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| Environmental account  framing workbook |
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Contributing to the Australian Government National Plan for Environmental Information initiative

Environmental account framing workbook

Environmental Information Programme

Bureau of Meteorology

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www.bom.gov.au/environment

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### Abbreviations

|  |  |
| --- | --- |
| BSU | basic spatial unit |
| SEEA | System of Environmental-Economic Accounting |
| SNA | System of National Accounts |

## Part A: Introduction and instructions

**Environmental accounts provide organised information for a clearly defined decision-making purpose. They are systematic and comparable, and use standard definitions based on accepted measurement and accounting theory. The environmental accounting process described in this workbook is based on the *Guide to environmental accounting in Australia* (Bureau of Meteorology 2013). The application of the environmental accounting process produces a clear purpose and need for an account, and identifies the best available scientific knowledge.**

## 1. Introduction

**The *Environmental account framing workbook* (the Workbook) describes how to frame an environmental account. The methodology considers answers to a basic set of questions that are needed to scope and then specify an account.**

Before an environmental account can be produced, it must be framed. The framing process steps through a series of questions, such as the purpose of the account, who will be involved in producing it, the account subject, and how it will be measured.

The Workbook is designed to guide users through the process of framing an environmental account. For more information about the theory and practice of this discipline, refer to the *Guide to environmental accounting in Australia* (Bureau of Meteorology 2013). Framing an account can be an extensive process requiring rigorous attention to detail and involving input from a range of stakeholders including experts familiar with the account subject. Many aspects require adherence to standards (accredited or de facto) to ensure the quality of the final account. Components of the process such as establishing a conceptual model and an evidence base for the account subject can involve substantial commitment of time and expertise.

In some instances, organisations may already have in place systems and data that are account-ready or that can easily be modified or adapted to fulfil the requirements of an account. Much of the account framing process may simply be another way of organising already available information.

The Workbook provides a logical and efficient pathway through account scoping and specification. It provides a way to keep track of the process and produce a fully specified account that is fit for its intended purpose. Other benefits of using the Workbook include consideration of all aspects of the account at the design stage, increased credibility and legitimacy, and delivery of comprehensive documentation for the account.

### 1.1 Steps for framing an environmental account

Producing an account is a three-step process (Figure 1). This document guides account producers through the first two steps, which together constitute the framing of an account (or a series of closely related accounts). These steps are:

1. scoping the account(s); and
2. specifying the account(s).

Both steps are broken down into modules, all of which should be completed to frame the account(s). Once framed, each account specification can be passed to the next step of the process, the production of the account.



Figure 1. The account production process.

A single scoping process can be used to specify and produce multiple, closely related accounts. The process is described in more detail in Chapter 2.

### 1.2 The role of perspectives in framing an account

An environmental account is always framed from one or more perspectives and the perspective(s) chosen will determine a number of features of the account, for example, the units used to measure the account subject.

The *Guide to environmental accounting in Australia* presents a Joint Perspectives Model that sets out key relationships between the environment, society, and the economy relevant to producing environmental accounts (Figure 2). This model consists of four nested systems: the physical Earth, living, human cultural, and economic systems. Each system has emerged from all the others listed before it and is not separate from them. This means that any transaction in an emergent system can also be viewed from the perspective of the systems in which it is nested.



Figure 2. Joint Perspectives Model.

In the lower cross-sectional view, the vertical dotted lines delineate systems while the coloured horizontal slices represent the different perspectives from which systems can be viewed. For each perspective (slice), potential accounting units are listed.

The perspective of the account framer (economic, human cultural, living, or physical Earth perspective) will influence choices and outcomes throughout the account-framing process. For example, the purpose and motivation for producing the account will depend on the perspective. If the account is intended to interface with the System of National Accounts (SNA) (European Commission et al. 2009), an economic perspective must be included. On the other hand, if the intent is to measure the ability of ecosystems to continue to deliver benefits to people (i.e., sustainable ecosystem services) a living or physical Earth perspective may be most useful.

The account perspective is also central to producing a conceptual model for the account subject. For example, if an economic perspective is being used to account for environmental assets, such as carbon or water in terms of a dollar value, the conceptual model underpinning the account will need to include an agreed scientific basis and evidence base for monetary valuation of environmental assets.

For more information on using joint perspectives in environmental accounting, see Chapter 5 in the *Guide to environmental accounting in Australia*.

### 1.3 Where to go for more information

Please refer to the *Guide to environmental accounting in Australia* for assistance in completing the Workbook. In particular, Chapter 7 of the guide describes the approach for framing an environmental account. The *Guide to environmental accounting in Australia* is available from [www.bom.gov.au/environment/activities/accounts.shtml](file:///C:\Users\lsainsbu\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\U5L9Y2PY\www.bom.gov.au\environment\activities\accounts.shtml)

For more information about environmental accounting, visit [www.bom.gov.au/environment/activities/accounts.shtml](file:///C:\Users\lsainsbu\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\U5L9Y2PY\www.bom.gov.au\environment\activities\accounts.shtml) or contact [environment@bom.gov.au](mailto:environment@bom.gov.au)

## 2. Instructions: Framing an account

**Framing an account or a series of closely related accounts requires scoping and specifying the account(s). Both steps of the framing process are broken into eight modules, all of which should be completed. There is no fixed order for completing the modules and much of the process is iterative. Modules can be completed to a certain stage and revisited throughout the framing process until all modules are completed.**

### 2.1 Scoping the account

The aim of this step is to establish an understanding of the accounts to be framed. Different options may be considered, such as comparing possible data sources and relevant standards.

Figure 3 introduces the scoping step’s first four modules. These relate to the purpose, subject, participants, and conceptual basis of the account(s).

Figure 4 introduces a further four modules for the scoping step. These address the practicalities of framing an account, such as how to measure the account subject, specifying the units of measurement, and matching the chosen units to available datasets.

The modules may be completed in any convenient or logical order, beginning by filling in information that is already known. This will determine to some extent the subsequent shape and scope of the account.



**iterative  
process**

**Module 2: Identify account participants (who?)**

*Guiding questions:*

* Who will use the account? What is their perspective on the account?
* Who will produce the account?
* Who will provide independent legitimacy (scientific accreditation) for the account?
* Who will assure (audit) the account?
* Who will participate in establishing the conceptual model and evidence base for the account?

**Module 1: Establish purpose or motivation (why?)**

*Guiding questions:*

* What is the intended outcome of keeping this environmental account?
* Why is this important? Is there a statutory or other type of obligation?
* How will this environmental account help to achieve the intended outcome?

**Module 3: Scope the subject of account (what?)**

*Guiding questions:*

* What is the account about?
* What is the main thing being measured for this account?
* What are the assets or flows for which information is needed?
* From what accounting perspective/s will these measurements be made (i.e., the physical Earth, living, human cultural, or economic system)?

**Module 4: Establish a conceptual model and evidence base for the account subject (what?)**

*Guiding questions:*

* What is the reasoning for this account? What are the perspectives driving the account?
* What is the science that links the account subject and perspective with the numbers representing measurements (observations, estimates) of it?
* What is the relationship of these measurements/numbers with the real world?
* How were the numbers that represent measurements of the account subject obtained?
* Who are the experts and stakeholders likely to have useful (including differing) ideas about answers to these questions?
* Does a relevant and reliable evidence base (e.g., compiled and synthesised peer-reviewed literature) exist or will it need to be established or supplemented? How will it be maintained?

Figure 3. Scoping an account—modules to establish purpose and conceptual basis.



**Module 6: Framework and methods—scope suitable production and reporting frameworks and methods (how?)**

*Guiding questions:*

* What accounting frameworks are available to suit the purpose and subject of the account?
* Will links need to be made to the other accounts, such as economic accounts? If so, what frameworks are in use? How will measures be converted (e.g. gigalitres to dollars)?
* Will links need to be made to international reporting frameworks? If so, what characteristics does the account framework need?
* What are the account production infrastructure requirements, for example, the data management capacity or the analytical and modelling capacity?
* Are there gaps in the account methods? If so, is a research agenda or training required?
* What are the account and reporting products like (tables, maps, and charts)?

**Module 5: Data—scope the data relevant to the account subject (how?)**

*Guiding questions:*

* What datasets are required to populate the account?
* What datasets are available that relate to the purpose and subject of the account? What datasets need to be collected that relate to the purpose of the account? Are the data ‘fit for purpose’?
* What are the appropriate scales relevant to the account? Consider:

– critical temporal processes that will determine how often the account needs to be done to meet the stated purpose;

– location and extent of the reporting area; and

– account purpose and participants’ management requirements.

* What classification schemes already in place are relevant to the purpose of the account?
* What variables will be used to measure the account subject from each of the relevant perspectives?

**Module 7: Consider statistical units and report boundaries (how?)**

*Guiding questions:*

* According to the account framework, what are the basic entities and structure of the account? For example, if it is a SEEA ecosystem account (European Commission et al. 2013), what are the spatial and temporal characteristics of the basic spatial unit (BSU)? What are the ideal characteristics to record against each BSU?
* What report boundaries and aggregations are of relevance to the account? For example, the account may use specific ecosystem types (e.g., wetlands) or administrative regions (e.g., States and Territories).
* What are the practical resolutions of the statistical units and report boundaries? Consider the resolution of available data that is needed to meaningfully measure the characteristics of interest to account users.
* Within the total extent of the reporting area, what are the areas over which the data will be aggregated for reporting purposes?

**Module 8: Consider relevant standards (how?)**

*Guiding questions:*

* What standards and processes will be used to ensure the credibility, legitimacy and transparency of the information to be entered into this account?
* Can relevant accredited or de facto standards be identified or do they need to be developed?
* Is there a role for scientific accreditation (e.g., of the evidence base, the account methodology or the selected measures)? If so, does the accreditation process meet national and/or international standards?
* Is there a recognised process for assuring (auditing) the account? If not, does one need to be established?

Figure 4. Scoping an account—modules to address practicalities.

### 2.2 Specifying the account

Once an account subject is scoped, the information obtained can be used to specify one or more related accounts. At any point during the scoping process where specifications become clear, these can be entered into the specification document (Chapter 3).

Figures 5 and 6 provide the specification questions for each of the eight modules. The same questions (why, who, what, why, and how) are addressed, but each specification document provides a clear and concise description for a specific account. A comparison of how the modules are applied to both the account scoping and account specification steps is shown in Table 1.



**Module 1: Describe purpose or motivation (why?)**

*Specifications:*

* Name the environmental account and state its associated vision, rationale, purpose, and objectives.

**Module 2: Specify the account**

**participants (who?)**

*Specifications:*

* List the account producers, users, independent certification providers and assurers (auditors), including contact details.
* List the participants in collaborative conceptual modelling of the account subject.

**Module 3: Specify the subject of account (what?)**

*Specifications:*

* Define and describe the account subject.
* Designate the account perspective(s) and

the reasons, in terms of the account

purpose, for choosing these perspectives.

**Module 4: Document the conceptual model and evidence base for the account subject (what?)**

*Specifications:*

* Produce a conceptual model or models (via written or pictorial means) and evidence base for the current understanding of the account subject, from each perspective covered by the account (physical Earth, living, human cultural, and/or economic system perspectives).
* If valuations using one perspective (e.g., gigalitres as a physical Earth measure) are to be converted to units from another perspective (e.g., dollars), produce conceptual models of the current understanding underpinning this conversion.
* Define the process for maintaining the conceptual model and evidence base.

**iterative  
process**

Figure 5. Account specification–modules 1–4.



Figure 6. Account specification–modules 5–8.

**Module 7: Define statistical units and report boundaries (how?)**

*Specifications:*

* Define the BSU that will be used.
* Define the entities over which the data will be aggregated for reporting purposes.

**Module 8: Specify standards (how?)**

*Specifications:*

* Document any accredited standards that will be applied to the following aspects of the account:
  + accounting framework;
  + conceptual modelling;
  + data collection;
  + dataset;
  + classifications;
  + statistics;
  + certification and accreditation; and
  + quality, auditing and assurance.
* If no accredited standards exist, list protocols or recognised best practices that will be used as de facto standards to assure the credibility, legitimacy, and transparency of each aspect of the account.

**Module 6: Framework and methods—specify the account production and reporting frameworks and methods (how?)**

*Specifications:*

* Nominate an accounting framework (e.g., SEEA) and explain the reason for the choice.
* Outline the methods for producing the account, including the accounting period, resolution of the account (spatial, temporal, and thematic), measurement units (monetary, physical), measurement methods (sampling, observation), and aggregation methods.
* Define the account production infrastructure requirements (data management and analytical capacity).
* Define the account and reporting products (tables, maps and charts).
* Define the research

**Module 5: Data: specify the data**

**relevant to the account subject (how?)**

*Specifications:*

* Identify the most suitable data for producing the account including data status and management requirements, as well as arrangements for access.
* If data are to be collected, specify the collection standards.
* Identify fitness (value, issues, and constraints) of the use of data for the account purpose.
* Provide comprehensive metadata for each dataset.

Table 1. Modules of the account-scoping and account specification steps.

|  |  |  |
| --- | --- | --- |
| Module | Step 1: Scoping | Step 2: Specifying |
| 1. | Establish purpose or motivation.  (Why?) | Describe purpose or motivation.  (Why?) |
| 2. | Identify account participants.  (Who?) | Specify account participants.  (Who?) |
| 3. | Scope the subject of the account. (What?) | Specify the subject of the account.  (What?) |
| 4. | Establish a conceptual model and evidence base for the account subject. (What?) | Document the conceptual model and evidence base for the account subject. (What?) |
| 5. | Scope the data relevant to the account subject. (How?) | Specify the data relevant to the account subject. (How?) |
| 6. | Scope suitable production and reporting frameworks and methods.  (How?) | Specify the account production and reporting frameworks and methods.  (How?) |
| 7. | Consider statistical units and report boundaries. (How?) | Define statistical units and report boundaries. (How?) |
| 8. | Consider relevant standards.  (How?) | Specify standards.  (How?) |

An important part of framing the account is crosschecking to ensure that specifications are concordant across all modules. There should be a final crosscheck of each part of the account specification against all the other parts to ensure a viable account is specified.

Once the specification document is complete, the account is ready for production.

### 2.3 Documentation

With the user’s addition of other elements, such as a synopsis or executive summary, an account specification (with the completed Workbook as an appendix) can fulfil other accounting functions in addition to informing account production. For example, it can be published as a formal piece of metadata about the account, for review by anyone wanting to know how the account was produced. It could also be used as a sign-off document within the account-producing organisation or as part of the process of seeking support to produce the account.

## 3. Instructions for using the Workbook

### 3.1 Step 1: Scoping

• Use the following pages in Chapter 4 of your Workbook to complete the account-scoping   
process.

• For each module, the Workbook includes:

* a statement on its purpose;
* actions needed to complete the module;
* examples and tips; and
* guiding questions.

• At the beginning of the scoping process, establish an initial understanding of the account(s) to be framed by filling the Workbook with known information, that is, anything constrained or given for each module.

• Proceed by populating the Workbook. Complete each scoping module in any order, revisiting   
and revising the modules as needed until all details are recorded.

### 3.2 Step 2: Specification

• Use the specification document in Chapter 5 to record the specifications needed to produce an   
account. A blank account specification template can be downloaded from [www.bom.gov.au/environment/activities/accounts.shtml](file:///C:\Users\lsainsbu\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\U5L9Y2PY\www.bom.gov.au\environment\activities\accounts.shtml)

• Complete one specification document for each account.

• Figures 5 and 6 (Chapter 2) provide the specification questions for each of the eight modules.   
The answers to the specification questions are based on the scoping process (Step 1).

• Check the account’s feasibility by crosschecking all the modules for concordance.

## Part B: Workbook

**The following two chapters are for scoping (Chapter 4) and specifying (Chapter 5) the account.**

## 4. Account scoping

**Introduction to the account**

**Purpose:** To provide the context of the account.

**Action:** Briefly summarise the purpose and subject of the account and any links with other accounts.

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### 4.1 Module 1—Establish purpose or motivation (why?)

**Purpose:** Primarily, the purpose of an environmental account is to obtain timely and credible information about changes in the account subject (e.g., gains or losses to ecosystem assets) that are relevant to decision-making. The purpose or motivation for an account is strongly influenced by the perspectives and worldview of the account users on the account subject.

**Action:** Identify and document the purpose for the account.

**Examples:**

• Meeting environmental management objectives e.g. managing ecosystem structure, composition,   
function and processes, reducing the impact of waste, providing feedback necessary for adaptive management and learning

• Providing a basis for ecosystem services stewardship payments.

**Guiding questions:**

• What is the intended outcome of keeping this environmental account?

• Why is this important? Is there a statutory or other type of obligation?

• How will this environmental account help to achieve the intended outcome?

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### 4.2 Module 2—Identify account participants (who?)

**Purpose:** To provide clarity about the participants and to align the account with their needs. Identifying the participants also helps to underpin the legitimacy of the account.

**Action:** Identify account participants and document their roles and relationships, within the context of the account purpose.

**Tip:** Refer to the Joint Perspectives Model in Chapter 5 of the *Guide to environmental accounting in   
Australia* for assistance in documenting the user’s perspective.

**Example:** The Bureau of Meteorology produces the National Water Account. Examples of users are managers of environmental flows and people interested in the water market. The National Water Account seeks to meet the Australian Water Accounting Standard 1, which provides the basis for it to be assured.

**Guiding questions:**

• Who will use the account? What is their perspective on the account?

• Who will produce the account?

• Who will provide independent legitimacy (scientific accreditation) for the account?

• Who will assure (audit) the account?

• Who will participate in establishing the conceptual model and evidence base for the account?

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### 4.3 Module 3—Scope the subject of account (what?)

**Purpose:** To define the subject of an environmental account. This depends on the account’s purpose and the perspectives and objectives of the interested parties.

**Action:** Scope and document the subject of the account within the context of its purpose and the perspective of participants.

**Tip:** For more information on perspectives, see the Joint Perspectives Model in Chapter 5 of the *Guide to environmental accounting in Australia*.

**Examples:**

• extent and condition of vegetation in the Murray–Darling Basin;

• national biocarbon stores and flows; and

• national water stores and flows.

**Guiding questions:**

• What is the account about?

• What is the main thing being measured for this account?

• What are the assets or flows for which information is needed?

• From what accounting perspective(s) will these measurements be made (i.e., the physical Earth,   
living, human cultural, or economic system)?

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### 4.4 Module 4—Establish a conceptual model and evidence base for the account subject (what?)

**Purpose:** To provide a conceptual model that is the succinct summary of the agreed reasoning for the choice of account subject. The model should distil the best available current knowledge into a conceptual model, which then provides the basis for measurement, account production, and subsequent policy and activity. The conceptual model and evidence base is the key to developing a credible, legitimate, relevant, and enduring account.

**Action:**

• Collaboratively identify, document, and maintain the conceptual model of the subject of the   
account, within the context of the account purpose and participants.

• Develop and maintain an evidence base underpinning the conceptual model.

**Tip:** For more on the development of conceptual models and associated evidence bases, see   
Chapter 7 in the *Guide to environmental accounting in Australia*.

**Examples:**

• The Framework for the Assessment of River and Wetland Health uses conceptual models to   
underpin selection of indices of aquatic ecosystem functioning.

• The Central West Catchment Management Authority maintains a detailed evidence base for their  
Catchment Action Plan.

**Guiding questions:**

• What is the reasoning for this account? What are the perspectives driving the account?

• What is the science that links the account subject and perspective with the numbers   
representing measurements (observations, estimates) of it?

• What is the relationship of these measurements/numbers with the real world?

• How were the numbers that represent measurements of the account subject obtained?

• Who are the experts and stakeholders likely to have useful (including differing) ideas about  
answers to these questions?

• Does a relevant and reliable evidence base (e.g., compiled and synthesised peer reviewed   
literature) exist or will it need to be established or supplemented? How will it be maintained?

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### 4.5 Module 5—Data: scope the data relevant to the account subject (how?)

Purpose: To match the account subject required by managers and policy makers with the scientific capability and data, and to measure it is a critical step towards specifying the account.

**Action:**

• Identify measurement units and methods relevant to the account subject, within the context of the account purpose and the perspectives of the participants.

• Define and select a scale (resolution) in the spatial, temporal, and thematic dimensions for   
measuring and reporting the account subject. Measurement units and methods may need to be identified for more than one accounting perspective (physical units, ecological units, economic units, etc.).

**Guiding questions:**

• What datasets are required to populate the account?

• What datasets are available that relate to the purpose and subject of the account? What datasets   
need to be collected that relate to the purpose of the account? Are the data ‘fit for purpose’?

• What are the appropriate scales relevant to the account? Consider:

– critical temporal processes that will determine how often the account needs to be done to meet the stated purpose;

– location and extent of the reporting area; and

– account purpose and participants’ management requirements.

• What classification schemes already in place are relevant to the purpose of the account?

• What variables will be used to measure the account subject from each of the relevant   
perspectives?

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### 4.6 Module 6—Framework and methods: scope suitable production and reporting framework and methods (how?)

**Purpose:** To establish a suitable framework for the account, such as SEEA. The framework provides the principles, concepts, methods, and accounting rules for the account and should be clearly aligned with the purpose of the account and perspective of the account users. The accounting methods are required to bridge the gap between the intended account conceptual model and the practicalities of data availability and resource constraints.

**Action:** Scope and provide reasons for the selection of the account framework and methods.

**Tip:** For more information on environmental accounting frameworks, see Appendix 1 in the *Guide to environmental accounting in Australia.*

**Guiding questions:**

• What accounting frameworks are available to suit the purpose and subject of the account?

• Will links need to be made to the other accounts, such as economic accounts? If so, what frameworks are in use? How will measures be converted (e.g., gigalitres to dollars)?

• Will links need to be made to international reporting frameworks? If so, what characteristics does the account framework need?

• What are the account production infrastructure requirements, (e.g., the data management capacity or the analytical and modelling capacity)?

• Are there gaps in the account methods? If so, is a research agenda or training required?

• What are the account and reporting products like (tables, maps, and charts)?

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### 4.7 Module 7—Consider statistical units and report boundaries (how?)

**Purpose:** To provide a clear definition of a statistical unit (or accounting or analytical unit); this is at the core of any account as this is the base unit to which measurements and estimates are assigned.

**Action:**

• Define a statistical unit for the account that is consistent with the account’s conceptual model, the resolution of available datasets, accounting framework, and the account purpose. Ideally, this should be a unit that remains stable through repeated accounting periods.

• Define report boundaries for aggregating information.

**Guiding questions:**

• According to the account framework, what are the basic entities and structure of the account? For example, if it is a SEEA ecosystem account (European Commission et al. 2013), what are the spatial and temporal characteristics of the basic spatial unit (BSU)? What are the ideal characteristics to record against each BSU?

• What report boundaries and aggregations are of relevance to the account? For example, the account may use specific ecosystem types (e.g., wetlands) or administrative regions (e.g., States and Territories).

• What are the practical resolutions of the statistical units and report boundaries? Consider the resolution of available data that is needed to meaningfully measure the characteristics of interest to account users.

• Within the total extent of the reporting area, what are the areas over which the data will be aggregated for reporting purposes?

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### 4.8 Module 8—Consider relevant standards (how?)

**Purpose:** To ensure, through the use of accredited standards, that a high quality, consistent, and repeatable process is used to produce an account. Meeting standards strengthens the evidence base and strongly supports the credibility of the account.

**Action:** Identify and set standards and de facto standards relevant to the account subject and that meet accounting principles, within the context of the account purpose and participants.

**Tip:** See Chapter 10 in the *Guide to environmental accounting in Australia* for more information on how to identify or develop standards for environmental accounting.

**Examples:**

• System of Environmental-Economic Accounting Central Framework;

• Australian Water Accounting Standard 1;

• United Nations Food and Agriculture Organization Land Cover Classification System; and

• Australian Bureau of Statistics Australian Statistical Geography Standard.

**Guiding questions:**

• What standards and processes will be used to ensure the credibility, legitimacy, and transparency of the information to be entered into this account?

• Can relevant accredited or de facto standards be identified or do they need to be developed?

• Is there a role for scientific accreditation (e.g., of the evidence base, the account methodology, or the selected measures)? If so, does the accreditation process meet national and/or international standards?

• Is there a recognised process for assuring (auditing) the account? If not, does one need to be established?

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## 5. Account specification document

**Introduction to the account**

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### 5.1 Account purpose

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### 5.2 Account participants

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### 5.3 Account subject

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### 5.4 Account conceptual model and evidence base

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### 5.5 Account data

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### 5.6 Account framework and methods

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### 5.7 Account statistical units and report boundaries

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### 5.8 Account standards

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## References

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