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Working Party on National Accounts

HANDBOOK ON MEASURING INTELLECTUAL PROPERTY PRODUCTS
DRAFT CHAPTER ON MINERAL EXPLORATION AND EVALUATION

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HANDBOOK ON MEASURING INTELLECTUAL PROPERTY PRODUCTS

DRAFT CHAPTER ON MINERAL EXPLORATION AND EVALUATION

Introduction

1. With the development of SNA93 mineral exploration was introduced as a new category of produced asset. Essentially mineral exploration activity is seen to lead to the formation of an intellectual property asset which is owned and economically exploitable.

2. This treatment of mineral exploration has been retained in the current revision to SNA93 with a number of clarifications supported by the AEG. This chapter explores some of the issues associated with the capitalisation of mineral exploration and discusses appropriate treatment within the system of accounts. The discussion also touches on issues with the measurement of subsoil assets as they are closely linked with mineral exploration and evaluation.

International Standards and Mineral Exploration as an asset

SNA68

3. Under the 1968 System of National Accounts (SNA68) all expenses associated with mineral exploration were treated as intermediate consumption. As mineral exploration activity takes place prior to extraction there is no production to offset these costs and therefore firms undertaking this activity on their own-account may be shown as operating at a loss. This view was not seen as meeting the economic reality of the situation where companies undertaking mineral exploration were seen as investing in an activity in the expectation of future revenue flows.

SNA93

4. To more appropriately reflect the economic reality of the activity the 1993 SNA introduced a new category of produced intangible fixed capital, called mineral exploration (AN.1121). It was defined as :

> *"The value of expenditures on exploration for petroleum and natural gas and for non-petroleum deposits. These expenditures include pre-licence costs, licence and acquisition costs, appraisal costs and the costs of actual test drilling and boring, as well as the costs of aerial and other surveys, transportation costs, etc., incurred to make it possible to carry out the tests." System of National Accounts 1993*

5. From a macro-economic measurement perspective the capitalisation of mineral exploration can be justified on the basis that mineral exploration adds to the stock of knowledge in the economy and that it is a necessary step in exploiting sub-soil deposits for economic purposes.

System of Environmental and Economic Accounting (SEEA) 2003

6. SEEA was developed with the purpose of exploring how sets of statistical accounts can be compiled which permit investigation and analysis of the interaction between the economy and the environment. SEEA 2003 contains a detailed discussion of accounting for mineral exploration (paragraphs 8.46 - 8.65) which builds on the SNA93 treatment and provides further guidance on accounting for the activity in both SNA and SEEA contexts.

International Accounting Standards

7. The International Accounting Standards Board (IASB) released an interim guideline for the treatment of exploration and evaluation activity in 2004, International Financial Reporting Standard 6 (IFRS6). This standard is reflective of the divergence of accounting treatment across jurisdictions and allows treatment of the costs to be considered on a case by case basis either capitalising the costs or writing them off as an expense. When first recognised in the balance sheet, exploration and evaluation assets are measured using the cost model. Subsequently, entities can measure these assets using the cost of revaluation model. Once the feasibility of extracting a mineral resource has been demonstrated, the assets fall outside IFRS 6 and are reclassified to other IFRSs.

8. IFRS 6 is an interim standard and the IASB has formed a working group in 2005 to take a more in-depth look at the issues of financial accounting in the extractive industries, including the issues around mineral exploration. A discussion paper is scheduled for release in 2008.

Update to SNA93

9. The update of SNA 93 reconsidered the issue of mineral exploration and the following recommendations, all clarifications of the existing SNA, were endorsed by the ISWGNA.

i. The produced asset “mineral exploration” should be described as “mineral exploration and evaluation” and the coverage should be described using the criteria of the International Accounting Standards Board (IASB) (see next section).

ii. The assets for mineral exploration and evaluation and for subsoil deposits should continue to be recorded as separate assets, the first as a produced asset and the second as a non-produced asset.

iii. The description of the valuation of mineral exploration should be clarified to ensure that actual market costs are used when specialised enterprises provide inputs to the activity.

iv. In the absence of a market price the valuation of subsoil resources should be based on the net present value of the resource rent of the resource. The resource rent is that part of gross operating surplus unattributable to other identified assets, specifically fixed assets including mineral exploration and evaluation.

v. Payment by the extractor to the owner of the resource should be recorded as property income (rent) regardless of the label given to the payments.

Coverage of Mineral Exploration and Evaluation activity

10. SNA93 Rev1 recommends using the criteria of the IASB to describe the coverage of this item. The key criteria for recognising expenditures as exploration and evaluation assets is the degree to which the expenditure is associated with discovering mineral resources. IFRS 6 contains the following discussion on coverage:

"An entity shall determine a policy specifying which expenditures are recognised as exploration and evaluation assets and apply the policy consistently. In making this determination, an entity considers the degree to which the expenditure can be associated with finding specific mineral resources. The following are examples of expenditures that might be included in the initial measurement of exploration and evaluation assets (the list is not exhaustive):

i. Acquisition of rights to explore.
ii. Topographical, geological, geochemical and geophysical studies.
iii. Exploratory drilling.
iv. Trenching.
v. Sampling.
vi. Activities in relation to evaluating the technical feasibility and commercial viability of extracting a mineral resource."

Leases and licences

11. The costs of acquiring leases or other rights of tenure in the area of interest are included in the cost of the exploration and evaluation asset if they are acquired as part of the exploration for, and evaluation of, mineral resources.

Ownership

Mineral Exploration and Evaluation

12. Exploration activities are usually funded by the extractor looking to discover sub-soil assets which they can then exploit. As the funder of the costs owns the results and as the future gains from the activity will fall to them, they are deemed to be the owners of the asset. However, in many countries, the firm granted the exploration licence has an obligation to provide a given set of results/tests to the government who then make it part of the public record.

13. This may raise issues around the ownership of public goods similar to those confronted for 'freely available' Research and experiment development (R&D). However, in this case, while information might be available publicly, generally the knowledge can only be used directly by the owner of the exploration rights in the first instance. Even beyond this, the knowledge can only be exploited by one extractor at a time, thus limiting any broader, simultaneous use, public economic benefit that might arise in cases such as freely available R&D.

Sub-soil Assets

14. In many countries, the government retains ownership of all subsoil assets. Mining companies purchase licenses and pay royalties for the right to access and extract these assets. Under SNA93 principles these subsoil assets are recorded on the balance sheet of the general government sector as the legal owner. New treatments of ownership were proposed as part of the SNA93 Rev1 process but the ISWGNA decided to retain the original SNA93 treatment and place the issue on the long-term research agenda.

Valuation

Mineral Exploration and Evaluation

15. The preferred valuation basis, in line with SNA principles, is purchasers' prices. This price should be observable where a third party is contracted to undertake the exploration and evaluation activity. However much of this activity is undertaken on an own-account basis where a market price is not observable. When this occurs the activity should be valued at the sum of costs of production consisting of:

i. Intermediate consumption.
ii. Compensation of employees.
iii. Consumption of fixed capital.
iv. A return to fixed capital.
v. Taxes (less subsidies) on production.

Sub-soil Assets

16. Observed market price is the preferred valuation method for sub-soil assets. However, where there is no market for sub-soil assets, the net present value of the resource rent of the resource is the most appropriate valuation methodology. For more information on how this method can be applied refer to chapter 26 of Australian System of National Accounts: Concepts, Sources and Methods, (cat. no. 5216.0).

Price and Volume Measures

17. The preferred index to use for deflation of mineral exploration is an output Producer Price Index for the industry. However, given the unique nature of mineral exploration activity, it is likely that an output price index will not be available in many countries.

18. Several years ago the Australian Bureau of Statistics (ABS) undertook a preliminary investigation into the feasibility of constructing an output price index for mineral exploration. The investigation included discussions with the peak industry body and with specialist mineral exploration firms. Indications were that it would be feasible to construct an output index based on a model pricing approach but that it would be quite resource intensive to maintain given the rapidly evolving technology used in the production process.

19. An alternative is to use an input index reflecting the various costs of production. However, the use of an input index means that productivity gains are not captured and it would be a reasonable assumption that productivity gains have been significant in exploration activity eg the introduction of remote sensing exploration. Countries may consider adding an adjustment for productivity gains to the input index, for example the index could be adjusted by a long-run estimate of productivity growth for the economy.

20. Volume measures should be derived through deflation of current price estimates preferably using chain volume techniques. See 'chapter 16 Price and volume measures' of SNA93 Rev 1 for more details on volume methods.

Consumption of Fixed Capital and Capital Services

21. As discussed above mineral exploration and evaluation is an economic asset because it contributes to the stock of knowledge on sub-soil resources and allows those resources to be exploited for economic purposes. It seems reasonable to state that the knowledge is of value while there are still

resources available to be exploited and therefore that the life of the exploration asset should be the same as that of the sub-soil assets. An argument could be made that as the scope of sub-soil assets is limited to proven reserves, and as the size of these reserves changes with developments in technology, then the life of the mineral exploration asset needs to reflect sub-soil assets which may come 'on line' in the future. However, this argument relies on assumptions about future events in determining the life, and hence stocks, of mineral exploration assets. Since building future assumptions into estimates in the accounts is, by consensus, typically avoided it is recommended that asset lives be based on current economic circumstances.

22. It should be recognised that the gross returns (rentals) to owners of the mineral exploration asset are dependent on the returns received in the mining of the sub-soil asset i.e. that mineral exploration is a productive asset providing service flows to the mineral extraction industry. Thus mineral exploration should be included within the fixed assets for mineral extraction when calculating a return to fixed capital for that industry. As the resource rent is equivalent to gross operating surplus excluding returns to fixed capital then, all else being equal, larger mineral exploration and evaluation expenditure will lead to smaller resource rent of the sub-soil asset.

Balance Sheet

23. There are two issues with balance sheet accounting for mineral exploration and evaluation and both are linked with the valuation of sub-soil assets: 1) the potential for 'double counting' and 2) concerns over the recording of ownership.

'Double Counting'

24. The use of NPV of resource rents to measure the value of sub-soil assets gives rise to the view that the total value of mineral exploration is already captured in the value of the stock of subsoil assets. This implies that mineral exploration has no market value over and above that of the subsoil assets themselves, and that by including both in the balance sheets would lead to double counting.

25. SEEA 2003 addresses this issue and recommends the following treatment:

> *"The inclusion of mineral exploration as a form of fixed capital contributes to the allowance for consumption of fixed capital which must be deducted from gross operating surplus to reach resource rent. Resource rent is thus lower when mineral exploration is treated as capital expenditure than when it was treated as intermediate consumption." (SEEA 2003, para 8.50)*

Recording Ownership

26. As discussed above, in many countries sub-soil assets remain legally owned by the government and SNA93 Rev1 recommends they be recorded as such in the balance sheet. The mineral exploration and evaluation asset however is generally owned by the extractor, usually in the private/business sector. Given that the two assets are inextricably linked and that the mineral exploration has no value without an accompanying sub-soil asset, recording ownership of the two assets in different sectors raises some issues - for example in the study of productivity in the mining industry. Adopting this treatment also means that the 'full picture' of subsoil and mineral exploration assets can only be understood in the national balance sheet and not in sectoral balance sheets. Compilers should be aware that the proposed national accounting treatment may not suit all types of analysis.

ABS Sources and Methods

27. The ABS runs two surveys of firms involved in exploration activity on a quarterly basis - the mineral exploration survey and the petroleum exploration survey. Data are collected from private sector companies with licences to explore in Australia (including Australian waters). The ABS is able to ensure full coverage of the activity as it is compulsory to have a license prior to engaging in exploration activity. The respondent companies range from the largest companies in Australia to small exploration ventures.

28. The two surveys cover all expenditure (capitalised and non-capitalised) during the exploratory or evaluation stages in Australia and Australian waters. Expenditures include cost of exploration, determination of recoverable reserves, engineering and economic feasibility studies, procurement of finance, gaining access to reserves, construction of pilot plants and all technical and administrative overheads directly associated with these functions.

29. Examples are costs of satellite imagery, airborne and seismic surveys, use of geophysical and other instruments, geochemical surveys and map preparation; licence fees, land access and legal costs, geologist inspections, chemical analysis and payments to employees and contractors. Cash bids for offshore petroleum exploration permits are also included.

30. On the survey forms respondents allocate exploration expenditure as either expenses or capital as they would in their financial accounts. The data definition for the items are in line with Australian accounting standards, which is in turn based on international accounting standards, and are quite straight forward for respondents to complete. For National Accounts purposes the two entries are combined to form the estimates for mineral exploration GFCF. As the quarterly sources are a census, the annual is simply an aggregate of the four quarters.

31. An input price index is constructed for deflation of current price estimates. It consists predominantly (around 77%) of wage rates for the mining industry (sourced from the Labour Price Index) with the remainder consisting of material inputs, such as diesel, and industrial machinery & equipment which are sourced from the Producer Price Indexes collection. Currently no adjustment is made for productivity change. As stated earlier the ABS has investigated the feasibility of an output price index for mineral exploration but decided, on balance, that it was not a value proposition.

32. The asset lives for mineral exploration are assumed to coincide with mine and oilfield lives. These are derived indirectly using average annual production for each commodity divided into the commodities economic demonstrated resources from the balance sheets. The average mine life used for mineral exploration is 34 years.

33. Within the Australian Balance Sheets mineral exploration assets are not identified separately. The value of the exploration asset is assumed to be implicitly included within the value of the sub-soil assets which are valued using the NPV methodology. With the introduction of SNA93 Rev1 changes the ABS will be seeking to implement a more satisfactory methodology which separately identifies the exploration and sub-soil assets as described in this chapter.

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