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International Accounting Standards Board

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INFORMATION FOR OBSERVERS

Board Meeting: **16 October 2006, London**

Project: **Extractive Activities research project**

Subject: **Assessing fair value of a reserve/resource asset according to the qualitative characteristics of financial reporting information (Agenda Paper 4D)**

Purpose of this paper

1. This paper considers whether adopting fair value as either the measurement or disclosure objective for minerals or oil & gas reserves and resources would satisfy the qualitative characteristics of decision useful financial reporting information, as identified in the IASB's July 2006 Discussion Paper *Preliminary Views on an improved Conceptual Framework for Financial Reporting: The Objective of Financial Reporting and Qualitative Characteristics of Decision useful Financial Reporting Information* (hereafter the "proposed Framework").

Relationship of this paper within the agenda paper package

2. The primary purpose of this agenda paper package is to consider *if* minerals and oil & gas reserves and resources should be measured at fair value. This question is addressed in this Paper.

3. As outlined above, this paper evaluates whether an estimate of the fair value of reserves and resources would be consistent with the qualitative characteristics of

the proposed Framework. This assessment takes into account responses to the research project team's request for information on the measurement of reserve/resource volumes and values that were received from the research project's Advisory Panel members and other interested parties. The Appendix to this paper provides summaries of the request for information and the key points raised by the respondents. The Appendix has been omitted from the observer note.

4. In making this assessment of an estimation of fair value as a measurement or disclosure objective for reserves and resources, the research project team has concluded that the:

   (a) income approach would usually be used to estimate the fair value of reserves and resources – this was addressed in Agenda Paper 4A;

   (b) unit of account for the fair value measurement of reserves and resources should be the cash-generating unit (CGU), as determined in accordance with IAS 36 *Impairment of Assets* principles – this was addressed in Agenda Paper 4B; and

   (c) fair value would be identified as a Level 3 fair value in accordance with the fair value hierarchy outlined in FAS 157 *Fair Value Measurements* as significant inputs to the estimate are unobservable inputs – this was addressed in Agenda Paper 4C.

5. Agenda Papers 4E and 4F follow on from this assessment of the suitability of fair value measurement of reserves and resources by briefly looking at:

   (a) the previous conclusions reached by standard-setters in relation to the fair value measurement of oil & gas reserves and other non-financial assets – refer Agenda Paper 4E; and

   (b) possible alternatives to the fair value measurement of reserves and resources that could be explored further by the research project – refer Agenda Paper 4F.

Outline of paper

6. This paper is structured as follows:

   (a) paragraphs 7-10 discuss the objectives of financial reporting;

(b) paragraphs 11-83 assess the fair value measurement of reserves and resources according to the qualitative characteristics of decision-useful financial reporting information; and

(c) paragraphs 84-86 present the research project team's views regarding the suitability of fair value as a measurement or disclosure objective for minerals and oil & gas reserves and resources.

Objective of financial reporting

What is the objective of financial reporting?

7. An assessment of the suitability (or otherwise) of measuring or disclosing mineral or oil & gas reserves and resources at their fair values must be made in the context of the overall objective of general purpose external financial reporting (for convenience hereafter referred to as "financial reporting"). The proposed Framework, at paragraph OB2, explains that the objective of financial reporting is to:

> …provide information that is useful to present and potential investors and creditors and others in making investment, credit, and similar resource allocation decisions.

8. The proposed Framework suggests that financial reporting should provide information that allows users to assess the amounts, timing, and uncertainty of the entity's future cash inflows and outflows (the entity's future cash flows) (refer paragraph OB3). To make such an assessment of an entity's cash generating ability users need to know the nature and quantity of the resources available for use in an entity's operations (refer paragraph OB20).

9. The research project team is therefore assessing the suitability of fair value measurement of reserve and resource assets as an alternative measurement basis to historical cost (which represents existing practice in extractive activity accounting) because the costs incurred in exploration, evaluation and development of a minerals or oil & gas deposit has no necessary correlation with the cash flows that may be capable of being generated from the deposit. In this respect, minerals and oil & gas reserves and resources are different from many other types of assets (e.g. machinery) where the cost of the asset at initial

acquisition is likely to be indicative of the cash generating potential of the asset.[1]

10. In considering the potential application of fair value to reserves and resources, it is notable that the objective of general purpose financial reporting to provide decision-useful information does not require the measurement of items to necessarily be precise. The imprecision within financial reporting is acknowledged by the proposed Framework, which at paragraph OB15 states that "To a significant extent, financial reporting information is based on estimates, rather than exact measures…". The proposed Framework acknowledges that users of financial reports therefore "need to be aware of the characteristics and limitations of the information in [financial reports]" (paragraph OB15).

Qualitative characteristics

11. This section considers estimates of the fair value of a reserves and resources asset according to the qualitative characteristics of decision-useful financial reporting information, which are identified by the proposed Framework as being:

    (a) relevance;

    (b) faithful representation;

    (c) comparability; and

    (d) understandability.

12. Relevance and faithful representation are deemed to be essential characteristics. Comparability and understandability are desirable, but are subsidiary to relevance and faithful representation. Each of these factors however are subject to the constraint that the benefits of presenting the financial reporting information should exceed the related costs.

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[1] In respect of this criticism of historical cost, some Advisory Panel members have noted that, subsequent to initial acquisition, depreciated cost is unlikely to be a good indicator of future cash flows of assets in many other industries as well (e.g. long-lived assets held by utilities). They therefore argue that the extractive industries should not be singled out by moving to fair value measurement to redress a criticism of historical cost that has broader relevance.

Relevance (other than timeliness)[2]

13. The proposed Framework (at paragraph QC8) suggests that relevant information is information that is capable of making a difference in the decisions of users by helping them to either:

    (a) evaluate the potential effects of past, present, or future transactions or other events on future cash flows (predictive value); or

    (b) confirm or correct their previous evaluations (confirmatory value).

14. Fair value measurement of reserves and resources is considered to provide relevant information for:

    (a) investment decision-making; and

    (b) assessing the past performance of management.

Investment decision making

15. The relevance of information relating to minerals and oil & gas reserves and resources to investment decision making is clearly acknowledged in the following quotes:

> Reserves and resources are the life blood of the mining industry. As a result, they also have a large role in determining equity market values as well as accounting profits. Indeed, much of the value of the mining industry is derived from reserves and resources that are not recorded on companies' balance sheets.
> Source: *mine* review of global trends in the mining industry*, PricewaterhouseCoopers, May 2004, page 27
>
> Oil & gas reserves information is vitally important as a driver of market values of publicly quoted companies in the sector. It is also critical to the calculation of reported income, through its use in asset depletion and impairment calculations.
> Source: *Presenting the full picture. Oil & gas: reserves measurement and reporting in the 21st century*, Deloitte, 10 February 2005, page 1
>
> The value of the reserves is the prime aspect of the valuation of a pure exploration and production oil and/or gas company and in many instances the most important aspect in the valuation of the major integrated oil companies.
> Source: An analyst's response to the research project team's request for information
>
> The fair value provides the most relevant information regarding the largest asset currently unrecorded on the financial statements—mineral reserves.
> Source: An Advisory Panel member's response to the research project team's request for information

16. Although the PwC and Deloitte quotes are not proposing that reserves and resources should be measured at fair value, two things are evident from the above quotes:

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[2] Timeliness is considered below at paragraphs 28-33.

(a) reserves and resources are key drivers in determining the market values of an entity's equity; and

(b) under current reporting practice, the value attributable to reserves and resources is generally not reflected in the asset measurement on the balance sheet.

17. The fair value measurement of reserves and resources is considered to have predictive value as it is a representation of the cash flows that are expected to be generated by the asset. Current historical cost reporting practice does not provide the same level of relevant information about expected future cash flows. This is because the value of a reserve and resource asset can be very different from the cost of acquiring it. The asset could be found through exploration, in which case there is no nexus between the fair value of the asset and the costs incurred in finding and developing the asset (unless the capitalised costs that have been incurred have been written down to fair value as a result of an impairment). Alternatively, the asset could have been acquired at a discount or a premium, or there may have been a change in the economic and political factors that prevailed at the time the acquisition was made.

18. Users indicated that fair value information may also be useful for assessing:

(a) the value of an entity relative to the market price of its equity instruments; and

(b) an entity's borrowing capacity and its ability to repay.

19. Users explained that a reported fair value estimate would be used as an input or data point when they develop their own valuation of the asset or the entity.

20. Significantly, users would not rely only on a fair value estimate. They may hold different views on some assumptions that would influence the fair value estimate and also may be concerned about possible bias within the fair value estimate. For these reasons, users expressed a strong preference for the disclosure of inputs to the fair value estimate so that they can adjust those inputs as they see fit in developing their valuation. This is broadly consistent with the following statement in paragraph OB20 of the proposed Framework on the objective of general purpose financial reporting:

> …[Information about an entity's financial position] is also likely to help those who wish to estimate the value of the entity, but financial reports are not designed to show the

value of an entity. Estimating the value of an entity would require taking into account information in addition to that provided in financial reports, for example, general economic conditions in the industry in which the entity operates.

21. A consequence of measuring the reserves and resources unit of account (which in Paper 2 is identified as the CGU, as per IAS 36 principles) at fair value is that in some cases fair valuing the unit of account will be tantamount to fair valuing the entity. This is particularly true for single mine or field companies, whereby the CGU represents the totality of the entity's business. It may also hold true for larger entities with several mines or fields, because to the extent that each CGU is operated as a separate business, the fair value measurement of the unit of account will similarly represent a fair value of each business of the entity. These outcomes appear to be in conflict with the statement in paragraph OB20, because the fair value of the reserve and resource unit of account will be influenced by factors such as "general economic conditions in the industry in which the entity operates". Some of the Advisory Panel members raised the concern that fair valuing reserves and resources could lead to an attempt to capture market capitalisations in balance sheets. The research project team agrees that the use of fair value as a measurement objective in such cases has the potential to blur the distinction between reporting of the financial position of the entity and the market capitalisation of the entity.

Information that is not available under historical cost models

22. Fair value measurement provides information on an entity's reserves and resources that is not readily accessible under current reporting practice. In the absence of the recognition and fair value measurement of reserves and resources, users have to undertake their own valuation of the entity's reserves and resources assets. These valuations must be made on the basis of available information, which in accordance with current reporting practice for minerals and oil & gas reserves and resources usually involves:

    (a) historical cost accounting of minerals and oil & gas properties – which, broadly speaking, involves capitalising:

        (i) costs incurred in the exploration, evaluation and development of reserves and resources;[3]

[3] The exploration, evaluation and development costs that are capitalised are determined according to the historical cost model that the entity applies to those costs. The model applied may be a

(ii) the purchase price for any acquired reserves and resources;

(b) disclosure of volume estimates for one or more categories of reserves and resources, which may (or may not) be prescribed by an accounting standard, rules set by a securities regulator, or stock exchange listing rules; and

(c) only for oil & gas entities that apply US GAAP, the standardised measure of proved oil & gas reserves.

23. Only disclosing reserve and resource volumes does not permit a user to appreciate the cash flow generating potential of a reserves and resources asset. Reserves essentially represent the portion of a minerals or oil & gas deposit that is expected to be economically recoverable – in other words, extracted at a profit. Therefore, the disclosure of reserve (and resource) volumes provide an indication of the volumes that may be produced profitably, but it does not indicate either the quantum of net cash flows that are expected from production or how susceptible the volume estimate is to changes in commodity prices or operating costs. An example of this can be found in the oil & gas industry. The high oil price in recent years has resulted in some companies that are parties to Production Sharing Contracts reporting lower reserves volumes because their entitlements to "cost oil" (i.e. barrels of oil that the company is entitled to under the contract to recoup costs incurred in exploration, evaluation and development) is less when the oil price is high. (In other words, fewer barrels of oil are needed for the company to recoup the costs it has incurred on that project.) This has the potential to confuse some users of reserve and resource disclosures because, although the volume of disclosed reserves might fall, the cash flows expected to be generated from those reserves should not change.

Assessing past performance of management

24. Assessing the past performance of management is not limited to determining the return management has generated on the funds entrusted to it by investors and creditors. It also involves determining how well management is managing the entity's asset base. In the research project team's opinion, ascertaining both the return on capital and return on assets is arguably more significant in the

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form of successful efforts accounting, full cost accounting, area of interest accounting, or may involve the expensing of all exploration and evaluation costs.

extractive industries, where there is no necessary nexus between the costs incurred and the value of resultant assets (i.e. the discovered reserves and resources). The return of capital indicates how well management has invested the funds under its control – that is, it measures the income earned from the capital invested. In contrast, the return on assets helps to indicate whether management is using the asset efficiently or whether another entity may be able to use the asset more efficiently – that is, it measures the income earned relative to the value of the asset.

25. The research project team considers that both measures provide decision-useful information. Working out the return on capital requires access to historical cost information, which is available in financial reports. However working out the return on assets requires knowledge of asset fair values (or information to estimate fair values), which presently is not readily available in financial reports.

Reporting of cost information in a fair value measurement environment

26. The research project team does not intend that the reporting of fair value and costs incurred during the exploration, evaluation and development phases be mutually exclusive. There was unanimous support among users for the continued reporting of cost information. Cost information was identified as being useful for things such as:

    (a) assessing the quality of management's stewardship of the funds entrusted to it;

    (b) determining the cost of acquiring reserves and resources;

    (c) calculating the return of capital spent, and therefore determining the performance of management; and

    (d) providing a (preliminary) indicator of future capital costs and depreciation charges.

27. The research project team acknowledges that this information should be available to users under a fair value model through disclosures and cash flow statements. If a fair value model is to be adopted, how such information will be presented will be a subject for further research.

Timeliness

28. The proposed Framework (at paragraph QC8) explains that relevant information is also timely information. That is, for information to be relevant it must be available to decision makers before it loses its capacity to influence decisions.

29. The time (and cost) required to prepare a fair value estimate for reserves and resources has the potential to adversely affect the relevance of the information reported. Existing practice in reporting reserve and resource volumes and, for SEC registrants, standardised measure calculations for proved oil & gas reserves can provide an insight to the challenges in preparing reserve and resource information in a timely fashion. However, the research project team acknowledges that the time and effort required to prepare fair value estimates clearly would be more involved. This is not just because a fair value estimate is a more comprehensive calculation but also because the fair value would generally need to be audited if the fair value were reported on the balance sheet or in the notes to the financial statements. At present, reported reserve and resource volumes and the standardised measure are generally unaudited.

30. In preparing minerals or oil & gas reserve and resource estimates for public reporting purposes, Advisory Panel members explained that the process for estimating reserve and resource volumes involves an initial estimate of volumes at some point during the year, with the year-end estimate representing the initial estimate adjusted for any material changes in the inputs used.

31. The standardised measure for proved oil & gas reserves is prepared on the basis of the publicly reported proved reserves volumes. Advisory Panel members advised that the standardised measure will usually be calculated around 4 weeks after the volumetric data is available, although some noted that the elapsed time for preparing the measure can be up to three months (e.g. November to January). This timeframe is indicative of the reporting timetable the companies are working to. One Advisory Panel member noted that the incremental effort involved in developing the standardised measure can be attributed to "determining the revenue based on the proved production forecast and the relevant applicable year-end prices, estimating the development expenditures, production expenses, abandonment expenditure as well as the related tax

calculations in order to arrive at a discounted cash flow standardized value for the proved reserves".

32. The general consensus among Advisory Panel members was that a fair value measure would necessitate a significant increase in the level of effort and preparation time compared with either a standardised measure or a reserve and resource volume estimate. Some of the specific reasons for this are explored later in this paper in the context of benefits and costs (see paragraphs 75-83).

33. The research project team agrees that the effort required to prepare fair value estimates would be (far) greater than currently required for reserve and resource volumes estimates and standardised measure calculations. The elapsed time required to finalise the fair value calculation within the confines of the financial reporting timetable, which is dependent on the jurisdiction but commonly 6-8 weeks after the close of the reporting period, would be, at best, similar to that required for reserve and resource volume estimation but conceivably may take longer due to, among other factors, allowing sufficient time for audit of the fair values. This will have some impact on the timeliness of the fair values reported (i.e. they may not be true year-end estimates of fair value of the asset).

Faithful representation

34. The proposed Framework (at paragraph QC16) suggests that for information to be useful in making resource allocation decisions, it must be a faithful representation of the real-world economic phenomena that it purports to represent. The economic phenomena represented in financial reports are identified as:

    (a) economic resources and obligations; and

    (b) the transactions, and other events and circumstances, that change them.

35. For information to be a faithful representation of this economic phenomena, it must be:

    (a) verifiable;

    (b) neutral; and

    (c) complete.

Verifiability of underlying minerals or oil & gas volume estimate

36. The proposed Framework explains that "verifiability implies that different knowledgeable and independent observers would reach general consensus, although not necessarily complete agreement, either:

    (a) that the information represents the economic phenomena that it purports to represent without material error or bias (by direct verification); or

    (b) that the chosen recognition or measurement method has been applied without material error or bias (by indirect verification)" (paragraph QC23).

37. Information about in-situ minerals and oil & gas volumes is generally communicated in terms of estimate of reserve and resource volumes. For this information to be verifiable, ideally there should be a general consensus that the information represents the minerals or oil & gas deposit without material error or bias. However reserves and resources cannot be directly verified as the in-situ volumes cannot be counted or observed because they are not definitive measures – they can only be estimated.

38. Verifiability of reserve and resource information is therefore limited to indirect verification which means that "the amount or other representation is verified by checking the inputs and recalculating the outputs, using the same accounting convention or methodology" (paragraph QC25). The proposed Framework notes that indirect verification, by itself, is not ideal because a general consensus that the method was applied appropriately does not mean that the amount faithfully represents the economic phenomena; in other words, the amount could still be subject to material error notwithstanding that the estimation method was applied appropriately. Nevertheless, indirect verification provides some assurance that the method used was applied carefully and without material error or bias.

39. Challenges with verifying the fair value of reserves and resources include:

    (a) knowledge about the minerals or oil & gas deposit;

    (b) the large number of variables required to estimate a fair value for reserves and resources; and

(c) the susceptibility of the fair value estimate to material changes in value based on changes in assumptions.

Knowledge about the minerals or oil & gas deposit

40. Underpinning a minerals or oil & gas reserve and resource estimate is the understanding of the geology of the deposit. Some of this uncertainty can be minimised by collecting adequate data and ensuring that the estimate is performed by competent and experienced personnel. Nevertheless, some uncertainty remains because the data collected is always sparse relative to the size of the deposit. For example, in the case of mineral reserves and resources it has been noted that:

> A point often overlooked when considering the reliability of a Resource/Reserve estimate for a new deposit is the fact that the geological model, upon which the estimate is wholly dependent, is based almost entirely on interpretation from drill samples which themselves represent only a tiny fraction of the mineralised body (often less than 0.001%).
> Source: Stephenson, P R and Vann, J, 2001. *Common Sense and Good Communication in Mineral Resource and Ore Reserve Estimation* – The AusIMM Guide to Good Practice (Ed: A C Edwards). pp13-20 (The Australasian Institute of Mining and Metallurgy: Melbourne)

41. The reserve and resource estimation challenge in the minerals industry depends on factors such as the location and shape of the deposit and the geological variability of the deposit. The challenge will be greater for some minerals (e.g. diamonds) where geological variability may be more extreme than for others (e.g. coal) where the geology may be more constant.

42. Although there are generally accepted processes and practices in estimating in-situ minerals and oil & gas volumes, verifying the volume estimate is difficult due to the data collected representing a very small sample of the overall deposit and therefore the reliance on estimate preparers to exercise their judgment in order to interpret the data and develop a reserve and resource estimate. Therefore, the reliability of the estimate is largely dependent on the competence and experience of those involved in making the estimation.

43. Some may question why disclosing reserve volumes is appropriate given the difficulties with verifying the estimates. In fact, for these very reasons, some jurisdictions place restrictions on which categories of reserves and resources can be publicly disclosed and on how those reserves and resources are to be estimated. Dealing with uncertainties in reported reserve and resource estimates is also achieved by reporting the estimates according to clearly defined

categories that indicate degrees of uncertainty (e.g. proved, probable, and in the case of oil & gas reserves, possible). These categories are understood to group together a range of uncertainty (e.g. a probable oil & gas reserve may include reserves with an 85% probability of being produced and those with a 55% probability).

44. It is important to note that a minerals or oil & gas deposit may contain more mineralisation or oil & gas than has been classified as a reserve or resource. The confidence in the quantity (and quality) of this mineralisation or oil & gas will, by definition, be less than the disclosed reserve and resource volumes. For instance, possible reserves (in respect of oil & gas) and inferred resources (in respect of minerals) are estimates with a low level of confidence.[4] Nevertheless regardless of the reserves and resources classifications that are presently disclosed by an entity, the scope of the fair value estimate would include the reserve and resource volumes as well as any additional volumes that potentially would be classified as reserves and resources in the future. In other words, the scope of the fair value estimate would include any future prospectivity associated with the deposit.

45. The fair value of a property includes all the reserves, whatever degree of certainty attaches to them, but the degree of uncertainty of different parts of the reserve will affect the fair value. Clearly, information on reserves and resources is critical to understanding an extractive entity and disclosing reserves in well defined categories is the optimal disclosure given the uncertainties. This does not necessarily mean the disclosed data is a good input to a fair value estimate.

The large number of variables

46. Reserves and resources are essentially estimates of the volumes that are – or are expected to become – economically recoverable. Determining whether a unit of volume is economically recoverable requires assumptions to be made about factors such as the development and production schedule, capital and operating costs, commodity prices, taxes and royalties, exchange rates and discount rates. As noted in Paper 3 (about applying the fair value hierarchy to reserves and resources), these assumptions are used to assess whether volumes are

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[4] Although possible reserves (in the context of oil & gas) and inferred resources (in the context of minerals) are not directly compatible concepts, they are both classifications that are used to communicate that a low level of confidence exists in the estimate.

economically recoverable, and would also be applied to value the deposit – that is, quantify the extent to which the volumes are economic.

47. An Advisory Panel member outlined the following subjective assumptions and/or risks that would need to be reflected in a fair value calculation. This list was prepared from an oil & gas perspective, but the research project team considers that the factors mentioned would also be relevant to the fair value measurement of mineral reserves and resources. These subjective assumptions and/or risks in a fair value calculation are considered to include:

    (a) future market conditions and the resulting impact of future prices;

    (b) future tax, legal and fiscal regimes that will be in place when the reserves are produced;

    (c) future inflation levels and the impact on development and production costs;

    (d) availability and quality of labour, material and equipment in each geographic region and the impact on the development schedule and on development and production costs;

    (e) political stability of the country of operation and the related impact on both future cash flows and the discount rate used to value those cash flows, including the risk of expropriation;

    (f) security risk;

    (g) risk of reserve/resource estimates being incorrect;

    (h) development and operating risks;

    (i) risk of not being able to optimally produce reserves with the available technology; and

    (j) development of existing and future markets, including the proximity to those markets.

    Many of these assumptions and risks would also apply to the fair value measurement of assets in other industries (e.g. agriculture). However, arguably the subjectiveness of a fair value estimate of reserves and resources relative to other assets has the potential to be compounded due to the number and extent of variables involved in estimating the fair values of reserves and resources.

48. Inputs such as these which would be used to develop a reserve and resource volume estimate – and indeed the fair value estimate[5] – largely comprise asset-specific or entity-specific assumptions. For instance, key drivers of the estimate of future cash flows that are asset-specific include the estimated size of the underlying recoverable resource, the schedule for developing and producing the resource and the costs that will be incurred to develop, extract and transport the product. Accordingly, even if some of the inputs to the reserve and resource estimate can be directly verified by reference to observable market data (most likely commodity prices and exchange rates, if at all), the reserves and resources estimate will nevertheless remain incapable of being directly verified. To be able to indirectly verify a reserve and resource estimate – either a volume or value estimate – would require either:

    (a) the disclosure of the inputs used to prepare the estimate – noting that, given the number and complexity of assumptions used to prepare the estimates, the disclosures would be voluminous[6] and may include material that is deemed to be commercially sensitive; or

    (b) the estimate would have to be subject to independent audit.

Susceptibility to material changes in value based on minor changes in assumptions

49. Reserve and resource volume estimates are a point in time estimate. They are dynamic and change (and can change considerably) if an input to the estimate is revised. This is even more pronounced with fair value estimates. One preparer from the mining industry explained that assumptions about changes in mineral commodity prices will always affect the fair value estimate but may not necessarily affect the reserves and resources volume estimate.

50. The susceptibility to material changes in value based on changes in assumptions is compounded by the long life of many minerals and oil & gas deposits. This is highlighted in the following case study of the valuation of Olympic Dam in Australia.

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5 Agenda Paper 4C concluded that a fair value estimate of reserves and resources would be expected to be identified as a Level 3 fair value measurement, in accordance with FAS 157.

6 See further discussion in relation to the assessing a fair value measurement of reserves and resources in accordance with the completeness qualitative characteristic.

Case study – Olympic Dam

51. Olympic Dam is located in Australia and contains copper, uranium, and gold reserves and resources. It is estimated that production at Olympic Dam will continue for at least 60 or 70 years, depending on the production plan that is applied.

52. A valuation of Olympic Dam was prepared in late 2004 by Grant Samuel and Associates as part of an Independent Expert's Report it prepared for WMC Resources Ltd in response to an acquisition proposal made by Xstrata Plc. Grant Samuel's report was published in WMC's Target Statement of 4 January 2005. Grant Samuel valued WMC's Olympic Dam operations in the range of US$3.7 – 4.1 billion and noted that the valuation reflected both the value of current operations and the potential for a major expansion in production volumes. The valuation was based on discounted cash flow analysis of two scenarios for the long term development of Olympic Dam. The valuation noted that:

> Olympic Dam is a unique asset within the international resources sector. Despite the substantial scale of its current operations, it is essentially still at an early stage of its development. Its vast resource and very long mine life mean that there are a number of future development options for the project, some of which are not yet contemplated. Its value will be significantly affected by developments in the uranium market, which appears to be in a state of transformation. Accordingly, estimates of the value of Olympic Dam are inevitably imprecise.

53. The fact that Olympic Dam is a long-lived asset that is still in early stages of development means that its fair value also reflects a pronounced "option value".[7] The valuation described this as:

> Management's ability to change production rates, operating strategies and other aspects of the project means that significant positive and negative movements in the copper or uranium prices over the life of the project would have disproportionately positive impacts on the value of Olympic Dam. Olympic Dam may be able to take advantage of future technological improvements or other developments to mine and treat mineralisation that is not currently economic. Given the very long project life, even after the contemplated expansion of production to around 500,000tpa, it is reasonable to expect further project expansions in the future.

54. The research project team considers that it would be difficult to verify an estimate of the option value of a property such as Olympic Dam, as it would require a general consensus on what the inputs to the option value would be and how the option value should be measured. Presumably it would only be possible to reach a general consensus for a range – most likely a very broad

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[7] "Option value" was the term used by the valuer.

range – reflecting the expectation that individual estimates would vary significantly depending on the individual's expectations for the future. In the context of reserve and resource volume reporting, the research project team notes that volumes attributed to "option value" would not be expected to be classified as reserves.

55. Estimating fair value for long-lived assets means that it may be necessary to forecast cash flows beyond the period for which development and production plans can themselves be reasonably forecast. This was evidenced by the approach adopted in valuing Olympic Dam. The valuation comprised:

    (a) forecast cash flows for a 30 year or 33 year period, depending on the development scenario being modelled; and

    (b) terminal values for the value that would be realised after the forecast period, which was indicated as being a further 40 years or 30 years of operation depending on the development scenario being modelled.

    In the absence of detailed plans, the estimation of terminal values may be based on some general assumptions about ongoing cash flows. The uncertainty with those estimates is tempered by the effect of discounting long-term future cash flows. The valuation noted that the terminal value would contribute approximately US$450 million to the NPV in Scenario A and US$700 million in Scenario B, based on mid-point prices, a 9% discount rate and 3.5% cost inflation. This represents between 11% and 19% of the estimated value of Olympic Dam.

56. The valuation also acknowledges, and in some cases quantifies, the effect that changes to inputs may have on the valuation. To illustrate the sensitivity of the valuation to changes in inputs, it provides the following examples:

    (a) "a 1% increase in the discount rate would reduce calculated DCF values by approximately US$475 million in Scenario A and approximately US$820 million in Scenario B";

    (b) "an increase of 10% in operating costs reduces the NPVs calculated for Scenario B by over US$900 million"; and

    (c) "a delay of five years in the commencement of the expansion would have a negative impact of approximately US$190 million on the NPV".

57. The valuation of Olympic Dam concluded with an explanation as to why Grant Samuel's valuation might differ from other market participants. It stated:

> Grant Samuel's valuation of Olympic Dam in the range US$3.7 – 4.1 billion is substantially higher than the values attributed to Olympic Dam by market analysts. Differences in valuation can reflect a number of factors, including assumptions regarding mine life, production volumes, commodity prices, exchanges rates, expansion potential and discount rates. The sensitivity analysis set out above demonstrates that relatively small changes in assumptions can have a significant impact on calculated net present values. Grant Samuel's review suggests that some of the differences between analysts' valuations of WMC and Grant Samuel's valuation reflect differing assumptions regarding mine life, expansion potential, and discount rates.

Use of fair value estimates for business combinations and impairment testing

58. Accounting standards such as IFRS 3 *Business Combinations* and IAS 36 already require the fair valuing of assets embodying reserves and resources in certain circumstances. The question therefore arises as to whether the fair value of the reserves and resources asset determined for these purposes provides a precedent for using fair value as the measurement or disclosure objective for all reserves and resources assets each reporting period. Advisory Panel members disagreed with the suggestion that a precedent might exist, and identified a distinction between the use of fair value generally and the use of fair value in a business combination (as per IFRS 3) or fair value less costs to sell in an impairment test (as per IAS 36).

(a) In relation to impairment testing, it was noted that fair value is only used to ensure that the carrying amount of the asset does not exceed its recoverable amount, and therefore fair value can only be used to write-down – not write-up – the value of the asset.

(b) In relation to business combinations, it was noted that:

(i) the purchase price is objective information that can provide a framework within which to estimate fair value;

(ii) management are likely to have spent considerable time and effort during the transaction valuing the business's reserves and resources so that an appropriate bid price can be determined; and

(iii) preparers have 12 months following an acquisition to "true up" the initial fair value calculations performed at acquisition date. This was seen as acknowledging the difficulties in getting access to information and completing accurate and reliable valuations.

59. [Paragraph omitted from observer note]

Neutrality

60. The proposed Framework explains neutrality as the "absence of bias intended to attain a predetermined result or to induce a particular behaviour" (paragraph QC27).

61. As explained in Agenda Paper 4C (about applying the fair value hierarchy in FAS 157 to reserves and resources assets), a fair value estimate for a reserve and resource asset will comprise a significant number of entity-specific rather than observable market assumptions. The reliance on entity-specific assumptions has the potential to adversely affect the capacity for the fair value estimate to be representationally faithful. Due to the uniqueness of minerals and oil & gas deposits and the inherent subjectivity in valuing those deposits, both users and preparers raised concerns about the potential existence and opportunities for management bias to be reflected in the fair value estimate. One user expressed concern that, in practice, a fair value estimate would not be useful because "management may have incentives to skew the assumptions so as to make the fair value estimate higher or lower for tax, visual or perception reasons". Preparers seemed to share this concern. One preparer noted that because "The majority of fair value inputs are not market derived, in particular when fair valuing reserves that are not market quoted eg. coking coal, aggregates etc … changes in estimates may become used as a profit smoothing device".

62. The research project team does not believe bias can be removed from fair value estimates of reserves and resources. Concerns about over-reporting fair values could be addressed to some extent by requiring the estimates to either be:

    (a) prepared by independent consultants or in-house competent persons that are subject to professional sanction; or

    (b) audited by independent consultants.

    However this may not address concerns about under-reporting of fair values if the estimate preparers (or management) are risk averse.

Completeness

63. The proposed Framework explains completeness as "including in financial reporting all information that is necessary for faithful representation of the economic phenomena that the information purports to represent" (paragraph QC32).

64. Due to the significance of subjective estimates, the research project team considers that, for a fair value to be able to faithfully represent the reserves and resources asset, the fair value estimate must be accompanied by disclosures of all of the key assumptions. Such disclosure would be required if users are to be able to indirectly verify the fair value estimates. Disclosure of key assumptions is envisaged by the proposed Framework in the context of the objective of general purpose financial reporting, where at paragraph OB26 it states:

> Financial reporting should include management's explanations and other information needed to enable users to understand the information provided. The usefulness of financial reports to investors, creditors, and others in forming expectations about an entity is enhanced by management's explanations of the information in them. Management knows more about the entity and its affairs than external users do and can often increase the usefulness of financial reports by identifying particular transactions and other events and circumstances that have affected the entity or may affect it in the future and by explaining their financial effects on the entity. In addition, financial reporting often provides information that depends on, or is affected by, management's estimates and judgements. Investors, creditors, and others are aided in evaluating estimates and judgemental information by explanations of underlying assumptions or methods used, including disclosure of significant uncertainties about principal underlying assumptions or estimates.

65. As noted earlier in the analysis, disclosing the assumptions necessary to be able to provide some level of verification of the fair value would result in voluminous disclosure. The specific features of such disclosures have not been considered, but it follows that disclosure of information relating to the major inputs to the fair value estimate would probably be critical. Therefore the disclosures would be expected to include, among other things, the description of the reserve and resource properties including the nature of the interests held in those properties, the estimate reserve and resource volumes and an explanation of the estimation methods used, planned production and cost profiles, assumptions about commodity prices and discount rates, and explanation of project risks. To be useful, some of this information may need to be presented on a property-by-property basis, rather than at a portfolio level. Only some of this information is currently disclosed, most notably the estimates of reserve and resource volumes. However, for the oil & gas industry in particular, this

information is often not presented on a property-by-property basis. The research project team acknowledges that, of itself, voluminous disclosure is not a bad outcome provided it is presented clearly and capable of being understood. However, it will add to the time required to prepare and present the disclosures. This is discussed further below in the context of costs and benefits of fair valuing reserves and resources.

66. Advisory Panel members from both mining and oil & gas companies expressed concern that requirements to disclose inputs used in reserve and resource volume estimates and fair value estimates might lead to the disclosure of commercially sensitive information. Examples included disclosure of commodity price outlook and discount rates that reflect the entity's cost of capital. For instance, an entity's views on future commodity prices is considered commercially sensitive because their disclosure may prejudice the entity in future asset sales or acquisitions or in negotiating contracts for the sale of its production. The research project team notes that a fair value estimate would require a market participant's view – rather than an entity-specific view – on inputs such as prices and discount rates. As noted in Agenda Paper 4C (about applying the fair value hierarchy), sometimes market participant views regarding commodity prices may be able to be directly observed or extrapolated from other market transactions. In those cases, there should not be any confidentiality concerns with disclosing those assumptions. However, for commodities that are not exchange traded and/or the quality or location has a material influence on the commodity price, the price assumption used may be based on entity-specific assumptions, which may be confidential. In addition, there may be asset-specific factors that are necessary to gain an understanding of the valuation that are deemed commercially sensitive – such as negotiated entitlements under production sharing contracts.

Comparability (including consistency)

67. The proposed Framework suggests (at paragraph QC35) that comparability enhances the usefulness of financial reporting information. Comparability enables users to identify similarities in and differences between two sets of economic phenomena. The consistent use of accounting policies and

procedures, either from period to period within an entity or in a single period across entities, helps to achieve comparability.

68. The research project team considers that the fair value measurement of reserve and resource assets will not be readily comparable, particularly between entities. The large number of inputs to the fair value measurement and the subjectivity inherent in those inputs affects not only the ability to verify the valuation, but also to compare the valuation across entities. The lack of comparability of fair value estimates for reserve and resource assets was a concern shared by both users and preparers.

69. The challenge of obtaining a comparable fair value estimate can also be illustrated by considering a single property that has multiple owners. In theory, it would be expected that the fair value of each interest in the property would be the same relative to the size of the interest. However, given the absence of observable market inputs that could be used to estimate fair value, the research project team anticipates that each preparer's estimate of fair value may not be the same.

70. [Paragraph omitted from observer note]

71. The research project team considers that it may be possible to provide some degree of comparability of fair value measurements by requiring the disclosure of key inputs to the fair value estimate. However, as noted earlier, this could lead to voluminous disclosure and the disclosure of commercially sensitive information. As an alternative, some users and preparers noted that some degree of comparability could be delivered if some inputs to the fair value estimate were standardised (e.g. commodity prices, discount rates). The research project team agrees that the use of standardised inputs may have an influence on the comparability of the fair value estimates, but considers the influence to be limited because the use of some standardised inputs cannot compensate for the subjectivity inherent in the other inputs to the fair value estimate that are not being standardised (e.g. views on the geology and recovery rates). Consequently, standardisation may come at the cost of faithfully representing the unique features of the asset being valued. This risk is acknowledged by the proposed Framework, which at paragraph QC37 states "An overemphasis on uniformity, for example, requiring all entities to use the

same assumptions on economic factors such as the expected future dividend rate on their shares as inputs to a valuation model, may reduce comparability by making unlike things look alike". Another consequence of using standardised inputs is that they may be rigid and not reflect market participant assumptions. Therefore the use of standardised inputs in a valuation may preclude that valuation from being a fair value measurement in accordance with FAS 157.

Understandability

72. The proposed Framework (at paragraph QC39) explains that understandability enables users who have a reasonable knowledge of business and economic and financial activities and financial reporting, and who study the information with reasonable diligence, to comprehend the meaning of the information. Information that is classified, characterised and presented clearly and concisely will enhance understandability. The proposed Framework cautions that relevant information should not be excluded solely because it may be too complex or difficult for some users to understand.

73. The users that are identified as the target audience of financial reporting should therefore be expected to be aware and have some understanding of the uncertainties inherent in estimating reserve and resource volumes and in obtaining an estimate of fair value for assets containing reserves and resources. For users to comprehend fair value measurement of reserves and resources, the measurement would have to be accompanied by disclosure of the key inputs to that measurement. The research project team expects that these disclosures may have to be more comprehensive than, say, for financial instruments due to the uncertainties involved. As noted earlier, the information needed to verify and compare fair value measurements of reserves and resources is expected to be substantial.

74. Voluminous disclosures may also have the unintended consequence of impeding understandability. For instance, the volume of disclosure necessary to understand the fair value estimates may overwhelm the user.

Constraints on financial reporting information

Benefits and costs

75. Paragraph QC53 of the proposed Framework explains that the benefits of financial reporting information should justify the costs of providing and using that information. Paragraph QC58 goes on to outline the consideration of benefits and costs in the context of standard setting as:

> In assessing whether the benefits of a proposed standard are likely to justify the costs it imposes, standard-setters generally consider the practicability of implementing it and whether some degree of precision might be sacrificed for greater simplicity and lower cost, in addition to other factors. Standard-setters' assessment of whether the benefits of providing information justify the related costs usually will be more qualitative than quantitative. Even the qualitative information that standard-setters can obtain about benefits, in particular, and costs often will be incomplete. Nevertheless, standard-setters should do what they can to assure that benefits and costs are appropriately balanced.

76. The benefits of fair value measurement of reserves and resources assets were discussed above in relation to the relevance qualitative characteristic.

77. The implications of fair value being the measurement or disclosure objective for reserves and resources include:

    (a) each reserves and resources asset controlled by an entity and that satisfies the recognition criteria[8] would be measured at fair value;

    (b) fair value would be measured for each reserves and resources asset each reporting period, noting this would include interim reporting periods; and

    (c) the fair value estimates and associated disclosures would be audited, on the basis that many jurisdictions that adopt IFRS require financial statements and note disclosures to be audited.

    Consequently, fair value measurement is anticipated to have a pronounced impact on both preparation and audit costs, as well as broader resourcing costs.

Preparation and audit costs

78. Preparing a fair value estimate for each reserves and resources asset each reporting period is considered to impose a significant increase in compliance costs, even though reserve and resource valuations are currently prepared for the following range of public reporting purposes:

    (a) attributing fair values following an acquisition;

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[8] Identifying the point of initial recognition for a reserves and resources asset in a fair value measurement environment is not being addressed in this package of agenda papers.

(b) impairment testing; and

(c) disclosing the standardised measure of proved oil & gas reserves (for SEC registrants only).

79. Fair value measurement of assets containing reserves and resources is required by IFRS 3 following the acquisition of a business and by IAS 36 when determining recoverable amount for impairment testing purposes.[9] The use of fair value in both cases is limited, due to fair value only being estimated when there is a business acquisition or impairment trigger and fair value only being estimated for those reserves and resources that are being acquired through the business or being tested for impairment. Nevertheless, in both cases, Advisory Panel members advised that estimating fair value in these circumstances involved significant time and effort.

80. Paragraphs 28-33 above (about the timeliness of fair value estimates) indicated that a significant amount of time and effort is involved in preparing a reserve and resource volume estimate and the standardised measure disclosure for proved oil & gas reserves. However, consistent with the comments above, Advisory Panel members indicated that a fair value estimate would require significantly more time and effort to prepare than is currently required for volume or standardised measure disclosures.

81. Although reserve and resource volumes and standardised measure disclosures are prepared for public reporting each annual reporting period (unlike the estimates of fair value prepared for business combination or impairment testing purposes), the general consensus among preparers from both mining and oil & gas companies was that the effort to prepare a fair value estimate would be orders of magnitude above what is presently required for either of those purposes. The additional effort not only reflects the additional work to identify the fair value inputs and compute the estimate, but also the effort associated with refining the estimate through internal governance processes prior to it being publicly reported.

82. Furthermore, Advisory Panel members have identified that the fair value measurement or disclosure of reserves and resources would make it extremely

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[9] The fair value prescribed by IAS 36 is 'fair value less costs to sell'. IAS 36 states that recoverable amount is the higher of value in use and fair value less costs to sell.

difficult, if not practically impossible, to meet the annual reporting timetable and provide timely reserve and resource information. Furthermore, preparing new fair value estimates for interim reporting periods – including quarterly reports – would add another dimension to this practical reporting challenge.

Broader resourcing costs

83. An Advisory Panel member also explained that fair value measurement of reserves and resources would create an opportunity cost in addition to direct costs of preparing and presenting that information.

Conclusion

84. Value-based information relating to reserves and resources has relevance (as noted at paragraphs 13-27), however users indicated more support for disclosures of inputs necessary for them to compile their own valuation of the reserves and resources assets rather than the reporting of fair value estimates. Without strong support from users for the fair value measurement of reserves and resources, the research project team is unable to recommend that fair value should be the measurement objective given the:

    (a) difficulties in obtaining an estimate of fair value that is verifiable, neutral and comparable; and

    (b) significant compliance costs that each mining and oil & gas entity would incur to estimate and presenting the fair value of each reserve and resource asset under its control.

85. To provide some assurance that the fair value estimate is capable of being verifiable, neutral and comparable, the research project team considers that substantial disclosures of key inputs and assumptions to the fair value estimate would also be required. The preparation and presentation of these disclosures in a financial report together with the fair value estimate is expected to compound the compliance cost impact of fair value as a measurement and disclosure objective for reserves and resources.

86. Consequently, the research project team considers that the research focus for the measurement objective for balance sheet should now shift to:

    (a) the investigation of historical cost based models; and

(b) types of disclosures that can provide users with value-based information that is considered to be decision-useful. The type and nature of such disclosures will be subject to further research, but some disclosure ideas that may be considered by the research project team and the Advisory Panel are presented in Agenda Paper 4F.