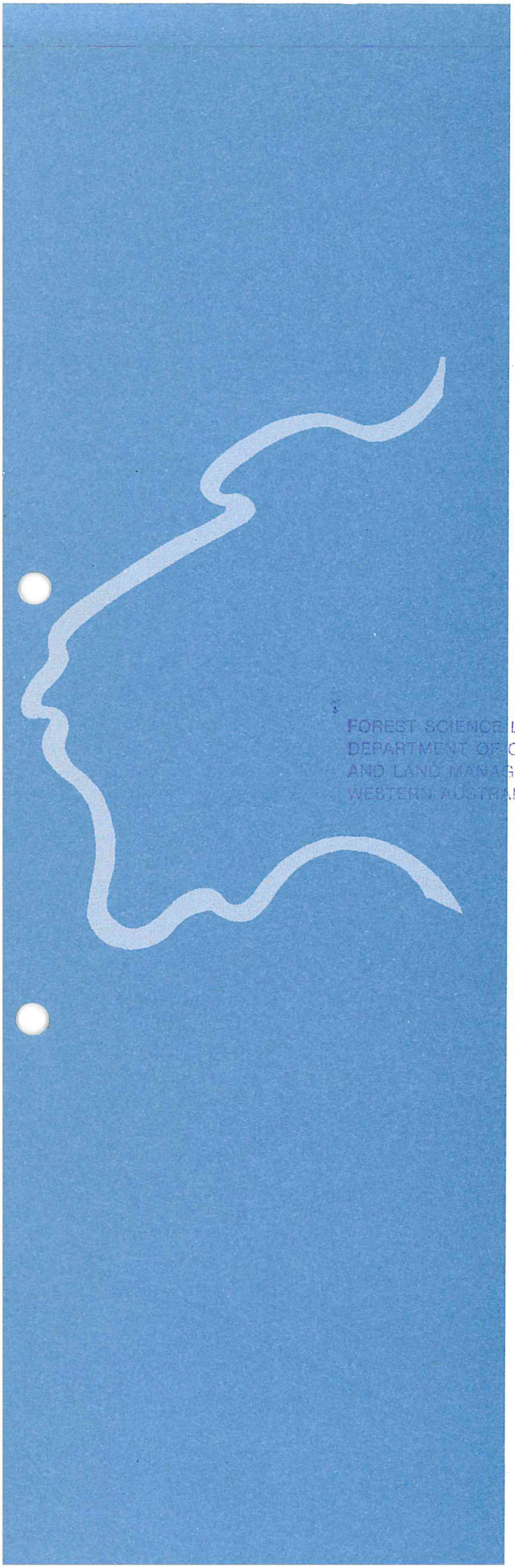

Environmental Protection Authority

Guidance for the Assessment of Environmental Factors

(in accordance with the Environmental Protection Act 1986)

Minimising Greenhouse Gas Emissions

No. 12

Interim

June 1998

Western Australia

Department of Environmental Protection

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TO WHOM IT MAY CONCERN

Your ref:
Our Ref: 58/96/12
Enquiries: Ruth Clark

EPA INTERIM GUIDANCE FOR ASSESSMENT OF ENVIRONMENTAL FACTORS No. 12 - MINIMISING GREENHOUSE GASES

The Environmental Protection Authority (EPA) is an independent statutory authority and is the key provider of independent environmental advice to the Government.

The EPA's objectives are to protect the environment and to prevent, control and abate pollution. The EPA aims to achieve this through the development of environmental protection guidance for the environmental impact assessment (EIA) of proposals. The EPA, in conjunction with the Department of Environmental Protection (DEP), has commenced the on-going development of such documents.

I have enclosed a copy of the EPA *"Interim Guidance for the Assessment of Environmental Factors No 12 - Minimising Greenhouse Gases"* and seek your comments.

This document is out for a 12 month test period closing on 11 June 1999.

Comments should be returned to Ruth Clark, Environmental Officer, Policy Co-ordination Division, Department of Environmental Protection, Westralia Square, 141 St Georges Terrace, Perth 6000 no later than 11 June 1999.

Please address any enquiries to Ruth Clark on 9476 7406

You will also find enclosed a copy of *"Final Guidance for the Assessment of Environmental Factors No. 34 - Linkage Between EPA Assessment and Management Strategies, Policies, Scientific Criteria, Guidelines, Standards and Measures Adopted by National Councils"*. Due to some misprints in the April 1998 release of this document it was decided to reprint and reissue the corrected version. Please replace your existing version with this new one.

K J Taylor
DIRECTOR
EVALUATION DIVISION

12 June, 1998

FOREWORD

The Environmental Protection Authority (EPA) is an independent statutory authority and is the key provider of independent environmental advice to Government.

The EPA's objectives are to protect the environment and to prevent, control and abate pollution. The EPA aims to achieve some of this through the development of environmental protection guidance for the environmental impact assessment (EIA) of proposals.

In 1992, when the Environmental Protection Act 1986 was reviewed, a key sentiment expressed related to the uncertainty of outcome of the EIA process. The EPA addressed this concern by identifying priority factors for which EPA guidance and position statements needed to be developed to establish the grounds for judging the environmental acceptability of developments in advance of project planning and design.

This document is one in a series of documents being issued by the EPA to address this concern. The series is written to assist proponents, consultants and the public generally to gain additional information about the EPA's thinking in relation to aspects of EIA process. The series provides the basis for EPA's evaluation of and advice on development proposals subject to EIA. The guidance statements are only a small part of the overall process to achieving an environmentally acceptable proposal. Consistent with the notions of continuous environmental improvement and adaptive environmental management, the EPA expects proponents to take all reasonable and practicable measures to do better than the minimal requirements of this guidance.

The following approach (as presented in section 3.2 of the document) would be used by the EPA during the assessment of any proposed project or extension where greenhouse gas emissions is considered to be a relevant environmental factor. Proponents shall in the Consultative Environmental Review (CER), Public Environmental Review (PER) or Environmental Review Management Programme (ERMP) documentation:

a) using the methodology developed and periodically updated by the National Greenhouse Gas Inventory Committee estimate the gross emissions of greenhouse gases that may be emitted from the proposed project for each year of its operation in absolute and in carbon dioxide equivalent figures;

b) using the methodology developed and periodically updated by the National Greenhouse Gas Inventory Committee estimate:

   (i) the gross removals of greenhouse gases from either sink enhancement programs or carbon dioxide stabilising techniques; and

   (ii) loss of sink through land clearing,

linked to the proposed project for each year of its operation in carbon dioxide equivalent figures;

c) indicate the intended measures and efficient technologies to be adopted to minimise total greenhouse gas emissions in the proposed project, including appropriate abatement measures;

d) compare the greenhouse gas emissions of this proposed project (per unit of product and/or other agreed performance indicators) with other similar established projects using the same and different technologies; and

e) as a matter of information, indicate whether the proposed project will be entered into the Commonwealth Government's "Greenhouse Challenge" voluntary cooperative agreement program (whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate).

This guidance statement has the status 'interim' which means it has been reviewed by stakeholders and the public and is sufficiently far advanced in its development that it can be released for a one year trial period. I am pleased to release this document.

Bernard Bowen

Bernard Bowen
CHAIRMAN
ENVIRONMENTAL PROTECTION AUTHORITY

12 June 1998

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Guidance No. 12

Guidance for Minimising Greenhouse Gas Emissions

Key words: greenhouse gas emissions, reductions, climate change, greenhouse challenge

1 PURPOSE

The purpose of this guidance statement is to:

a) ensure best available efficient technologies are used in Western Australia to minimise greenhouse gas emissions;

b) ensure that potential greenhouse gas emissions emitted from proposed projects where greenhouse gas emissions is considered to be a relevant environmental factor are adequately addressed;

c) protect the environment as defined by the *Environmental Protection Act 1986 (EP Act 1986)* with focus on minimising greenhouse gas emissions; and

d) present to the public and proponents the Environmental Protection Authority's (EPA) position on greenhouse gas emissions on new proposed projects and extensions subject to Environmental Impact Assessment (EIA).

This guidance statement applies to all new proposed projects and extensions subject to EIA by the EPA where greenhouse gas emissions is considered to be a relevant environmental factor.

2 INTRODUCTION

The greenhouse effect is a natural phenomenon that warms the earth and enables it to support life. Without it, the average temperature on earth would be around -18°C, a frozen wilderness, instead of the current +15°C. It works on the same principle as the ordinary glass garden greenhouse, where glass allows light to get in, but does not allow for the heat to get out. This makes for a much higher temperature inside the greenhouse [(1)].

On a planetary scale, similar processes occur. Light from the sun penetrates the atmosphere and reaches the earth's surface, warming it. The earth re-radiates much of this heat in the form of (invisible) infra red radiation. Infra red rays have a longer wavelength than incoming sunlight, and for this reason can be absorbed by certain gases in the atmosphere, labelled greenhouse gases. This absorption of heat warms up the atmosphere, which in turn radiates some of the heat back to the earth. Greenhouse gases include water vapour (H_2O), carbon dioxide (CO_2), methane (CH_4), chlorofluorocarbons (CFCs), perfluoromethane (CF_4), perfluoroethane (C_2F_6), ozone (O_3), oxides of nitrogen (NO_x), carbon monoxide (CO), non methane volatile organic compounds (NMVOC), hydrofluorocarbons (HFCs), sulphur dioxide (SO_2) sulphur hexafluoride (SF_6) and nitrous oxide (N_2O) [(1)].

Human activity has dramatically increased the amount of greenhouse gases in the atmosphere. Figures compiled by the Intergovernmental Panel on Climate Change (IPCC), established in 1988 by World Meteorological Organisation and the United Nations Environment Program to carry out internationally coordinated assessments of

the magnitude, timing and potential impacts of climate change, show the concentration of carbon dioxide has increased by about 30% over the past 200 years. Methane has shown a 145% rise [2].

In its Second Assessment Report, the IPCC reported that, inter alia:

- climate has changed over the past century;
- the balance of evidence suggests a discernible human influence on global climate;
- climate is expected to change in the future as concentrations of greenhouse gases in the atmosphere increase; and
- for many regions and systems, the effects of climate change are likely to be adverse [2].

These findings were supported in the Ministerial Declaration of the Second Conference of the Parties [3] to the United Nations Framework Convention on Climate Change (UNFCCC) in July 1996 and give credence to the need for more effective action by all countries, including Australia.

The IPCC also concludes that global mean surface air temperature is likely to rise by between about 1^0C and 3.5^0C by the year 2100. Projections of average sea level rise by the year 2100 attributed to global warming range from 15cm to 95cm [1].

The UNFCCC provides the focus for international action to address the threat of climate change. The objective of this treaty, which came into force in March 1994, is to achieve 'stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure the food production is not threatened and to enable economic development to proceed in a sustainable manner [1].'

An international agreement was reached at the Kyoto Climate Change Conference in December 1997. The Kyoto Protocol [4] when ratified would represent a significant first step in an effective international response to climate change. Developed countries have agreed to a collective target for the period from 1990 to the 2008 to 2012 budget period (referred to as the 2010 budget period) of reducing greenhouse gas emissions by just over 5.0% compared with 1990 levels. The Conference adopted differentiated targets with Australia's target being an 8.0% growth above 1990 levels.

The Kyoto Protocol also agreed to allow for forest sinks and to credit reductions in emissions due to a decrease in land clearing. Emissions trading is also allowed for, although further negotiations will be required for agreement on methodologies for all of these outcomes.

National Inventories have been prepared by the National Greenhouse Gas Inventory Committee (NGGIC) for each of the years between 1988 and 1995. Net emissions in 1988 and 1990 were 508 Mt and 535 Mt respectively [5].Total emissions in 1995 were 6.0% higher than in 1990 [6]. The publication "Summary and Analysis of Trends, National Greenhouse Gas Inventory 1988 to 1996" is expected to be finalised in July 1998. This will provide more up-to-date methodologies and comparisons of emissions for different years and will include performance indicator information.

Western Australian inventories were compiled by the NGGIC for the years 1988 and 1990. In 1988 and 1990 Western Australia's net greenhouse emissions totalled the carbon dioxide equivalent of 40 Mt and 46 Mt respectively [7].

Australia with 0.3% of the world's population contributes 1.4% of global greenhouse gases [8,9]. Western Australia contributed about 8.5% of the 1.4% in 1990.

There is wide dissension in the scientific community over the climatic and environmental effects that can be expected as a result of increasing levels of greenhouse gases. The nature, extent and the rate at which the change will occur is still subject to vigorous scientific debate. The majority view held in the scientific community is that global warming is occurring.

The Enhanced Greenhouse Effect has been given a 4 star rating in the draft 1997 Western Australian (WA) State of the Environment Report which indicates the issue has a high priority for government and community action. The EPA has decided to acknowledge the problem and, in taking action, the precautionary principle has been adopted.

3 GUIDANCE

3.1 The Environmental Objective

The EPA's environmental objective is to ensure that potential greenhouse gas emissions emitted from proposed projects are adequately addressed and best available efficient technologies are used in Western Australia to minimise Western Australia's greenhouse gas emissions.

3.2 Environmental Protection Authority's Basis for Assessment

For the purposes of implementing the above environmental objective, the following approach will be used by the EPA during the assessment of any proposed project where greenhouse gas emissions is considered to be a relevant environmental factor.

3.2.1 Environmental Protection Authority's Basis for Assessment for Consultative Environmental Reviews (CER), Public Environmental Reviews (PER) or Environmental Review Management Programmes (ERMP)

Proponents shall in the CER, PER or ERMP documentation:

a) using the methodology [10] developed and periodically updated by the National Greenhouse Gas Inventory Committee estimate the gross emissions of greenhouse gases that may be emitted from the proposed project for each year of its operation in absolute and in carbon dioxide equivalent figures;

b) using the methodology [10] developed and periodically updated by the National Greenhouse Gas Inventory Committee estimate:

   (i) the gross removals of greenhouse gases from either sink enhancement programs or carbon dioxide stabilising techniques; and
   (ii) loss of sink through land clearing,

   linked to the proposed project for each year of its operation in carbon dioxide equivalent figures;

c) indicate the intended measures and efficient technologies to be adopted to minimise total greenhouse gas emissions in the proposed project, including appropriate abatement measures;

d) compare the greenhouse gas emissions of this proposed project (per unit of product and/or other agreed performance indicators) with other similar established projects using the same and different technologies; and

e) as a matter of information, indicate whether the proposed project will be entered into the Commonwealth Government's "Greenhouse Challenge" [11] voluntary cooperative agreement program (whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate).

3.2.2 Environmental Protection Authority's Basis for Assessment for Environmental Management Programs

Before the project is commissioned the proponent shall, in the Environmental Management Program (if required by Minister):

a) using the methodology [10] developed and periodically updated by the National Greenhouse Gas Inventory Committee more accurately estimate the gross emissions of greenhouse gas that may be emitted from the proposed project for each year of it's operation in absolute and in carbon dioxide equivalent figures;

b) using the methodology [10] developed and periodically updated by the National Greenhouse Gas Inventory Committee more accurately estimate:

(i) the gross removals of greenhouse gases from either sink enhancement programs or carbon dioxide stabilising techniques; and
(ii) loss of sink through land clearing,

linked to the proposed project for each year of its operation in carbon dioxide equivalent figures;

c) indicate the final measures and efficient technologies adopted to minimise total greenhouse gas emissions in the proposed project, including appropriate abatement measures; and

d) as a matter of information, indicate whether the proposed project has been entered into the Commonwealth Government's "Greenhouse Challenge" [11] voluntary cooperative agreement program (whether on a project specific basis, company wide arrangement or within an industrial grouping, as appropriate).

4 APPLICATION

4.1 Area

This guidance statement shall be applied throughout the State of Western Australia by proponents for all new proposed projects formally assessed by the EPA where greenhouse gas emissions is considered to be a relevant environmental factor.

4.2 Duration and Review

The duration of this guidance statement is for five years unless some unforeseen circumstance requires it to be revised.

5 RESPONSIBILITIES

5.1 Environmental Protection Authority Responsibilities

The EPA will apply this guidance statement to any proposed project put forward where greenhouse gas emissions is considered to be a relevant environmental factor.

The EPA will recommend to the Minister the imposition of these requirements following its assessment of proposals for which greenhouse gas emissions is a relevant environmental factor.

Where the proponent demonstrates to the EPA that this guidance statement has been incorporated into proposals, the proponent should expect the assessment process to be facilitated.

5.2 Department of Environmental Protection Responsibilities

The Department of Environmental Protection will assist the EPA in applying this guidance statement in environmental impact assessment and in conducting its own functions under Part V of the *EP Act 1986*.

5.3 Proponent Responsibilities

The Proponent should demonstrate to the EPA that this guidance statement has been incorporated into the proposal. If appropriate, licence conditions may require periodic updates.

6 DEFINITIONS

Abatement

limiting, abating, avoiding or sequestering greenhouse gas emissions through source reduction, carbon stabilising techniques or sink enhancement. Abatement measures may not necessarily result in net emission reduction when compounded with changes in production or activity level [11].

Absolute Emissions

Refers to the total emissions of greenhouse gases expressed in terms of the actual mass of each individual gas emitted over a specified time period [11].

Carbon Dioxide Equivalent

This is calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential factor. This will enable emissions of different gases to be added together and compared with carbon dioxide [12].

Consultative Environmental Review (CER)

This is the level of assessment generally used for proposed projects which are likely to have relatively easily managed environmental impacts and public interest is restricted to the local community and/or special interest groups. All CER documents prepared by proponents are publicly available, and a public review period of up to four weeks is normally required [13].

Commonwealth Government's "Greenhouse Challenge" Voluntary Cooperative Agreement Program

The Greenhouse Challenge is a cooperative effort by industry and Commonwealth Government to reduce greenhouse gas emissions through voluntary industry action. Participation in the challenge will be through 'cooperative agreements' between the Commonwealth Government and industry participants.

The objective of these agreements is to capture the capacity of industry to abate its greenhouse emissions, mainly by improving its efficiency in energy use and processing. A successful program will mean that Australia is developing sustainable strategies that respond effectively to climate change, while enhancing Australian industry competitiveness.

The following features form the basis for cooperative agreements between industry and the Commonwealth to abate greenhouse gas emissions and enhance sinks, as part of a comprehensive approach.

Cooperative agreements include the following:

- an appropriate emissions inventory;
- specific greenhouse action plans;
- a commitment to regular monitoring and reporting of performance against action plans;
- provision for verification of performance; and
- a public statement, as agreed by the parties, on the undertakings contained in the agreement [11].

Environmental Review Management Programme (ERMP)

This is the most comprehensive and detailed level of assessment and is used mainly for major projects which have strategic environmental implications and are of state wide interest. Proposed projects of this type have a need for detailed evaluation, extensive public review, and a comprehensive environmental management programme. The public review period is normally ten weeks [13].

Greenhouse Gases

Proponents would be required to report on the emissions of:

a) carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluoromethane (CF_4) and perfluoroethane (C_2F_6) in terms of their absolute emissions and their "carbon-dioxide equivalent" (CO_2-e) and

b) oxides of nitrogen (NO_x), carbon monoxide (CO), non methane volatile organic compounds (NMVOC), hydrofluorocarbons (HFCs), sulphur dioxide (SO_2) and sulphur hexafluoride (SF_6) in terms of their absolute emissions .

The "carbon dioxide equivalent" is calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential (GWP) factor published by the Intergovernmental Panel on Climate Change [12,14].

Gross Emissions

The actual mass of the greenhouse gases emitted. These emissions may be expressed as either absolute or carbon dioxide equivalent emissions.

Global Warming Potential (GWP)

Global Warming Potential is the warming potential of a gas. GWPs are revised from time to time as knowledge increases about the influences of different gases and processes on climate change. GWPs also vary with the time horizon being considered. The 100 year horizon is generally used in policy analyses. At the time of the publication of this document the GWPs were 1 for carbon dioxide (CO_2), 21 for methane (CH_4), 310 for nitrous oxide (NO_2), 23 900 for sulphur hexafluoride (SF_6), 6 500 for the PFC perfluoromethane (CF_4) and 9 200 for the PFC perfluoroethane (C_2F_6). GWPs are not available for other greenhouse gases at this stage [2,6,12].

Measures

Refers to the range of possible actions undertaken which directly or indirectly contribute to the abatement of greenhouse gas emissions through source reduction or sink enhancement [11].

National Greenhouse Gas Inventory Committee (NGGIC)

The National Greenhouse Gas Inventory Committee consists of representatives of the Commonwealth, State and Territory Governments and oversees the development of greenhouse gas inventory methods and compilation of inventories for Australia (Environment Australia, pers. comm.). Up-to-date methodology workbooks may be obtained by contacting Environment Australia.

Net Greenhouse Gas Emissions

The actual mass of the greenhouse gases emitted minus any emissions that may have been removed through sink enhancement [5,11].

Public Environmental Review (PER)

This level of assessment is used for a proposed project with either major public interest or potential for significant environmental impacts of at least regional interest. PERs normally have an eight week public review [13].

Sink Enhancement

An activity that results in greenhouse gases being removed from the atmosphere, eg tree planting.

7 LIMITATIONS CLAUSE

This guidance statement has been prepared by the Environmental Protection Authority to assist proponents and the public. While it represents the contemporary views of the Environmental Protection Authority, each proposal which comes before the Environmental Protection Authority for environmental impact assessment will be judged on its merits. Proponents who wish to deviate from the requirements of this document should therefore provide justification for the proposed departure.

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Status Signed-off by EPA at this stage.

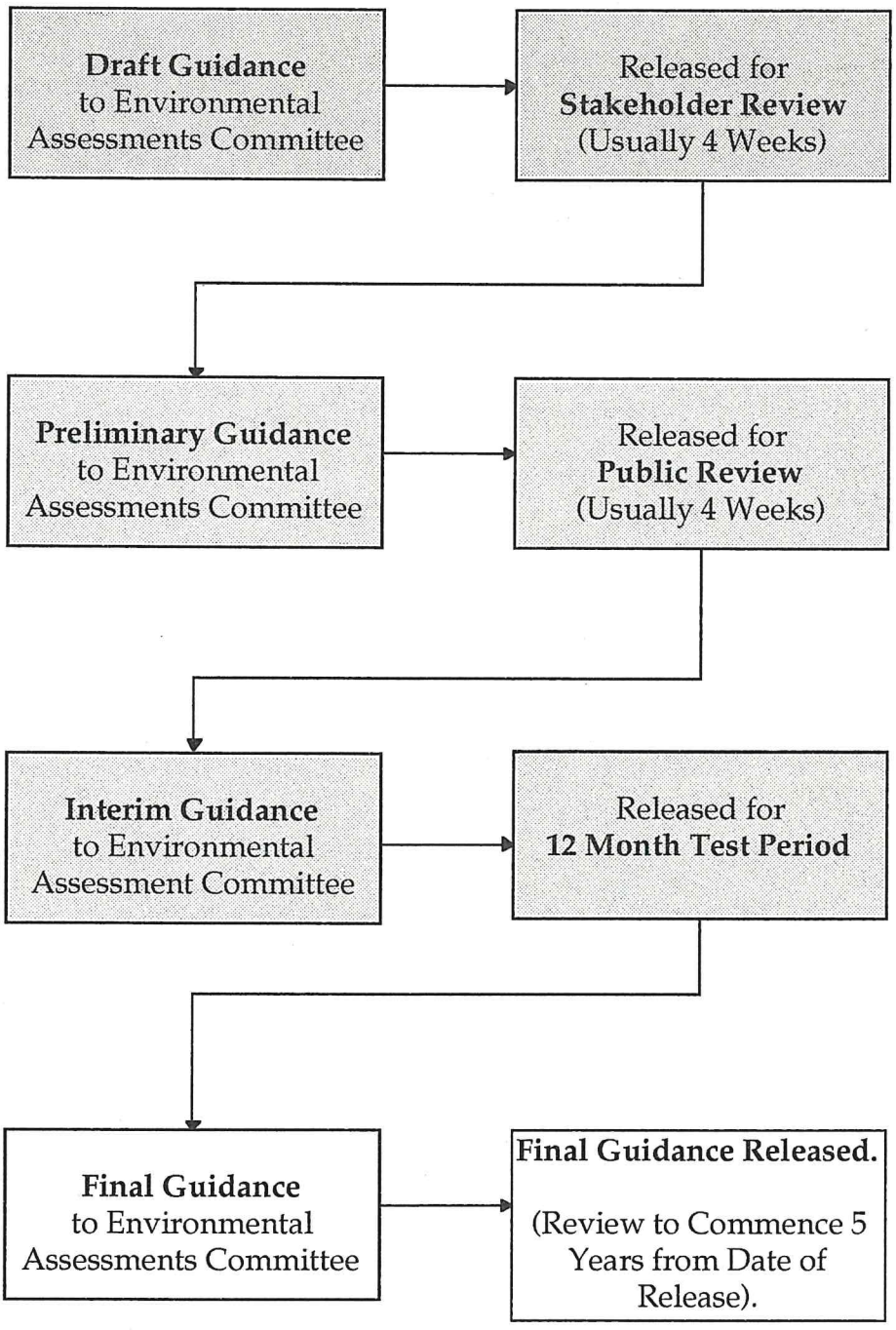
Citation This interim EPA guidance statement can be cited at this time and is used by the EPA for the purposes of EIA with respect to this factor.

Acknowledgments The EPA acknowledges Ms R Clark, DEP for compiling the guidance statement, Mr C Sanders, formerly of the DEP and Dr B Jenkins CEO of the DEP for drafting the original guidance statement, Ms J Taylor, Ms M Turpin and Ms S Thomas, DEP for coordinating the development of the guidance statement and Dr B Jenkins CEO of the DEP for further valuable comments. The EPA also thanks the following past and present DEP staff for their valuable comments and assistance on drafts, Mr A Baker, Ms C Fryer, Ms X Nguyen, Mr R Sippe, Mr K Taylor, Mr F Tromp, Mr M Waite, Dr R Wallis and Ms L Willock.

Contact Officer Ms R Clark, DEP (08) 9476 7406

Appendix 1

Guidance for the Assessment of Environmental Factors Flow Diagram



Note: Shaded areas denotes those parts of the process completed