Question 3.1: Are additional standards for the valuation of early-stage companies a critical area that should be addressed by the IVSC? Please explain why.

Being able to demonstrate the risk and value proposition is an important aspect in the capital raising process. Anything that increases market efficiency has the potential to have a disproportionally positive economic impact. Before valuation can occur, a consistent vocabulary is required to communicate risk to the investor. The mineral resource and mining industry has an established, global system for communicating risk. This time-proven risk communication system is adopted across international legal and regulatory systems. It is critical that the IVS consider the established extractive industries framework to avoid divergence and investor confusion. It is in the public interest that there is harmonisation across all sectors to avoid the situation of 'one persons inferred being another person's proven'.

Question 3.2: In which areas of the valuation of early-stage companies do you see the greatest diversity in practice? Are there additional areas of concern not noted above in this ITC? If so, please discuss.

The greatest area of diversity in assessing early stage assets and companies is in the language that underpins risk communication.

Within the mineral exploration and mining sector, the risk language is defined by the CRIRSCO family of codes. Within Australia, this is embodied by the JORC Code which is incorporated into law and forms part of the stock exchange ('ASX') listing rules. The committee governing the JORC Code was established in 1971. Since the first edition being published in 1989, there has been five revisions to the JORC Code. The success of the JORC Code resulted in similar codes of practice being adopted across the globe, with co-ordination and communication being managed through the CRIRSCO framework.

The strength of the CRIRSCO family of codes is that they are easily understood by the public and due to their principles basis, are applicable to assets with substantially different qualities (e.g. consider the difference between a large scale open pit coal mine, and a small, narrow, high-grade underground gold mine). To provide context to the risk associated with mineral assets, when a deposit is brought into commercial production (after extensive analysis), typically less than one-millionth of the deposit has been sampled, from which interpolation and extrapolation of heterogenous material is made. Given that the original JORC Code has been subject to continual evolution over the last 46 years, it is reasonable to consider it be a time and battle proven system.

It is vital that the IVS helps co-ordinate risk language such as that used within the JORC Code. For example, the petroleum industry uses the 'PERC' Guidelines which uses similar sounding terms, that have substantially different meanings. For example, a JORC 'reserve' has a very high level of confidence (perhaps akin to stages 5 and 6 in the AICPA definitions), but under the PERC definitions the term 'reserve' may apply to an asset with a low level of certainty. This leads to the situation where an investor who is indifferent to whether an asset falls within the mineral or petroleum asset class, may misinterpret the risk being communicated in a report. There is an opportunity for the IVS to help reduce the potential confusion between the CRIRSCO family of codes, PERC Guideline, the AICPA Guide and any other risk-communication framework

Question 3.3: Of the potential Standard Alternatives outlined above (A, B, C), which do you prefer and why?

Alternative B (discussion paper) is the preferred outcome. As the CRIRSCO family of codes is established within legal and regulatory systems across the globe, significant efforts are required to align the accepted vernacular. Only when there is consistency in the language being used can an effective Standard (Alternative C) be produced.

Extractive Industries Question 5.1: **Should IVSC produce combined standards and guidance for Extractive Industries or produce separate pronouncements for mining and for oil and gas? If you believe the latter, please indicate the reasons why you consider separate guidance is appropriate.**

Petroleum and minerals have developed similar, but somewhat difference classification systems. As such, the valuation principles and financial standards may be applied equally to either industry, where appropriate, however, there are areas where modified applications may be required for the following reasons:

- The Petroleum Resource Management Scheme (PRMS) provides classes for all hydrocarbons (discovered, undiscovered, commercial or sub-commercial), whereas the JORC Code-type schema focuses only on those classes deemed to be economic or reasonably assured of becoming economic and thus suitable for public disclosure of Mineral Resources and Ore Reserves.
- Under PRMS, all estimates of reserves and resources refer to the "sales quantities" delivered at a custody transfer point according to product delivery specifications. Under JORC Code (2012), Ore Reserves typically refer to run-of -mine ((ROM) tonnages and grade (percentage of the ultimate refined product). JORC requires disclosure of recovery factors which permit the reader to calculate "sales quantities" and to report sales quantities of the product.
- The class Contingent Resources within the PRMS encompasses a total inventory of all hydrocarbons that meet the discovery criteria. JORC's Mineral Resources are a subset and only include those deposits that have reasonable prospects for eventual economic extraction.
- Under PRMS, petroleum Marginal Contingent Resources are considered equivalent to Mineral Resources. JORC provides no category for "Discovered Not Economic" deposits.
- Petroleum's Contingent Resources refer to sales volumes that would be derived by application of a defined project; Mineral Resources are estimated as in-situ tonnage and grade based on defined cut-off grades, since a specific extraction plan has not yet been defined.
- The concept of classifying and measuring "Not Recoverable" (discovered and undiscovered) quantities as used by the PRMS system does not exist within the current JORC schema. Exploration results are insufficient to permit estimation of Mineral Resources and are limited to disclosure of thickness and grade of mineralised intercepts.
- JORC's use of Modifying Factors in Feasibility Studies to define Ore Reserves is similar to the PRMS's use of contingencies in development panning studies. JORCS' Ore Reserves and PRMS's Petroleum Reserves classes show a similar high-level of commercial certainty. Reserves are those portions of resource quantities that can be received by projects that satisfy specified commercial conditions using validated technology. PRMS' classification of reserves for new projects anticipates initiation of development within five-years (with some documented exceptions); JORC's definitions require reserves to be economic, but time to anticipated production for new projects is not specified. Best practice is for unproduced reserves to be periodically validated by updated Feasibility Studies.
- JORC's Proven and Probable Ore Reserves have the same general level of associated confidence as PRMS's Proved Reserves (i.e. about ±10%). However, the big difference is that PRMS's concept of 2P (Proved plus Probable Reserves) is only of medium confidence (i.e ±50%), despite similar language being used in both codes. Furthermore, the mining industry applies these confidence limits on a local scale, and PRMS applies these limits on a project scale. JORC has no equivalent to PRMS's Possible Reserves category; quantities related to deposits with similar low confidence levels remain as Inferred Mineral Resources.
- Petroleum reserves and resource estimates are typically expressed on a new working interest (entitlement) basis after reduction for royalties and production owing to others. Mineral Resources and Ore Reserves are typically reported on a 100 percent basis with the share attributable to the Company shown separately.
- Measured and Indicated Mineral Resources have the same geological confidence levels as Proven and Probable Ore Reserves. PRMS's Proved, Probable, and Possible Reserves categories have the same general technical confidence levels as their C1, C2, and C3 Contingent Resources categories. PRMS's C1, C2 and C3 categories have similar associated confidence levels to JORC's Measured, Indicated and Inferred categories but with the caveat that the PRMS categories refer to sales quantities while the JORC categories are based on in situ geological uncertainty.
- The concept of cumulative scenarios as expressed by PRMS's low/best/high estimates (and equivalent 1P/2P/3P in Reserves and 1C/2C/3C in Contingent Resources) is not used in the JORC classification model.
- Underlying quantitative cumulative probability targets and derived average confidence factors used by PRMS to guide placement of uncertainty category boundaries (when probabilistic methods are used) are not part of the JORC system. Nonetheless, mineral evaluations take account of volatility of incremental cash flows related to uncertainty in incremental tonnage and grade produced over relevant time periods in assigning resources and reserves categories. Probabilistic methods can be used to assist in evaluating the uncertainty of tonnage and grade produced.

- Production in the JORC system can be derived directly from reserves categorised as only Probable or from deposits with both Proven and Probable Reserves. Production in the PRMS system can only be derived from Proved Developed Reserves. JORC does not separate Developed from Undeveloped reserves based on status of facilities and associated capital requirements, although regulators may require this for public reporting, and some mining companies do this for internal planning purposes.

Please note that CRIRSCO and IMVAL Templates are not codes of practice. Instead, these templates act as a common reference point for technical codes such as JORC, and valuation codes such as VALMIN. The technical (CRIRSCO family) codes such as JORC are incorporated into law and security exchanges across the globe. The IVS must make a clear distinction between technical and valuation codes, and codes and international templates. It is important to note that country specific codes such as JORC and VALMIN take into account local law and regulation, and may not be suitable reference points.

Combined standards and guidance may be helpful. The IMVAL Template provides a common point of reference for mining and oil and gas valuation codes. Unlike CRIRSCO, the IMVAL Template currently lacks the procedural-terms-of-reference safeguards to be considered a reliable and robust reference point in the long term. Further work is currently required. It is suggested that the IVS helps IMVAL establish organisational robustness, or assumes responsibility for development of appropriate guidance.

There are no unique qualities of mining and oil and gas valuations that necessitate different valuation approaches or methods, only the inputs vary.

Question 5.2: Should the standards focus just on the valuation of reserves and resources or should it extend to other assets employed in the industry and to entire businesses in the sector? Please provide reasons for your answer.

The standards must look beyond resources and reserves and consider exploration potential. To do otherwise leads to a misrepresentation of value. The valuation of infrastructure built on assets is very much dependent on the valuation of the exploration/resources/reserves.

Question 5.3: Which classification code or codes are most commonly used in your industry / sector? Which code do you normally use or rely on? Are you aware of differences across your / industry sector on the classification codes used? If so please indicate whether these differences cause problems in undertaking or understanding valuations.

In Australia, the key mineral codes currently used are:

- The 2012 edition of the JORC Code, being the Australasian Code for the public reporting of Exploration Results, Mineral Resources and Ore Reserves
- The 2015 edition of the VALMIN Code, being the Australasian Code for the Public Report of Technical Assessments and Valuations of Mineral Assets
- The 2007 edition of the PRMS

VALMIN is the code used by Australian companies, CIMVAL is used by Canadian companies and SAMVAL is used by South African companies. Outside these jurisdictions, practitioners use what they are most familiar with which will generally be one of these codes.

Over the past 5 years there has been significant harmonisation and alignment between the VALMIN, SAMVAL and CIMVAL codes. As such, it is relatively easy to translate between each of these codes. THE SPE-PRMS system is widely used for oil and gas and is presents a more significant step for an evaluator moving between the oil and gas and minerals space.

Question 5.4: When valuing with a discounted cashflow do you use internal production forecasts developed by the entity's own geological and engineering specialists, external forecasts, or a combination of both and you adjust the production forecasts for risk by reserve category?

Will depend on the purpose and scope of the valuation, as well as the amount of available information to estimate future cash flows. For public reporting purposes. it is generally a combination of both and adjust for risks. In general, external forecasts of macro-economic inputs (commodity prices, exchange rates, inflation rates etc) are considered as providing a critical level of independence, and therefore carry more weight with the Valuer. The application of these factors, however, is not straight-forward, as they will require adjustments to the mineral inventory available for mining, as the Ore Reserves will have been estimated using either the owner's own estimates or perhaps outdated external estimates.

It is important to understand the characteristics of the subject Ore Reserves and whether the production forecasts are inclusive of volumetric or grade risk adjustments, in order to understand the risks in the underlying cashflows for valuation analysis.

Depending on the circumstances, production forecasts may be modified or adjusted by a probability weight based on the amount of information pertaining to a particular resource/reserve and the conversion factor appropriate for the resource/reserve category.

Question 5.5: Please indicate what methods you use or are familiar with that fall under the Cost Approach and that are used in valuing assets in the Extractive Industries. Please indicate in your experience how the cost of an equivalent asset is determined and please indicate the three most common adjustments that are made in your experience to reflect physical, functional or economic obsolescence, and what metrics are used to determine these adjustments?

The cost approach is very commonly applied to the valuation of exploration assets, where the assets (specifically tangible assets) are too early stage to apply an income approach but where the exploration that has been done is valuable because it is work that a new owner would need to do. A key consideration is whether such exploration expenditures have added to or detracted from value.

Cost based methods that are commonly used, but not necessarily endorsed by the VALMLIN Committee, in Australia include:

- Depreciated replacement cost (DRC) / Depreciated optimised replacement cost (DORC)
- Multiples of exploration expenditure
- Expected Value Method or decision tree (combination cost, income/market approaches)
- Kilburn geoscientific rating method
- Reproduction / Replacement cost

Both direct and indirect cost estimation methods are typically used.

- Under the indirect method, inflationary indices are applied to historical costs to estimate a current reproduction/replacement cost.
- Under the direct method, current reproduction/replacement costs are estimated through direct quotations from vendors, engineering estimates, capital budgets, etc.

From this point, there is no difference in the application of appraisal depreciation (physical, function and economic).

Question 5.6: Please identify any intangible assets that are normally separately identified and valued; i. In transactions between entities in the Extractive Industries and ii. When accounting for the acquisition of a business in the Extractive Industries.

Intangible assets often considered in the Australian mining industry includes permits and approvals, authorisations, favourable or unfavourable contracts, off-take agreements, access to funding, water rights, air rights, access rights, port or rail entitlements, workforce and goodwill.
However, very few of these intangibles are separately identified and valued, but moreover are typically bundled together and handled in terms of the project maturity rather that line item dollar estimates.

Question 5.7: In your experience what, if any, value is attributed to components of goodwill, eg an assembled skilled workforce, in corporate transactions in the Extractive Industries. Please briefly indicate any valuation techniques used to establish the value of goodwill in such circumstances.

The VALMIN Code is restricted to the valuation of mineral assets, not necessarily to business valuation. Goodwill is typically considered in regards to business valuation and as such may not form part of a VALMIN Code compliant valuation.

Goodwill is typically identified as the residual of the purchase price from the acquired assets and liabilities assumed. Depending on the commodity, the ~~property~~ asset and the owner, goodwill may or may not be present. Certainly, within Australia there has been considerable legal debate recently regarding the presence of goodwill in relation to gold transactions.

Rather than adding value via goodwill, examples such as this reduce the discount (e.g. there is a cost in replacing staff) that would otherwise be applied.

Question 5.8: Please provide any examples of which you are aware of significant differences between the value of otherwise similar resources arising solely from different Governmental policies. Please indicate how "country risk" factors are reflected in the way in which you price or value extractive assets.

There are a number of local country ~~nationalism~~ issues that need to be assessed by any mining company prior to a new investment in certain countries. Certainty, royalties, taxes and duties are a large impost which vary between countries. The requirement to process materials to certain levels of finished product (work-in-progress) within the country before export may have a significant impact on the profitability of the mining operation in any given country. Others may include transfer pricing policies, tax breaks and holidays, and industrial relations / employment conditions.

One measure of the differential is the cost of capital applicable in each of the various ~~domiciles~~jurisdictions.