Department of
Infrastructure, Planning and Natural Resources

Guideline for the Preparation of Environmental Management Plans

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Foreword

This Guideline was prepared to assist government agencies, contractors, developers and other stakeholders prepare effective environmental management plans (EMPs).

There is a reliance on the EMP to ensure that a project's actual environmental impacts are consistent with those evaluated in the environmental impact assessment (EIA) process. The EMP is therefore fundamental to the EIA process and should ensure that commitments given at a project's planning and assessment stage are carried through to the construction and/or operation stage.

The Guideline may also be useful to an EMP's users as well as its preparers. Councils may wish to use this document as a guide when requiring that an EMP be prepared as part of a development consent. The general public may use the Guideline when reviewing EMPs for projects or activities that may affect them.

This EMP Guideline was developed in consultation with government agencies, contractors and industry groups.

Contents

Glossary of Terms

conditions of approval	Obligations imposed on an activity assessed under Part 5 of the *Environmental Planning & Assessment Act 1979*.
conditions of consent	Obligations imposed on a development assessed under Part 4 of the *Environmental Planning & Assessment Act 1979*.
construction environmental management plan (CEMP)	A site or project specific plan developed to ensure that appropriate environmental management practices are followed during the construction phase of a project.
construction method statement (CMS)	A component of a Framework EMP that addresses environmental management issues relevant to a specific site and/or activity.
environmental aspect	Element of an organisation's activities, products or services that can interact with the environment.
environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.
environmental management plan (EMP)	A site or project specific plan developed to ensure that appropriate environmental management practices are followed during the construction and/or operation of a project.
environmental management representative (EMR)	A person generally appointed for large projects to independently review, audit and endorse a project's environmental activities.
environmental management system (EMS)	The part of an organisation's overall management system that includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.
environmental policy	Statement by an organisation of its intentions and principles for environmental performance.
framework EMP	An overarching EMP providing environmental management information relevant to an entire project.
government agency	NSW Government department, authority or state owned corporation.
minister	Minister administering the *Environmental Planning and Assessment Act 1979*

operation environmental management plan (OEMP)	A site or project specific plan developed to ensure that appropriate environmental management practices are followed during the operation phase of a project.
organisation	Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.
project	Term used in this document to refer to any design, construction or operation activity associated with a development under Part 4 of the *Environmental Planning and Assessment Act 1979* (the Act) or an activity under Part 5 of the Act.
proponent	For the purposes of this EMP Guideline 'proponent' is used to refer to both an applicant for a development application under Part 4 of the *Environmental Planning and Assessment Act 1979* (the Act) and also a proponent for an activity under Part 5 of the Act

1 Introduction

1.1 Background

The Department of Infrastructure, Planning and Natural Resources (DIPNR) prepared this *Guideline for the Preparation of Environmental Management Plans* (EMP Guideline) to assist government agencies, contractors, developers and other stakeholders prepare effective environmental management plans (EMPs).

Project proponents, including government agencies, are often required to prepare a project specific EMP as a condition of approval or consent. There is a reliance on the EMP to ensure that a project's actual environmental impacts are consistent with those evaluated in the environmental impact assessment (EIA) process. The EMP is therefore fundamental to the EIA process and should ensure that commitments given at a project's planning and assessment stage are carried out in the construction and/or operation stage.

The primary purpose of the EMP Guideline is to ensure a minimum standard and consistent approach to EMP preparation. Use of this guideline will improve the contribution that an EMP can make to the effectiveness of the EIA process and assist in ensuring that commitments made in a project's EIA are implemented.

This EMP Guideline was developed in consultation with government agencies, contractors and industry groups.

1.2 What is an EMP?

An EMP is a site or project specific plan developed to ensure that appropriate environmental management practices are followed during a project's construction and/or operation.

An effective EMP should ensure:

- application of best practice environmental management to a project
- the implementation of a project's EIA including its conditions of approval or consent
- compliance with environmental legislation, and
- that environmental risks associated with a project are properly managed.

2 Scope and Purpose

2.1 Purpose

A criticism of the EIA process is that once approval or consent for a project is obtained, the implementation of identified environmental controls is not subject to the same scrutiny. As a result, a project's construction and operation impacts may not be consistent with earlier predictions or commitments. One method of improving the effectiveness of the EIA process is to strengthen a project's EMP.

The purpose of the EMP Guideline is to:

- assist proponents in the preparation of an effective and user-friendly EMP
- improve the contribution that an EMP can make to the effectiveness of the environmental management process
- ensure a minimum standard and consistent approach to the preparation of EMPs
- ensure that the commitments made as part of the project's EIA are implemented throughout the project life, and
- ensure that environmental management detail is captured and documented at all stages of a project.

The EMP Guideline provides assistance in the preparation and implementation of an EMP. It is not prescriptive or detailed but provides a broad framework and direction. Application of the guideline will require tailoring of EMPs to ensure they are project and site specific.

2.2 Scope

The EMP Guideline was prepared primarily for proponents of projects requiring consent or approval from the Minister. It is intended to cover both construction and operation. The Guideline may also be useful to an EMP's users as well as its preparers. Councils may wish to use this document as a guide when requiring that an EMP be prepared as part of a development consent. The general public may use the Guideline when reviewing EMPs for projects or activities that may affect them.

The scope of an EMP will vary depending on the scale and nature of a project. The EMP Guideline is applicable to a range of projects and activities. For example it may be used for large linear projects, such as the construction and operation of freeways, or it may be used for smaller site-based projects or activities such as the construction and operation of a mine or factory.

This EMP Guideline is not a:

- template for an EMP
- guide to implementation of the Australian Standards for environmental management (AS/NZS ISO 14000 series), or
- replacement for other NSW Government guidelines or specifications for environmental management such as the NSW Government document *Environmental Management Systems – Guidelines* (NSW Department of Public Works and Services, 1998). That document identifies a requirement that all government projects or activities "will require the preparation of an appropriate site-specific Environmental Management Plan (EMP) prior to the commencement of the relevant site works".

2.3 Other Related Documents and Requirements

EMPs generally form one component of an organisation's and/or project's environmental management documentation. EMPs should not be prepared in isolation but be consistent and integrated with existing environmental documentation such as:

- an organisation's environmental management system (EMS), and
- a project's environmental impact assessment (EIA) and approval or consent documentation.

2.3.1 Environmental Management System

Many organisations have developed an EMS. An EMS provides the means to identify, manage and monitor environmental risk associated with an organisation's activities, products and services. Such systems focus on pollution prevention, resource management, and continuous improvement in environmental performance and provide the means to demonstrate ongoing environmental compliance.

The basic elements of an EMS, as outlined in the Australian Standards for environmental management (AS/NZS ISO 14000 series), are similar to the key elements that make up an EMP (refer to *Section 4* of this EMP Guideline). Where an organisation has an EMS it would be expected that an EMP would be consistent with, and incorporate key components of, their EMS.

2.3.2 EIA Documentation

The environmental impact of development and land use proposals in NSW is required to be assessed in accordance with the *Environmental Planning & Assessment Act 1979* (EP&A Act). Parts 4 and 5 of the EP&A Act are relevant to the EMP Guideline. Under these two parts an EIA document must be prepared and used as the basis for a project's environmental assessment.

The Minister has a consent or approval role for some projects assessed under Part 4, and for all projects assessed under Division 4 Part 5 of the EP&A Act. Details of the differences between these types of project can be found on DIPNR's website (www.dipnr.nsw.gov.au). When approving a project the Minister may impose conditions on the approval (Division 4 Part 5 projects) or conditions of consent (Part 4 projects).

The EIA documentation that will need to be considered when preparing an EMP may include:

- an environmental impact statement (EIS), or statement of environmental effects (SEE), or review of environmental factors (REF)
- a representations report (relevant for Division 4 Part 5 projects only)
- concurrence reports from other agencies or local councils
- conditions of approval or consent, and
- any other approval, licence or permit required.

Requirements and commitments specified or made in these documents must be incorporated into an EMP. If undertaken correctly this would ensure that the resultant impacts of a project's construction and operation are consistent with its approval or consent.

For Division 4 Part 5 projects requiring an EIS, a proponent must prepare a representations report as part of its request for approval. A representations report allows a proponent to consider issues raised in representations to the EIS exhibition and, where appropriate, further define the project and its environmental, social and economic controls.

Conditions from approvals, licences and permits required from other government agencies will also need to be considered in the EMP. These agencies may include:

- the Department of Environment and Conservation
- the Department of Primary Industries, and
- the NSW Heritage Office.

Appendix A provides a chart illustrating the post-approval process and provides an indication of the documentation that will need to be considered when preparing an EMP.

3 EMP Preparation

3.1 Why Prepare an EMP?

EMPs are valuable tools to:

- define details of who, what, where and when environmental management and mitigation measures are to be implemented
- provide government agencies and their contractors, developers and other stakeholders better on-site environmental management control over the life of a project
- allow proponents to ensure their contractors fulfil environmental obligations on their behalf, and
- demonstrate due diligence.

In addition, EMPs are often required as part of tendering for projects and are essential for some types of government projects.

3.2 When Should an EMP be Prepared?

A construction EMP is generally developed about the same time as the detailed design and related activities are undertaken. Each process should influence the other. An operation EMP should be developed before commencing operation of an activity or development.

The broad steps for the preparation of an EMP in relation to the post-approval process are illustrated in the flowchart contained in **Appendix A**. The flowchart summarises the implementation of environmental requirements for a project from approval or consent through to construction, operation and decommissioning.

It is important to note that an EMP is a "living" document that should be focused on continual improvement (refer to *Section 3.5*) and should be updated as necessary.

3.3 Who Should be Consulted?

Specific impacts and associated environmental control measures may not be fully described at the EIA stage of a project. For this reason, government agencies that have environmental protection responsibilities may need to be consulted as part of an EMP's preparation. Any agency consultation undertaken at this stage should be limited to that required by specific conditions, or clarify specific issues, or obtain other approvals, licences or permits.

Authorities that typically need to be consulted include:

- Department of Environment and Conservation
- the Department of Primary Industries
- NSW Heritage Office, and
- local councils.

During the preparation of an EMP, all relevant parties should be consulted as early as possible to facilitate a reasoned response.

Broader community involvement in the EMP may also be appropriate, depending on the type of project. Community liaison groups are often established for larger projects. These groups may comment on the specific environmental management measures to be considered in an EMP.

In all cases, the specific requirements arising from environmental assessment and consultation should be established and defined as early as possible for inclusion in the EMP.

3.4 Who Should Prepare, Certify and Approve an EMP?

A project's proponent (whether government agency, developer or industry) retains primary responsibility for the environmental performance of its projects or activities. As such, the proponent is responsible for ensuring the preparation, certification, approval and implementation of an acceptable EMP whether for construction or operation.

During a project's construction and/or operation the preparation and implementation of an EMP is often passed onto a contractor by a contract specification. While an EMP might be prepared and implemented by a contractor the responsibility for implementing the conditions of approval or consent lies with the proponent.

Conditions of approval or consent generally require that an EMP be approved before commencing construction and operation. The time required to obtain an approval often depends on the quality of the documentation provided.

The certification and approval requirements for an EMP should be recognised before the document is prepared to ensure that sufficient time is allowed.

3.5 Should an EMP be Reviewed?

An EMP is not static. It is a working document that requires review and amendment during the life of a project. Making changes to an EMP is an important aspect of improving a project's environmental management. The EMP review process is also a valuable means of continually improving the effectiveness of current and future EMPs.

Review timings depend on the nature and scale of the project but would typically be undertaken:

- when there is a change in the scope of the project
- following significant environmental incidents
- when there is a need to improve performance in an area of environmental impact
- at the completion of environmental audits, and
- at the end of a project (to allow for improvements in subsequent projects).

The review process should include looking at the environmental controls and procedures in use to make sure they remain effective. Reasons for making changes to the EMP should be documented. A copy of the original EMP document and subsequent versions should be kept for the project records.

The EMP should state under what circumstances an updated EMP should be re-submitted to an approval or consent body, for review and approval. A requirement to submit updated EMPs to the relevant authority may also be stipulated in conditions of approval or consent.

4 Model EMP

4.1 Types of EMPs

EMPs can be prepared at different times in a project's life. Usually these are prepared as:

- Construction EMPs (CEMPs), and
- Operation EMPs (OEMPs).

CEMPs are developed to ensure that appropriate environmental management practices are followed during a project's construction. OEMPs are developed to ensure that appropriate environmental management practices are followed during a project's operation and decommissioning. This EMP Guideline can be used for both CEMPs and OEMPs.

4.2 EMP Structure

The scope and content of an EMP will be a function of both the significance of a project's potential environmental impacts and also a project's size. Consequently it is not possible (or desirable) to prepare an EMP template as part of these guidelines. There are, however, common elements that should be included in all CEMPs or OEMPs. The following sections identify and describe these common EMP elements. Some discussion is also provided for variations in an EMP for different sized projects.

All EMPs should include information covering the four elements shown in **Figure 4-1**. A description of information and issues that may need to be addressed under each element is provided in *Section 4.3*. **Figure 4-1** is also provided in the format of a checklist in **Appendix B** which can be used to ensure that the EMP addresses these common elements.

Each of the four elements may have different end users and their preparation should be tailored to suit. **Table 4-1** identifies potential end users.

Table 4-1 Users of the EMP Document

EMP Element	Main End User
Background	All stakeholders – internal and external Community groups Approval or Consent Authority
Environmental Management	Proponent's management and supervisory staff Approval or Consent Authority
Implementation	Proponent's management and supervisory staff Construction Staff and Site Staff Community groups Operations Staff Approval or Consent Authority
Monitor and Review	Proponent's management and supervisory staff Approval or Consent Authority

Background

- Introduction
- Project Description
- EMP Context
- EMP Objectives
- Environmental Policy

Environmental Management

- Environmental Management Structure and Responsibility
- Approval and Licensing Requirements
- Reporting
- Environmental Training
- Emergency Contacts and Response

Implementation

- Risk Assessment
- Environmental Management Activities and Controls
- Environmental Management Plans or Maps
- Environmental Schedules

Monitor and Review

- Environmental Monitoring
- Environmental Auditing
- Corrective Action
- EMP Review

Figure 4-1 Information to be included in an EMP

4.3 EMP Document Description

This section provides a detailed description of information and issues that may need to be addressed under each EMP element. The EMP format should be adapted to suit a project's specific issues and requirements.

4.3.1 Background

4.3.1.1 Introduction

An introduction may be appropriate for large or publicly available EMPs. It can be used to provide a brief description of the project's background including its objectives and the steps that led to the selected project. It could also identify the key players involved.

4.3.1.2 Project Description

A project description should be provided in enough detail to define the nature and scope of the project. It should include the following:

Location

The site location should be described and a plan indicating the location of the activities provided. A general description of the environment of the site and surrounds would also be useful.

Construction/Operation Activities

A description of the construction and/or operation activities to be undertaken should be provided. This may include:

- a brief description of construction/operation processes
- working or operating hours, including details of any activities required to be undertaken outside of these hours
- employment numbers and type
- the plant and equipment to be used, and
- the location of site facilities and work compounds.

Timing and Scheduling

Anticipated commencement and completion dates should be listed. If the project is to be completed in stages then separate dates for each stage should be provided.

4.3.1.3 EMP Context

This section should describe how the EMP fits into the overall planning process for the project. This will involve providing a list of the project's environmental studies (e.g. EIS/REF/SEE) and any approval or consent documentation.

Any government agency or other stakeholder consultation that has been undertaken during the preparation of the EMP should be summarised. A summary of how the outcomes of the consultation outcomes were incorporated into the EMP should also be provided.

Some proponent's may have existing environmental management documents, such as an environmental management system (EMS). This section should also indicate the relationship of the EMP with such documents.

4.3.1.4 EMP Objectives

This may be a point form list of what the EMP is trying to achieve. It can include objectives that relate to general site management, special site features and best practice environmental management. The objectives should be project specific and not broad policy statements.

4.3.1.5 Environmental Policy

Where relevant, a proponent's environmental policy should be provided.

4.3.2 Environmental Management

4.3.2.1 Environmental Management Structure and Responsibility

An EMP should provide a clear organisation structure for the project including the names and positions of personnel responsible for environmental management. A description of the roles and responsibilities of each identified person should also be documented. The roles and responsibilities of subcontractors should also be identified.

A person should be nominated with the specific task of ensuring that the EMP is implemented and maintained. This is generally a project's manager or an organisation's environmental manager.

An approval or consent authority may require that an Environmental Management Representative (EMR) be appointed during construction of large projects. The role of the EMR should be specifically identified in a project's environmental management structure.

4.3.2.2 Approval and Licensing Requirements

A project's regulatory framework must be identified. An EMP should include relevant requirements to ensure they are considered, including:

- listing the conditions of approval or consent. It may be useful to include these as a matrix indicating where in the EMP each condition of approval or consent is addressed
- provision of a table listing the legislation relevant to the project and any licences, approvals or permits required to be obtained under that legislation. The table should identify the relevant section(s) of the legislation and specific triggers
- identifying the person (or role) responsible for obtaining the licences, approvals and permits and when they should be obtained and renewed, and
- describing any other requirements that apply to the project e.g. voluntary agreements, stakeholder agreements, EMS requirements, etc.

4.3.2.3 Reporting

A description of the reporting requirements for the project should be provided and include:

- a list of reports required, for example:
  - construction monitoring
  - non-compliance
  - corrective action
  - complaints management
  - auditing
  - pre-construction and pre-operation compliance, and
  - any reports required by government agencies
- a description of a typical report content
- personnel responsible for preparing the reports and when they are to be prepared
- communications protocols establishing who is responsible for distributing information, what is to be distributed and to whom, and the frequency of communication, and
- document control procedures.

4.3.2.4 Environmental Training

All employees should undergo general environmental awareness training and training about their responsibilities under the EMP. The training should ensure that all employees understand their obligation to exercise due diligence for environmental matters. Employees in this instance means all people working on-site including contractors and subcontractors.

Environmental training should include:

- a site induction
- familiarisation with the requirements of the EMP
- environmental emergency response training
- familiarisation with site environmental controls, and
- targeted environmental training for specific personnel. For example, plant operators may require specific training in dust minimisation.

The need for additional or revised training should be identified and implemented from the outputs of monitoring and reviewing the EMP.

Records of all training should be maintained and should include:

- who was trained
- when the person was trained
- the name of the trainer, and
- a general description of the training content.

4.3.2.5 Emergency Contacts and Response

The EMP should nominate a contact person(s) for emergencies that will be available 24 hours a day, seven days a week, and who has the authority to stop or direct works. It should also document the procedures to be followed in the event of an environmental

emergency. An environmental emergency is any event that causes or has the potential to cause material harm to the environment. These procedures need to include:

- the names and contact details (including all-hours telephone numbers) for emergency response personnel
- response personnel responsibilities
- contact details for emergency services (ambulance, fire brigade, spill clean-up services)
- the location of on-site information on hazardous materials, including Material Safety Data Sheets and spill containment materials
- steps to follow to minimise damage and control an environmental emergency, and
- instructions and contact details for notifying relevant government agencies, local councils and, if necessary, nearby residents.

4.3.3 Implementation

4.3.3.1 Risk Assessment

The type and level of risk assessment will vary depending upon the stage of a project (i.e. whether design, construction or operation). Documents or investigations that contain risk assessment information include:

- EIA document (i.e. EIS/SEE/REF)
- representations report
- assessment or decision report
- conditions of approval or consent
- detailed design, and
- construction methodology.

Their relevance to the EMP risk assessment would vary according to the project's stage. There are also several Australian standards that discuss risk assessment.

This section of the EMP should generally follow the following steps:

1) provide a list of the activities to be carried out. This should describe all project activities including those undertaken by subcontractors or suppliers together with ancillary works such as materials transport to and from the site and site establishment
2) identify the actual and potential environmental impacts associated with each activity
3) identify which environmental impacts are significant. Methods for risk assessment should be selected that are appropriate to the project and the existing EIA
4) use this information to design the environmental management activities, controls and monitoring to prevent or minimise those environmental impacts appropriately, and
5) state how often, and when, this risk assessment will be carried out.

The function of the risk assessment is not to repeat or supersede a project's EIA or its conditions of approval or consent. Rather it is to ensure that these are effectively translated into actual construction or operation techniques.

4.3.3.2 Environmental Management Activities and Controls

An EMP should specify all the environmental management activities, mitigation and control measures that will be used to prevent or minimise environmental impacts. It should include the detailed mitigation measures identified from the risk assessment. This is usually the largest section of an EMP.

This section must assign responsibility for control measures to specific personnel and provide timeframes for their implementation. It may also specify the monitoring measures associated with the control measure. Where monitoring measures are identified the EMP should state the minimum performance level or criterion to be achieved. Quantitative criteria are preferred but this may not always be possible in which case qualitative criteria may be used.

4.3.3.3 Environmental Control Plans or Maps

Environmental control plans or maps are a particularly useful on-site reference tool and should be included in every EMP. An example is a plan (or plans) indicating the location of the following:

- environmentally sensitive areas on and adjacent to the site
- waterways including drains
- erosion and sediment control measures
- works areas, machinery or vehicle parking, spoil dumps, fuel and chemical stores
- vegetation that requires protection
- restrictions on traffic movement, and
- monitoring locations.

Plans may also form the basic implementation section of an EMP for a specific site. An example of an environmentally sensitive area plan produced as part of a CEMP is provided in **Appendix C**.

4.3.3.4 Environmental Schedules

Environmental management schedules are copies of forms, reports or registers used during a project's day-to-day environmental management. Examples include:

- Site Inspection Checklist
- Non-compliance and Corrective Action Report
- Complaints Report
- Environmental Incident Report
- Environmental Training Register
- Waste Register, and
- Monitoring Checklist.

Relevant schedules must be included in the EMP.

4.3.4 Monitoring and Review

4.3.4.1 Environmental Monitoring

This section of the EMP should explain how environmental management activities and controls will be monitored.

A monitoring checklist should be developed specifying when the environmental control activities need to be carried out, who is responsible and what methods will be used to measure effectiveness. It should include space for sign-off to verify that the control action was undertaken and is working effectively. The checklist should also specify if, and when, follow-up action is required and who is responsible.

Details of how monitoring records will be collated, distributed and stored should also be provided.

4.3.4.2 Environmental Auditing

The EMP should describe the program and procedures for periodic auditing of the EMP's implementation and effectiveness. The audits should determine whether or not the EMP was properly implemented and maintained and provide information for the EMP review.

The audit program and procedures should cover both internal and external auditing requirements, including scope, frequency and methods, as well as the responsibilities and requirements for conducting audits and reporting results.

The frequency of audits should reflect the level of significance of environmental impacts and the results of previous audits.

4.3.4.3 Corrective Action

The EMP should define procedures for dealing with non-compliance with environmental management controls, environmental incidents and emergencies. The procedures should also define who is responsible and has the authority for handling and investigating non-compliance, taking action and completing corrective and preventative action.

Schedules should be developed for recording environmental incidents, non-compliance and corrective and preventative actions.

4.3.4.4 EMP Review

This section should describe how the EMP will be reviewed; including looking at the environmental controls and procedures to make sure they are still applicable to the activities being carried out. It should include:

- when/how often this will be done (refer to *Section 3.5*)
- who will be responsible for reviewing the EMP, recording decisions and the reasons for them, and making subsequent changes
- how the site/project team will be informed of those changes, and
- when the reviewed EMP should be submitted to the approval or consent authority.

4.4 Project Size and Complexity

4.4.1 Introduction

The size and the complexity of a project will influence how an EMP is presented, the format of the information and the level of information that is included. **Table 4-2** summarises different formats that may be used. This information is further detailed in the following sections.

For small projects (for example projects small in area with no complex environmental issues) the structure of the EMP may be organised using checklists or a site or issues based format. For large projects (for example involving multiple sites and/or complex environmental issues) there are a range of EMP formats. These could be based on each stage and/or each site.

Whichever EMP format is used the documentation should be as short and simple as possible, to facilitate easy use in the field, and provide practical and accessible information. Wherever possible, plans and/or checklists should be used in preference to written descriptions.

Table 4-2 EMP Formats

Size of Project	Format of EMP	Example of Environmental Management Activities and Controls section of EMP
Small	Template EMP and checklist format	**Appendix D(i)**
	Site based - categorise environmental impacts and controls under each site	**Appendix D(ii)**
	Issues based - categorise environmental impacts and controls under environmental issues headings	**Appendix D(iii)**
Large	Stage-based approach - categorise environmental impacts and controls under each stage of the project	**Appendix D(iv)**
	Combined issues, stage and site-based approach - categorise environmental impacts and controls under issues, or stage, or site headings	-

4.4.2 Small Projects - Template EMP and Checklists

For small projects it may be adequate to adopt a template/checklist format for an EMP. Template and checklist EMPs may also be useful for projects that require the same type of work to be undertaken at different locations, for example weed removal activities. Such activities generally result in similar environmental impacts and require implementation of similar environmental controls and management measures regardless of the location.

A template EMP may include much of the generic information required to be included in 'Background' and 'Environmental Management' elements of the EMP that is similar for each site. Space may be provided for tailored 'Implementation' and 'Monitoring and Review' sections (i.e. site specific information such as environmental activities and controls, plans, monitoring and review details).

Checklists are often developed for use during site inspections. They should include a list of control measures to be implemented, space for indicating if the controls were implemented and space for comments. Checklists should also be signed and dated by the person completing the inspection.

An example of an environmental checklist that could be used in the 'Implementation' section of a template EMP for weed removal activities is included in **Appendix D(i)**. The checklist provided in the Appendix does not represent the entire EMP.

4.4.3 Small Projects - Site-based Format

For small projects (construction or operation) the structure of the 'Implementation' element of the EMP can be organised using a site-based format. This involves combining all environmental issues and impacts into one environmental management table for each site. The table should include who is responsible for the implementation of individual controls, at what stage in the project the controls should be implemented, space for sign-off and dating to verify that the controls were implemented and sources or references for the control. Where practical the location of control measures, monitoring locations and the like should be indicated on a plan.

An example of a site-based table format for the 'Implementation' section of an EMP is provided in **Appendix D(ii)**.

4.4.4 Small Projects - Issues-based Format

For small projects or for projects that do not have specific stages or multiple sites, the structure of the 'Implementation' section may be organised using an issues-based format. The issues-based format involves organising the environmental impacts, management activities and controls information under each identified environmental issue.

Typical environmental issues include:

- erosion and sedimentation
- water quality
- groundwater
- air quality
- flora and fauna
- rehabilitation
- indigenous heritage
- non-indigenous heritage
- noise and vibration
- waste
- hazardous materials, and
- traffic.

Tables should be created for each identified environmental issue and the relevant control measures included. The table should also include who is responsible, the timing/frequency of implementation of controls, space for sign-off and dating to verify implementation and sources/references. Plans should be used where practical.

An example of an issues-based table format for the 'Implementation' section of an EMP is provided in **Appendix D(iii)**.

4.4.5 Large Projects - Stage-based Format

For large projects, carried out over extended periods, the 'Implementation' section of the EMP may be developed using a stage-based format. The stage-based format involves documenting the environmental issues and control measures for each stage of a project. For example, a separate table could be set-up for the pre-construction stage, construction stage and the post-construction stage. This can create some repetition but is useful in large projects as each table provides a separate checklist for each stage in a project's progression.

An example of a stage-based table to be used as part of the 'Implementation' element of an EMP is provided in **Appendix D(iv)**.

4.4.6 Large Projects - Combined Format

4.4.6.1 Description

For large, linear projects, such as construction of a road tunnel or railway, a combination of issues, stage and site-based formats is useful. This essentially involves breaking-up the different elements of an EMP into separate documents to make the environmental management document more manageable and user-friendly. Conditions of approval or consent for such projects may require that this approach be adopted.

The following discussion relates to construction activity but the logic could be equally applied in an operation EMP.

The combined format involves the preparation of:

- a construction framework EMP
- issue specific sub-plans, and
- site or activity specific construction method statements (CMS).

This document structure is illustrated in **Figure 4-2**. The following sections provide a general overview of the structure and content of each document.

The contents of the construction framework EMP and the sub-plans and construction method statements can vary depending on how the documents are structured. The following outlines provide a general guide. Similarly the need for issue specific sub-plans will depend on the project and level of information provided in the construction framework EMP.

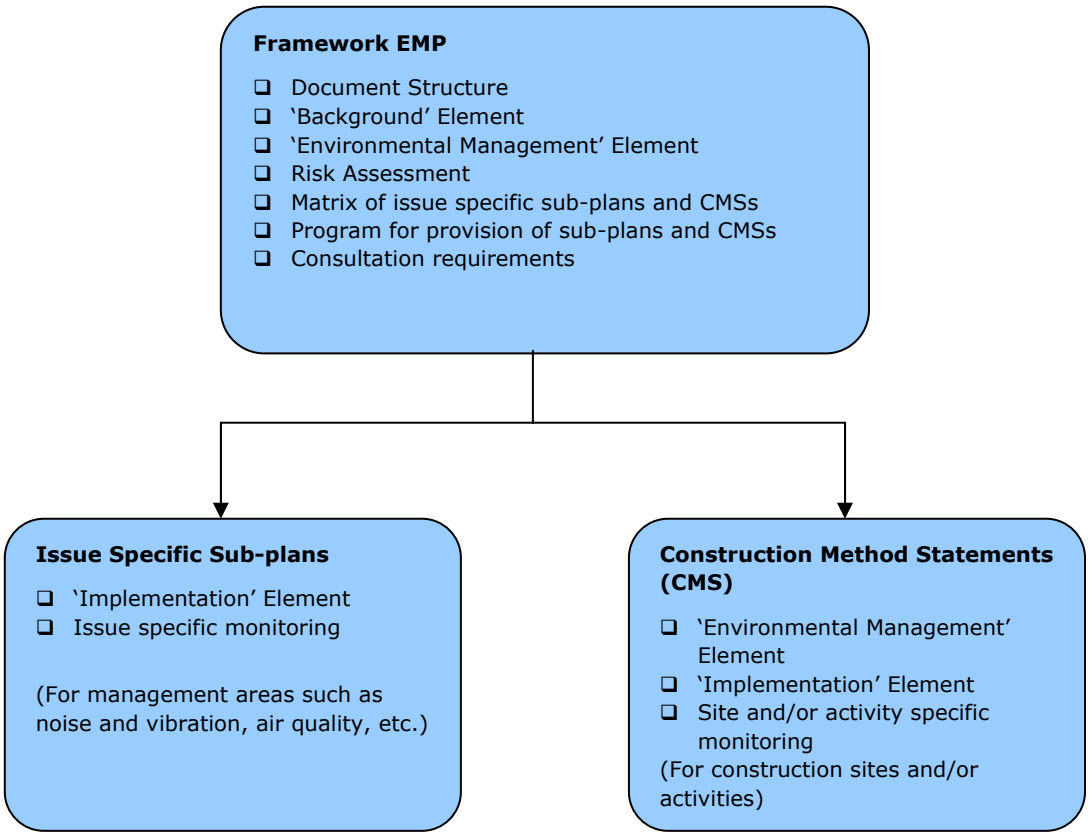


Figure 4-2 Document Structure for Combined Format

4.4.6.2 Construction Framework EMP

The Construction Framework EMP should provide the overarching environmental management information relevant to a project. It should include all the information described in the 'Background' and 'Environmental Management' EMP sections as well as:

- document structure and relationship to the sub-plans and CMSs
- matrix of sub-plans and the CMSs to be prepared
- individual risk assessments on each CMS
- timeframes for preparation, implementation, review and completion of sub-plans and CMSs
- details of the community consultation process, roles and responsibilities, and
- parts of the 'Monitoring and Review' EMP section, including information detailing project environmental auditing, corrective action, document control and EMP review.

4.4.6.3 Issue Specific Sub-Plans

Issue specific sub-plans should contain information relevant to key environmental management issues. Individual sub-plans could be prepared for issues such as:

- erosion and sedimentation
- water quality
- groundwater
- air quality
- flora and fauna
- rehabilitation
- indigenous heritage
- non-indigenous heritage
- noise and vibration
- waste
- hazardous materials, and
- traffic.

The sub-plans should contain the information in the 'Implementation' section of the EMP (*Section 4.3.3*) and should contain information as described in *Section 4.4.4*. They should include detailed information relating to environmental monitoring of the specific issue and contingency planning for exceedances.

4.4.6.4 Construction Method Statements (CMS)

Separate CMSs can be prepared for specific construction sites and/or activities (such as tunnelling, rock breaking, etc). They should include relevant information from the 'Environmental Management' (*Section 4.3.2*) and 'Monitoring and Review' (*Section 4.3.4*) EMP sections and all of the information from the 'Implementation' (*Section 4.3.3*) EMP sections. CMSs can be as simple as a plan.

5 Role of DIPNR

Conditions of approval or consent issued by the Minister often require that construction or operation EMPs be prepared for a project. A further requirement may be that these documents be approved by the Director General of DIPNR (or delegate) before the activity occurs. In its examination of an EMP DIPNR would consider factors such as:

- the adequacy of the response to any condition of approval or consent
- how commitments made in a project's EIA were incorporated into a project
- the roles and responsibilities of personnel responsible for implementing the EMP
- the ease of use of the EMP documentation, and
- a proponent's prior performance on similar projects.

Conditions of approval or consent may require that an Environmental Management Representative (EMR) be appointed during the construction of large or complex projects. This person performs an independent (of the proponent and contractor) review role for an EMP's preparation and implementation. An EMR's specific duties would be described in a condition of approval or consent but would typically involve the following activities:

- considering and advising DIPNR and the proponent on matters specified in the conditions and a project's compliance
- reviewing the CEMP
- periodically monitoring the proponent's activities to evaluate compliance with the CEMP
- recommending to a proponent to stop work immediately if an unacceptable impact on the environment is occurring or is likely to occur, and
- providing regular reports to DIPNR on matters relevant to the carrying out the EMR role.

6 Key Success Factors

Key success factors for preparing and implementing an effective EMP were identified from stakeholder consultation during the EMP Guideline's preparation. **Table 6-1** provides a summary of the factors stakeholders thought were important components of an EMP. These factors could be used as a further checklist of an EMP's adequacy and usability.

Table 6-1 Key Success Factors Checklist

Indicator	Check(Y/N)
EMP Structure	
A management tool showing how environmental impacts will be controlled?	
Well defined, clear document structure?	
Clearly and concisely written?	
Prescriptive?	
Realistic?	
Written for its users (i.e. construction and operation personnel)?	
Site specific?	
Easy to update?	
A dynamic assessment tool?	
Auditable?	
Prepared in parallel with detailed project design?	
EMP Content	
Only relevant detail?	
Environmental objectives and/or performance criteria?	
Allocation of responsibility?	
Clear identification of environmental controls, including responsibility and timing?	
Definition of parameters which trigger review?	
Environmental training requirements?	
Environmental Policy?	
Checklists?	
Reporting and auditing requirements?	
Explanation of relationship of EMP to other environmental management documents (e.g. EMS)?	
Project specific approvals and licensing requirements?	
Links to relevant approval and consent conditions?	
EMP as a Management Tool	
Reflect level of available information?	
Draws on commitments from the EIA process?	
Contain an environmental risk assessment?	
Use plans to illustrate requirements – e.g. sensitive sites and location of controls?	
Define relationship between EMP and EMS?	
Identify areas of uncertainty and contain contingency plans to cover uncertainty?	

7 Information Sources

A wide variety of information is available discussing an EMP's content and preparation. Details of some relevant websites are contained in **Table 7-1** while relevant Australian Standards include:

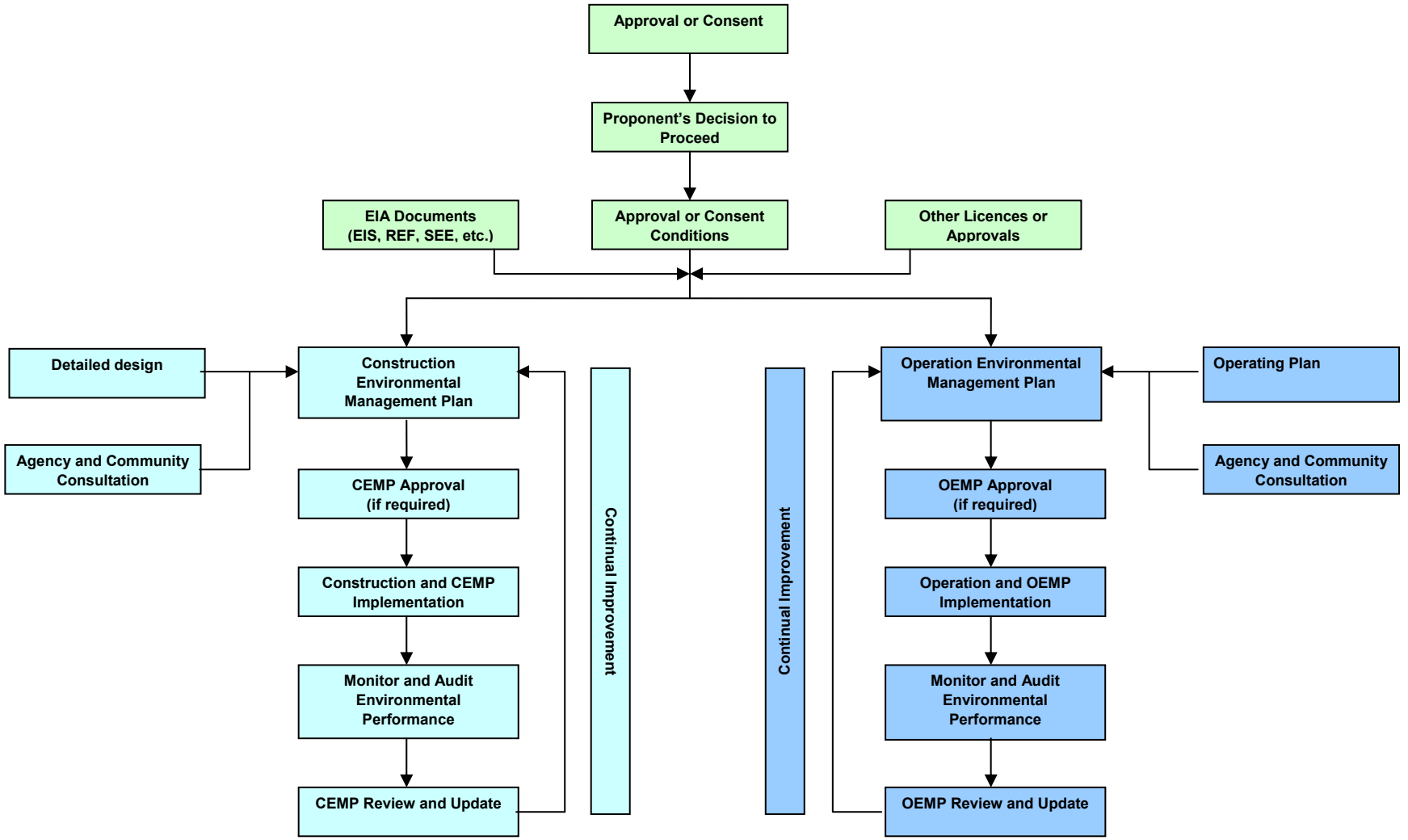
- Australian Standard/New Zealand Standard (AS/NZS) International Organisation for Standardisation (ISO) 14000 Series (including AS/NZS ISO 14001 *Environmental management systems – Specification with guidance for use*)
- AS/NZS ISO 19011:2003: *Guidelines for quality and/or environmental management systems auditing*
- AS/NZS 4360:1999 *Risk management*, and
- HB 203-2000: *Environmental risk management - Principles and process*.

Table 7-1 Websites with EMP Information

Source	Outline	Contact, correct at July 2004
Construction Agency Coordination Committee (CACC)	The CACC brings together the NSW Government's construction agencies to develop, implement and promote improved practices and standards to government construction procurement.	www.construction.nsw.gov.au
Victorian Environment Protection Authority	Environmental Guidelines for Major Construction Sites, February 1996	www.epa.vic.gov.au
Transport SA	Environmental management plan guidelines for construction	www.transport.sa.gov.au
Landcom – The Blue Book	Managing urban stormwater: soils and construction (the 'blue book'). The aim is to improve the management of urban water quality	www.landcom.nsw.gov.au
Landcom	A Guide for Landcom's Project Managers and Civil Contractors (EMP Guide)	www.landcom.nsw.gov.au
NSW Department of Infrastructure, Planning and Natural Resources	Standard Brief Conditions for the Provision of Project Management Services. Appendix N: Guidelines for the Preparation of a Review of Environmental Factors and an Operational Environmental Management Plan	www.dipnr.nsw.gov.au (natural resource management section)
Queensland Environmental Protection Agency	Environmental Management of Mining Guideline 10.	www.epa.qld.gov.au
VicRoads	Project Management Guidelines – Environmental Protection	www.vicroads.vic.gov.au
Roads & Traffic Authority	Environment Protection (Environmental Plan_ Guidelines Specifications G35 &G36)	www.rta.nsw.gov.au
NSW Environment Protection Authority	Model EMP: Environmental Management Plan for Landscaping Works	www.epa.nsw.gov.au
NSW Environment Protection Authority	Environmental Best Management Practice Guideline for Concreting Contractors	www.epa.nsw.gov.au
Australian Government Department of Agriculture, Fisheries and Forestry	Australia's National Framework for Environmental Management Systems in Agriculture	www.affa.gov.au

Appendix A

Post-Approval EMP Process



POST-APPROVAL EMP PROCESS

Appendix B

EMP Content Checklist

Does Your EMP Contain	Yes	No
Background (EMP Guideline Section 4.3.1)		
Introduction		
Project Description		
EMP Context		
EMP Objectives		
Environmental Policy		
Environmental Management (EMP Guideline Section 4.3.2)		
Environmental Management Structure & Responsibility		
Approval and Licensing Requirements		
Reporting		
Environmental Training		
Emergency Contacts and Response		
Implementation (EMP Guideline Section 4.3.3)		
Risk Assessment		
Environmental Management Activities and Controls		
Environmental Control Plans or Maps		
Environmental Schedules		
Monitoring and Review (EMP Guideline Section 4.3.4)		
Environmental Monitoring		
Environmental Auditing		
Corrective Action		
EMP Review		

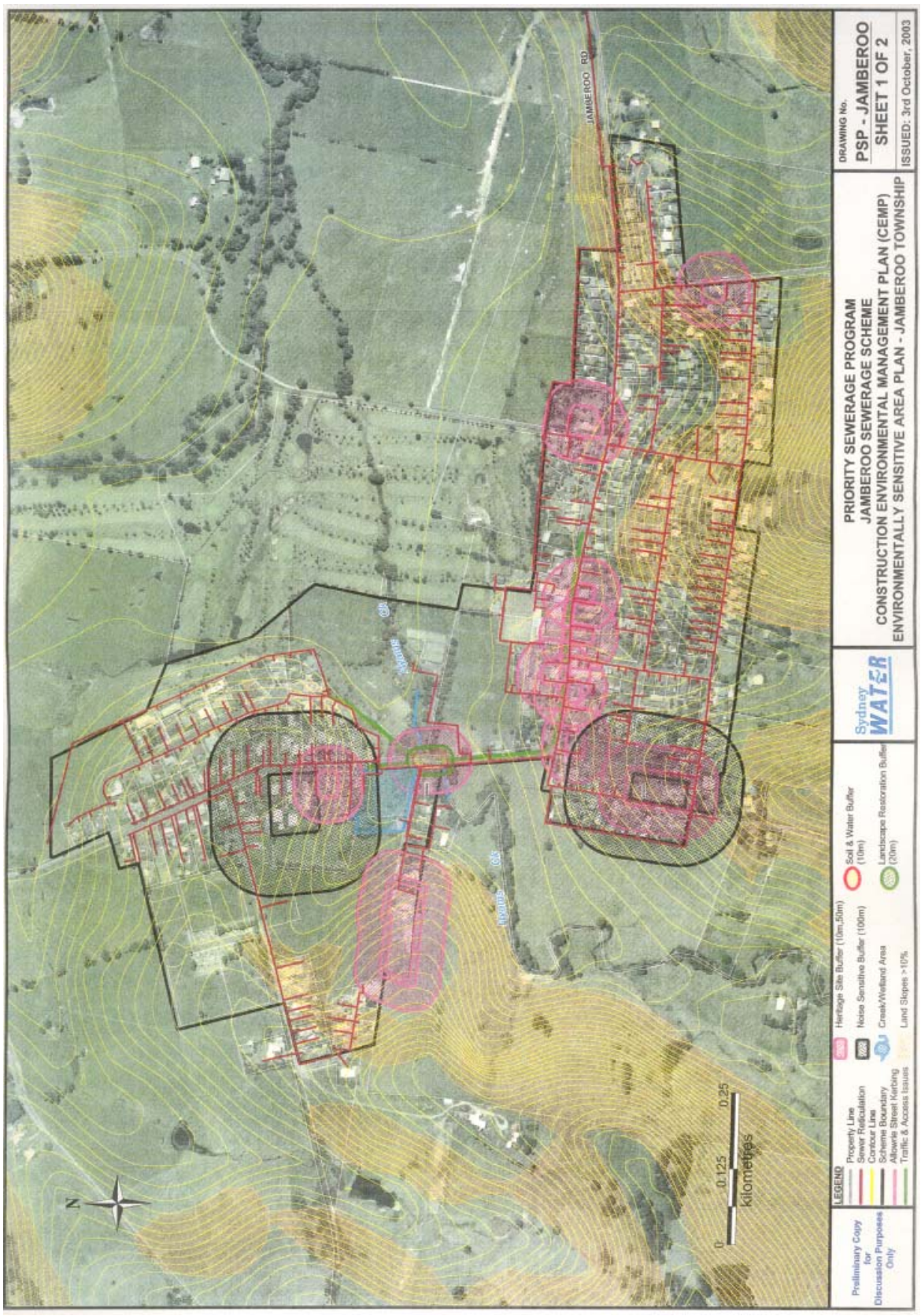
Note: This checklist highlights the main components of an EMP. It is not an EMP template.

EMP CONTENT CHECKLIST

Appendix C

Site Plan Example

DIPNR thanks Sydney Water for its permission to reproduce this “Environmentally Sensitive Area Plan”, sourced from Sydney Water’s Priority Sewerage Program - Jamberoo Sewerage Scheme. The plan presented in the Appendix is reduced in size from that used by construction personnel.



SITE PLAN EXAMPLE

Appendix D

Example EMP Implementation Sections

Note: These examples are intended to indicate broad formats and typical levels of detail for the 'Implementation' section of an EMP. Detailed information relevant to specific issues shown in the examples should not necessarily be regarded as correct.

(i) Small Project Checklist
Environmental Management Activities and Controls:
Weed Removal Activities

Project Name:			
Project Location:			
Environmental Controls:	*Yes*	*No*	*Comments*
Air Quality			
Are vehicles being restricted to sealed or dedicated areas?			
Is machinery complying with emission standards (i.e. emissions not visible for more than 10 seconds)?			
Are truck and vehicle speeds below 20km/hr on unsealed access tracks?			
Soils and Hydrogeology			
Are geotextile fences installed in appropriate locations and secure?			
Are geotextile fences clean and well-maintained?			
Is overburden being placed upslope as a protective bund?			
Noise Control			
Is all site work being conducted inside prescribed hours (i.e. between 7am-6pm Mon to Fri, 8am-1pm Sat, no work Sunday or Public Holidays)?			
Hazardous Goods			
Are MSDS available?			
Are spill kits on-site and complete?			
Are all chemicals, fuel and wastes being kept in sealed containers and not in drainage lines?			
Waste Management			
Is all cut vegetation being retained on-site in piles?			
Are plant containers and other waste being removed from site daily?			
Is the site left in a tidy and safe condition every day?			
Subcontractors			
Have all subcontractors completed a site induction?			
Are all subcontractors complying with the EMP?			

Complete a Non-compliance Report/Corrective Action Report for any "NO" answers.

Name of person inspecting site:	
Signature:	
Date and time of site inspection:	

(ii) Small Project Site-based Table

Environmental Management Activities and Controls: Quarry Operations

Environmental Management Control	Person Responsible	Timing / Frequency	Completed (Initials/Date)	Reference / Notes
General Site Issues				
Conduct site induction training for all personnel to alert them to sensitive work areas, explain the requirements of the EMP, outline an individual's responsibilities and inform all workers of emergency response procedures. Documented evidence of such training is to be available before commencing work on-site.	Environmental Manager	Before commencing work then ongoing for new employees / contractors		EMP Section 2.4
Ensure all operations are undertaken in accordance with the Environment Protection Licence (EPL) obtained under the provisions of the *Protection of the Environment Operations Act 1997*.	All site personnel	Ongoing during operations		EMP Section 2.2
Ensure emergency procedures are displayed in a prominent position within the site working area.	Safety Manager	Before commencing work		EMP Section 2.5
Allocate a person for the dissemination of general information on the site operations. Identify a contact person(s) and contact numbers for receiving comments or complaints from the community.	Environmental Manager	Before commencing work		EMP Section 1.1
Establish a register of complaints before work commences and maintain for the full duration of the work. The register shall record details of complaints, complainant contact information and action taken to address complaints.	Environmental Manager	Before commencing work		Consent Condition 5.1
Conduct audits of the EMP at least once a month. These will involve reviewing all documents, records and monitoring results to ensure compliance with the EMP.	Environmental Manager	Monthly		EMP Section 4.2
Indigenous Heritage				
If any Aboriginal archaeological sites or artefacts are discovered during the works, ensure work ceases immediately in the vicinity and that the DEC is contacted for further advice and action.	Site Supervisor	Ongoing during operations		EIS Section 4.10.1, Consent Condition 3.53

Environmental Management Control	Person Responsible	Timing / Frequency	Completed (Initials/Date)	Reference / Notes
Air Quality				
To prevent dust emissions from vehicles ensure that all vehicles entering or leaving the site and carrying a load that may generate dust are covered to prevent dust emissions at all times, except during loading and unloading.	Site Supervisor	Ongoing during operations		Consent Condition 3.6
Install, operate, and maintain dust control measures and/or equipment on the following: - all processing equipment - internal haul roads and disturbed areas - truck loading areas, and - all stockpiles including raw material, product, topsoil, and overburden.	Site Supervisor	Ongoing during operations		Consent Condition 3.7
Ensure a mobile water tanker equipped with a pump and sprays is used to suppress dust from unsealed roads when in use.	Site Supervisor	Ongoing during operations		Consent Condition 3.8
Flora and Fauna				
Fence the boundary of the construction zone to prevent construction plant and equipment entering adjacent vegetated areas.	Site Supervisor	Before commencing work		EIS Section 4.7.1
Restrict the removal of trees and other vegetation to the minimum required for quarry activities, the processing plant, and areas necessary for fire control.	Site Supervisor	Ongoing during operations		EIS Section 4.7.1, Consent Condition 3.11
Rehabilitate and revegetate works of extracted strips progressively.	Site Supervisor	Ongoing during operations		EIS Section 4.7.1, Consent Condition 3.12
Establish a riparian zone, revegetated with local native species, along the length of the reconstructed ephemeral waterway in the quarry.	Environmental Manager	Post-quarrying activities		EIS Section 4.7.1, Consent Condition 3.17

Environmental Management Control	Person Responsible	Timing / Frequency	Completed (Initials/Date)	Reference / Notes
Water Quality				
Prepare a Soil and Water Management Plan (SWMP) before commencing work. The SWMP shall provide for: - the prompt completion of works relating to drainage and sediment control to minimise exposure time of disturbed areas - the provision of sediment and filter traps, in advance of and in conjunction with earthworks operations, to prevent contaminated run-off leaving the site, and - scour protection / energy dissipation measures in drainage lines below drainage outlets. All controls are to be designed and installed in accordance with *Managing Urban Stormwater: Soil and Construction, Department of Housing 1998*. This plan is implemented and maintained for the period of quarrying and subsequent rehabilitation.	Environmental Manager	Before commencing work		EIS Section 4.8.1, Consent Condition 3.19
Ensure erosion and sedimentation control measures are installed before commencing land disturbance, and remain in place until the erosion hazard reverts to its pre-existing level.	Site Supervisor	Before commencing work then ongoing		EIS Section 4.9.1
Ensure drainage through and from areas of disturbance is designed to minimise surface flow velocities. Where appropriate, surface water flows from disturbed areas (including stockpile sites) are to be directed to sediment control facilities. Run-off from outside the work area is to be diverted around the disturbed catchment or through the area without mixing with site run-off, to prevent overloading erosion control structures.	Site Supervisor	Ongoing during operations		EIS Section 4.9.1
Ensure discharge of stormwater from the site is clear of sediment and pollution in accordance with the provisions of the *Protection of the Environment Operations Act 1997* and the EPL for the quarry.	Environmental Manager	Ongoing during operations		Consent Condition 3.24

Environmental Management Control	Person Responsible	Timing / Frequency	Completed (Initials/Date)	Reference / Notes
Noise				
Ensure activities are restricted to the following hours: - 7:00 am to 6:00 pm Monday to Friday - 8:00 am to 1:00 pm Saturday - No work on Sundays or public holidays.	Site Supervisor	Ongoing during operations		Consent Condition 3.40
Ensure noise from the site does not exceed the following at any residence not owned by the quarry: - an $L_{Aeq(15\ minute)}$ of 44 dB(A) between 7am and 6pm Monday to Saturday, and - an $L_{Aeq(15\ minute)}$ of 37 dB(A) between 6am and 7am Monday to Saturday;	Environmental Manager	Ongoing during operations		Consent Condition 3.41
Waste Management				
Ensure waste is disposed in compliance with the requirements of *Waste Avoidance and Resource Recovery Act, 2001* at a waste facility licensed to accept the type of waste presented.	Site Supervisor	Ongoing during operations		EIS Section 4.11.1

(iii) Small Project Issues-based Table

Environmental Management Activities and Controls: Demolition Works – Noise

Noise				
Environmental Management Control	**Person Responsible**	**Timing / Frequency**	**Completed (Initials/Date)**	**Reference / Notes**
Ensure construction or demolition activities are restricted to the following hours: - 7:00 am to 6:00 pm Monday to Friday - 8:00 am to 1:00 pm Saturday - No work on Sundays or public holidays	Site Supervisor	During demolition		SEE Section 4.11, Consent Condition 10
If the hours of demolition and construction activities need to be varied, ensure prior written approval is obtained from the local council. Any request to alter construction hours should include: - a clear justification of the need for the work - details of the type of activity and the extended hours, and - an analysis of the resultant noise levels at residences in the vicinity of the site.	Site Supervisor	During demolition		Consent Condition 11
Before commencing work, send a letter to all residents and industrial/commercial users whose premises may be affected by demolition noise. Ensure the letter includes: - hours of operation and duration of the demolition work, and - contact details for more information and/or to register complaints.	Environmental Manager	Before demolition		Consent Condition 12
Ensure that all noise complaints are recorded in a logbook. Ensure all complaints are investigated and concerns addressed.	Environmental Manager	During demolition		Consent Condition 13
Ensure high efficiency mufflers are used on all construction equipment and manufacturer's noise control equipment is intact. All equipment used on site shall have evidence of compliance with recommended noise levels outlined in AS2436, 1981.	Site Supervisor	Before and during demolition		SEE Section 4.11
Ensure all construction equipment is well maintained.	Site Supervisor	During demolition		SEE Section 4.11

(iv) Major Project Stage-based Table

Environmental Management Activities and Controls: Road Construction

Stage: Pre-construction

Environmental Management Controls	Person Responsible	Completed (Initials/Date)	Reference / Notes
Stage: Pre-construction			
Miscellaneous Issues			
Before commencing construction, and then at three-monthly intervals, advertise in relevant local newspapers, the nature of works proposed for the forthcoming three (3) months, the areas in which these works are proposed to occur, the hours of operation and a contact telephone number.	Communications Officer		Approval Condition 11
Nominate a person(s) to serve as the Environmental Management Representative (EMR) for the Director-General's approval at least three (3) months before construction commences.	Environmental Manager		Approval Condition 18
Prepare site induction training for all personnel to alert them to sensitive work areas, explain the requirements of the EMP, outline an individual's responsibilities and inform all workers of emergency response procedures.	Environmental Manager		EIS Section 4.1
Complaints Management			
Establish and publicise a 24 hour toll-free complaints contact telephone number. The aim of the complaints line is to enable any member of the public reach a person who can arrange appropriate response/corrective action to their complaint within two hours.	Communications Officer		Approval Condition 9
Establish a system to: - receive, record, track and respond to complaints - ensure that a verbal response is provided to the complainant within two hours (unless the complainant agrees otherwise) - provide a written response within seven calendar days if the complaint cannot be resolved verbally, and - ensure information on all complaints received and response times is available to the EMR daily and on request to relevant government agencies.	Communications Officer		Approval Condition 10
Nominate an appropriate person(s) to implement and manage the Complaints Management System. Ensure the name and contact details of this person(s) is provided to the Council, the Director-General and relevant agencies upon appointment and at least one week before construction commences.	Communications Officer		Approval Condition 10

Environmental Management Controls	Person Responsible	Completed (Initials/Date)	Reference / Notes
Traffic			
Prepare a road dilapidation report before construction commences and after construction is complete for all non-arterial roads likely to be used by construction traffic. Provide a copy of the report to the Council.	Engineering Manager		EIS Section 5.6 Approval Condition 26
Consult with Council to develop management techniques for construction traffic on local roads.	Engineering Manager		Approval Condition 27
Air Quality			
Identify dust sensitive land uses/industries and consult with them about the proposed mitigation measures.	Environmental Manager		Approval Condition 45
Design monitoring system for dust deposition and TSP and commence monitoring before construction commences.	Environmental Manager		EIS Section 5.8 Approval Condition 46
Noise			
Ensure all plant, vehicles and machinery proposed to be used during construction have evidence of compliance with recommended noise levels outlined in AS2436, 1981.	Environmental Manager		EIS Section 5.9
Ensure all temporary noise barriers are erected before commencing construction (refer to EIS Section 5.9).	Environmental Manager		EIS Section 5.9
Flora and Fauna			
Ensure construction footprints are surveyed and marked using poly-web fencing or other such measures, before commencing vegetation clearing.	Environmental Manager		EIS Section 5.10 Approval Condition 91
Where possible seed of locally native species is to be collected before commencing construction and/or during construction to provide seed stock for revegetation purposes to the satisfaction of a qualified bushland regenerator.	Environmental Manager		EIS Section 5.10 Approval Condition 94
Indigenous & Non-Indigenous Heritage			
Ensure temporary protective fencing is placed around sites considered to be archaeologically sensitive and for which Consent to Destroy Permits are not being obtained.	Environmental Manager		EIS Section 5.11 Approval Condition 102
Prepare Plans of Management for any historically significant items potentially affected by the Project. Plans of Management shall be prepared in consultation with the Council and NSW Heritage Office.	Environmental Manager		EIS Section 5.11 Approval Condition 103

Environmental Management Controls	Person Responsible	Completed (Initials/Date)	Reference / Notes
Water Quality			
Prepare a Soil and Water Management Plan (SWMP) before commencing work. The SWMP shall provide for: - the prompt completion of works relating to drainage and sediment control to minimise exposure time of disturbed areas - the provision of sediment and filter traps, in advance of and in conjunction with earthworks operations, to prevent contaminated run-off leaving the site, and - scour protection/energy dissipation measures in drainage lines below drainage outlets. All controls are to be designed and installed in accordance with *Managing Urban Stormwater: Soil and Construction, Department of Housing 1998*. This plan is implemented and maintained for the period of quarrying and subsequent rehabilitation.	Environmental Manager		EIS Section 5.16 Approval Condition 105
Ensure erosion and sedimentation control measures are installed before commencing land disturbance, and remain in place until the erosion hazard reverts to its pre-existing level.	Site Supervisor		EIS Section 5.16
Hazard Management			
Ensure storage areas for fuels, oils and chemicals on-site: - comply with the requirements of relevant authorities - are surrounded by impervious bund walls to contain 120% of the maximum possible spillage volume - are not within 20 metres of any areas of concentrated water flows, or poorly drained areas, and - are not within the drip line of trees.	Site Supervisor		EIS Section 5.19
An emergency procedure for chemical spills and other potential incidents shall be developed before work commences.	Site Supervisor		EIS Section 5.19
Ensure hydrophobic material, for the mopping up of any hydrocarbons in the event of a spill, is stored on-site and that relevant personnel are trained in its use.	Site Supervisor		EIS Section 5.19