Clearing of native vegetation on Victoria Location 10598 Cockleshell Gully Road, Shire of Dandaragan

Mr Craig Underwood

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 832
November 1996

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of $10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment

12th Floor, Dumas House

2 Havelock Street

WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the $10 fee) must reach the Minister's office no later than 5.00 pm on 22 November, 1996.

Environmental Impact Assessment (EIA)

Process Timelines in weeks

Date	Timeline commences from receipt of full details of proposal by proponent	Time (weeks)
20/11/95	Proponent Document Released for Public Comment	
18/12/95	Public Comment Period Closed	4
11/2/96	Issues Raised During Public Comment Period Summarised by EPA and Forwarded to the Proponent	3
22/3/96	Proponent response to the issues raised received	5
5/11/96	EPA reported to the Minister for the Environment	26

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Summary and recommendations

This report and recommendations provides the Environmental Protection Authority's (EPA) advice to the Minister for the Environment on the environmental acceptability of the proposal to clear 870 hectares of native vegetation on Victoria Location 10598 Cockleshell Gully Road, Shire of Dandaragan.

The proponent is Mr Craig Underwood, the owner of Victoria Location 10598.

A number of environmental issues raised by the proposal were considered by the EPA. From these the EPA has identified the environmental factors relevant to the proposal requiring detailed evaluation as:

- clearing native vegetation;
- retention of vegetation buffers to protect environmental values of adjacent national parks;
- impact of clearing native vegetation on rare plant communities and rare flora and fauna;
- impact of clearing native vegetation on wetlands and watercourses;
- impact of clearing native vegetation on groundwater levels and the caves within Drovers Cave National Park;
- farm management; and
- risk of spreading dieback *(phytophthora)* as a result of clearing the property

Following evaluation of the key environmental factors relevant to the proposal, the EPA has concluded that the proposal can be managed to meet the EPA's objectives subject to the proponent's commitments, and the conditions and procedures in the assessment report.

Conclusion

The EPA has evaluated the proposal to clear native vegetation on Victoria Location 10598 Cockleshell Gully Road, Shire of Dandaragan and has concluded that the project is environmentally acceptable, subject to the proponent's commitments and the Environmental Protection Authority's recommendation.

Recommendation No.	Summary of recommendation
1.	**The proposal, as modified by the proponent's commitments, to clear native vegetation on Victoria Location 10598 can be managed to meet the Environmental Protection Authority's environmental objectives subject to the successful implementation of the proponent's commitments.**

1. Introduction and background

1.1 Purpose of this report

This report provides the Environmental Protection Authority's (EPA) advice and recommendations to the Minister for the Environment on the environmental acceptability of the proposal to clear 870 hectares of native vegetation on Victoria Location 10598 Cockleshell Gully Road, Shire of Dandaragan (refer to Figure 1).

1.2 Background

The Notice of Intent outlining the proposal to clear Victoria Location 10598 was referred by the Commissioner for Soil and Land Conservation to the EPA for environmental impact assessment in March 1994.

There are a number of potential environmental impacts which may result from the proposal, which were of sufficient concern for the EPA to require a formal environmental impact assessment. This included impacts on biodiversity, rare plant communities, rare flora and fauna, wetlands, watercourses, impact of rising groundwater levels on the caves within Drovers Cave National Park and the risk of spreading dieback *(phytophthora)* .

The level of assessment was set at Consultative Environmental Review (CER) by the EPA in April 1994. The CER was available for comment during a 4 week public review period which closed in December 1995.

The CER addresses a proposal, by the landowner Mr Craig Underwood, to clear 870 hectares of native vegetation on Victoria location 10598 Cockleshell Gully Road, Shire of Dandaragan. The land to be cleared is located 17 kilometres north east of Jurien and abuts the southern boundary of Lesueur National Park and the eastern boundary of Drovers Cave National Park (refer to Figures 2).

The proponent proposes to plant tagasaste, which is a commercial fodder crop, on the 870 hectares of land to cleared. The 500 hectares of land that is currently cleared is already planted with tagasaste. Tagasaste has been planted as a commercial crop within the Shire of Dandaragan for a number of years.

Victoria location 10598 comprises of 1705 hectares of which 500 hectares (30%) is currently cleared. It is proposed to retain 350 hectares (21%) of the property as native vegetation in accordance with the farm plan prepared by Agriculture Western Australia. The farm plan is shown in Figure 3.

1.3 Structure of the report

This report has been divided into seven sections.

Section 1 introduces the report by stating its purposes, describes the background to the proposal and its assessments and outlines the structure of the report.

Section 2 briefly describes the proposal. The proposal is described in more detail in the proponent's CER (Alan Peggs Rural Pty Ltd, 1995).

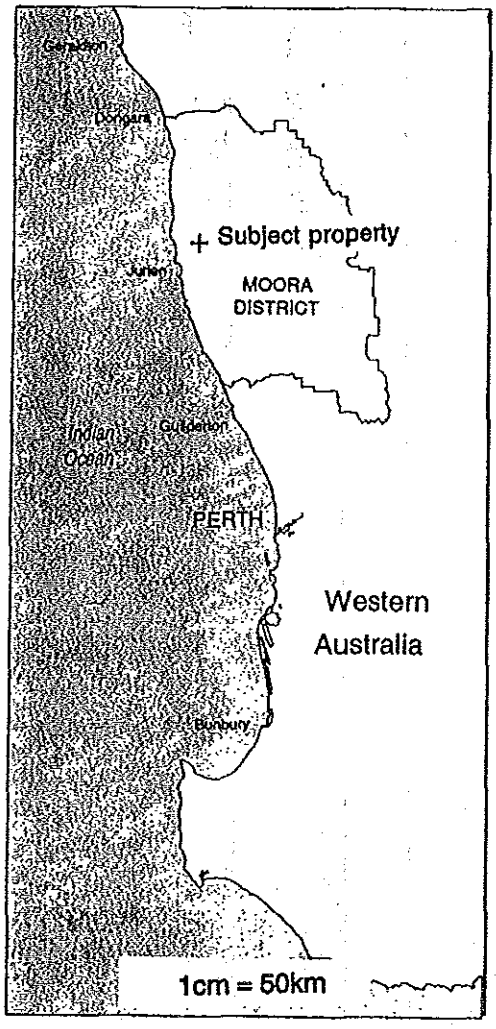
Section 3 explains the method of assessment and provides a summary of the issues raised through the setting of guidelines and in public submissions. From these issues and others raised throughout the assessment process, those factors that require further evaluation by the EPA are identified. Table 1 summarises this assessment.

FACTORS	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCIES COMMENTS	PUBLIC COMMENTS	IDENTIFICATION OF KEY ENVIRONMENTAL FACTORS
Biophysical impacts				
1.Clearing native vegetation.	•To clear 870 hectares of native vegetation and plant tagasaste as a commercial fodder crop.	•CALM consider that the land clearing will have minimal impact on the adjacent National Parks. •The NPNCA has advised that it supports the views expressed by CALM. •The DEP advise that the proposed clearing is in an area of high species diversity.	•No further clearance of native vegetation should be allowed.	EPA EVALUATION REQUIRED
2.Retention of vegetation buffers.	•Provide vegetation buffers around wetlands, water courses and along the boundaries of the National Parks.	•AgWA and CALM provided comments on suggested buffer locations and widths.	•Remnant vegetation areas are narrow and vulnerable to change. •Buffers are needed to protect conservation values of the National Parks.	EPA EVALUATION REQUIRED
3.Impact of land clearing on rare plant communities and rare flora and fauna.	•It is proposed to retain 21% of the property as remnant native vegetation.	•CALM has advised that there are several rare species on the surrounding lateritic upland areas and the lateritic heath on the property should not be cleared.	•The proposal may adversely affect rare plant communities and rare flora and fauna, and could significantly deplete the areas of woodlands at the northern limit of the Bassendean sands.	EPA EVALUATION REQUIRED
4.Impact of land clearing on wetlands and watercourses.	•There are wetlands on the property which have been identified as having conservation value.	•The DEP advise that the wetlands on the subject property may be identified in the draft South West Lakes EPP.	•A wider area of remnant vegetation should be retained adjacent to the winter wet depressions. •The proposed land clearing poses a threat to the conservation value of the wetlands.	EPA EVALUATION REQUIRED
5.Impact of land clearing on groundwater levels and the caves within Drovers Cave National Park.	•Clearing native deep rooted vegetation and replacing it with a deep rooted fodder crop (tagasaste).	•Ag WA advise that tagasaste may lower the groundwater level on the subject lot. •The WRC advise that a change in recharge on the property would be unlikely to result in large regional water level rises.	•General concerns regarding impact on changes in groundwater levels.	EPA EVALUATION REQUIRED
8.Impact of clearing on salinity	•Potential for salinity due to rising groundwater table as a result of clearing native vegetation.	•The WRC has advised that soil salt storage may be low as the groundwater is fresh and additional recharge would tend to decrease the groundwater salinity.		NO FURTHER EPA EVALUATION REQUIRED. Potential land degradation can be adequately managed under the Soil and Land Conservation Act.

Table 1. Identification of key environmental factors requiring EPA evaluation.

6.Farm management	A farm plan has been prepared .	•Ag West has advised that tagasaste is a suitable crop provided a farm plan is prepared and implemented. •The DEP advise that the Farm Management Plan should include a vegetation and groundwater monitoring programme.	•It will be necessary to manage the remnant vegetation retained after clearing.	EPA EVALUATION REQUIRED.
7.Risk of spreading dieback *(phytophthora)* as a result of clearing the property	•The proposed land clearing may spread *phytophthora.*	•The DEP advise that a dieback hygiene should be prepared.	•Land clearing may cause the spread of *phytophthora.*	EPA EVALUATION REQUIRED.
9.Land stability	•Clearing native vegation may and grazing cattle may cause soil erosion.	•Ag West advise that cattle may loosen soil between the rows of tagasaste which can lead to erosion and recommend that a 20 metre buffer be retained on either side of the watercourses.		NO FURTHER EPA EVALUATION REQUIRED. Potential land degradation can be adequately managed through the Soil and Land Conservation Act.
10.Management of exotic flora and fauna.	•Clearing of land may result in the spread of exotic flora into adjacent conservation areas.	•CALM has advised that retention of a native vegetation buffer along the entire boundary adjacent to the national parks is required to reduce the risk of weed encroachment.	•Tagasaste is an evasive woody weed and could become a weed on the fringes of Cockleshell Gully.	NO FURTHER EPA EVALUATION REQUIRED Exotic flora and fauna can be adequately managed by Ag WA and CALM.
11.Nutrient management	Tagasaste only requires small amounts of fertiliser to grow successfully as a commercial crop.	•CALM has advised that buffers be retained along watercourse to act as a biological filter. •AgWA has advised that considerable research and development has occurred with tagasaste in regard to nutrient and water requirements on the coastal sandplain north of Perth over the last 10 years.	•Retaining the buffers to act as filters is incompatible with the objective of retaining their natural values.	NO FURTHER EPA EVALUATION REQUIRED
Social Surroundings				
12.Aboriginal heritage	Potential impact of land clearing on Aboriginal sites.	•The Aboriginal Affairs Department recommend that prior to land clearing a suitable qualified consultant be engaged to conduct ethnographic and archaeological surveys of the area.		NO FURTHER EPA EVALUATION REQUIRED
13. Landscape Amenity	The land clearing could impact on the visual amenity of views from Lesueur National Parks.	•DEP indicates that the clearing will be visible from Lesueur National Park looking towards Jurien, however much of the area is already cleared.		NO FURTHER EPA EVALUATION REQUIRED

Table 1. Identification of key environmental factors requiring EPA evaluation.



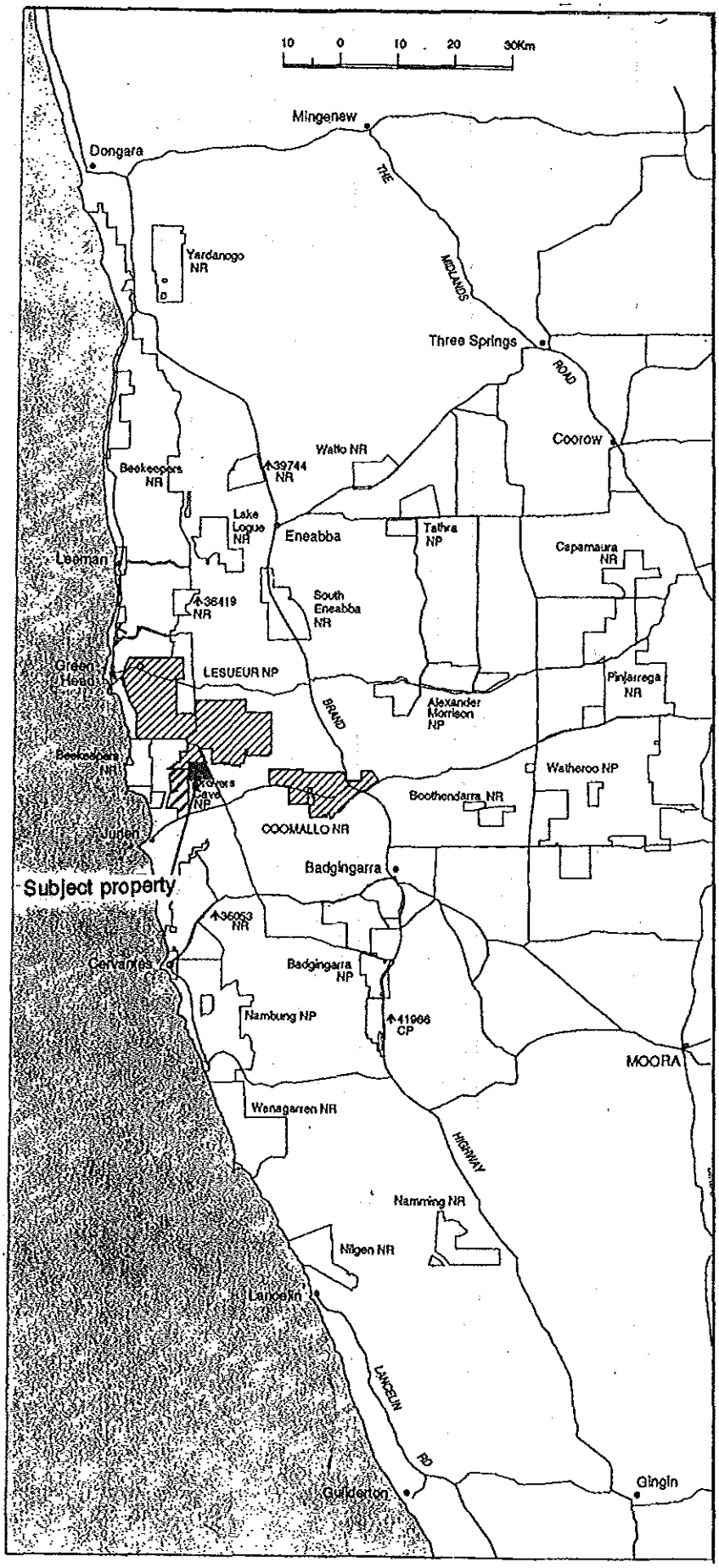


Figure 1. Locality of Victoria Location 10598 Cockleshell Gully Road, Shire of Dandaragan.

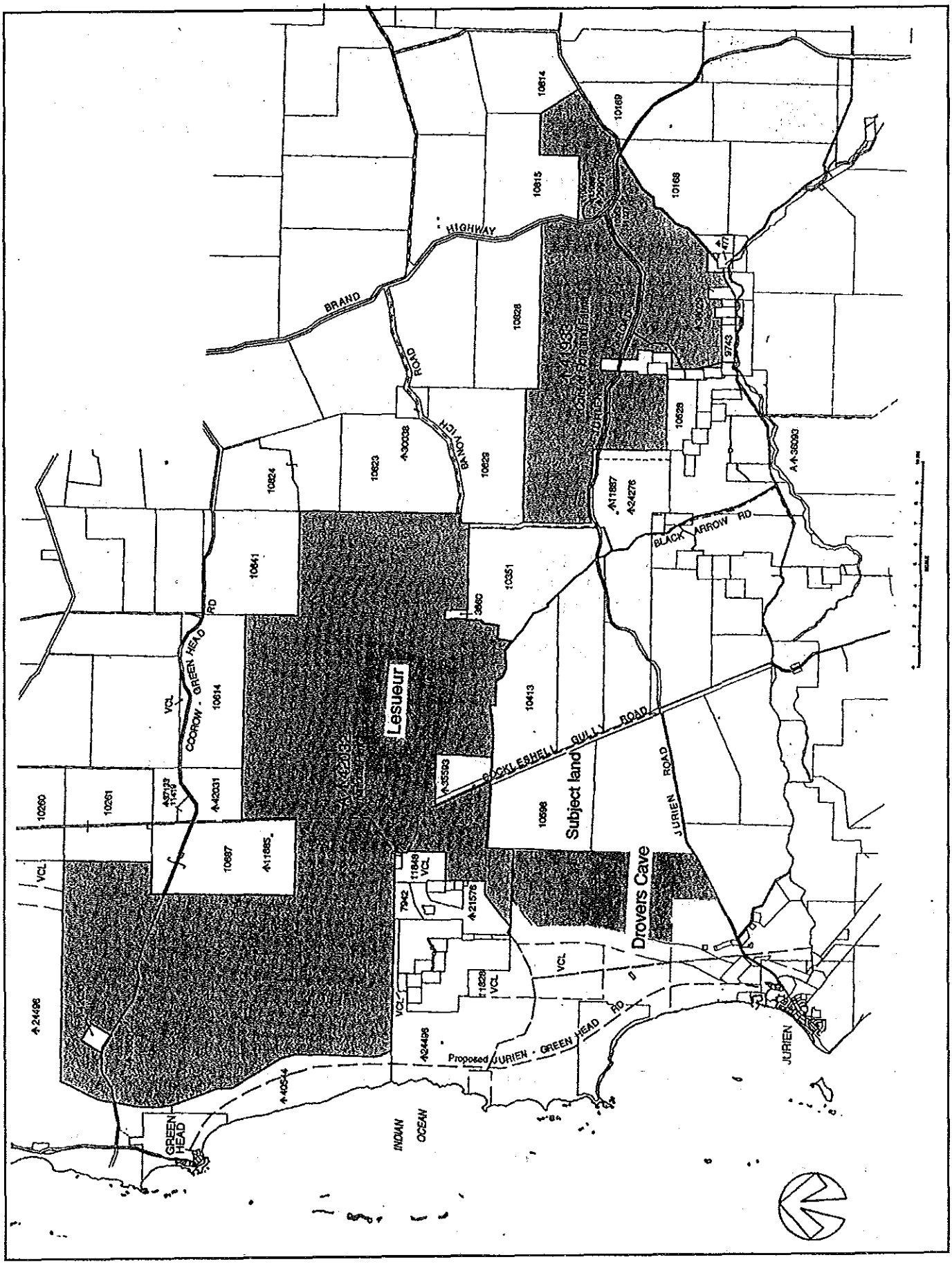


Figure 2. Lesueur and Drovers Cave National Parks in relation to Victoria Location 10598.

Section 4 sets out the evaluation of the environmental factors relevant to the proposal. Each factor is dealt with in its own subsection. The objectives of the assessment for that factor are defined, the relevant EPA policy is stated and any technical information is provided. Comments from key agencies/interest groups are summarised, and the proponent response is presented. The subsection on each factor is concluded with the EPA's evaluation in terms of achieving the stated objectives. Table 2 summarises this evaluation.

Section 5 provides the EPA's advice to the Minister for the Environment and Section 6 describes the recommended environmental conditions.

References cited in this report are provided in Section 7.

2. The proposal

The proponent, Craig Underwood, proposes to clear 870 hectares (49% of total property area) of native vegetation on Victoria Location 10598 Cockleshell Gully Road, Shire of Dandaragan. The property has a total area of 1705 hectares of which 500 hectares (30%) is currently cleared. It is proposed to retain 350 hectares (21%) of the property as native vegetation in accordance with the farm plan (refer to Figure 3).

The proponent proposes to plant a commercial fodder crop (tagasaste) on the cleared land. The 500 hectares of land that is currently cleared is already planted with tagasaste.

It is proposed that native vegetation will be retained in the following areas to the satisfaction of the Department of Conservation and Land Management (CALM), Agriculture Western Australia (AgWA) and Department of Environmental Protection (DEP) as shown in the farm plan:

- vegetated buffers along the property boundaries which abut the Lesueur and Drovers Cave National Parks;
- vegetated buffers along watercourses and around wetlands; and
- areas where there are vegetation communities likely to have Rare and Endangered Flora.

3. Environmental impact assessment method

3.1 Steps in the procedure of assessment

The purpose of the environmental impact assessment is to determine the key environmental factors relevant to a proposal and to formulate conditions and procedures to which the proposal should be subject if it proceeds.

A set of administrative procedures have been identified (refer to flow chart in Appendix 1) in order to implement this method of assessment.

The first step in the method is to identify the environmental issues to be considered. A list of issues is identified by the EPA through the preparation of guidelines.

These issues are then considered by the proponent in the CER both in terms of identifying potential impacts as well as making project modifications or devising environmental management strategies.

The proponent's CER was available for public review for four weeks between 20 November 1995 and Monday 18 December 1995. During this period five submissions were received of which two were from government agencies and three from interest groups and the general public. A list of submitters appears in Appendix 3.

KEY ENVIRONMENTAL FACTORS	OBJECTIVES	EVALUATION FRAMEWORK	PROPONENT'S COMMITMENTS	EPA EVALUATION
Biophysical impacts				
1.Impact of clearing native vegetation	•To ensure maintenance of adequate representation of native vegetation associations that are in the area proposed to be cleared.	•Vegetation associations represented on the farm are to be included in the proposed reserves. •20% of deep-rooted native vegetation to be retained on the farm and within the shire and sub-catchment.	•To retain representative vegetation associations within the reserves to the satisfaction of AgWA and CALM. •21% remnant vegetation to be retained on the farm.	Proponent's commitments are considered adequate. No recommendation required.
2.Retention of vegetation buffers	•Maintain adequate buffers to protect the environmental values of wetlands, watercourses and National Parks.	•A 30 metre buffer should be provided along a seasonally flowing watercourse; A 50- metre wide buffer or a buffer 1 metre AHD higher than the furthest extent of the vegetation should be provided around a wetland. •Buffers should be an adequate width to protect the environmental values of the National Park.	•To prepare and implement a revised Farm Management Plan. This plan will provide for the retention of buffer distances to the satisfaction of the DEP, CALM and AgWA. •Preparation of a remnant vegetation monitoring programme to the satisfaction of CALM. •To maintain buffers in accordance with the Farm Management Plan to the satisfaction of CALM. •To maintain the environmental values of the buffers.	•Proponent's commitments are considered adequate. •No recommendation required.
3.Impact of land clearing on rare plant communities and rare flora and fauna.	•To ensure that clearing of native vegetation does not result in the loss of any rare plant communities and rare flora and fauna.	•No significant change to, or loss of, rare plant communities or rare flora and fauna. •CALM has advised that there is no rare flora and fauna on the property.	All areas on the property that may contain rare flora and fauna will be protected by inclusion within the proposed buffers.	•Proponent's commitments are considered adequate. •No recommendation required.

Table 2. Summary of Environmental Protection Authority recommendations.

4.Impact of land clearing on wetlands and watercourses.	•Protect the environmental values of the wetlands and watercourses on the property.	•No significant change to, or loss of the environmental values of the wetlands or watercourse.	•Maintain buffers in accordance with the revised farm management plan. •To monitor water quality in targeted wetlands and watercourses on the property on an annual basis. •Commitments include the provision of buffers to protect the environmental values of the wetlands and water course.	•Proponent's commitments are considered adequate. •No recommendation required.
5.Impact of land clearing on groundwater levels and the caves within Drovers Cave National Park.	•To ensure that clearing of native vegetation does not result in changes in groundwater levels that will impact on environmental values of caves within Drovers Cave National Park.	•Maintain current water balance and acceptable groundwater levels.	•Prepare a groundwater monitoring programme and monitor bores on a regular basis in unison with AgWA. •Prepare a water balance management programme to the satisfaction of the Water and Rivers Commission.	•Proponent's commitments are considered adequate. •No recommendation required.
6.Farm management	•Protect the environmental values of the remnant native vegetation, wetlands, water courses and National Parks via best management practices.	•Ensure that the farm is managed and maintained in a manner which minimises potential environmental impacts.	•To prepare a Farm Management Plan. •Develop and maintain the property in accordance with the Farm Plan prepared by AgWA.	•Proponent's commitments are considered adequate. •No recommendation required.
7.Risk of spreading dieback (*phytophthora*) as a result of clearing the property.	•Ensure that the proposal to clear native vegetation does not increase the risk of spreading *phytophthora*.	CALM Dieback Disease Hygiene Manual.	•The proponent has undertaken to manage and minimise the spread of phytophthora through the inclusion of a Dieback Hygiene Plan as part of the farm plan to the satisfaction of CALM.	•Proponent's commitments are considered adequate. •No recommendation required.

Table 2. Summary of Environmental Protection Authority recommendations.

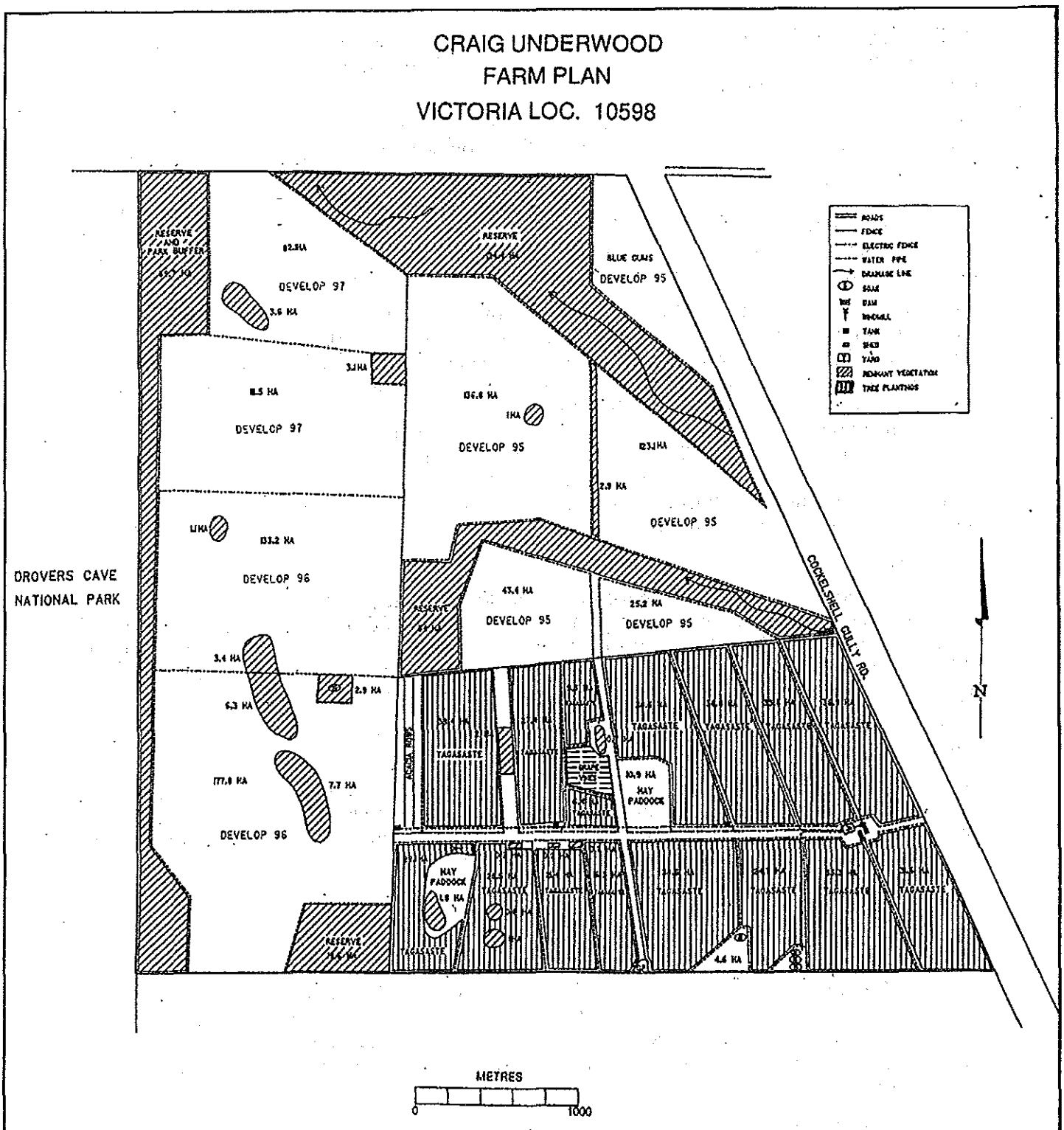


Figure 4. Farm Plan prepared for Victoria Location 10598

Figure 3. Farm plan Victoria Location 10598.

Following completion of the public review period, the responses received were summarised by the DEP on behalf of the EPA. This process raised additional environmental factors to be considered by the proponent.

The proponent was invited to respond to the factors raised in the submissions. Appendix 2 contains a summary of the factors raised in the submissions and Appendix 4 contains the proponent's response to those factors.

Thirteen environmental factors varying in significance have been identified. The EPA considered all the factors and has identified those that are considered to be relevant environmental requiring further evaluation by the EPA those that can be addressed through the processes of other agencies or are no longer relevant to the proposal.

For each environmental factor, the environmental impacts of the proposal, and the proponent's environmental management commitments, were evaluated in the context of the EPA's assessment objective and relevant policy and technical information. The complete list of the proponent's consolidated environmental management commitments is included in Appendix 5 of this report. If the commitments achieve the assessment objectives, there is no need for the EPA to make recommendations to the Minister for the Environment on these issue, otherwise the EPA may recommend conditions and procedures necessary to achieve the EPA's objectives. Where the proposal has unacceptable environmental impacts, the EPA can advise the Minister for the Environment. The Minister for the Environment determines whether the proposal should proceed and under what conditions.

Limitations

This evaluation has been undertaken using information currently available. The information has been provided by the proponent through preparation of the CER document and supplementary documentation, by DEP officers utilising their own expertise and reference material, by utilising expertise and information from other State government agencies, information provided by members of the public, and by contributions from EPA members.

The environmental impact assessment of this proposal was conducted in accordance with the Environmental Impact Assessment Administrative Procedures 1993.

The EPA recognises that further studies and research may affect the conclusions. The EPA considers that if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur following a new referral to the EPA.

3.2 Public and agency submissions

Comments were sought on the proposal from the general public, community groups, as well as local and State government agencies. During the 4 week public submission period from 20 November to 18 December 1995, five submissions were received. A summary of the issues raised in the submissions (refer Appendix 2) and a copy of the submissions received from government agencies were forwarded to the proponent for response. Submissions were received from:

- 1 from a member of the public;
- 2 from interest groups and organisations; and
- 2 from State Government agencies.

The principal factors raised in the submissions in relation to the proposed land clearing included:

Biophysical Impacts

- retention of vegetation buffers;
- impact of clearing native vegetation on rare plant communities and rare flora and fauna;

- impact of clearing native vegetation on groundwater levels and the caves within Drovers Cave National Park;
- impact on clearing native vegetation on wetlands and watercourses;
- risk of spreading of dieback *(phytophthora)*;

Social Surroundings

- Aboriginal heritage

The Environmental Protection Authority has considered the submissions and the proponent's response to the factors raised in the submissions as part of the assessment of the proposal.

3.3 Review of factors

3.3.1 Identification of relevant factors

Thirteen factors were raised during the environmental impact assessment process including those factors identified in the guidelines for the CER, subsequent consultations with EPA members and relevant government agencies and the submissions described above. The factors are as follows:

Biophysical Impacts

- clearing native vegetation
- retention of vegetation buffers
- impact of land clearing on rare plant communities and rare flora and fauna
- impact of land clearing on wetlands and watercourses
- impact of land clearing on groundwater levels and the caves within Drovers Cave National Park
- impact of clearing on salinity
- farm management
- risk of spreading dieback *(phytophthora)* as a result of clearing the property
- land stability
- management of exotic flora
- nutrient management

Social Surroundings

- Aboriginal heritage
- landscape amenity

The EPA has evaluated the above factors in order to identify those key environmental factors warranting further evaluation by the EPA. Other factors can be managed by the proponent in accordance with their environmental management commitments and in compliance with DEP regulations and guidelines, or through approvals required from other agencies (refer to Table 1). Each factor is discussed below

3.3.2 Identification of key environmental factors relevant to the proposal requiring EPA evaluation

Biophysical impacts

Clearing native vegetation

The dominant vegetation communities on the property are *banksia* woodland and *Eucalyptus todtiana* woodland.

The proponent proposes to clear 870 hectares (49% of total property area) of native vegetation on Victoria Location 10598. The property has a total area of 1705 hectares of which 500 hectares (30%) is currently cleared. It is proposed to retain 350 hectares (21%) of the property as native vegetation.

A farm plan (refer to Figure 3) has been prepared by the proponent with assistance from Agriculture Western Australia. It is proposed to clear the property in accordance with the farm plan.

Submissions received during the public review period stated that the proposed clearing should not be permitted as it may threaten biodiversity.

The EPA recognises that clearing of native vegetation is an issue of environmental concern and considers that the protection of adequate areas of native vegetation is important to maintain biodiversity of native vegetation and fauna.

This factor requires further evaluation by the EPA (Section 4.1).

Retention of vegetation buffers

It is proposed to retain 350 hectares (21% of total property area) of native vegetation on Victoria Location 10598. The majority of the remnant vegetation retained will be located in buffer areas abutting the Lesueur and Drovers Cave National Parks, wetlands and watercourses in accordance with the farm plan prepared by the proponent.

A number of submissions were concerned at the likely environmental impact of the proposal to clear native vegetation adjacent to the national parks.

This factor is of general concern to the EPA and for this reason it has been identified as a factor which requires further evaluation by the EPA (Section 4.2).

Impact of land clearing on rare plant communities and rare flora and fauna

A number of submissions raised concern that the proposed land clearing may impact on Declared Rare Flora, although CALM has advised that no known Declared Rare Flora is likely to occur on the property.

CALM has advised that if there are priority species on the property, they are likely to occur in the areas of lateritic heath. It is proposed to retain vegetation on the lateritic heath areas.

This factor requires further evaluation by the EPA (Section 4.3).

Impact of land clearing on wetlands and watercourses

There are a number of wetlands on the property which are identified in the draft Environmental Protection (South West Lakes) Policy.

A number of submissions were concerned at the impact of the land clearing on the watercourse that drain from Victoria Location 10598 into Lesueur National Park

This factor requires further evaluation by the EPA (Section 4.4).

Impact of land clearing on groundwater levels and the caves within Drovers Cave National Park

A number of submissions raised the concern that clearing native vegetation on the subject lot may increase groundwater recharge and alter the groundwater levels within the caves in Drovers Cave National Park.

This factor requires further evaluation by the EPA (Section 4.5).

Impact of clearing on salinity

Tagasaste is a perennial shrub and has similar water requirements as native vegetation which should ensure that the impact on existing water tables is minimal.

Several studies have been conducted by Agriculture Western Australia on the water use of tagasaste and the effect on water tables. It has been found that tagasaste appears to use the same amount of groundwater as native vegetation. Some recharge occurs, but the amount of recharge is less than or equal to groundwater outflow.

The WRC has advised that soil salt storage, in the vicinity of the subject lot, can be expected to be very low as the groundwater is fresh, and additional recharge would tend to decrease the groundwater salinity.

It is considered that this factor does not warrant further assessment by the EPA.

Farm management

To reduce the likely impacts of the proposal to clear native vegetation on the environment the EPA considers that there is a need for commitments concerning the future management of the farm. These commitments relate to the:

- provision and maintenance of the vegetation buffers;
- monitoring of vegetation and groundwater levels; and
- implementation of a water balance management programme if detectable changes occur to the groundwater levels or the water quality within the wetlands and watercourses.

This factor requires further evaluation by the EPA (Section 4.6).

Risk of spreading dieback (phytophthora) as a result of clearing the property

Surveys conducted by CALM indicate that there is evidence of a number of species of *phytophthora* in the vicinity of Victoria Location 10598.

The subject lot is located within an area that has been identified by CALM as having a high *phytophthora* management priority.

One of the submissions received during the review period expressed concern that the threat of spreading *phytophthora* is the most serious threat raised by the proposed land clearing.

This factor requires further evaluation by the EPA (Section 4.7).

Land Stability

Clearing of native vegetation and trampling by grazing cattle can result in soil erosion by wind and water.

The proponent has committed to preparing a revised farm plan to the satisfaction of AgWA, CALM and EPA prior to the land being cleared to manage potential land degradation problems. For example the farm plan will require the provision of wind breaks.

The EPA considers that potential land degradation issues can be adequately managed by the Commissioner for Soil and Land Conservation in accordance with the Soil and Land Conservation Act and via the implementation of a farm plan.

It is considered that this factor does not warrant further assessment by the EPA.

Management of exotic flora

The proponent has advised that it is proposed to retain vegetation buffers along the property boundaries abutting the Lesueur and Drovers Caves National Parks to prevent the spread of weeds into these conservation areas as requested by CALM.

It is considered that this factor does not warrant further assessment by the EPA.

Nutrient management

Tagasaste has a root system more than 10 metres in depth and is able to extract nutrients far deeper in the soil profile than traditional annual crops and pastures. For this reason tagasaste only requires relatively small applications of fertiliser to grow successfully as a commercial fodder crop. Plant analysis is the only reliable method for determining the fertiliser requirements for tagasaste (Wiley, 1994).

Nitrogen is not required as tagasaste is a leguminous shrub and fixes its own nitrogen from the atmosphere.

There is expected to be minimal leaching of nutrients into the groundwater or via surface runoff into wetlands and watercourses due to the low fertiliser application rates.

It is considered that this factor does not warrant further assessment by the EPA.

Social Surroundings

Aboriginal heritage

The Aboriginal Affairs Department has advised that there are no known sites of anthropological or ethnographic significance on the property.

All Aboriginal sites in Western Australia are protected under the *Aboriginal Heritage Act 1972.*

It is considered that this factor does not warrant further assessment by the EPA.

Landscape amenity

Victoria Location 10598 is visible from the southern slopes of Mount Lesueur. It is considered that the proposal to clear native vegetation on the property will impact on the view from Lesueur National Park. However, the majority of the private land to south of Lesueur National Park has already been cleared and is also visible from Mount Lesueur.

It is considered that this factor does not warrant further assessment by the EPA.

3.3.3 Summary

Table 1 summarises the process used by the EPA to evaluate the factors raised during the environmental impact assessment process. The table identifies the factors, the relevant proposal characteristics, and the comments received from specialist government agencies and the general public. If an factor is considered environmentally significant it becomes a factor relevant to the proposal and is further evaluated by the EPA (as summarised in Table 2). Section 4 of this report provides the detail of this evaluation.

The factors identified in Table 1 as requiring further evaluation by the EPA are:

- clearing native vegetation;
- retention of vegetation buffers;
- impact of clearing vegetation on rare plant communities and rare flora and fauna;
- impact of clearing vegetation on wetlands and watercourses;
- impact of clearing vegetation on groundwater levels and the caves within Drovers Cave National Park;
- farm management; and
- risk of spreading *(phytophthora)* as a result of clearing the property.

4. Evaluation of key environmental factors relevant to the proposal

4.1 Clearing native vegetation

Objective

To ensure maintenance of adequate representation of native vegetation associations that are in the area proposed to be cleared.

Existing Policy

An objective of the *National Strategy for the Conservation of Australia's Biological Biodiversity (ANZECC 1996)* is to ensure that effective measures are in place to retain and manage native vegetation, including controls on clearing. The Strategy also states that the current rate and distribution of native vegetation clearing should be assessed and monitored.

In May 1995 the Western Australian State Government adopted the *Remnant Vegetation Policy* which restricts clearing in agricultural areas if deep-rooted perennial vegetation would be reduced to less than 20% of the property area. Clearing is also discouraged where total remnant vegetation within a local government authority or sub-catchment is less than 20%. This policy is implemented under the Soil and Land Conservation Act by the Commissioner for Soil and Land Conservation.

Technical information

The Lesueur area has long been recognised as an area of exceptionally diverse flora. Lesueur National Park ranks as one of the three most important areas for flora conservation in southern Western Australia and its diversity is of international significance (CALM, 1995).

CALM has advised that the native vegetation to be cleared on Victoria Location 10598 includes two vegetation communities, *Banksia* woodland and open *Eucalyptus todtiana* woodland.

Comments from key agencies/interest groups

CALM has advised that

- the current conservation reserve system (including Lesueur and Drovers Cave National Parks) in the vicinity of Location 10598 includes adequate representative communities of native flora of this area; and
- the vegetation to be retained including the buffers will provide additional protection for the existing reserve system.

The National Parks and Nature Conservation Authority (NPNCA) supports the views expressed by CALM.

The public submissions contained the following comments with respect to this issue:

- remnant vegetation areas are narrow and susceptible to change due to groundwater changes and *phytophthora* infection; and
- no further clearance of native vegetation should be allowed.

Response from the proponent

Portions of remnant native vegetation (21% of the property area) will be retained on the property in accordance with the farm plan to the satisfaction of AgWA and CALM.

The proponent has undertaken the following commitment to protect representative native vegetation associations that are in the area proposed to be cleared:

- Representative vegetation associations on Victoria Location 10598 that may contain Declared Rare Flora and Priority fauna species will be retained in reserves under the Soil and Land Conservation Act (Commitment 1; Appendix 5).

EPA Evaluation

The EPA recognises that clearing of native vegetation is an issue of environmental concern and is committed to the protection and management of remnant native vegetation.

The EPA notes CALM's advice that the native flora communities of this area are adequately represented within the existing conservation reserves and the vegetation buffers will provide additional protection. The EPA also notes the proponent's commitment to retain vegetation associations that may contain Declared Rare Flora. In view of CALM's advice and the proponent's commitment, the EPA concludes that the environmental objective to protect representative native vegetation associations can be satisfied for this factor.

4.2 Retention of vegetation buffers

Objective

Maintain adequate vegetation buffers to protect the environmental values of wetlands, watercourses and National Parks.

Existing Policy

The EPA recommends that the width of the dry land buffer around a wetland should be either 50 metres or the equivalent of 1 metre AHD higher than the furthest extent of the wetland vegetation, which ever is the largest

The EPA recommends that the minimum buffer along a watercourse which flows in response to specific rain events should be 10 metres.

The EPA is currently reviewing the criteria used to assess land clearing proposals. The review acknowledges that the provision of a native vegetation buffer adjacent to conservation reserves improves the viability and conservation values of the reserve by providing larger core areas, and buffers the reserve from edge effects. As part of the review it was also noted that the required width of the buffers will depend on the robustness of the vegetation associations, with vegetation communities on nutrient poor soils (such as on Victoria Location 10598) requiring smaller buffers. Specific buffer widths were not recommended as part of the review.

Technical information

The proponent's farm plan shows that it is proposed to provide the following native vegetation buffers:

- a 100m buffer along the western property boundary which abuts Drovers Cave National Park;
- a 150m buffer along the watercourse in the north east corner of the property; and
- 50m buffers around all of the wetlands on the property.

Comments from key agencies/interest groups

AgWA has advised that cattle grazing on tagasaste may loosen the soil to a depth of 10 centimetres and when rainfall intensity exceeds infiltration capacity surface runoff may result in sheet erosion, particularly during summer. AgWA recommends that the vegetation buffers around the watercourses on Victoria Location 10598 be extended an additional 20 metres to ensure that sediment is trapped on site. AgWA further advise that the buffer areas are to be reserved under the provisions of the Soil and Conservation Act.

CALM has requested that wider vegetation buffers should be provided;

- along the water course to the north of the property which drains into Cockleshell Gully in Lesueur National Park; and
- along the property boundaries which abut Drovers Cave National Park and Lesueur National Park.

CALM has also requested that the environmental values of the vegetation buffer be maintained and a monitoring programme be prepared to detect changes in these environmental values.

The public submissions contained the following comments with respect to this factor:

- remnant vegetation buffers are narrow and vulnerable to change due to groundwater changes and *phytophthora* infection; and
- buffers are needed on Victoria Location 10598 to protect the conservation values of the National Parks.

Response from the proponent

The proponent has advised that the current farm plan which proposes the clearance of 870 hectares (refer to Figure 3) will be revised so that the requests of CALM and AgWA to increase the width and extent of the buffer areas can be met.

The proponent has also advised that native vegetation buffers will be provided and maintained along the property boundaries that abut the National Parks, around wetlands and ephemeral watercourses in accordance with the revised farm plan.

The proponent has made the following commitments:

- Provide and maintain vegetation buffers around the property boundaries, wetlands and watercourses in accordance with the revised farm plan to the satisfaction and requirements of CALM, AgWA and DEP (Commitment 2; Appendix 5);
- To maintain the environmental values of the buffers to the satisfaction of CALM (Commitment 3; Appendix 5); and
- Prepare and implement a vegetation monitoring programme, prior to Victoria Location 10598 being cleared, to the satisfaction of CALM, WRC, AgWA and DEP (Commitment 4; Appendix 5).

EPA Evaluation

The EPA considers it important to retain the environmental values of the Lesueur and Drovers Cave National Parks and the watercourses and wetlands located on Victoria Location 10598.

The EPA notes that the proponent has committed to:

- preparing a revised farm plan to provide and maintain vegetation buffers to the satisfaction of CALM, AgWA and DEP;
- providing and maintaining vegetation buffers around the property boundaries, wetland and watercourses in accordance with the revised farm plan;
- maintaining the environmental values of the vegetation buffers; and
- preparing a programme to monitor the environmental values of the remnant vegetation.

The proponent's commitments are designed to ensure that CALM and AgWA's requirements to extend the buffers, length ways, along the property boundaries abutting the National Parks and widen the buffers around the watercourses is satisfied.

The EPA concludes that the proponents commitments are adequate to meet the EPA's objective of maintaining adequate vegetation buffers to protect the environmental values of wetlands, watercourses and National Parks.

4.3 Impact of land clearing on rare plant communities and rare flora and fauna

Objective

To ensure that clearing of native vegetation does not result in the loss of any rare plant communities and rare flora and fauna.

Existing Policy

The Wildlife Conservation Act protects Declared Rare Flora (DRF) and requires specific approval to be given before any known DRF are removed. The Act also protects Threatened and Priority fauna species and requires specific approval to take or kill protected fauna. This Act is administered by CALM.

It is the proponent's responsibility to ensure that no DRF is taken without Ministerial consent.

Technical information

CALM has advised that there are several declared rare species located within Lesueur National Park to the north east of the subject property.

Most of these species are known to be located within lateritic upland areas. *Eucalyptus johnsoniana* is known to occur on sandplain heath as well as lateritic hills, and *Hemiandra gardneri* is known to occur on open disturbed heath.

Comments from key agencies/interest groups

CALM has advised that the current reserve system in the vicinity of Location 10598 generally represents the vegetation flora and fauna of this area. CALM has also advised that no known DRF is likely to occur on the property. Although as a precaution CALM has advised the proponent that the lateritic heath on Victoria Location 10598 should be retained to ensure that any declared rare species that may occur are protected.

The public submissions contained the following comments with respect to this factor:

- The proposal may adversely impact on rare plant communities and rare flora and fauna.
- Clearing may adversely impact on some plants of significance in areas of sand as well as laterite.
- The clearing proposal could significantly deplete the areas of woodlands at the northern limit of the Bassendean sands. Only a small portion of this system is represented in Lesueur National Park.
- The values of the remnant vegetation areas will gradually be devalued.
- Fauna will be dislocated as a result of this proposal.

Response from the proponent

The proponent has advised that remnant vegetation will be retained on the lateritic health as recommended by CALM.

The proponent has undertaken the following commitment to ensure that clearing of native vegetation does not result in the loss of any rare plant communities and rare flora and fauna:

- All areas of vegetation on Victoria Location 10598 that may contain DRF or Threatened and Priority fauna species will be retained and reserved under the Soil and Land Conservation Act (as per commitment 1; Appendix 5).

EPA Evaluation

The EPA is aware that the sandplain country in this area has a high floral species diversity and considers it important that vegetation communities are adequately represented within conservation estates in the long term. This concern was reflected in public submissions as well as by members of the EPA.

The EPA notes:

- CALM's advice that the vegetation communities where Declared Rare Flora species may occur are adequately represented in the existing National Parks, conservation reserves and areas of remnant vegetation proposed to be retained on Victoria Location 10598;
- the proponent's commitment that all areas that may contain Declared Rare Flora or Threatened and Priority fauna species will be retained and reserved under the Soil and Land Conservation Act.

The EPA concludes that the proponent's commitments are adequate to meet the environmental objective for this factor of ensuring that the clearing of native vegetation will not result in the loss of any rare plant communities or rare flora and fauna.

4.4 Impact of land clearing on wetlands and watercourses

Objective

Protect the environmental values of the wetlands and watercourses.

Existing Policy

The EPA recommends that the width of the dry land buffer around a wetland should be either 50 metres or the equivalent of 1 metre AHD higher than the furthest extent of the wetland vegetation, which ever is the largest

The EPA recommends that the minimum buffer along a watercourse which flows in response to specific rain events should be 10 metres.

There are a number of wetlands on the property which may be included in the draft Environmental Protection (South West Lakes) Policy which is soon to be finalised by the Minister for the Environment. The purpose of the policy will be to protect lakes in the south west of Western Australia from being degraded and destroyed.

Technical information

The location of the wetlands and watercourses on Victoria Location 10598 are shown on Figure 3.

Comments from key agencies/interest groups

The Water and Rivers Commission (WRC) advises that the relationship between the groundwater and the ephemeral wetlands on the property is uncertain. It is considered likely that the wetlands may be seasonally inundated and not connected to the water table.

The DEP advise that there are a number of unmodified vegetated wetlands on the property that are included in the draft Environmental Protection (South West Lakes) Policy.

The public submissions contained the following comments with respect to this factor:

- the proposed clearing is a threat to the conservation values of the wetlands; and
- a wider area of remnant vegetation should be retained adjacent to the winter wet depressions, particularly those draining into the north west of the property.

Response from the proponent

The proponent has undertaken the following commitments to minimise the impact of land clearing on wetlands and watercourse.

- To maintain the environmental values of the buffers to the satisfaction of CALM and the DEP (as per Commitment 3; Appendix 5); and
- Prepare a revised farm plan to include the provision of native vegetation buffers around wetlands and watercourses in accordance with the requirements of CALM, AgWA and DEP (Commitment 5; Appendix 5);
- Provide and maintain buffers around the wetlands and watercourses in accordance with the revised farm plan to the requirements and satisfaction of the CALM, AgWA and DEP (Commitment 6; Appendix 5);
- Prepare and implement a water quality monitoring and management programme, prior to Victoria Location 10598 being cleared, to the satisfaction of WRC, CALM and DEP (Commitment 7; Appendix 5).

EPA Evaluation

The EPA considers it important to retain the environmental values of the watercourses and wetlands located on Victoria Location 10598, particularly those that are included in the draft Environmental Protection (South West Lakes) Policy.

The EPA notes the comments made in the public submissions stating that the proposal to clear native vegetation is a threat to the conservation values of the wetlands and that a wider area of remnant vegetation should be retained adjacent to the winter wet depressions, particularly those draining into the north west of the property.

The EPA also notes that the proponent has committed to:

- maintaining the natural environmental functions and processes (or environmental values) of the native vegetation within the buffers; and
- revising the farm plan to include the provision of wider native vegetation buffers around wetlands and watercourses to the satisfaction of AgWA and CALM;
- providing and maintaining buffers around the wetlands and watercourses; and
- preparing and implementing a water quality monitoring and management programme to detect and ameliorate changes in water quality resulting from farming practices on the cleared land.

The EPA concludes that the proponent's commitments satisfy the concerns raised in the public submissions and are designed to ensure that adequate buffers will be provided and water quality monitored to ensure that the environmental values of the wetlands and watercourses on the property are protected.

4.5 Impact of land clearing on groundwater levels and the caves within Drovers Cave National Park

Objective

To ensure that clearing of native vegetation does not result in changes to groundwater levels that will impact on the environmental values of the caves within Drovers Cave National Park.

Technical information

The Water and Rivers Commission (WRC) has provided the following hydrological analysis for Victoria Location 10598 and the area in the vicinity of the subject lot.

The property is underlain by superficial sands, with Tamala Limestone occurring in the extreme south west portion and extending westwards into Drovers Cave National Park. The sands and limestone are believed to overlie the Triassic Lesueur Sandstone, below the property, and to overlie Kockatea in the western part of the national park. The geological structure of the area is complex and the subsurface geology cannot be predicted with certainty.

A bore drilled on the subject property encountered clay to 35 metres, which is likely to be consistent with the lithology of the superficial formations. This bore indicated that groundwater may be perched within 3 metres of the surface. Hydrological data from drilling conducted in the south east corner of the property, intersected the Lesueur Sandstone aquifer, with the water table at about 10m below surface.

Groundwater flow in the superficial formations appears to be westwards, whereas groundwater in the Lesueur Sandstone flows south westwards. Groundwater recharge takes place on the outcrop area of the Lesueur Sandstone around Mt Lesueur and through the superficial sands.

Groundwater from the Lesueur Sandstone appears to leak upwards along the Beagle Fault zone and to discharge into the Tamala Limestone. Caves in Drovers Cave National Park may have been formed by dissolution of limestone by upward discharging groundwater from the Lesueur Sandstone, flowing westwards over the impermeable Kockatae Shale. Some caves may be developed at the water table whereas others may have formed by collapse.

A report produced by AgWA (Agriculture Western Australia, 1994) states that groundwater studies have shown that the water table under a block planting of tagasaste dropped 0.5 metres/year during a four year period. This eliminated the waterlogging and salinity that occurred down slope. In a similar situation, on the adjoining catchment, the water table has risen by 0.4 metres/year under a traditional annual pasture and crop rotation

Comments from key agencies/interest groups

The WRC has advised that clearing of native vegetation for pasture or annual cereal crops on sandplain may increase groundwater recharge by a factor of up to three, however, replanting to a deep-rooted perennial crops such as tagasaste would probably restore to a great extent the original water balance. This opinion is also shared by AgWA.

The WRC has also advised that changes in recharge on the property alone would be unlikely to result in large regional water level rises in the Lesueur Sandstone as it is highly permeable and at least several hundred metres thick. The water level in the Lesueur Sandstone is 10-20 metres below surface and water levels 9 kilometres to the south has risen at a rate of 0.06 metres per annum from 1972-80.

Much of the land to the east of Old River Cave, and extending to the boundary of the Lesueur Sandstone aquifer, has already been cleared. However there has been no monitoring to date to assess any resulting effects.

Increased recharge to the groundwater east of the national park may result in a slight increase in groundwater recharge through the cave system, however, this would be extremely difficult to quantify given the variability of seasonal flows and the complex Mesozoic geology of the area. Investigation of the hydrology of the caves would also be difficult given the depth below surface in a karst terrain, which would hinder the acquisition of hydrological data by drilling.

The public submissions contained the following comments with respect to this factor:

- an investigation should be undertaken of the aquatic fauna of Old River Cave prior to any land clearance;
- land clearing will have a major impact on the groundwater table and the cave systems in Drovers Cave National Park;
- a comprehensive study of the hydrology of this area should be undertaken prior to any land clearing;
- changes in groundwater level should be monitored after land clearing;

- a contingency plan should be established in the event that groundwater levels do rise; and
- the water requirements of the proposal could have environmental impacts.

Response from the proponent

The proponent has reiterated the advice provided by AgWA and the WRC, stating that tagasaste will result in the same groundwater balance as the existing native vegetation and the there is not likely to be any impact on the caves within Drovers Cave National Park.

The proponent has requested AgWA to monitor groundwater levels on the property prior to and after land clearing. AgWA has agreed to undertake this work in conjunction with the proponent's groundwater monitoring programme. The proponent has also undertaken commitments to:

- Prepare a groundwater monitoring programme prior to Victoria Location 10598 being cleared, to the satisfaction of WRC, AgWA and DEP (Commitment 8; Appendix 5); and
- Prepare a water balance management programme to be implemented to the satisfaction of the WRC and the DEP, if detectable changes occur to the groundwater levels (Commitment 9; Appendix 5).

EPA Evaluation

The EPA considers that it is important that there is no adverse environmental impact on the caves within Drovers Cave National Park as a result of the proposed clearing.

The EPA notes the advice provided by the WRC that replanting to a deep-rooted crop such as tagasaste is likely to create a similar water balance as native vegetation.

The EPA considers that the concerns raised in the public submissions regarding the impact of clearing on groundwater levels, preparation of contingency plans should groundwater levels rise are adequately satisfied through the WRC's advice, AgWA's agreement to monitor groundwater levels and the proponent's commitments.

It has been noted that the proponent has committed to:

- preparing a groundwater monitoring programme to measure changes in groundwater levels before and after land clearing; and
- preparing a water balance management programme which could involve measures such as replanting deep-rooted vegetation. This programme should be implemented to the satisfaction of the WRC and the DEP, if detectable changes occur to the groundwater levels.

The EPA concludes that the proponent's commitments are adequate to ensure that clearing of native vegetation does not result in changes in groundwater levels that will impact on the caves in Drovers Cave National Park.

4.6 Farm management

Objective

Protect the environmental values of the remnant native vegetation, wetlands, watercourses and National Parks via best management practices in farming.

Existing Policy

Agriculture Western Australia's *Procedures for the Administration and Assessment of Clearing and Protection of Native Vegetation in Western Australia (1994)* state that a proponent may be prevented from clearing land by issuing a Soil Conservation Notice (SCN). A condition of the SCN may be for example to prepare a farm plan prior to clearance being given to clear the land.

Comments from key agencies/interest groups

AgWA has advised that tagasaste is a suitable crop provided a farm plan is prepared and implemented.

The DEP advises that a vegetation and groundwater monitoring programme should be prepared to identify the long term impacts of clearing vegetation on areas of remnant vegetation (buffers) and groundwater levels.

One of the public submissions suggested that a management plan should be prepared for the farm involving the provision of adequate buffers and a dieback control programmes.

Response from the proponent

The proponent has advised that a farm plan has been prepared to eliminate potential land degradation problems both within and beyond the farm boundaries. This includes the provision of vegetation buffers to minimise likely impacts of land clearing on the adjoining national parks, and the planting of tagasaste in rows to reduce wind erosion.

The proponent has undertaken the following commitments to minimise the impact on the remnant native vegetation, wetlands, watercourses and national parks:

- A revised farm plan for Victoria Location 10598 will be prepared to the satisfaction of AgWA, CALM and DEP prior to the land being cleared (Commitment 10; Appendix 5);
- Develop and maintain the property in accordance with the revised farm plan prepared to the satisfaction of AgWA, CALM and the DEP (Commitment 11; Appendix 5); and

EPA Evaluation

The EPA considers that best management practices are required in order to protect the environmental values of the remnant native vegetation, wetlands, watercourses and National Parks.

The EPA considers that the concerns raised in the public submissions regarding the need to prepare a management plan have been addressed through the proponent's commitments.

The EPA notes that the proponent has committed to:

- preparing a revised farm plan for Victoria Location 10598 to incorporate modifications recommended by CALM and AgWA;
- develop and maintain the property in accordance with the revised farm plan; and
- preparing vegetation, groundwater and water quality monitoring programmes.

The EPA concludes that the proponent's commitments are adequate to protect the environmental values of the remnant native vegetation, wetlands, watercourses and National Parks via best management practices.

4.7 Risk of spreading dieback *(phytophthora)* as a result of clearing

Objective

Ensure that the proposal to clear native vegetation does not increase the risk of spreading *phytophthora.*

Existing Policy

CALM's Dieback Policy (1992) relating to the management of CALM land has the following aims:

- prevent the introduction of dieback into disease-free areas; and
- minimise spread in the areas where the disease already occurs.

CALM requires that road and firebreak maintenance be conducted in accordance with the Dieback Hygiene Manual.

It is considered that these same aims should be adopted by owners of private farm land.

Technical information

Phytophthora is a soil-borne fungus which infects and rots plant roots, causing the plants to die. The disease caused by *phytophthora* is commonly known as dieback.

Surveys conducted by CALM between 1990 and 1994 indicate that there is evidence of a number of species of *phytophthora* near Victoria Location 10598, including *P.cinnamomi, P. citricola, P. megasperma var. megasperma and P. drechsleri..*

The subject lot is located within an area identified by CALM as a high priority management area for the following reasons:

- high rainfall;
- known incidences of infections; and
- high public use.

Human activities and natural processes that disturb and move soil and water containing *phytophthora* spores also have the potential to spread dieback.

Comments from key agencies/interest groups

The DEP advises that the proponent should prepare a Dieback Hygiene Management Plan to avoid the spread of dieback via the movement of farm machinery.

The public submissions contained the following comments with respect to this factor:

- the proposed land clearing poses a serious threat to the spread of *phytophthora;*
- dieback could be spread around the property from existing infections by machinery during land clearing; and
- an assessment of the extent of phytophthora should be conducted.

Response from the proponent

The proponent advises that *phytophthora* has not infected tagasaste and does not consider that it will be a problem as *phytophthora* is spread in damp conditions and tagasaste is intolerant to these conditions.

The proponent has undertaken the following commitment to ensure that the proposal to clear native vegetation does not increase the risk of spreading *phytophthora.*

- Prepare a Dieback Hygiene Management Programme to the satisfaction of CALM to manage and minimise the spread of *phytophthora,* prior to Victoria Location 10598 being cleared (Commitment 12; Appendix 5).

EPA Evaluation

The EPA considers it important that the proposal to clear native vegetation on Victoria Location 10598 does not increase the risk of spreading *phytophthora.*

The EPA notes CALM's advice that dieback is spread when soil or water containing *phytophthora* spores are moved from location to another and recognise that land clearing and farming may spread dieback if not properly managed. The public submissions also raised the concern that the proposed land clearing would spread *phytophthora.*

The EPA notes that the proponent has committed to preparing a Dieback Hygiene Management Programme to the satisfaction of CALM and considers that this will minimise the risk of land clearing spreading dieback.

The EPA concludes that the proponent's commitments are adequate to meet the objective of not increasing the risk of spreading *phytophthora.*

5. Advice to the Minister for the Environment

The EPA has assessed the proposal by Mr Craig Underwood to clear 870 hectares (49% of total property area) of native vegetation and retain 350 hectares (21%) on Victoria Location 10598 Cockleshell Gully Road, Shire of Dandaragan.

In undertaking its assessment the EPA has reviewed the proponent's CER, submissions from the public and government agencies, relevant literature and the proponent's revised environmental management commitments.

The environmental factors relevant to the proposal, the conditions and the procedures, if any, to which any implementation of that proposal should be subject and other recommendations as the EPA sees fit, as required under Section 44(1) of the Environmental Protection Act 1986, are set out below.

5.1 Environmental factors relevant to the proposal

The EPA identified the following environmental factors as being relevant to the proposal:

- clearing native vegetation;
- retention of vegetation buffers;
- impact of land clearing on rare plant communities and rare flora and fauna;
- impact of land clearing on wetlands and watercourses;
- impact of land clearing on groundwater levels and the caves within Drovers Cave National Park;
- farm management; and
- risk of spreading dieback *(phytophthora)* as a result of clearing the property

The environmental objectives for each factor above are given in Section 4 and in Table 2. The relevant environmental factors for this proposal should be read in the context of these objectives.

5.2 Conditions and procedures to be applied if the proposal is to be implemented.

The EPA has set out in Section 6 the recommended conditions and procedures to which any implementation of this proposal should be subject. These include:

(a) implementation of the proponent's commitments;

(b) requirements in relation to any changes in the proposal;

(c) maintenance of the proponent status;

(d) time limits on approval;

(e) compliance auditing;

(f) environmental management; and

(g) procedures for assessing compliances and receiving advice.

The proponent should consider the relevant factors and manage to the objectives set out in Section 4. A general environmental management plan should be established for the implementation of the proposal. The plan should adopt quality assurance principles (such as those adopted in the voluntary Australian Standard ISO 9000 series) and environmental management principles (such as those adopted in the voluntary draft Australian Standard ISO 14 000 series).

Throughout the life of the proposal, the proponent shall exercise all care and due diligence in managing the proposal to ensure the protection of the environment.

As part of the management system there should be annual audit and review. Performance indicators for each objective should be established.

5.3 Conclusion

The EPA has concluded that the proposal to clear native vegetation on Victoria Location 10598 Cockleshell Gully Road, Shire of Dandaragan can be managed to meet the objectives established by the EPA, subject to the implementation of the commitments made by the proponent (refer to Appendix 5) and the EPA's recommendation below.

Recommendation 1

The proposal, as modified by the proponent's commitments, to clear native vegetation on Victoria Location 10598 can be managed to meet the Environmental Protection Authority's environmental objectives subject to the successful implementation of the proponent's commitments.

Recommendation 2

That the Minister for the Environment note that as part of the proponent's groundwater monitoring programme, Agriculture Western Australia has been requested to monitor groundwater levels on the property prior to and after the vegetation on Victoria Location 10598 has been cleared.

The proponent is committed to preparing a number of monitoring and management programmes to the satisfaction of relevant government agencies. The EPA has requested that the proponent prepare one monitoring and management programme which incorporates the intent of all of the commitments. The EPA has also requested that the proponent develop and include within the monitoring and management programme quantifiable and auditable performance indicators.

6. Recommended environmental conditions

Based on the assessment of this proposal and the recommendations in this report, the Environmental Protection Authority considers that the following recommended environmental conditions are appropriate for the proposal:

CLEARING OF NATIVE VEGETATION ON VICTORIA LOCATION 10598
COCKLESHELL GULLY ROAD, SHIRE OF DANDARAGAN (ASSESSMENT 880).
MR CRAIG UNDERWOOD

1 Proponent Commitments
The proponent has made a number of environmental management commitments in order to protect the environment.

1-1 In implementing the proposal, the proponent shall fulfil the commitments made in the Consultative Environmental Review, and in response to issues raised following public submissions; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

The environmental management commitments were published in Environmental Protection Authority Bulletin **832** and a copy is attached.

2 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

2-1 Subject to these conditions and the proponent's commitments to modify the proposal, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal.

2-2 Where, in the course of the detailed implementation referred to in condition 2-1, the proponent seeks to change the designs, specifications, plans or other technical material submitted to the Environmental Protection Authority in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

3 Proponent

These conditions legally apply to the nominated proponent.

3-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

4 Time Limit on Approval

The environmental approval for the proposal is limited.

4-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period to the Minister for the Environment.

Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Department of Environmental Protection that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years.

5 Compliance Auditing

To help determine environmental performance and compliance with the conditions, periodic reports on the implementation of the proposal are required.

5-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.

6 Environmental Management

6-1 Throughout the life of the proposal the proponent shall exercise all care and due diligence in managing the proposal to ensure the protection of the environment.

6-2 The proponent shall prepare and implement an environmental management plan and environmental management procedures (for example those provided for in the Australian Standards 9000 and 14 000 (draft) series) to manage the relevant environmental factors to achieve the objectives specified in this Bulletin, with appropriate monitoring, auditing and reporting to ensure compliance with these conditions and procedures and the ongoing protection of the environment.

6-3 If through the implementation of the procedures referred to in 6-2 the proponent identified a relevant environmental factor not listed as such in this Bulletin, the proponent shall immediately report to the Minister on that factor, a proposed objective and any proposals for management of the factor to achieve the objective.

Procedure

1 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.

2 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.

7. References

Agriculture Western Australia (1994). *Procedures for the Administration and Assessment of Clearing and Protection of Native Vegetation in Western Australia.* Agriculture Western Australia. Perth, WA.

Alan Peggs Rural Pty Ltd (1995). *Consultative Environmental Review of the proposed clearing of land on Victoria Location 10598 Cockleshell Gully Road, Shire of Dandaragan.* Alan Peggs Rural Pty Ltd. Perth, WA.

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Davies, P. and Lane, J. (1995). *Guidelines for Design of Effective Buffers for Wetlands on the Swan Coastal Plain.* Australian Nature Conservation Agency. Canberra, ACT.

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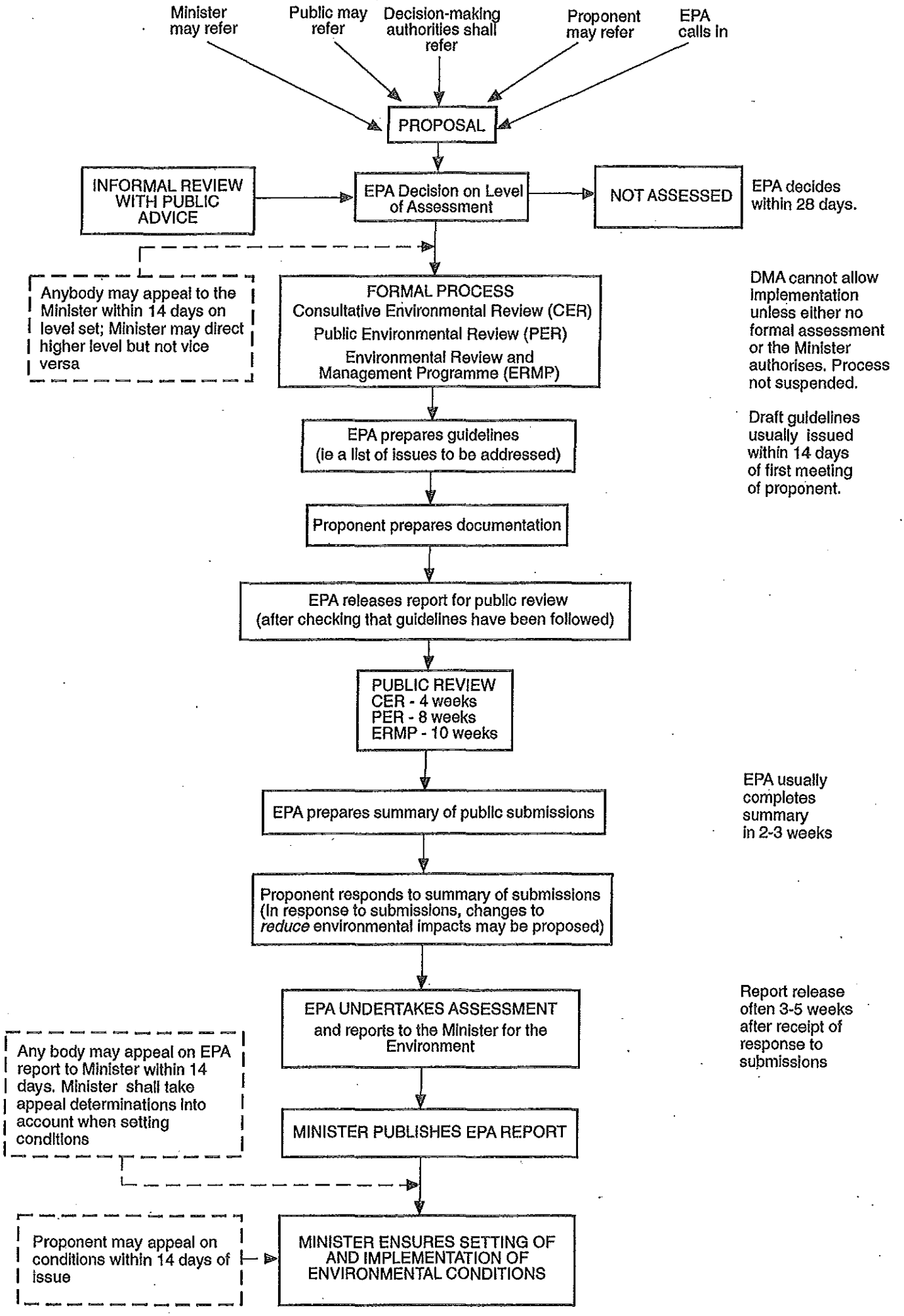
Appendix 1

Environmental impact assessment flow chart

EIA PROCESS FLOW CHART



Appendix 2

Issues raised by general public, government agencies and conservation groups in submission received on the CER

ISSUES RAISED BY GENERAL PUBLIC, CONSERVATION GROUPS AND GOVERNMENT AGENCIES.

Submissions received from Conservation Council of WA, Department of Conservation and Land Management, Aboriginal Affairs Department, Australian Speleogical Federation Inc. and E.A Griffin & Associates Consulting Botanist.

Physical and Biological Impacts

1.0 **Impact of Clearing on Lesueur National Park and Drovers Cave National Park**

1.1 Control methods including buffers and eradication programmes are not clearly specified and appear insufficient.

2.0 **Impacts on declared rare flora and fauna or priority species**

2.1 Tagasaste is an evasive woody weed and could become a weed on the fringes of Cockleshell Gully.

2.2 Clearing native vegetation in order to establish tagasaste is not justifiable.

2.3 The proposal poses unacceptable threats to biodiversity.

2.4 CALM advise that due to the occurrence of lateritic heath it is possible that declared rare flora occur on the property.

2.5 Rare flora is likely to occur in areas proposed for clearing as well as for retention. An adequate assessment is not possible from the information presented.

2.6 The retention of damplands could be a significant complement to the Lesueur National Park. A similar conclusion could be made for the Banksia woodlands.

2.7 Retention of a native vegetation buffer along the entire boundary adjacent to the national parks is required to reduce the likelihood of weed encroachment from the farm into the parks.

2.8 CALM considers that the impact on CALM managed values and estate will be small, due to the environmental considerations outlined in the CER and the proposed development of the area to the comprehensive plan prepared by Agriculture Wester Australia.

2.9 The impact on flora is unacceptable.

2.10 The information on vegetation in the CER is entirely inadequate. There is no map of the current situation.

3.0 **Impact on hydrology.**

3.1 Groundwater movement is not as simple as implied in the CER. Clearing may cause groundwater to rise in the vicinity of the fault.

3.2 A full hydrological report of the wetlands and the property needs to be prepared for the proponent by hydrologists with greater understanding of agricultural enterprise, in particular tagasaste plantations.

3.3 Little work has been done on the effects of tagasaste on either soil nutrients or water use, especially under fertiliser applications.

3.4 What are the overall water requirements of the farm and what will be the impacts on the environment?

3.5 It is anticipated that the clearing of 873ha of land would have a major impact on the groundwater table.

4.0 Impact on nearby caves

4.1 Further investigation be undertaken of the effects of clearing on the hydrology of Old River Cave prior to any land clearing.

4.2 Further investigation be undertaken of the aquatic fauna of Old River Cave prior to any land clearance.

4.3 It is anticipated that the proposed clearing would impact on all cave systems developed at the water table.

5.0 Proposed management of remnant vegetation to protect ecological values

5.1 The areas which are intended to be set aside and protected as remnant vegetation may not be viable because they are narrow and potentially vulnerable to change due to local water rise and *Phytophthora* infection.

5.2 Retaining the drainage lines within the property to act as biological filters is incompatible with the objective of retaining their natural values.

6.0 Need for a comprehensive management plan

6.1 The need for a proper and comprehensive management plan is essential to a project of this nature and should be made open and available for comment.

6.2 Is the proposal viable? Are there other viable landuses if tagasaste is not viable?

6.3 Specific commitments should be made to monitor groundwater rises through the use of piezometers. Criteria should be set for a threshold rise to trigger particular management actions.

6.4 A management programme involving aspects of *Phytophthora* disease risk assessment, control and monitoring should be prepared.

7.0 Protect the value of wetlands and streams

7.1 The value of these wetlands and their water source needs to be identified.

7.2 The CER does not refer to the provision of buffers along Cockleshell Gully.

7.3 A wider area of remnant vegetation should be retained adjacent to the winter wet depressions, particularly those draining to the northwest corner of the property.

Pollution

8.0 Spread of dieback

8.1 The potential impact of *Phytophthora* on the remnant native vegetation and the surrounding National Parks has been overlooked in the report. Two species are very close to the property and clearing could very easily spread these species and exacerbate their impact.

8.2 An assessment of the extent of infection of Phytophthora species in the vicinity should be conducted.

Social Impacts

9.0 Aboriginal heritage issues

9.1 An ethnographic or archaeological survey should be conducted of the area prior to land clearing.

Appendix 3

List of submitters

LIST OF SUBMITTERS

1. Conservation Council of WA
2. Australian Speleogical Federation Inc.
3. Department of Conservation and Land Management
4. E.A Griffin & Associates Consulting Botanist
5. Aboriginal Affairs Department

Appendix 4

Proponent's response to issues raised

ISSUES RAISED BY CONSERVATION GROUPS AND GOVERNMENT AGENCIES

Clearing of Land on Victoria Location 10598 - Cockleshell Gully Road Jurien

Assessment 880

Comments by Craig Underwood/Alan Peggs Rural

Physical & Biological Impacts

1.0 Impact of Clearing on Lesueur National Park and Drovers Cave National Park

1.1 *Control methods including buffers and eradication programs not clearly specified and appear insufficient.*

The buffers of natural vegetation on the borders of the two national parks, along existing streamlines and around ephemeral wetlands were developed in accordance with the recommendations of Mr Bill Evans, Senior Ranger, Department of Conservation and Land Management. CALM consider, given these buffers, the proposal to clear natural vegetation on Victoria Location 10598 will have minimal impact on the adjoining reserves. (See CALM letter 15 Sep 94 and CALM comment 2.8).

The areas proposed as buffers are detailed in the comprehensive farm plan prepared for the property by Agriculture WA. This plan forms the first of the environmental commitments detailed for the property. (See CER p.15.)

In addition there is a commitment to maintain the buffers and reserves as specified in the second of the environmental commitments. (See CER p.15.)

In terms of eradication there is a commitment to eradicate feral fauna, in particular rabbits, from the property. (See CER p.15.) This will be undertaken in association with the Agriculture Protection Board.

All these commitments will be audited by Agriculture WA and/or CALM.

On this basis it is considered the buffer and eradication programs are clearly specified and are sufficient to minimise the impact on the two national parks.

2.0 Impacts on declared rare flora and fauna or priority species

2.1 Tagasaste is an evasive woody weed and could become a weed on the fringes of Cockleshell Gully.

Tagasaste is not an easy plant to establish. It requires timely and appropriate management to ensure a productive stand is established. Without this management failure is common. Under these circumstances it is highly unlikely it will establish with

no management . Despite tagasaste having been present for over ten years in the West Midlands and with 70000 hectares now planted, there has been no evidence to date that the plant has the potential to become an evasive weed.

In its seedling stage the plant is very palatable to feral fauna particularly rabbits. Without appropriate feral fauna control the probability of establishment failure is high.

2.2 Clearing of native vegetation in order to establish tagasaste is not justified.

It is not clear on what grounds this statement is made. On economic grounds the return on capital from a tagasaste based livestock enterprise is relatively high for an agricultural investment. (Thorniley, Peggs and Butt 1996 p.207.)

2.3 The proposal poses unacceptable threats to biodiversity.

This statement is not supported by the Department of Conservation and Land Management. "CALM considers the impact on CALM managed values and estate will be small due to the environmental considerations outlined in the CER and the proposed development of the area (in accordance with) the comprehensive plan prepared by Agriculture WA." (See 2.8)

Given the property is bordered by two national parks which total c.30000 ha and around 36% of the Shire of Dandaragan is covered in natural vegetation it is difficult to see how the proposal poses an unacceptable threat to biodiversity.

2.4 CALM advise that due to the occurrence of lateritic heath it is possible declared rare flora occur on the property.

This concern is recognised and as such the area of lateritic heath on the property has been placed in a reserve in the proposal. (See also CER p.10).

2.5 Rare flora is likely to occur in areas proposed for clearing as well as for retention. An adequate assessment is not possible from the information presented.

According to CALM there is no evidence of rare flora on the property. In addition Dr S.Patrick of the State Herbarium confirms no declared or rare flora or taxa are known or a likely to occur on the property. (See CER p.10).

2.6 The retention of the damplands could be a significant complement of the Lesueur National Park. A similar conclusion could be made for the Banksia woodlands.

It is not known whether this is the case or not. However the time to have made this decision was prior to release of property for agriculture.

2.7 Retention of a native vegetation buffer along the entire boundary adjacent the to the national parks is required to reduce the likelihood of weed encroachment.

The natural vegetation buffers in place in the proposal were developed in accordance with CALM recommendations. These took into the account the need to prevent the

possibility of weed encroachment. However if CALM wish for the buffers to be extended to take into account the NW boundary with Lesueur National Park this is quite acceptable.

2.8 CALM considers that the impact on CALM managed values and estate will be small due to the environmental considerations outlined in the CER and the proposed development of the area to the comprehensive plan prepared by Agriculture WA.

This statement is endorsed. As an unbiased source this statement has significant credibility.

2.9 The impact on flora is unacceptable

This statement is supported by CALM or Dr S.Patrick of the State Herbarium.

See comments in 2.3, 2.4 and 2.5. See also CER p.10.

2.10 The information in the CER is entirely inadequate. There is no map of the current situation

The comment in the first part of the statement is disputed. The information in the CER was sufficient for CALM to state in 2.8 the impact of the proposal "...on CALM managed values and estate will be small."

There is no map of the current situation because none was available. However the existing vegetation on the property is detailed in p.10 of the CER. The current areas planted to tagasaste and existing reserves are detailed in the map of the farm plan contained in the Appendices of the CER.

3.0 Impact on Hydrology

3.1 Groundwater movement is not as simple as implied in the CER. Clearing may cause groundwater to rise in the vicinity of the fault.

The information in the CER was based on that provided by Hydrology Section of the Department of Mines and Energy.

Clearing of natural vegetation and replacement with annual crops or pastures may well cause groundwater levels to rise. However planting tagasaste is likely to result in groundwater levels remaining as they are. This is because tagasaste is a perennial shrub like much of the natural vegetation it is intended to replace. Hence a tagasaste plantation in terms of water use will mimic the water use of natural vegetation. Data from a trial at Wongan Hills comparing water use by *Ecalyptus camaldulensis* and tagasaste indicated, on a per hectare basis, water use was similar (Eastham *et al.* 1993 and Scott 1991).

3.2 A full hydrological report of the wetlands and the property needs to be prepared for the proponent by hydrologists with greater understanding of agricultural enterprises in particular tagasaste plantations.

Such a report is not considered necessary. There is only one hydrologist in the state with a knowledge of tagasaste plantations. This is Russell Speed who is a hydrologist with Agriculture WA at Geraldton. He has undertaken research on the impact of tagasaste on groundwater levels at New Norcia (Speed *et al.* 1993). He is a strong proponent of the use of tagasaste plantations and alleys to manage groundwater recharge in cleared areas planted to annual crops and pastures. He considers tagasaste mimics natural vegetation in terms of water use.

3.3. Little work has been done on the effects of tagasaste on either soil nutrients or water use, especially under fertiliser applications.

This statement is simply not correct. An extensive research program has been carried out by Agriculture WA, the University of WA and the CSIRO over the past ten years into the agronomy and management of tagasaste. A summary of this work was recently documented in a set of working papers prepared for a Tagasaste Review Workshop held at Yanchep between 27 February and 1 March this year (Lefroy *et al.* 1996).

3.4 What are the overall water requirements of the farm and what will be the impacts on the environment ?

When the area is developed for tagasaste and running 800 breeding cows and their replacements daily water requirements are likely to peak at 100000 litres per day when temperatures reach 40 degrees Celsius. However on average daily water use is expected to average 40000 litres per day. This will be supplied from an existing soak in the south eastern corner of the property.

3.5 It is anticipated that the clearing of 873 ha of land would have a major impact on the groundwater table.

For the reasons outlined in 3.1 this is not likely to be the case. If the area was to be planted to annual crops and pastures it may be the case.

4.0 Impact on Nearby Caves

4.1 Further investigation be undertaken of the effects of clearing on the hydrology of Old River Cave prior to clearing.

This cave is located to the south west of the property. Given the hydrologist's report and the likelihood tagasaste will not impact on groundwater tables there does not seem to be a case for further investigation (See CER p.11).

4.2 Further investigation be undertaken of the effects of clearing on the aquatic fauna of Old River Cave prior to clearing.

See comments in 4.1 above.

4.3 It is anticipated that the proposed clearing would impact on all cave systems developed at the water table.

It is not clear what is meant by this statement. However as discussed in 4.1 above the proposal is unlikely to have any impact on the caves in Drovers Cave National Park.

5.0 Proposed Management of Remnant Vegetation to Protect Ecological Values

The areas which are intended to be set aside and protected as remnant vegetation may not be viable because they are narrow and potentially vulnerable to change due to local water rise and Phytophthora *infection.*

As discussed in 3.1 it is unlikely water levels will rise as a result of clearing and planting to tagasaste. Hence there is not likely to be a threat to the remnant vegetation from rising groundwater tables.

Phytophthora has not been a problem in any of the 70000 ha of tagasaste planted in the West Midlands to date. It is understood Phytophthora is a major problem in the hardwood forests of WA. However it is most acute in waterlogged areas and much less severe in freely draining sands (Wiley *etal.* 1996). As tagasaste is intolerant of waterlogging it is not recommended to plant tagasaste on soils subject to waterlogging. In the proposal no soils which are subject to waterlogging will be planted to tagasaste.

5.2 Retaining the drainage lines within the property to act as biological filters is incompatible with the objective of retaining their natural values.

Tagasaste as a deep rooted perennial shrub is very efficient at taking up any nutrients applied. On this basis there is unlikely to any significant escape of nutrients to cause damage to drainage lines. Therefore preserving natural vegetation as a drainage line is not necessarily incompatible with preservation for natural values.

6.0 Need for a Comprehensive Management Plan

6.1 The need for a comprehensive management plan is essential to a project of this nature and should be made open and available for comment.

The CER is a public document available for comment. It details a comprehensive management plan for project which has the imprimatur of CALM and Agriculture WA.

6.2 Is the proposal viable ? Are there other viable land uses if tagasaste is not viable ?

The proposal is financially viable. (See Thorniley, Peggs and Butt 1996 and Peggs 1996.)

If tagasaste failed alternative viable land uses would be to plant *Pinus radiata* or *pinaster* for softwood production. CALM is offering financially attractive sharefarming arrangements to farmers in the West Midlands in order to increase future

supplies of softwood. CALM now produces *Phytophthora* resistant *Pinus* seedlings. Blue gums may also be a possibility in the future.

6.3 Specific commitments should be made to monitor groundwater rises through the use of piezometers. Criteria should be set for a threshold rise to trigger particular management actions.

Agriculture WA would be welcome to establish groundwater monitoring sites on the property. Given there is unlikely to be a rise in groundwater levels under tagasaste there is no need for particular management actions to be implemented as groundwater levels rise.

6.4 A management programme involving aspects of Phytophthora *disease risk assessment, control and monitoring should be prepared.*

Phytophthora has not been a problem for tagasaste planted in the West Midlands to date. (See 5.1.) This is because the disease is more prevalent in waterlogged areas. As tagasaste is intolerant of waterlogging these areas have not been planted to it. Hence it is likely tagasaste in the West Midlands has avoided the problem so far.

If the disease did become a problem for tagasaste the application of Phosphorus Acid (Fosject) is an option to control dieback. An option in the future is to develop cultivars of tagasaste which are resistant to dieback.

7.0 Protect the Values of Wetlands and Streams

7.1 The value of these wetlands and their water source needs to be identified.

The wetlands are ephemeral with water only being present during winter. The source of water is likely to be winter rainfall events which result in these clay based depressions filling with water and because of poor drainage this water remains there for a period of time.

The proposal recognises the value of these ephemeral wetlands and incorporates then into reserves.

7.2 The CER does not refer to the provision of buffers along Cockleshell Gully.

This presumably refers to the boundary along Cockleshell Gully Road. CALM's concern was that there be buffers along all boundaries with the National Parks. (See CALM fax 3 Jan 1996.) If CALM considers it appropriate to have a buffer along Cockleshell Gully Road this is acceptable.

7.3 A wider area of remnant vegetation should be retained adjacent the winter wet depressions, particularly those draining to the northwest corner of the property.

The reserves proposed were considered appropriate by CALM and Agriculture WA. An extension of the buffer along the northern boundary in the NW corner will add to the area reserved in this part of the farm.

8.0 Spread of Dieback

8.1 The potential impact of Phytophthora *on the remnant native vegetation and the surrounding National Parks has been overlooked in the report. Two species are very close to the property and clearing could very easily spread these species and exacerbate their impact.*

Phytophthora is not likely to be a significant problem on freely draining sand soils. As discussed above no tagasaste in the West Midlands have been affected by *Phytophthora* to date. CALM do not consider the proposal as a potential dieback threat to either national park.

8.2 An assessment of the extent of infection of Phytophthora *species in the vicinity should be conducted.*

This is not considered necessary as no dieback has been reported in either of the national parks adjoining the property. Nor has dieback been identified on the property. On the developed part of the property 400 ha have been planted to tagasaste. There is no evidence of any dieback in this area.

Social Impacts

9.0 Aboriginal Heritage Issues

9.1 An ethnographic or archaeological survey should be conducted of the area prior to land clearing.

The Heritage and Culture Division of the Aboriginal Affairs Department indicates no known aboriginal sites are located in the area proposed to be cleared.

On this basis an ethnographic or archaeological survey would appear to be unwarranted.

Alan Peggs for
Craig Underwood

22 March 1996

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Appendix 5

Proponent's commitments

FACTORS	OBJECTIVES	No	COMMITMENTS	WHEN	BY WHOM	To whose satisfaction
Biophysical impacts						
1.Impact of clearing native vegetation	•Protect representative native vegetation associations that are in the area proposed to be cleared.	1	•Representative vegetation associations on Victoria Location 10598 that may contain Declared Rare Flora and Priority fauna species will be retained in reserves as part of the Agreement to Reserve.	•Agreement to Reserve to be finalised prior to land clearing.	•proponent	AgWA and CALM
2.Retention of vegetation buffers	•Maintain adequate vegetation buffers to protect the environmental values of wetlands, watercourses and National Parks.	2	•Provide and maintain vegetation buffers around the property boundaries, wetlands and watercourses in accordance with the revised farm plan to the satisfaction and requirements of CALM, AgWA and the DEP.	•During land clearing	•proponent	CALM, AgWA and DEP
		3	•Maintain the environmental values of the buffers to the satisfaction of CALM.	•For the life of proposal	•proponent	CALM
		4	•Prepare and implement a vegetation monitoring programme, prior to Victoria Location 10598 being cleared, to the satisfaction of CALM and DEP.	•Prior to land clearing and during the life of the proposal	•Proponent	CALM and DEP
3.Impact of land clearing on rare plant communities and rare flora and fauna.	•To ensure that clearing of native vegetation does not result in the loss of any rare plant communities and rare flora and fauna.		as per commitment 1			
4.Impact of land clearing on wetlands and watercourses.	•Protect the environmental values of the wetlands and watercourses on the property.	5	•Prepare a revised farm plan to include the provision of native vegetation buffers around wetlands and watercourses in accordance with the requirements of CALM, AgWA and DEP ;	prior to land clearing	•proponent	CALM, AgWA and DEP
		6	•Provide and maintain buffers around the wetlands and watercourses in accordance with the revised farm plan to the requirements and satisfaction of the CALM, AgWA and DEP; and	•for the life of the proposal	•proponent	CALM, AgWA and DEP
		7	•Prepare and implement a water quality monitoring and management programme, prior to Victoria Location 10598 being cleared, to the satisfaction of WRC, CALM and DEP.	•prior to land clearing	•proponent	WRC, CALM and DEP

Appendix 5. Proponent's commitments

5.Impact of land clearing on groundwater levels and the caves within Drovers Cave National Park.	•To ensure that clearing of native vegetation does not result in changes in groundwater levels that will impact on environmental values of caves within Drovers Cave National Park.	8 9	•Prepare a groundwater monitoring programme prior to Victoria Location 10598 being cleared, to the satisfaction of WRC, AgWA and DEP; and •Prepare a water balance management programme to be implemented to the satisfaction of the WRC and the DEP, if detectable changes occur to the groundwater levels.	•prior to land clearing •for the life of the project.	•proponent •proponent	WRC, AgWA and DEP WRC and DEP
6.Farm management	•Protect the environmental values of the remnant native vegetation, wetlands, water courses and National Parks via best management practices.	10 11	•A revised farm plan for Victoria Location 10598 will be prepared to the satisfaction of AgWA, CALM and DEP prior to the land being cleared. •Develop and maintain the property in accordance with the revised farm plan prepared to the satisfaction of AgWA, CALM and the DEP.	•prior to land clearing •during land clearing	•proponent •proponent	AgWA, CALM and DEP AgWA, CAM and DEP
7.Risk of spreading dieback (*phytophthora*) as a result of clearing the property.	that the proposed land clearing does not increase the risk of spreading *phytophthora.*	12	•Prepare a Dieback Hygiene Management Programme to the satisfaction of CALM to manage and minimise the spread of phytophthora, prior to Victoria Location 10598 being cleared.	prior to land clearing	proponent	CALM

Appendix 5. Proponent's commitments