining entities although the trend in disclosure is to move away from providing

* Prepared by the Resources and Reserves Committee of the Society For Mining, Metallurgy And Exploration, Inc

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this information. The PricewaterhouseCoopers 2008 gold survey of 45 gold mining and development entities found that only 31 per cent of entities chose to disclose the sensitivity of reserves to price assumptions in 2008 whereas 40 per cent of those surveyed entities had disclosed the sensitivity in prior reporting periods. An example of this disclosure is provided in exhibit 5.5 below.

Exhibit 5.5

Proven and Probable Equity Reserves

We had proven and probable gold reserves of 85.0 million equity ounces as of December 31, 2008.

For 2008, reserves were calculated at a \$725, A\$850 or NZ\$1,000 per ounce gold price assumption. Our 2008 reserves would decline by approximately 10% (8.2 million ounces), if calculated at a \$675 per ounce gold price. An increase in the gold price to \$775 per ounce would increase reserves by approximately 4% (3.3 million ounces), all other assumptions remaining constant. For 2007, reserves were calculated at a \$575, A\$750 or NZ\$850 per ounce gold price assumption.

Edited extract from Newmont Mining, 2008 Annual Report, Management Discussion and Analysis, page 27

- 5.67 Sensitivity analyses are rarely disclosed by other minerals or oil and gas entities. Gold mining entities appear to be the exception because of the extent to which the gold price is affected by speculation. The disclosure of reserves sensitivities therefore helps the entity to show its exposure to the gold price.

Reconciliation of changes in quantities from year to year

- 5.68 A disclosure that explains the changes in the entity's reserves between the current year and the preceding year should help users to obtain a better understanding of the nature and extent of estimation uncertainties associated with the reserves estimates. These uncertainties may relate to geological, economic, legal and environmental conditions as well as to governmental and sovereign risk factors. This type of disclosure should also assist users in evaluating the entity's financial performance for the current reporting period by identifying, and attributing quantities to, the significant causes for the change in the entity's reserves estimates—which would include production for the current period and new additions to reserves arising from subsequent discoveries.

- 5.69 This explanation could be presented as a numerical reconciliation or as a narrative discussion of the main reasons for change with the quantities attributable to the change(s) being identified as part of the disclosure. Current practice across the minerals and oil and gas industries is mixed regarding whether an explanation is provided, and if it is, whether the explanation is a numerical reconciliation or a narrative discussion. In the project team's opinion, the explanation format that provides the most useful information will often depend on the level of disaggregation associated with the reserve quantity disclosure. Disclosure of reserve quantities at the property level (ie the mine or field) would make a narrative discussion useful because the explanation could provide specific comments on the cause(s) for the change, as well as quantifying the quantities attributable to the change in estimate. However, if reserve quantities are not disclosed for individual properties, a narrative discussion of the reasons for change may be too complex to understand, or too cumbersome to prepare, in which case numerical reconciliation may be more suitable.
- 5.70 If a numerical reconciliation for a reserve quantity disclosure is provided, the project team thinks that the reconciliation should identify changes resulting from:
- (a) discoveries and extensions;
 - (b) revisions of previous estimates, which may include revisions as a result of:
 - (i) geological factors (eg a better understanding of the geology as a result of additional drilling activities);
 - (ii) commodity price factors; or
 - (iii) other economic factors (eg a change in taxation or discount rates);
 - (c) production of minerals or oil and gas;
 - (d) acquisition of reserves through the purchase of minerals or oil and gas properties; and
 - (e) disposal of reserves through the sale or disposal of minerals or oil and gas properties.

An example of a numerical reconciliation is provided at exhibit 5.2 above. In addition, the project team recommends that a numerical reconciliation should be complemented by a narrative discussion of the reasons for significant changes in the estimate (if any), with the discussion referring to the specific properties involved.

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- 5.71 If a narrative discussion is provided instead of a numerical reconciliation, the project team expects that the discussion should provide users with at least as much information on the reasons for change as would be available in a numerical reconciliation. For this reason, the narrative explanation of changes in the reserves estimate should include, at a minimum, a discussion of all changes identified in the numerical reconciliation. An example of a narrative discussion is provided at exhibit 5.6 below, although it should be noted that this disclosure does not quantify the gas production for the reporting period.

Exhibit 5.6

North West Shelf			
		Proved	Proved + Probable
Dry Gas	Bcf	3,389	3,775
Condensate	MMbbl	70.6	101.9
Oil	MMbbl	11.2	19.6
<p>New Reserves bookings were made for the Lady Nora discovery (40 Bcf Dry Gas and 1.2 MMbbl Condensate Proved and 72 Bcf Dry Gas and 2.3 MMbbl Condensate Proved plus Probable Reserves). In addition, under the new 2007 SPE PRMS* guidelines an incremental 406 Bcf Dry Gas Proved was booked, which takes into account the independence of the individual North West Shelf field reservoir characteristics.</p> <p>In addition to production, negative revisions of 2.6 MMbbl Proved and 13.4 MMbbl Proved plus Probable Oil Reserves were the result of multi-disciplinary studies on Cossack Wanaea Lambert and Hermes and the transfer of Egret Reserves to Contingent Resources (5.1 MMbbl).</p> <p>Note: These volumes do not include the agreement to purchase reserves from Shell, which was signed on 8 February 2008.</p>			

Edited extract from Woodside Petroleum, 2007 annual report, page 35

Disclosure type 2: Value-based information

- 5.72 Reserve quantity disclosure is useful for indicating the amount of minerals or oil and gas that is expected to be economically recoverable, but it does not provide any indication of the amount of future cash inflows that those reserves might generate. Measuring minerals or oil

and gas properties at fair value or some other form of current value could provide this information, although as noted in Chapter 4 users expressed limited interest in these assets being valued at fair value or some other current value in the financial statements.

- 5.73 The types of value-based information about minerals or oil and gas reserves that should be disclosed depends on the basis chosen for measuring minerals or oil and gas properties in the statement of financial position—either at historical cost or at fair value.
- 5.74 If these assets are to be measured at historical cost (which is the project team’s recommendation in Chapter 4), the project team recommends that information relating to a current value measurement of these assets should be disclosed. The features of this proposed disclosure are discussed in Disclosure type 2A below.
- 5.75 Alternatively, if the decision is to measure these assets at fair value (which the project team has not recommended), the disclosure that should be provided is disclosure that amplifies the fair value that is presented in the financial statements. The features of this proposed disclosure are outlined in Disclosure type 2B below.

Disclosure type 2A: Current value measurement

- 5.76 The main current value measurement options under consideration for disclosure are:
- (a) Alternative A—a valuation of an entity’s minerals or oil and gas properties that is based on fair value measurement principles but presented as a valuation range rather than as a single point estimate; or
 - (b) Alternative B—a measure of the discounted cash flows attributable to an entity’s reserves.

Alternative A—valuation range estimates based on fair value measurement principles

- 5.77 Disclosing a range of fair value estimates for minerals or oil and gas properties has many of the conceptual benefits of fair value measurement without requiring management to present its fair value estimate as a single point estimate. Consequently, this disclosure could overcome some of the concerns raised about the potential variability associated with measuring minerals or oil and gas properties at fair value. The variability arises because the valuation requires many assumptions to be made, and many of those assumptions are based on unobservable inputs. The variability of the estimate can be further pronounced because

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the assets often have long useful lives and may contain ‘option value’ relating to future development or exploration potential. As a result, the fair value measurement of these assets can be susceptible to material changes in value resulting from only small changes in the assumptions used. The project team notes that disclosing the valuation as a range might help to address this by recognising the uncertainty associated with these assumptions. A similar disclosure approach was adopted in IAS 40 and IAS 41, which require the disclosure (if possible) of a range of estimates within which fair value is highly likely to lie for those investment properties and biological assets where fair value cannot be measured reliably.*

- 5.78 The usefulness of this disclosure would depend on whether the valuation range is sufficiently narrow to allow users to relate the range of estimates of fair value to the assumptions used. Other information that would also need to be disclosed includes the main assumptions used to prepare the estimates, the sensitivity of the ranges to changes in the main assumptions and a reconciliation of the changes in the valuation range between reporting periods. This information would also be necessary if a single point estimate of fair value was provided (see paragraph 5.96 below). The main difference in the disclosure is likely to be that because of difficulties with presenting a quantitative reconciliation of changes in a valuation range, a narrative discussion of the main reasons for change may need to be disclosed as a substitute for a quantitative reconciliation.
- 5.79 The project team acknowledges that many of the concerns raised by users and preparers with the fair value measurement of minerals or oil and gas properties (as discussed in Chapter 4) apply equally to the disclosure of a range of fair value estimates. For instance, many of the concerns expressed by preparers about the cost and effort associated with preparing fair value estimates would remain. This also includes the concern expressed by users that they would not directly use the fair values in their own analysis because the estimates may be based on inputs that are different from those that they would apply. Therefore, although the disclosure of a valuation range may provide some useful information about the variability of the estimate, the project team thinks that the benefit of disclosing a range of fair value estimates for minerals or oil and gas properties would not exceed the costs of preparing those estimates.

* IAS 40 paragraph 79(e)(iii) and IAS 41 paragraph 54(c)

Alternative B—discounted cash flow measurement of proved and probable reserves

- 5.80 The project team proposes that the current value measurement disclosure should be a discounted cash flow measurement of an entity's reserves. This disclosure is similar to the disclosure of a standardised measure of proved oil and gas reserves that is required by FASB ASC paragraph 932-235-50-30. As such, it is not an estimate of the fair value of the entity's minerals or oil and gas properties.
- 5.81 The project team concluded in Chapter 4 that this type of current value measurement is not suitable as a measurement basis for minerals or oil and gas properties in the statement of financial position. However, the project team thinks that this type of current value measurement should be disclosed nevertheless, because users familiar with the disclosure of the standardised measure indicated that it can provide useful information. Significantly, these users indicated that the disclosure of the standardised measure is useful even though, as noted in Chapter 4, the valuation itself is not. This may seem paradoxical; however, it is a reflection on how the information is used—and on what information is used. This is discussed further in paragraphs 5.85 and 5.88.

Categories of reserves to be valued

- 5.82 The project team proposes that the current value measurement that is disclosed should measure the entity's proved and probable reserves. As noted above, proved and probable reserves represent the best estimate of the entity's economically recoverable reserves on the basis of current approved development plans. Therefore, the valuation of these categories represents in effect a best estimate valuation, but without consideration of any future development or exploration potential that may exist at those properties. This would reduce, to some extent, the variability associated with the estimate. It would also reduce the time and cost associated with preparing the estimate.
- 5.83 A valuation based on proved and probable reserves is also consistent with the reserve quantities disclosure requirement, thereby providing a linkage between the reserve quantities and the future cash flows that could be generated from those quantities assuming the standardised conditions were to apply. The standardised measure disclosure required by FASB ASC paragraph 932-235-50-30 is limited to proved reserves. Therefore, even if this level of disclosure was considered sufficient for users in the oil and gas industry, it would not be suitable for application in the minerals industry because there are some minerals deposits that

can only satisfy the probable reserves classification. Omitting probable reserves from the standardised measure would therefore not provide for comparable levels of information being made available to users in the two industries.

Preparation basis

- 5.84 The current value would be measured using discounted cash flow techniques. Although the current value estimate could be prepared using market participant assumptions (where available), users surveyed by the project team indicated that if a current value estimate is provided, the assumptions underpinning the estimate should be standardised. This would lessen the extent to which the measurement is based on subjective forecasts of future conditions. Differing views were expressed on how to determine the standardised parameters for the economic assumptions, but the general thrust of the comments was:
- (a) for commodity prices—use a standardised price assumption such as historical average price or a current market price.
 - (b) for development and operating costs—use current costs.
 - (c) for discount rates—use a standardised discount rate or the entity's weighted average cost of capital (which would be disclosed).

Components of the current value measurement disclosure

- 5.85 Under FASB ASC paragraph 932-235-50-31, the components of the standardised measure are separately disclosed (eg future cash inflows, future production costs, future development costs, future income taxes and the effect of the discount rate). One of the uses of the disclosure of the individual components of the standardised measure is to compare the undiscounted future cash inflows from production with the discounted cash flow measurement to obtain some understanding of when the entity is expecting to produce the reserve quantities.
- 5.86 The project team recommends adopting a similar disclosure approach. Consequently, the current value measurement should be disclosed in conjunction with:
- (a) an explanation of the main assumptions made, including standardised assumptions; and
 - (b) a breakdown of the main components of the measurement. At a minimum, this would be expected to include:
 - (i) future production revenues;

- (ii) future operating and development expenditures (to be presented separately if feasible);
- (iii) future royalty and taxation expenditures; and
- (iv) the effect of discounting.

5.87 An example of the standardised measure required by FASB ASC paragraph 932-235-50-30 is provided below at exhibit 5.7.

Exhibit 5.7

(€ million)	Italy	North Africa	West Africa	North Sea	Caspian Area	Rest of World	Total consolidated subsidiaries	Total joint ventures and associates
At December 31, 2008								
Future cash inflows	46,458	62,785	22,344	16,056	22,199	13,622	183,464	4,782
Future production costs	(5,019)	(10,673)	(6,715)	(3,414)	(6,380)	(2,715)	(34,916)	(1,104)
Future development and abandonment costs	(6,805)	(6,153)	(3,868)	(2,166)	(5,114)	(1,897)	(26,003)	(1,845)
Future cash inflow before income tax	34,634	45,959	11,761	10,476	10,705	9,010	122,545	1,833
Future income tax	(11,329)	(27,800)	(5,599)	(7,621)	(2,781)	(1,901)	(57,031)	(1,032)
Future net cash flows	23,305	18,159	6,162	2,855	7,924	7,109	65,514	801
10% discount factor	(13,884)	(8,639)	(2,155)	(869)	(6,272)	(2,243)	(34,062)	(763)
Standardized measure of discounted future net cash flows	9,421	9,520	4,007	1,986	1,652	4,866	31,452	38

Edited extracts from Eni Annual Report 2008, page 255

Reconciliation of current value measurement

5.88 Users indicated that they are interested in how the standardised measure changes over time. FASB ASC paragraph 932-235-50-35 requires a factor analysis of the year-on-year changes to the standardised measure, showing the impact of changes in prices, costs, reserve discoveries etc. This provides users with information on the sensitivity of the value of

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reserves to changes in these factors. Although the assumptions behind the standardised measure may not be relevant, the effect of changes in those assumptions is considered useful information.

- 5.89 For that reason, if a current value measurement is disclosed, the project team recommends that an explanation of the changes in the current value measurement between the current year and the preceding year should also be provided. The reconciliation should identify the significant causes for the change in the measurement. This should include separately identifying the future cash flow impact of the changes identified in the reserve quantity reconciliation (see paragraph 5.70 above) as well as the future cash flow impact of other measurement assumptions, such as changes in:
- (a) commodity prices;
 - (b) operating costs;
 - (c) development costs;
 - (d) taxation and royalty arrangements; and
 - (e) the discount rate and the accretion of the discount.

- 5.90 An example of the reconciliation of the standardised measure required by FASB ASC paragraph 932-235-50-35 is provided at exhibit 5.8 below.

Exhibit 5.8

Changes in standardized measure of discounted future net cash flows (€ million)	2008
Beginning of year	53,893
Beginning of year related to joint venture and associates	(891)
Beginning of year consolidated	53,002
Increase (decrease):	
• sales, net of production costs	(26,202)
• net changes in sales and transfer prices, net of production costs	(39,699)
• extensions, discoveries and improved recovery, net of future production and development costs	1,110
• changes in estimated future development and abandonment costs	(6,222)
• development costs incurred during the period that reduced future development costs	6,584
	<i>continued...</i>

<i>...continued</i>	
• revisions of quantity estimates	5,835
• accretion of discount	10,538
• net change in income taxes	21,359
• purchase of reserves in-place	476
• sale of reserves in-place	25
• changes in production rates (timing) and other	4,646
Net increase (decrease)	(21,550)
Standardized measure of discounted future net cash flows consolidates	31,452
Standardized measure of discounted future net cash flows joint ventures and associates	38
Standardized measure of discounted future net cash flows	31,490

Edited extracts from Eni Annual Report 2008, page 256

Disaggregation basis for a current value measurement and reconciliation

- 5.91 Ideally, the current value measurement would be provided for each geographical location to complement the information provided in the reserve quantity disclosures. Disaggregating these disclosures by commodity type as well may not always be feasible because many minerals or oil and gas properties include more than one commodity (eg copper and gold, or oil and natural gas). In these cases, providing separate value-based disclosures for each commodity would require the future development and operating costs to be arbitrarily allocated to the current value measurement of each commodity. This could lessen the usefulness of a commodity-specific current value measurement.
- 5.92 The project team also acknowledges that disclosing a current value measurement and a reconciliation of that measurement on the same geographical basis as the reserves disclosure could cause preparation and presentation difficulties, especially for large diversified minerals and oil and gas entities. This is because of the volume of information that would need to be disclosed. A higher level aggregation may therefore need to be considered. The project team proposes that the current value measurement disclosure and the reconciliation disclosure should be presented by major geographical region because users surveyed by the project team generally indicated that disclosing this information at this level of aggregation would be sufficient for their needs.

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- 5.93 Another approach is to present the current value measurement reconciliation at a higher level of aggregation than the reserve quantity and current value measurement disclosures. The FASB made a similar decision for the reconciliation of the standardised measure after considering the cost-benefit implications of requiring the disclosure of a disaggregated value-based reconciliation. Further consideration should be given to which of these approaches is preferable on cost-benefit grounds.

Cost-benefit considerations

- 5.94 Preparers in the minerals and oil and gas industry do not support a requirement to disclose a current value measurement of minerals or oil and gas properties. They do not believe that the disclosure can be justified on cost-benefit grounds, owing to the expected costs involved to prepare the disclosure and the limited benefits they believe it would provide to users (especially users who are not familiar with the disclosure) given that the measurement does not provide a meaningful assessment of value. They also believe that the current value measurement has no relevance for internal management purposes.

Disclosure type 2B: Fair value measurement – disclosures that amplify the fair value measurement of minerals or oil and gas properties

- 5.95 If the statement of financial position measurement basis for minerals or oil and gas properties is fair value, the project team considers that disclosures similar to the fair value disclosure proposals in paragraph 57 of the exposure draft *Fair Value Measurement* and the disclosures required by paragraphs 47 and 50 of IAS 41 may be relevant. The purpose of these disclosures would be to provide users with information to assess the inputs used to develop the fair value measurement of the minerals or oil and gas properties and the effect that the asset measurement has on the statement of comprehensive income for the reporting period.
- 5.96 The types of information that should be disclosed to amplify the fair value measurement of minerals or oil and gas properties would include:
- (a) the fair value measurements at the reporting date.
 - (b) the level within the fair value hierarchy in which the fair value measurements in their entirety fall. As noted in Chapter 4, the fair value of minerals or oil and gas properties are expected to be based

- on significant unobservable inputs, and therefore the fair value measurements will generally be regarded as Level 3 fair values.
- (c) the disclosure of the main assumptions used in the fair value measurement estimate, including assumptions for commodity prices and discount rates.
 - (d) a reconciliation from the beginning balances to the ending balances of the fair value measurements, disclosing separately changes during the period attributable to the following:
 - (i) discoveries and extensions;
 - (ii) revisions of previous estimates owing to geological factors;
 - (iii) commodity price factors or other economic factors;
 - (iv) production of minerals or oil and gas;
 - (v) purchases of minerals or oil and gas properties; and
 - (vi) sales of minerals or oil and gas properties.
 - (e) if changing one or more of the inputs to reasonably possible alternative assumptions would change fair value significantly, the entity should state that fact and disclose the effect of those changes. The entity should disclose how the effect of a change to a reasonably possible alternative assumption was calculated. For this purpose, significance should be judged with respect to profit or loss, and total assets or total liabilities, or, when changes in fair value are recognised in other comprehensive income, on total equity.
 - (f) the valuation technique(s) used to measure fair value and a discussion of changes in valuation techniques, if any, during the period.
- 5.97 The project team proposes that for these fair value disclosures relating to minerals or oil and gas properties to be useful, the level of disaggregation should be consistent with the disaggregation approaches identified for Disclosure type 2A.

Disclosure type 3: Production revenues

- 5.98 The disclosure of an annual reconciliation of changes in reserve quantities estimates will show production quantities. However, users are also interested in knowing the revenue that is earned from that production, either by sales to third parties or from inter-entity transfers

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of the produced commodity to the entity's downstream operations. The separate disclosure of this information may assist users to value an entity's upstream and downstream operations separately.

- 5.99 Production revenue information is typically disclosed in accordance with the requirement in paragraph 35(b) of IAS 18 *Revenue* to disclose the amount of each significant category of revenue recognised during the period. Furthermore, production revenue by commodity is sometimes disclosed in segment reporting disclosures or in other information that is made publicly available by entities in the extractive industries. The project team recommends that the disclosure of production revenues should generally need to be presented separately only by commodity. This is because most of the commodity prices are set by international markets rather than by domestic considerations. Disclosing revenue by commodity would also complement the disclosure of production quantities, and thereby enable users to determine the average price realised on the sale of the entity's production. Separate presentation of production revenue by geography is recommended only if the commodity price is subject to local market conditions, for instance the sale of gas into domestic markets or gravel and aggregates in the minerals industry.

Disclosure type 4: Time series of exploration, development and production cash outflows

- 5.100 Disclosing the exploration, development and production cash outflows that were made in the current and prior periods would provide information that can be used to assess the entity's performance. For instance, the disclosure of this cash flow information should help users to calculate measures such as cash costs per unit of product (eg cash cost per ounce of gold) or to perform finding and development cost analysis in the oil and gas industry.
- 5.101 Because it would not be feasible to provide this cash flow information on a cumulative basis, the project team proposes that the disclosure of exploration, development and production cash outflows should be provided as a time series over a period that is sufficient to enable the identification of trends (possibly over five years). This information should be provided at the same level of disaggregation as the reserves quantity disclosure. An example of this type of disclosure is presented at exhibit 5.9 below, noting that it does not include the disclosure of production costs.

Exhibit 5.9

Exploration and Development Costs		Year ended December 31				
Millions of dollars	2008	2007	2006	2005	2004	
United States						
California						
Exploration	\$ -	\$ 4	\$ -	\$ -	\$ -	
Development	928	1,198	686	494	412	
Gulf of Mexico						
Exploration	682	617	705	612	478	
Development	1,923	2,237	1,632	639	475	
Other U.S.						
Exploration	46	37	46	32	5	
Development	1,497	1,775	868	596	372	
Total United States						
Exploration	\$ 728	\$ 658	\$ 751	\$ 644	\$ 483	
Development	4,348	5,210	3,186	1,729	1,241	
International						
Africa						
Exploration	\$ 347	\$ 408	\$ 379	\$ 225	\$ 271	
Development	3,723	4,176	2,890	1,871	1,047	
Asia-Pacific						
Exploration	516	324	314	124	82	
Development	4,484	1,897	1,788	1,026	567	
Indonesia						
Exploration	68	64	90	31	15	
Development	753	620	460	325	245	
Other International						
Exploration	270	372	388	341	226	
Development	1,879	1,504	1,019	713	542	
Total International						
Exploration	\$ 1,201	\$ 1,168	\$ 1,171	\$ 721	\$ 594	
Development	10,839	8,197	6,157	3,935	2,401	

Edited extracts from Chevron Corporation 2008 Supplement to the Annual Report, page 41

Chapter 6 – Publish What You Pay proposals

Introduction

- 6.1 A coalition of non-governmental organisations is promoting a campaign called Publish What You Pay (PWYP), which aims to help citizens of resource-rich* developing countries hold their governments accountable for the management of revenues from the minerals and oil and gas industries. This requires reliable information about the revenues received by a government from these industries. To achieve this, PWYP proposes that entities undertaking extractive activities should be required to disclose, in their financial reports, the payments they make to each host government. These payments could be in cash or in kind and should be disclosed on a country-by-country basis.
- 6.2 PWYP also proposes that disclosures should be provided on a country-by-country basis for other types of information including minerals or oil and gas reserve quantities, production quantities, production revenues, and costs incurred in development and production. The objective of these disclosures is to provide information on the scale of the entity's operations within individual countries. Citizens of resource-rich developing countries can compare this information with the amounts an entity has paid to governments of those countries.
- 6.3 This chapter analyses the PWYP proposals from two perspectives:
- (a) whether, and to what extent, the disclosures are consistent with the objectives of general purpose financial reporting; and
 - (b) whether the disclosures can be justified on cost-benefit grounds.

Background

- 6.4 The project team's analysis of these proposals takes into account the input provided by a round-table discussion on the PWYP disclosure proposals that was held in London on 15 September 2008. The round table was jointly sponsored by the Revenue Watch Institute[†] and the IASB.

* The IMF *Guide on Resource Revenue Transparency* (2007) states that a 'country is considered rich in hydrocarbons and/or mineral resources if it meets either of the following criteria: (i) an average share of hydrocarbon and/or mineral fiscal revenues in total fiscal revenue of at least 25 percent during the period 2000-2005 or (ii) an average share of hydrocarbon and/or mineral export proceeds in total export proceeds of at least 25 percent during the period 2000-2005'.

† The Revenue Watch Institute is a member of the PWYP coalition.

Participants included investors, preparers and auditors involved in the minerals and oil and gas industries, as well as representatives from PWYP, members of the project team, four members of the IASB and a representative of the International Public Sector Accounting Standards Board. Responses from the user survey and from further discussions with some investors are also considered in the following analysis.

PWYP proposals

6.5 The disclosures proposed by PWYP are presented at Figure 6.1 below.

Figure 6.1 – PWYP disclosure proposals

<p>1. Benefit streams to government:</p> <p>The significant components of the total benefit streams to government and its agencies should be disclosed on a country-by-country basis. At a minimum, this would include separate disclosure of:</p> <ul style="list-style-type: none"> • royalties and taxes paid in cash • royalties and taxes paid in kind (measured in cash equivalents) • dividends • bonuses • licence and concession fees. <p>2. Reserves:</p> <p>Reserves volumes and valuation measures (if required by the future IFRS) should be disclosed on a country-by-country basis.</p> <p>3. Production volumes:</p> <p>Production volumes for the current reporting period should be disclosed on a country-by-country basis. Optional disclosure of production volumes by key products and key properties is encouraged.</p> <p>4. Production revenues:</p> <p>Revenues from production should be disclosed on a country-by-country basis, with separate disclosure of production revenue attributable to:</p> <ul style="list-style-type: none"> • sales to external customers • transfers to downstream operations <p style="text-align: right;"><i>continued...</i></p>

...continued

5. Costs:

The following costs should be disclosed on a country-by-country basis:

- production costs
- development costs.

6. Key subsidiaries and properties:

The names and locations of each key subsidiary and property in each country should be disclosed.

- 6.6 The PWYP proposals are intended to complement the Extractive Industries Transparency Initiative (EITI), which encourages governments of resource-rich developing countries to ‘publish what you earn’.^{*} Both initiatives have the objective of promoting a more accountable system for the management of natural resource revenues, which in turn should help to combat corruption, improve governance and promote sustainable development in these countries. The EITI and other aspects of the PWYP campaign are outside the scope of this discussion paper.[†]

Disclosure in financial reports

- 6.7 PWYP recommends that its disclosure proposals should be incorporated into an eventual IFRS for extractive activities. They regard IFRSs as offering the best mechanism for creating a global and enforceable standard that will generate comparable information. Some entities in the minerals or oil and gas industries disclose some of the types of information being proposed by PWYP, but those disclosures are mainly

* The EITI is an international initiative in which producing countries voluntarily agree to follow established processes to improve the transparency of the payments made by companies, receipts by government and the reconciliation of the two sets of figures. Once a country has signed, the rules state that all companies operating in the territory should disclose their payments to government. Although 30 countries are members of EITI, not all have reached the stage of publishing their reports. Some publish only aggregated company data, while other EITI countries publish company-by-company data. A large number of companies, NGOs, investors, industry associations and intergovernmental organisations such as the World Bank and IMF are supporting the EITI.

† More information on the PWYP campaign and the EITI is available from <http://www.publishwhatyoupay.org/> and <http://www.eitransparency.org/>.

found in corporate social responsibility reports or sustainability reports published by the entity. PWYP's primary concerns with the information being reported in this manner are that it is:

- (a) voluntary—which makes it difficult to estimate reasonably how much natural resources income a host government is receiving if most entities that operate in the country are not disclosing the relevant payments;
- (b) not standardised—which makes it difficult to compare and compile the information provided by different entities;
- (c) not audited or traceable back to the financial statements—which means that the information reported is perceived to lack the reliability and credibility associated with financial reports.

These concerns would be overcome if an IFRS were to require the disclosures.

Relationship between the PWYP proposals and the objectives of financial reporting

6.8 Before addressing whether any of the proposals should be included in an IFRS, the extent to which the PWYP disclosure proposals might be consistent with the objectives of general purpose financial reporting needs to be considered. This involves considering whether:

- (a) users of the PWYP proposals are also primary users of financial reports; and
- (b) the PWYP proposals are within the scope of financial reports.

Users of the PWYP proposals

6.9 The information provided by the PWYP proposals would be mainly used by:

- (a) citizens of resource-rich developing countries and non-governmental organisations, primarily to hold the governments of those countries accountable for the management of natural resource revenues; and
- (b) capital providers, to the extent that the information is useful for assessing an entity's exposure to country risk and reputational risk.

6.10 Although each of these users of the PWYP proposals can be users of general purpose financial reports, the *Framework* indicates that financial reporting is primarily directed to meet the needs of existing and potential

equity investors, lenders and other creditors (ie capital providers)*. Information that is useful to capital providers for making decisions may also be useful to other users of financial reporting. These other users include suppliers, customers and employees (when not acting as capital providers), as well as governments and their agencies and members of the public. However, financial reporting is not directed to meeting the specialised needs of those other users. For this reason, the PWYP proposals have been assessed only from the perspective of whether capital providers would find the information useful. In this context, information may be regarded as useful if it is used to assess the future cash flows, including the riskiness of those cash flows (noting that this is also consistent with the disclosure objective identified in paragraph 5.5).

Scope of financial reports

- 6.11 In Chapter 1 the project team proposed that, for the purposes of this discussion paper, financial reporting should be regarded as including information that:
- (a) helps users of financial reports to make decisions;
 - (b) can reasonably be viewed as being within the scope of a complete set of financial statements; and
 - (c) meets a cost-benefit test.
- 6.12 IAS 1 *Presentation of Financial Statements* provides some examples of types of reporting that are outside the scope of IFRSs, and arguably outside the scope of financial statements altogether. Paragraph 14 states that

Many entities also present, outside the financial statements, reports and statements such as environmental reports and value added statements, particularly in industries in which environmental factors are significant and when employees are regarded as an important user group. Reports and statements presented outside financial statements are outside the scope of IFRSs.

However, even though corporate social responsibility reports and sustainability reports are outside the scope of IFRSs and may contain similar information to that being proposed by PWYP, this does not necessarily mean that the PWYP proposals are outside the scope of financial reporting. Rather, the project team considers that the disclosures could be reasonably viewed as being within the scope of financial reporting if capital providers—as the primary users of financial reports—consider that the information is important for making informed

* See paragraphs OB2 and OB6–OB9 of the *Framework*.

investment and lending decisions and to the extent that similar information cannot be readily obtained from other sources. The project team also notes that the type of information in the disclosures proposed by PWYP is either revenue and cost information that is inherently part of financial statements or is information related to reserve quantities that is similar to disclosures proposed in Chapter 5 of this discussion paper. A crucial question is the level of detail in the PWYP proposals—the requirement for disclosure on a country-by-country basis. This leads to the importance of considering the cost-benefit implications of providing this information within a financial report.

Usefulness of the PWYP proposals to capital providers

- 6.13 Users told the project team that country-level information helps in assessing the risks that an entity is exposed to from operating in those countries. The PWYP proposals are expected to be useful to capital providers to the extent that they provide information that can be used to make judgements about the entity's exposure to:
- (a) country-specific investment risks; and
 - (b) reputational risk.

Relevance of the scale of an entity's operations in individual countries for assessing country-specific investment risks

- 6.14 Most of the PWYP proposals provide information about the scale of an entity's operations within individual countries. This information could be used to assess the effect that country-specific investment risks may have on an entity. Country-specific investment risks may include:
- (a) economic risks relating to changes in foreign exchange rates and cost inflation;
 - (b) political and social risks relating to changes in government, expropriation of assets and civil unrest; and
 - (c) legal and regulatory risks relating to changes in the taxation or royalty regimes and rates and changes to other legal rights and obligations that may affect the entity.

Although these types of risks are not unique to the extractive industries or to resource-rich developing countries, they are generally viewed as being more prevalent and more pronounced in these industries and countries.

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- 6.15 The effect that country-specific investment risks may have on an entity depends on the materiality (in quantitative terms)* of its investments in that country relative to its overall financial position and performance. This is because the potential economic loss (or gain) to the entity arising from country-specific investment risks would be expected to be correlated to the relative value of the entity's investments in that country.
- 6.16 The PWYP proposals that may be useful for identifying the materiality of an entity's investments in specific countries, and the contribution those investments have on the entity's financial performance, include the country-by-country disclosure of:
- (a) reserve quantities—to provide an indication of the value of the entity's minerals or oil and gas properties in the country;
 - (b) production quantities and revenues—to show the current performance of those properties; and
 - (c) development and production costs—to quantify the capital that the entity is investing in the country and to assess the profitability of its operations.
- 6.17 The usefulness of this information was confirmed by users surveyed by the project team. As discussed in more detail in Chapter 5, these users generally indicated that information about reserve quantities, production and costs is relevant to their investment decision-making and should, at a minimum, be disclosed at the country level if the operations in that country are material to the entity.† In contrast, other users such as citizens and non-governmental organisations are seeking the disclosure of this information for each country regardless of whether the operations and investments in the country are material in amount to the entity. This represents a difference in needs between capital providers and citizens and non-governmental organisations.

Relevance of payment to governments for assessing country-specific investment risks and reputational risks

- 6.18 The disclosure of payments made by the entity to governments in their dual capacity as a taxation authority and as the owner of the minerals or

* Materiality depends on the amount of the item (a quantitative factor) and the nature of the item (a qualitative factor). Information is considered to be material if its omission or misstatement could influence the decisions that users make on the basis of an entity's financial information.

† Chapter 5 explains that some users, particularly mining analysts, suggested that some reserve volumes and production disclosures should be more specific—for example, presented separately for each major mine.

oil and gas is the centrepiece of the PWYP proposals. PWYP's intention is for these disclosures to be presented on a cash basis rather than an accruals basis, with payments in kind included at a cash-equivalent amount. Cash basis disclosure is preferred by PWYP because it would provide visibility of the amounts that are paid to governments. Separate disclosure of the major types of payments to governments is proposed because some payments, particularly non-recurring payments such as signature bonuses, are regarded as being more susceptible to misuse.

- 6.19 Consultations with investors on the PWYP proposals indicated that the disclosure of payments to governments would be useful in making investment decisions. This information could be useful in assessing the likelihood of a country-specific investment risk occurring and the entity's exposure to reputational risk. Investment risk assessments may take into account the size and the timing of the payments being made to governments. For instance, an economic risk assessment of an investment is likely to be different if a substantial signature bonus is paid in advance of knowing whether development and production on the property will be successful, compared with paying royalties levied on production and which should therefore be capable of being paid out of operating cash flows. In addition, some investors indicated that they would also use this information in assessing whether the investment satisfies their socially responsible investment criteria. To be useful for all these purposes, the disclosure of payments to governments would need to be presented on a country-by-country basis. Presenting these disclosures at a regional level, whereby the payments to the governments of individual countries within that region are aggregated, is not useful for these purposes.

Assessing the likely occurrence of country-specific investment risks

- 6.20 Some investors indicated that a key component of their country-specific investment risk assessments for individual entities relates to judgements about the existence and extent of corruption within the resource-rich countries in which entities operate. The disclosure of payments to governments can be used to provide a preliminary indication of possible corruption levels that may be present within a government, because it would enable users to compare the payments made to governments by entities in the extractive industries with the revenue that governments report they have received from those taxes, royalties and other revenue flows. Generally speaking, the greater the level of corruption, the greater the investor's concern about the integrity of the government and its commitment to honour existing terms and conditions relating to an

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entity's operations in that country. For instance, a government may make unilateral modifications to the entity's legal rights to explore and extract minerals or oil and gas, the entity's interests in joint arrangements, and the taxation or royalty arrangements that apply to the entity. These modifications could have significant effects on the value attributable to an entity's operations in that country. Consequently, investors would place a higher risk premium on their investments in entities that have operations in those countries or alternatively they might choose to avoid investing in those entities.

- 6.21 Investors also acknowledged that the disclosure of payments to governments should have wider social benefits for resource-rich developing countries by helping to improve the governance structures, and therefore the political, economic and social stability of those countries. Separate disclosure by type of payment could also improve governance structures and stability within countries where regional or local governments are receiving revenue directly from minerals or oil and gas entities or through revenue-sharing mechanisms with the national government. This is because, as noted by PWYP, typically only certain types of revenue streams flow to the regional or local government, and so those revenues are more likely to be identifiable if there is separate disclosure by type of payment. Improvements to governance structures and stability should have a positive influence on the well-being of the citizens of those countries and, ultimately, these improvements should also result in a lower risk premium being placed on investments in those countries.

Assessing reputational risk

- 6.22 An entity's reputation may be harmed if it is perceived to be associated with, or complicit in, corrupt government practices that have adverse social or environmental consequences. It may also be harmed if the entity is not perceived to be 'paying its fair share' in exchange for extracting a country's natural resources. This is one of the reasons for entities voluntarily publishing corporate social and sustainability reports. In this context, PricewaterhouseCoopers has put forward a model for calculating an entity's total tax contributions.*
- 6.23 Reputational risks can have economic consequences and capital providers would be expected to consider this when making their investment decisions. Direct costs associated with a loss of reputation might include compensation or remediation works to make good for the consequences of the entity's actions (real or perceived). Indirect costs

* This model is explained in *Total Tax Contribution Framework: What is your company's overall tax contribution?*, published by PricewaterhouseCoopers.

might include difficulties in ‘winning’ further business, such as securing new exploration and extraction rights or participation in joint arrangements, or in obtaining additional equity or debt financing.

- 6.24 Unlike investment risks, an entity’s exposure to reputational risks and the associated potential economic loss is not correlated to the scale of the entity’s investment in a particular country. This is an important point, particularly for large diversified minerals and oil and gas entities that may have operations in countries that are immaterial in size to the entity. Although immaterial to the entity in quantitative terms, the entity’s operations in some of those countries could be material to the entity in qualitative terms (eg material to the entity’s reputation) if, for example, the country was economically dependent on the investments made by the entity or if the political, social or environmental conditions in that country could be reasonably viewed as exposing the entity to reputational risks. It will not always be clear whether a country is material to the entity in this way, but ultimately this decision rests with the entity. Some participants at the round-table meeting suggested that the entity should use its best efforts to disclose payments to governments whenever there is a reasonable expectation that the entity’s operations would be material to the country, even though the country might not be material to the entity in quantitative terms.

Obtaining similar information from other sources

- 6.25 Respondents to the user survey and other investors whom the project team consulted indicated they often assess country risks (including corruption) and reputational risks using primarily qualitative information from sources such as security risk consultants’ reports. Some investors also refer to other relevant sources, which depending on the country and the entity, may include EITI reports, non-governmental organisations’ reports (eg Transparency International), and individual corporate social and sustainability reports. Investors noted that, if payments to governments were disclosed (on a comparable basis between entities), they would use this information directly in making their investment decisions. Security risk consultants and non-governmental organisations would be expected to use this information to refine their own assessments of individual country risks, noting that these assessments may also be reviewed by investors when making their investment decisions. This suggests that disclosures of payments to governments would be used in assessing risks associated with investment decisions, regardless of whether that information is used by the investor directly or indirectly after considering a security risk assessment or similar analysis.

Cost-benefit implications of the PWYP proposals

- 6.26 The previous section showed that, on the whole, the PWYP proposals would provide useful information to capital providers. This section considers the cost-benefit implications associated with the disclosures being proposed by PWYP, as identified in Figure 6.1 above. The cost-benefit analysis does not contemplate the disclosure of information that is not material to the entity from either a quantitative or qualitative perspective. To do so would be inconsistent with paragraph 31 of IAS 1 *Presentation of Financial Statements*, which states that an entity's financial report does not need to provide a specific disclosure required by an IFRS if the information is not material.

PWYP disclosure 1: Payments to governments

- 6.27 Figure 6.1 lists a variety of payments and other types of benefit streams that governments may receive from entities in the extractive industries. For the purposes of this discussion paper, the project team has not assessed the detail of how to calculate the payments to governments and which types of payments (or benefit streams) should be separately disclosed. The purpose of the discussion paper is instead to seek views on the general proposition that an entity engaged in extractive activities should be required to disclose payments it makes to governments, either separately or in total, because it provides useful information to capital providers and that the benefits of this information exceed the cost of providing it.

Additional benefit

- 6.28 Disclosing payments made to governments may provide users with additional information on an entity's taxation and royalty obligations. Respondents to the user survey indicated that understanding an entity's taxation and royalty obligations is particularly important in the extractive industries because of the generally higher tax or royalty rates relative to other activities and, in many cases, the complexity of the taxation or royalty regime. Most of the respondents indicated that disclosing the effect of taxation and royalty obligations is an area where financial reporting could make improvements. Users can typically model the effect of tax and royalty obligations when information about the features of the taxation or royalty regimes that apply in each country is publicly available. However, users find it difficult to model these obligations when the features of the regime are not known, which is more likely to be the case for contractually imposed royalties such as production sharing contracts (PSCs).

- 6.29 The difficulty in accessing and comparing this information was identified by users as another problem. For instance, it was noted that in accounting for various oil and gas royalty obligations (including PSCs), the effect is sometimes reflected in total in the reserve quantities disclosure and sometimes in the statement of comprehensive income in relation to the current period as part of production costs, operating expenses or income taxes.
- 6.30 The project team expects that, if payments to governments were disclosed in financial reports, this information could be used by users to help validate their modelling of taxation and royalty regimes and to make better comparisons across entities.

Preparation costs

- 6.31 There will be a cost associated with preparing and presenting this information in a financial report. Some entities indicated that significant changes to accounting systems and reporting processes would be required to capture those data and to collate them on a country-by-country basis.* It was noted that payments other than income tax amounts are not always separately identified in the general ledgers of subsidiary entities. The types of payments that might not be easily identifiable from a general ledger include:
- (a) taxes or royalties paid in kind rather than cash;
 - (b) indirect taxes and excise duties that are included in the cost of goods or services purchased from third parties; and
 - (c) net payments to governments that include both a tax or royalty component (ie a non-reciprocal transfer) and a purchase or sale transaction component (ie reciprocal transfer). These types of payments could be even more difficult to identify if it is unclear from the general ledger whether the recipient of the payment is a government agency.

* A similar observation is made in the PricewaterhouseCoopers publication *Total Tax Contribution: Global study for the mining sector, 2009*, which states that 'For most of the participating companies, this was the first time such data has been put together to show a picture of their real tax footprint. Each company carried out a data collection exercise to extract the relevant data from their books and records. It should be emphasised that not all of the participants were able to provide all of the data requested. In addition, each participant covered only some, not all, of their countries of operation.' The publication also concluded that '... In PwC's view, every mining company needs to have this on a regular basis for all its operating markets. It is essential management information and may also be helpful to inform communication and engagement with government and other key stakeholders.'

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- 6.32 The separate disclosure of these types of payments would also increase audit costs. Auditors consulted by the project team explained that reaching an audit opinion on the accuracy and completeness of a complete set of financial statements that included country-by-country disclosure of different types of tax payments would require a more precise and detailed (and costly) examination of those payments than if the information were aggregated in the consolidated financial statements as, for example, income tax expense or a production cost.
- 6.33 Despite these concerns about preparation, some entities have been voluntarily reporting information about the payments they make to governments. This suggests that those entities consider that the benefits of publishing some of the types of information being proposed by PWYP exceed the costs of preparation, noting though that the information may not always be presented to the same level of detail as proposed by PWYP and the information has not been audited. Some examples of such a disclosure are provided at Exhibit 6.1 below.

Exhibit 6.1 – Disclosure of payments made to governments

2007 Fiscal Contributions to Host Governments¹			
	Royalties	Taxes³	Total
Canada	475	186	661
US	–	(2)	(2)
UK	–	352	352
Netherlands	–	24	24
Norway	–	179	179
Denmark	4	10	14
Indonesia	391	183	574
Malaysia ²	443	108	551
Vietnam ²	6	8	14
Australia	3	83	86
Algeria	178	53	231
Tunisia	5	12	17
Trinidad and Tobago	20	50	70
Colombia	–	1	1

continued...

<i>...continued</i>			
Peru	–	–	–
Qatar	–	–	–
Other	–	1	1
Total Company	1,525	1,248	2,773
<p>1 Not all of this expense represents cash payments to host governments. Under certain contractual terms, royalties and taxes represent the entitlement of the host government to a portion of production. Talisman does not distinguish between cash payments and 'commodity-based payments' in determining the Company's total fiscal contribution to host governments. Talisman recognizes such amounts at market prices in the month the Company sells its share of production. With respect to other material payments of \$1 million or greater paid to governments, Talisman paid \$8 million to the government of Norway as a carbon tax, licence fee and NO_x fee. Talisman also paid the government of Indonesia a \$1 million signature bonus for the Sageri Exploration Block.</p> <p>2 Royalties and taxes paid to the Government of Malaysia include the Government of Vietnam's share of the PM-3 CAA royalties and taxes. Royalties represent cash payments and, in certain foreign operations, the entitlement of the respective governments to a portion of Talisman's share of production. For additional information, see the Notes to Talisman Energy Inc.'s Consolidated Financial Statements for the year ended December 31, 2007.</p> <p>3 Taxes represent current tax expense and current production taxes.</p>			

Edited extracts from Talisman Energy, 2007 Corporate Responsibility Report, page 34

Royalties and Taxes by Country for 2008 (Millions USD)				
	Government Royalties	Taxes	Total	Percent of Total
Australia	35.1	2.2	37.3	6%
Bolivia	5.3	1.1	6.4	1%
Ghana	13.5	0.1	13.6	2%
Indonesia	12.3	271.4	283.7	38%
New Zealand	0.8	4.3	5.1	1%
Peru	0.1	207.6	207.7	29%
USA	0.0	166.5	166.5	23%
Total	67.1	653.2	720.3	100%

Edited extract from Newmont Mining Corporation, Beyond the Mine (the Newmont Sustainability Report 2008)*

* Accessed from: <http://www.beyondthemine.com/2008/?l=2&pid=4&parent=17&id=144>

Confidentiality concerns

- 6.34 The disclosure of tax payments on a country-by-country basis may breach confidentiality agreements that the entity has with a government. The concern is that by disclosing this information, the entity may contravene the undertakings it has made with a government and face the risk of losing its assets (through expropriation) in that country.
- 6.35 Research undertaken for PWYP by the Columbia Law School provides a different perspective on these confidentiality concerns.⁷ After surveying over 150 minerals and oil and gas contracts between host governments and minerals and oil and gas entities, the research found that the confidentiality clauses were quite similar. Most clauses indicated that no party to the contract could disclose any information flowing from the contract without the written consent of the other parties, but typically the clauses include some standard exceptions that would permit the disclosure of information for compliance with the law and regulations. This would include compliance with IFRSs in those jurisdictions that incorporate IFRSs into their law or regulations.
- 6.36 A concern that has been raised by some preparers in response is that an entity may be discouraged from disclosing this information, even if its contract with a host government indicates that it is legally permissible to do so. The concern is that if either the host government, or the administrator of the contract on behalf of the host government, did not want the information to be disclosed, then the entity might lose future investment opportunities in that country to other entities that are not required to make that disclosure. Entities might also be concerned about the risk to its existing assets if its contracts had to be renewed or renegotiated. Whether either concern eventuates, however, would seem to depend on whether the economic significance of the entity's operations in that country would require separate disclosure and the ability for the government to take over the entity's operations or award them to other entities that are not required to make the same disclosures.
- 6.37 Both the research from the Columbia Law School and the concerns raised by preparers demonstrate that the ability of an entity to disclose this information will depend on the individual facts and circumstances of each case. The project team does not consider that the existence of confidentiality clauses that may prevent this level of disclosure in particular cases, or the perceived threat of the loss of existing assets or future opportunities that may discourage such disclosure, justifies not

* This research is published in Rosenblum P and Maples S, *Contracts Confidential: Ending Secret Deals in the Extractive Industries*, Revenue Watch Institute, 2009.

requiring this information to be provided. Instead, one approach could be to require the disclosure subject to an exemption similar to that in IAS 37 *Provisions, Contingent Liabilities and Contingent Assets*, which as explained in Chapter 5 provides an exemption in cases when disclosing the required information could be expected to prejudice seriously the position of the entity. In genuine cases where the disclosure of payments to governments is considered either to breach confidentiality requirements that a host government is expected to enforce or is expected to prejudice seriously the position of the entity for other reasons, the project team recommends that the entity should disclose why it is unable to disclose the information.

PWYP disclosure 2: Reserves

- 6.38 PWYP is proposing the country-by-country disclosure of reserve quantities and reserve valuation (if required by the IFRS).

Reserve quantities

- 6.39 As outlined in Chapter 5, the project team proposes the disclosure of minerals or oil and gas proved and probable reserve quantities. These reserve quantities should generally be separately disclosed at an individual country level because most of the non-geological risks associated with reserves are country-specific. When individual properties are material to the entity, the project team proposes that reserves quantities should be disclosed by property. The only difference from the PWYP proposals that would result in less information being disclosed is that the project team considers that a regional aggregation of reserve quantities is acceptable if the reserves attributable to a country are not material to the entity. This difference arises as a consequence of the materiality constraint that applies to financial reporting information.

Reserve values

- 6.40 Users indicated that if a reserves valuation—being a current value measurement of minerals or oil and gas properties, such as a fair value estimate or a standardised measure of discounted future cash flows—is disclosed, it should be presented on a disaggregated basis rather than as a single entity-wide valuation. Many users acknowledged that, in principle, the valuation should be disclosed at the same level of detail as reserve quantities, but said that the costs of preparing and presenting this valuation at this level of detail might exceed the benefits they would

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derive from this information. Users accepted that disclosing this information by major geographical region might be sufficient for their needs. However, this disclosure would not be sufficiently detailed to be useful to PWYP.

PWYP disclosure 3: Production quantities

- 6.41 PWYP is proposing the country-by-country disclosure of production quantities for the current reporting period. Additional disclosure by key products and key properties is encouraged.
- 6.42 In Chapter 5, the project team proposes that current period production quantities should be disclosed as part of a reconciliation of changes between the opening and closing estimates of reserve quantities. The reconciliation is to be disclosed at the same level of detail as the disclosure of reserve quantities and would identify the produced quantities by commodity. Reserves quantities, and therefore production quantities, would be shown by country (or property) where that is material to the entity. Consequently, the project team's proposals would not include separate disclosure of production quantities by country where those reserves were not material to the entity.

PWYP disclosure 4: Production revenues

- 6.43 The project team does not propose that production revenues should be disclosed on a country-by-country basis. As noted in Chapter 5, production revenue information is usually more relevant to capital providers if it is separately presented by commodity rather than by country. This is because production revenue is typically affected by commodity market factors that are generally international in nature. For this reason, the project team proposes that production revenue should be disclosed by commodity. Usually, disclosure of production revenue by country is useful to capital providers only when the commodity price is influenced by domestic factors (eg domestic gas sales). The project team therefore considers that the incremental benefit to capital providers of requiring the disclosure of production revenues by country would be small if information on production quantities is disclosed by country.
- 6.44 An entity's segment disclosures may provide some further detail on production revenues by possibly separately identifying sales to external customers from inter-entity transfers of the produced commodity to the entity's downstream operations. However, these disclosures are likely to be presented by commodity or business group rather than by country.

PWYP disclosure 5: Development and production costs

- 6.45 The project team proposes that the exploration, development and production costs incurred over a period of, say, five years should be disclosed to provide users with a time series of these cash outflows. This cost information would be disclosed at the same level as the reserve quantities information and therefore would not include separate disclosure of costs by country where the reserves were not material to the entity.

PWYP disclosure 6: Disclosure of key subsidiary and property information

- 6.46 The final PWYP proposal is for country-by-country disclosure of the names of key subsidiaries and the locations of key minerals or oil and gas properties. IFRSs, through IAS 24 *Related Party Disclosures* and IAS 27 *Consolidated and Separate Financial Statements*, already require the disclosure of information about an entity's significant investments in subsidiaries. This requirement is comparable to the PWYP disclosure proposal.
- 6.47 The project team's research showed that information about the locations of key minerals or oil and gas properties is typically available in the management commentary section of annual reports or in other information issued by minerals and oil and gas entities, such as project factbooks. In addition, paragraph 138(b) of IAS 1 requires an entity to disclose a description of the nature of its operations and its principal activities, if that information is not disclosed elsewhere in information published with its financial statements. The project team thinks that these existing disclosures are sufficient for communicating the nature of an entity's operations in countries that are material to the entity. These disclosures would not specify the properties or operations that belong to individual subsidiaries within each country, but information at this level of detail has not been identified by capital providers as being necessary to make informed investment decisions. Accordingly, the project team does not propose that information by subsidiary should be required.

Summary

- 6.48 On the basis of this analysis, country-specific information would be expected to be disclosed for reserve quantities, production quantities, development and production costs, together with a listing of key subsidiaries where that information is material to the entity. The disclosure of reserve values and production revenues would also be disclosed, but it is not expected to be on a country-by-country basis.

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- 6.49 The disclosure of payments to governments is not addressed either in IFRSs or the project team's disclosure proposals in Chapter 5. The project team has undertaken a preliminary review of the cost-benefit implications of disclosing payments to governments. The research shows that the disclosure of payments made to governments provides information that would be used by at least some capital providers in making their investment decisions, either by using the information to make their own assessments of investment risks and reputational risk or by providing better information to other risk analysts that advise the capital providers on investment and reputational risks.
- 6.50 Preparers have suggested that there would be a significant cost associated with disclosing information about payments made to governments. Preparers also raised concerns about the materiality of this information, both in terms of providing the disclosure on a country-by-country basis and the separate disclosure by payment type.
- 6.51 The project team notes that further study is required to conclude on whether the country-by-country disclosure of payments to governments is justifiable on cost-benefit grounds. This cost-benefit assessment could take into account the disclosure of all payments to governments or alternatively the disclosure of those types of payments to governments that are both significant and readily observable from the entity's financial records. To help with this assessment, additional comments on the cost-benefit implications of payments to governments are requested in response to this discussion paper.

Appendix A

Description of extractive activities

	Minerals industry	Oil and gas industry
Prospecting	Prospecting generally covers a large area and involves searching for a geological anomaly or structure that might warrant detailed exploration. Prospecting usually involves researching and analysing historical geological data and carrying out topographical, geological and geophysical studies. Some industry participants do not distinguish between prospecting and exploration activities.	
Exploration	Exploration is the detailed examination of a geographical area of interest that has shown sufficient mineral-producing potential to merit further exploration. Exploration activities include: <ul style="list-style-type: none"> • conducting topographical, geological, geochemical and geophysical studies; and • carrying out exploratory drilling, trenching and sampling activities. 	
	Exploration activities are undertaken to define and delineate a specific ore body and to determine the quantity, mineralogical nature and grade of the ore. In hard metals mining, exploration usually involves taking cores for analysis, sinking exploratory shafts, geological mapping, geochemical analysis, cutting drifts and crosscuts, opening shallow pits, and removing overburden in some areas.	Exploration activities are undertaken to examine in greater detail geological structures that have been identified as potential oil-bearing or gas-bearing formations to determine whether minerals may be present in commercial quantities. Exploration of potential oil-bearing or gas-bearing structures employs techniques such as seismograph shooting, core drilling and the drilling of an exploratory well.
<i>continued...</i>		

EXTRACTIVE ACTIVITIES

<i>...continued</i>		
	Minerals industry	Oil and gas industry
Evaluation	Evaluation activities involve determining the technical feasibility and commercial viability of mineral deposits that have been found through exploration.	
	Evaluation activities include: <ul style="list-style-type: none"> • drilling, trenching and sampling activities to determine the quantity and grade of the deposit; • examining and testing extraction methods and metallurgical or treatment processes; and • detailed economic feasibility evaluations to determine whether development of the reserves is commercially justified and to plan methods for mine development. 	Evaluation activities include: <ul style="list-style-type: none"> • drilling appraisal wells to gain additional information about the size and characteristics of the reservoir; • detailed engineering studies to determine how best the reservoir can be developed to obtain maximum recovery; and • detailed economic evaluations to determine whether development of the reserves is commercially justified.
Development	Development is the establishment of access to the mineral reserve and other preparations for commercial production. Development activities often continue during production.	
	Development activities include: <ul style="list-style-type: none"> • sinking shafts and underground drifts (often called mine development); 	Development activities include: <ul style="list-style-type: none"> • gaining access to and preparing well locations for drilling;
<i>continued...</i>		

<i>...continued</i>		
	Minerals industry	Oil and gas industry
	<ul style="list-style-type: none"> • making permanent excavations; • developing passageways and rooms or galleries; • building roads and tunnels; and • advance removal of overburden and waste rock. <p>Development (or construction) also includes the installation of infrastructure (eg roads, utilities and housing), machinery, equipment and facilities.</p>	<ul style="list-style-type: none"> • constructing platforms or preparing drill sites from which to drill wells to gain access to and produce the oil and gas reserves; • drilling wells to gain access to and produce the oil and gas reserves; and • installing equipment and facilities necessary for bringing the oil and gas to the surface and for handling, storing, and processing or treating the oil and gas to make them marketable or transportable.
Production	Production involves the extraction of the natural resources from the earth and the related processes necessary to make the produced resource marketable or transportable.	
	Depending on the materials removed from the earth and its mineral content, many different processes may be used to convert the ore or other raw product removed from the earth into a marketable product. Crushing and grinding, flotation, leaching, heap leach, milling, settling, and electrowinning are some of the processes commonly used to remove the saleable mineral from the mined ore or rock.	Production activities include lifting the oil or gas to the surface, gathering production from individual wells to a common point in the field, field treating, field processing (eg the removal of impurities and the separation of oil and gas necessary to make the product marketable or transportable), and storage of the production in field storage tanks.

Appendix B

Overview of minerals and oil and gas reserves and resources definitions

- B1 This appendix provides an overview of the following sets of reserve and resource definitions:
- (a) the International Reporting Template for the Public Reporting of Exploration Results, Minerals Resources and Mineral Reserves (the CRIRSCO Template);
 - (b) the Petroleum Resource Management System;
 - (c) the US SEC mineral reserve and oil and gas reserve definitions; and
 - (d) the United Nations Framework Classification for Fossil Energy and Mineral Resources.

The CRIRSCO Template

- B2 CRIRSCO is a Task Force of the International Council for Mining and Metals that is responsible for promoting and maintaining best practice reporting of mineral deposit estimates (ie mineral reserves and resources) and exploration progress (ie exploration results). In July 2006 CRIRSCO published the *International Reporting Template for the Public Reporting of Exploration Results, Minerals Resources and Mineral Reserves* ('the CRIRSCO Template').
- B3 The CRIRSCO Template is a consolidated version of the following national reporting codes:
- (a) the *Australasian Code for Reporting of Mineral Resources and Ore Reserves* (the JORC Code);*
 - (b) in Canada, the *CIM Definition Standards on Mineral Resources and Mineral Reserves* (the CIM Code);†
 - (c) in Chile, the *Certification Code For Exploration Prospects, Mineral Resources And Ore Reserves*;‡

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

† Prepared by the Canadian Institute of Mining, Metallurgy and Petroleum's Standing Committee on Reserve Definitions.

‡ Prepared by the Mineral Resources Committee of the Institution of Mining Engineers of Chile.

- (d) the *Pan-European Code for Reporting of Exploration Results, Mineral Resources And Reserves (the PERC Reporting Code)*;^{*}
- (e) in Peru, the *Code for Reporting of Mineral Resources and Ore Reserves*;[†]
- (f) the *Philippine Mineral Reporting Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves*;[§]
- (g) the *South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the SAMREC Code)*;[¶] and
- (h) in the United States, *A Guide for Reporting Exploration Information, Mineral Resources, and Mineral Reserves (the SME Code)*;[‡]

The definitions in the CRIRSCO Template are either identical to, or not materially different from, the definitions in those national reporting codes.[#]

- B4 The CRIRSCO Template (and each of the national reporting codes)^{**} sets out a framework for classifying tonnage and grade estimates of a mineral deposit according to the levels of geological confidence and degree of technical and economic evaluation. The primary classifications are ‘mineral resources’ and ‘mineral reserves’. A classification for

* Prepared by the Pan-European Reserves and Resources Reporting Committee (PERC).

† Prepared by the Joint Committee of the Venture Capital Segment of the Lima Stock Exchange.

§ Prepared by the PMRC Committee composed of the Philippine Minerals Development Institute Foundation, Philippine Society of Mining Engineers, Geological Society of the Philippines, Society of Metallurgical Engineers of the Philippines, Mines and Geosciences Bureau, The Philippine Stock Exchange, Inc., Board of Investments, Chamber of Mines of the Philippines and the Philippine Australia Business Council.

¶ Prepared by the South African Mineral Resource Committee (SAMREC) Working Group under the Joint Auspices of the Southern African Institute of Mining and Metallurgy and the Geological Society of South Africa.

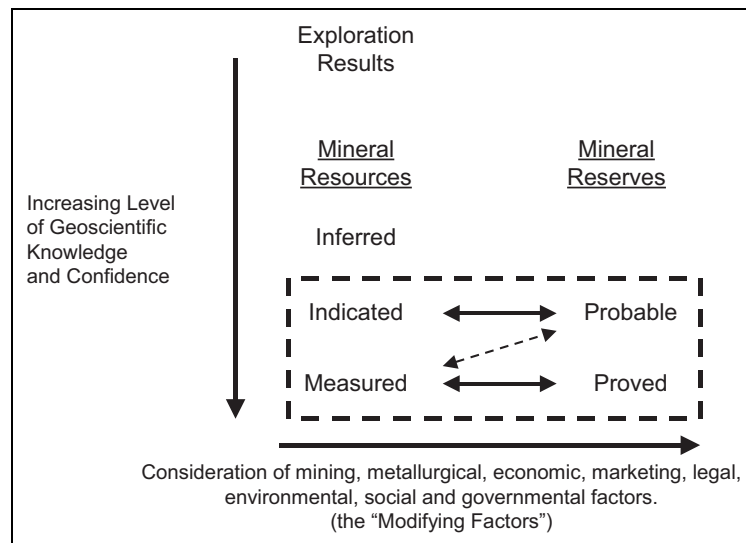
‡ Prepared by the Resources and Reserves Committee of the Society For Mining, Metallurgy And Exploration, Inc.

International Reporting Template for the Public Reporting of Exploration Results, Minerals Resources and Mineral Reserves (CRIRSCO Template), CRIRSCO, July 2006, page 2.

** The CRIRSCO Template is identified as a ‘template’ rather than a ‘code’ because, at present, it is intended to be used to assist jurisdictions to produce their own national reporting codes that are consistent with international best practice. In contrast, the national reporting codes are in most cases incorporated into that country’s securities regulations or stock exchange listing rules to prescribe the basis for the public disclosure of reserve, resource and exploration progress information.

‘exploration results’, which is a precursor to resources and reserves, is also included. The relationship between these classifications is illustrated by the following diagram and discussed further in the paragraphs below.*

Figure B.1



Resource definitions

B5 The CRIRSCO Template defines a ‘mineral resource’ as:

a concentration or occurrence of material of economic interest in or on the Earth’s crust in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence, sampling and knowledge.†

B6 Although a mineral resources estimate is based on predominantly geoscientific information, the CRIRSCO Template explains that the mineral resources classification does not represent an inventory of all mineralisation that has been drilled or sampled. Instead, it is a realistic inventory of mineralisation that might, in whole or in part, become

* CRIRSCO Template, Figure 1

† CRIRSCO Template, clause 19

economically extractable under assumed and justifiable technical and economic conditions. Consequently, any portions of a mineral deposit that do not have reasonable prospects for eventual economic extraction are not to be included as a mineral resource.

- B7 The mineral resources classification is subdivided into the following three categories according to the level of geological confidence associated with the resources estimate:
- (a) a 'measured mineral resource' is that part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a *high* level of confidence;
 - (b) an 'indicated mineral resource' is that part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a *reasonable* level of confidence; and
 - (c) an 'inferred mineral resource' is that part of a mineral resource for which tonnage, grade and mineral content can be estimated with a *low* level of confidence.

Reserve definitions

- B8 Mineral reserves are derived from a mineral resources estimate. The CRIRSCO Template defines a 'mineral reserve' as:

the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified.*

- B9 The assessments and studies described in the mineral reserves definition are generally referred to as feasibility studies, noting that some entities will prepare both a pre-feasibility study (or preliminary feasibility study) and feasibility study (or final feasibility study). It is the content of the feasibility study (rather than its name) that enables the reserves classification to be satisfied. In either case, the objective of a feasibility study is to produce a mine plan that indicates that extraction of the minerals would be technically achievable and economically viable. This mine plan is used in deriving the mineral reserves estimate.

* CRIRSCO Template, clause 28

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B10 Mineral reserves are subdivided into proved reserves and probable reserves. These reserves categories are derived from the measured and indicated resources categories.

(a) 'Proved reserves' represent:

- (i) the economically mineable part of a measured resource (ie a high level of confidence in the geology of the underlying resource); and
- (ii) a similarly high level of confidence in the reserves estimate after considering the effect of the modifying factors (ie mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors) on the estimate.

For some mineral deposits, classification as proved reserves may not be possible because, for example, the erratic distribution of the mineralisation throughout the deposit means that it is not possible or feasible to classify the deposit as a measured resource. In other cases, the proved reserves classification will not be satisfied if the collective effect of the modifying factors that are considered when converting a resource to a reserve result in the reserves estimate having a lower level of confidence than the corresponding measured resources estimate.

(b) 'Probable reserves' are either:

- (i) the economically mineable part of an indicated mineral resource (ie a reasonable level of confidence in the geology of the underlying resource); or
- (ii) the economically mineable part of a measured resource in those circumstances when the proved reserve classification cannot be satisfied.

B11 There are no mineral reserves classifications that are derived from the inferred resources classification. This is because there is insufficient knowledge of the geometry, grade and continuity of the mineral deposit to be able to apply the modifying factors to an inferred resource such that there is confidence in the outcome.

Exploration results

- B12 Exploration results include data and information generated by exploration programs that may be of use to investors but that do not satisfy the definitions of mineral resources or mineral reserves. This 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 to be made.

Estimate preparation

- B13 The CRIRSCO Template is regarded as being a principle-based classification system. It provides a framework for classifying estimates of reserves, resources and exploration results but does not prescribe in detail how those estimates are to be prepared. This is because it is not considered feasible to develop detailed rules to prescribe the techniques and assumptions that must be used in estimating reserves and resources for each individual commodity. Instead, the approach adopted in the CRIRSCO Template (and by the national reporting codes) is to require that the estimates be prepared by 'competent persons', who are suitably qualified and experienced individuals subject to an enforceable professional code of ethics and rules of conduct.*

The PRMS

- B14 The Petroleum Resource Management System (PRMS), published in March 2007, revised the previous reserves and resources definitions that had been published in 1997 and 2000 respectively. The PRMS was developed by the SPE Oil and Gas Reserves Committee, a standing committee of the SPE. Of the sponsors of the PRMS, the SPE, AAPG and SPEE are leading professional organisations in the oil and gas industry and the WPC is the international organisation that represents all aspects of the oil and gas industry.
- B15 The PRMS is designed to provide a common reference for the international oil and gas industry, including national reporting and regulatory disclosure agencies, and to support oil and gas project and portfolio management requirements†. From a regulatory disclosure perspective, the PRMS definitions are proposed to be incorporated into

* For further information, see CRIRSCO Template clauses 7–10 and accompanying commentary.

† *Petroleum Resource Management System (PRMS)*, SPE, 2007, page 1

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the oil and gas disclosure requirements of the Australian Securities Exchange* and are incorporated in the admission requirements for oil and gas entities listing on the London Stock Exchange's Alternative Investment Market.† Although the PRMS is not directly referenced in other regulatory disclosure requirements at this time (despite being widely accepted in the industry for internal management purposes and having been voluntarily adopted by some entities in their public disclosure of reserve or resource quantity estimates), it is:

- (a) very closely aligned with the oil and gas reserves and resources definitions used in conjunction with the Canadian Securities Administrators' National Instrument 51-101 *Standards of Disclosure for Oil and Gas Activities*,§
- (b) comparable to the revised SEC oil and gas reserves definitions in Regulation S-X, Rule 4-10 issued in 2008 (see paragraph B25 for further details).

B16 The PRMS refers to all types of oil and gas as petroleum.^ø It classifies all quantities of petroleum naturally occurring on or within the Earth's crust. Consequently, it classifies quantities of petroleum that have been discovered, quantities that are as yet undiscovered, and quantities that have already been produced. The classifications that will be of most relevance to financial reporting relate to estimates of quantities of petroleum that are discovered and recoverable, but have not yet been produced. This includes the classifications of reserves and contingent resources.

* Australian Securities Exchange, Exposure Draft *Proposed ASX Listing Rule Amendments*, 20 June 2007, proposed Listing rule 5.6A

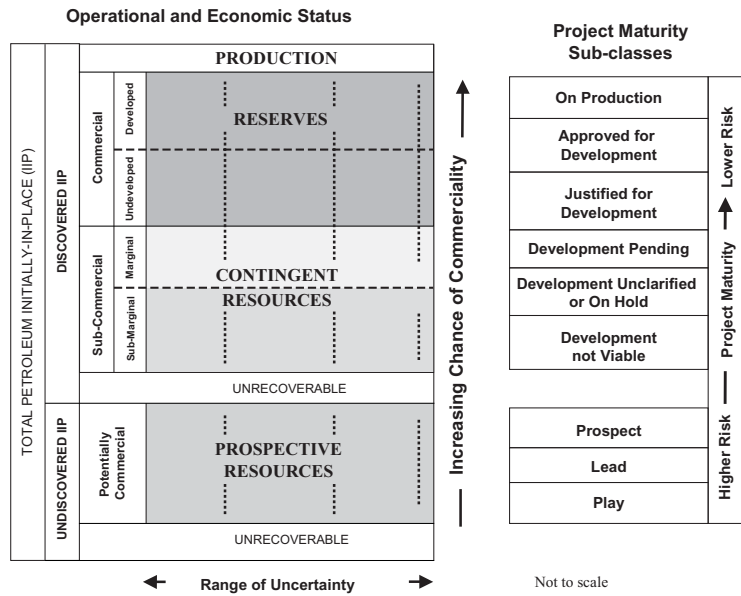
† London Stock Exchange Alternative Investment Market, *Guidance Note for Mining, Oil and Gas Companies*, March 2006

§ NI 51-101 cross refers to the reserve and resource definitions incorporated in the Canadian Oil and Gas Evaluation Handbook (COGEH) that is prepared jointly by The Society of Petroleum Evaluation Engineers (Calgary Chapter) and the Canadian Institute of Mining, Metallurgy & Petroleum (Petroleum Society). Section 5.1.1 of COGEH notes that 'There is now a broad alignment between COGEH and SPE-PRMS definitions and guidelines, but some minor differences remain'. Other industry participants have noted that the PRMS and COGEH are 'very closely aligned' and 'very similar' - see, for example, <http://www.sec.gov/comments/s7-29-07/s72907-29.pdf> and <http://www.sec.gov/comments/s7-29-07/s72907-82.pdf>.

ø Petroleum is defined in the PRMS, at page 2, as 'a naturally occurring mixture consisting of hydrocarbons in the gaseous, liquid, or solid phase. Petroleum may also contain non-hydrocarbons, common examples of which are carbon dioxide, nitrogen, hydrogen sulfide and sulfur.'

B17 The relationship between these classifications in the PRMS is illustrated by the following diagram and discussed further in the paragraphs below.*

Figure B.2



Reserves definitions

B18 'Reserves' are defined as:

those quantities of petroleum anticipated to be commercially recoverable by application of development projects to known accumulations from a given date forward under defined conditions. Reserves must further satisfy four criteria: they must be discovered, recoverable, commercial, and remaining (as of the evaluation date) based on the development project(s) applied.†

* CRIRSCO and SPE OGRC, *Mapping of Petroleum and Minerals Reserves and Resources Classification Systems* (the Mapping Report), September 2007, Figure 2. (This diagram is based on a draft depiction of the PRMS. The corresponding depictions of the PRMS in Petroleum Resource Management System (2007) are presented at figure 1-1 and figure 2-1 of that document.)

† PRMS, section 1.1

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- B19 Reserves are categorised as either proved, probable or possible reserves in accordance with the level of certainty associated with the estimates.
- (a) 'Proved reserves' refers to those quantities of petroleum that can be estimated with reasonable certainty to be commercially recoverable from known reservoirs and under defined economic conditions, operating methods, and government regulations. 'Reasonable certainty' is intended to express a high degree of confidence that the quantities will be recovered (if deterministic estimation methods are used) or that there should be at least a 90 per cent probability that the quantities actually recovered will equal or exceed the estimate (if probabilistic estimation methods are used).
 - (b) 'Probable reserves' have an equal likelihood that actual remaining quantities recovered will be greater than or less than the sum of the estimated proved plus probable reserves (2P). In this context, there should be at least a 50 per cent probability that the actual quantities recovered will equal or exceed the 2P estimate (if probabilistic estimation methods are used).
 - (c) 'Possible reserves' refers to those additional reserves that are less likely to be recoverable than probable reserves. With possible reserves, there is a low probability that the total quantities ultimately recovered from the project will exceed the sum of proved plus probable plus possible (3P) reserves. In this context, there should be at least a 10 per cent probability that the actual quantities recovered will equal or exceed the 3P estimate (if probabilistic estimation methods are used).
- B20 Reserves can also be characterised by their project maturity and/or development and production status. For reserves estimates, the PRMS identifies project maturity subclassifications relating to the business decisions required to move a project towards commercial production. These subclassifications are: 'on production'; 'approved for development'; and 'justified for development'. Subdivisions of the reserves estimate by development and production status are based on the funding and operational status of the wells and associated facilities within the reservoir development plan. These subdivisions are: 'developed reserves', which can be further subdivided into 'developed producing reserves' and 'developed non-producing reserves'; and 'undeveloped reserves'. Broadly speaking, characterising reserves by project maturity or by the status of the reserves can be useful for assessing the risks associated with the project and for forecasting the timing of cash flows associated with future production of oil and gas.

Resource definitions

- B21 'Contingent resources' are defined as:
- those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations, but the applied project(s) are not yet considered mature enough for commercial development due to one or more contingencies. Contingent Resources may include, for example, projects for which there are currently no viable markets, or where commercial recovery is dependent on technology under development, or where evaluation of the accumulation is insufficient to clearly assess commerciality.*
- B22 Like reserves, contingent resources are further categorised in accordance with the level of certainty associated with the estimates. Contingent resources can also be characterised by their project maturity and/or by their economic status. For contingent resource estimates, the project maturity subclassifications are: 'development pending'; 'development unclarified or on hold'; and 'development not viable'. The economic status of contingent resources estimates can be classified as:
- (a) 'marginal contingent resources', which are defined as those quantities associated with technically feasible projects that are either currently economic or projected to be economic under reasonably forecast improvements in commercial conditions but are not committed for development because of one or more contingencies; and
 - (b) 'sub-marginal contingent resources', which are defined as those quantities associated with discoveries for which analysis indicates that technically feasible development projects would not be economic and/or other contingencies would not be satisfied under current or reasonably forecast improvements in commercial conditions. The PRMS advises that these projects nonetheless should be retained in the inventory of discovered resources pending unforeseen major changes in commercial conditions.†

The US SEC definitions

- B23 The US SEC has developed rules that govern the definition and disclosure of mineral reserves and oil and gas reserves by SEC registrants. Separate definition and disclosure requirements exist for minerals and for oil and gas.

* PRMS, section 1.1

† Classifying reserve and resource estimates by project maturity was a feature of the SPE's previous oil and gas reserve and resource definitions. Classifying resource estimates by economic status is a feature that was introduced with the PRMS, and therefore may not be widely adopted at present.

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- B24 SEC Industry Guide 7 *Description of property by issuers engaged or to be engaged in significant mining operations* contains the definitions of mineral reserves, proven reserves and probable reserves. Industry Guide 7 does not define mineral resources because it generally prohibits the disclosure of estimates other than proved or probable reserves. The exceptions to this prohibition are if this information is required to be disclosed by foreign or state law or where such estimates have been previously provided to a person (or any of its affiliates) that is offering to acquire, or to merge or consolidate with, the registrant or otherwise to acquire the registrant's securities.
- B25 SEC Regulation S-X, Rule 4-10 *Financial accounting and reporting for oil and gas producing activities pursuant to the Federal Securities Laws and the Energy Policy and Conservation Act of 1975* contains the definitions of oil and gas reserves. This rule was revised on 29 December 2008. The SEC made the revisions after considering public comments in response to both a Concept Release (issued for comment in December 2007) and a Rule Proposal (issued for comment in June 2008). The revisions to this rule have resulted in the definitions of:
- (a) proved reserves, developed reserves and undeveloped reserves being updated to correspond more closely with current best practices in reserves estimation;
 - (b) probable reserves and possible reserves being added as a consequence of the revisions to the SEC disclosure requirements permitting, but not requiring, the disclosure of probable and possible reserves quantities; and
 - (c) oil and gas reserves now including oil and gas extracted from oil sand, shale, and coal beds. Before the revisions, the extraction of oil and gas from oil sands deposits was regarded as a mining operation with oils sands reserves to be disclosed as minerals reserves.

As a consequence of these revisions, the SEC oil and gas reserves definitions are now generally regarded as being broadly comparable to the reserves definitions in the PRMS. (The SEC definitions generally require historical commodity prices to be used in preparing reserves estimates.* Although the PRMS prefers the use of the entity's reasonable forecast of future prices, it also permits the use of historical prices.†)

* See paragraph 5.53 for further details.

† See PRMS, section 3.1.2.

- B26 The revisions also indicate that the disclosure of oil and gas resources quantities is still prohibited in SEC filings, although a definition of oil and gas resources has been added as part of the SEC revisions. This definition appears to be included for completeness. It indicates that resources include both discovered and undiscovered accumulations that are either estimated to be recoverable or unrecoverable. Consequently, this definition is too broad to be suitable for supporting accounting or disclosure requirements.

The UNFC

- B27 The United Nations Framework Classification for Fossil Energy and Mineral Resources (UNFC) is 'a universally applicable scheme for classifying petroleum and solid mineral (including energy mineral) reserves and resources. The Classification is designed to allow the incorporation of currently existing terms and definitions into this framework and thus to make them comparable and compatible.* It is designed to be a classification system capable of communicating information on fossil energy and mineral quantities that can meet the needs of:
- (a) long-sighted energy (and mineral) policies, which relates to the need to produce international mineral and energy studies in support of long-sighted and robust policies and strategies;
 - (b) government resources management, which relates to the needs of governments in implementing their policies through their resource management;
 - (c) corporate business process management, which relates to the needs of industry and in managing their business processes to serve their host countries, shareholders and stakeholders; and
 - (d) financial reporting, which relates to the needs of the financial community for allocating capital efficiently so as to reduce capital costs to a minimum.

In that regard, the UNFC is designed to classify in-place and recoverable quantities ranging from those that are being produced through to those that may (eventually) be produced but are as yet undiscovered (ie prospective resources) in a manner that meets the needs listed above.

* UNECE Ad Hoc Group of Experts on Harmonization of Fossil Energy and Mineral Resources Terminology *Report of the Task Force on Mapping of the United Nations Framework Classification for Fossil Energy and Mineral Resources*, 8 April 2008, page 7.

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- B28 The UNFC for minerals was recommended to be used by UN member states in 1997 and has been legislated in mineral-producing countries such as India and Ukraine. It was adapted to oil and gas in 2004. Accordingly, the UNFC is the only known classification that harmonises the main minerals and oil and gas classifications and is recognised and recommended for global use.
- B29 A revised version of the UNFC was issued in 2009 that, among other things, enables the CRIRSCO Template and the PRMS to be mapped closely to it. This means that, for example, entities providing reserve and resource disclosures that are consistent with the CRIRSCO Template and the PRMS definitions should be able to express them according to the classifications in the UNFC system.
- B30 The detailed formulation of the UNFC is being further developed jointly by CRIRSCO, SPE/WPC/AAPG/SPEE and a broad group of stakeholders. Part of the work consists of fine-tuning the classification to the needs that it is meant to serve. Financial reporting is one of them. Work is also under way:
- (a) to consider developing specifications (ie secondary rules) to meet stakeholder requirements; and
 - (b) to determine the long-term governance model for the UNFC.

Appendix C

User survey process

Purpose of the user survey

- C1 The survey was conducted to seek input from financial reporting users on:
- (a) how historical cost information on reserves and resources currently included in financial statements is used by users;
 - (b) how current value information on minerals and oil and gas reserves and resources included in financial statements might be used by users;
 - (c) attributes that should be included in a current value measurement of a minerals or oil and gas deposit for financial reporting purposes so that it would be useful to users;
 - (d) information that should be disclosed in financial statements to provide support for a current value measurement; and
 - (e) usefulness of a current value measurement relative to existing historical cost measurement models.

Number of responses

- C2 A total of 34 users were surveyed over the period from late February 2007 to early May 2007. All surveys were conducted either as face-to-face interviews or as telephone interviews.

User profile

- C3 The following types of users were interviewed:
- (a) users who cannot command tailored financial reporting information—specifically:
 - (i) buy-side analysts/fund managers: six interviews;
 - (ii) sell-side analysts: 21 interviews; and
 - (b) users who can command tailored financial reporting information but usually begin their analysis with publicly available information—specifically:
 - (i) venture capital: two interviews;

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- (ii) lenders: three interviews; and
 - (iii) debt-ratings agencies: two interviews.
- C4 The user survey interviewees were drawn from Australia, Canada, South Africa, the United Kingdom and the United States. The responses from the users surveyed therefore provide insights to the usefulness of the different types of information generated by minerals and oil and gas entities reporting in different jurisdictions. The users surveyed have a mix of backgrounds (eg as a geologist or a finance professional), and market specialisations (minerals or oil and gas, large producers or small explorers, specific minerals etc) and generally have 10 or more years' experience in analysing minerals or oil and gas entities.
- C5 As part of the user survey, the research project team also had informal discussions with certain market and securities regulators including staff from the United States Securities and Exchange Commission, the Ontario and Alberta Securities Commissions, and the Johannesburg Stock Exchange.

Survey questions

- C6 The user survey questions addressed the following topics:
- (a) the investment and lending decision process, including:
 - (i) the minimum information that users need to make informed investment or lending decisions in relation to a mining or oil and gas entity;
 - (ii) the extent to which the information needs differ depending on:
 - (A) whether the entity is involved only in exploration activities, upstream activities or upstream and downstream activities; and
 - (B) the type of mineral, oil or gas involved;
 - (iii) the sources of this information, such as financial statements, management commentary and the entity's website;
 - (b) the usefulness of existing reporting practices, including:
 - (i) whether measuring mineral or oil and gas property assets in the statement of financial position at their historical costs provides useful information; and

- (ii) whether measuring mineral or oil and gas property assets acquired in a business combination at their fair value provides useful information;
- (c) the current value measurement of mineral or oil and gas property assets, including:
 - (i) the advantages and disadvantages of presenting a current value measurement in the statement of financial position (and which would be supplemented by disclosures to help users understand the measurement) compared with providing only value-based information disclosures;
 - (ii) the most appropriate model for valuing these assets (eg discounted cash flow models);
 - (iii) whether the current value measurement should assign value to the entire deposit or exclude value attributable to some categories of reserves or resources;
 - (iv) whether development works and infrastructure assets should be recognised separately from the minerals or oil and gas property asset;
- (d) when the mineral or oil and gas property assets should initially be measured at current value (eg at acquisition of the exploration rights, discovery or project approval) and how frequently should the asset be remeasured (eg each reporting period, each annual reporting period or only when a significant event has occurred);
- (e) the level of detail (or disaggregation) associated with presenting the current value measurement and disclosing the supporting information and assumptions, such as reserve and resource volumes, that provides useful information and should be practical to prepare;
- (f) the disclosure of supporting information and assumptions, including:
 - (i) which categories of minerals or oil and gas reserve and resource quantities should be disclosed;
 - (ii) whether the assumptions used for commodity prices, exchange rates and discount rates should be either a market participant's assumptions, entity-specific assumptions or standardised assumptions, and whether the assumptions used should be disclosed;

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- (iii) whether the following types of information should be disclosed in the notes to the financial statements:
 - (A) development and production schedules;
 - (B) development and production costs; and
 - (C) taxation and royalty obligations;
- (g) whether the disclosure of reconciliations of changes in reserve and resource quantity estimates and changes in current value measurements would provide useful information;
- (h) whether the reserve and resource quantity estimates and the current value measurement should be required to be audited, prepared by an independent consultant or prepared by a competent person (as determined by relevant professional bodies), noting that the competent person may be either an employee or external to the entity; and
- (i) for users of oil and gas entity financial reports, whether they currently use the US GAAP standardised measure of proved oil and gas reserves in their analysis and, if so, how they use it and what are the deficiencies (if any) in the standardised measure.