PROPOSED SHEEPSKIN TANNERY BAKERS HILL

CASTELMAIN HOLDINGS

Report and Recommendations of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 358 September 1988

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i SUMMARY AND RECOMMENDATIONS

Castlemain Holdings purchased a 60 ha rural site zoned for noxious industry at Chitty Road, Bakers Hill in 1988. Castlemain proposes to construct a tannery with capacity of approximately 100,000 skins per year. Approximately 50% of the skins will be salted.

A Notice of Intent (NOI) was submitted by the proponent in March 1988 to the Environmental Protection Authority (EPA). The level of assessment was set at NOI. The public appealed the level of assessment and the appeal was partially upheld. As a result the NOI was released to surrounding landowners for comment commencing 8 July 1988 and concluding 8 August 1988. A public meeting was held approximately mid term of the review period. The Authority received 15 submissions.

The project will use a high performance treatment procedure. The scour water would be screened, lime dosed, and biologically treated using anaerobic, faculative and evaporation ponds. The saline rich slurry in the evaporation ponds would be trucked off site to a disposal site satisfactory to EPA. The chromium waste will be recovered and recycled. No effluent will be discharged to the surrounding environment.

The Authority has assessed the environmental impacts of the proposal utilizing the NOI and additional information supplied by the proponent and by other government agencies. EPA specifically notes the extensive list of commitments that the proponent has made in the NOI and in response to questions from EPA.

The Authority considers the project to be environmentally acceptable subject to the commitments given by the proponent in the NOI and in response to subsequent questions, and to the Authority's recommendations in this report.

RECOMMENDATION 1

The Environmental Protection Authority concludes that the proposal, as outlined in the Notice of Intent, is environmentally acceptable, and recommends that the proposal could proceed subject to the Authority's recommendations in this report and the commitments made by the proponent which are:

- **maximum production will be approximately 100,000 skins/annum;**
- **the tannery will operate to the requirements of relevant Government agencies;**
- **imported skins will meet the requirements of the Department of Agriculture of Western Australia;**
- **skins will not be dried on site and will be tanned using the "syntan" and chrome hand padding system;**
- **The only wastewater generated will be from the soaking and scouring stages of the process. Wastewater treatment will be by screening, limedosing, lagooning and evaporation. No discharge to the surrounding environment will take place;**
- **treatment lagoons will be constructed to EPA's satisfaction;**

. levee banks below the lagooning system area will be reconstructed;

. topsoil will be placed over the lagoon banks to encourage regrowth;

. additional lagoons will be constructed if necessary;

. leakage of lagoons will be corrected immediately;

. monitoring will be carried out by the Proponent to EPA's satisfaction;

. chemicals will be stored in a secure concrete lined sump area;

. trees will be planted to improve the appearance of the site;

. odour and noise will be controlled at all times; and

. salt management will be reviewed if an environmental impact is detected.

RECOMMENDATION 2

The Environmental Protection Authority recommends that the disposal of treated effluent via evaporation is environmentally acceptable. However, should detrimental environmental impacts be detected from monitoring, the EPA will require, as a condition of licence, that the proponent modify the operation to the satisfaction of EPA.

RECOMMENDATION 3

The Environmental Protection Authority recommends that prior to construction the proponent submit, and subsequently implement a monitoring programme to the satisfaction of EPA designed to detect any effluent treatment pond leakage.

The monitoring programme must include:

. initial baseline sampling period;

. details of parameters to be measured;

. sampling sites and times;

. reporting times to EPA, and

. commitment to modify the environment management programme, if necessary, to reduce the impact of pollution to the satisfaction of EPA.

RECOMMENDATION 4

The Environmental Protection Authority recommends that odours be controlled by the proponent at all times to the satisfaction of EPA, and the Shire of Northam.

RECOMMENDATION 5

The Environmental Protection Authority recommends that prior to commissioning the plant, the proponent should prepare and subsequently implement a tree planting programme to the satisfaction of EPA. This programme should be prepared in consultation with the Soil Conservation Division of the Department of Agriculture and the Shire of Northam.

RECOMMENDATION 6

The Environmental Protection Authority recommends that the proponent prepare detailed plans for the disposal of solid and liquid waste off site and these should be submitted to EPA for approval prior to commissioning the plant.

1. INTRODUCTION

Castlemain Holdings (trading as Mr Sheepskin), the proponent, is a Western Australian company. The proponent proposes to establish a sheepskin tannery at Barkers Hill near Northam.

The proposed tannery is located on a 60 ha block on Chitty Road, approximately 3km north east of Bakers Hill. The site is zoned for noxious industry but is presently used for rural purposes. It adjoins a residential subdivision.

A Notice of Intent (NOI) was submitted by the proponent in March 1988 to the Environmental Protection Authority (EPA). The level of assessment was set at NOI. The public appealed the level of assessment and the appeal was upheld in part. Consequently a "managed NOI" was required. The document was released for limited public review commencing 8 July and concluding 8 August 1988. After approximately two weeks of public review a public meeting was held so that the proponent could describe the proposal and the public could seek more information. The Authority received 15 submissions. All submissions sought modification to the proposal and many expressed a high degree of concern with the proposal. The Shire of Northam conditionally supports the project .

2. DESCRIPTION OF PROPOSAL

2.1 SITE

It is proposed to construct the tannery on Location 3709 Chitty Road, approximately 3km north east of Bakers Hill in the Shire of Northam (Figures 1A & B). It is used currently for the agistment of sheep. The area is zoned noxious but is predominantly rural in character. Some commercial and industrial activities occur there at present (e.g. brickyard, panel beater and free range piggery). The nearest house is approximately 0.5 km away from the site of the proposed tannery and lagoons. However, the nearest properties is within 100m. The topography of the site is dominated by a soil clad granite dome with intermittent outcrops especially near the top where the tannery will be situated. The proposed buildings and effluent treatment system will use less than 10% of the site.

2.2 OUTLINE OF OPERATION

The proponent purchased the site in 1988 and proposes to tan approximately 100,000 skins per annum. Skins would be obtained predominantly from the Wooroloo abattoir, with the product aimed at replacing tanned skins purchased outside the State.

The tannery will employ the environmentally acceptable syntan and chrome hand padding process where small volumes of chrome effluent will be contained and recycled. Wastewater will be produced from the soaking and scouring stages and will be adequately treated by screening, lime dosing, lagooning (anaerobic, facultative and aerobic) and evaporation (Fig.2). The resulting salt slurry will be disposed in a manner acceptable to EPA. Initially the proponent considered irrigation to its property as a method for treated water disposal but all decision making authorities found this unacceptable due to the potential salt problems.

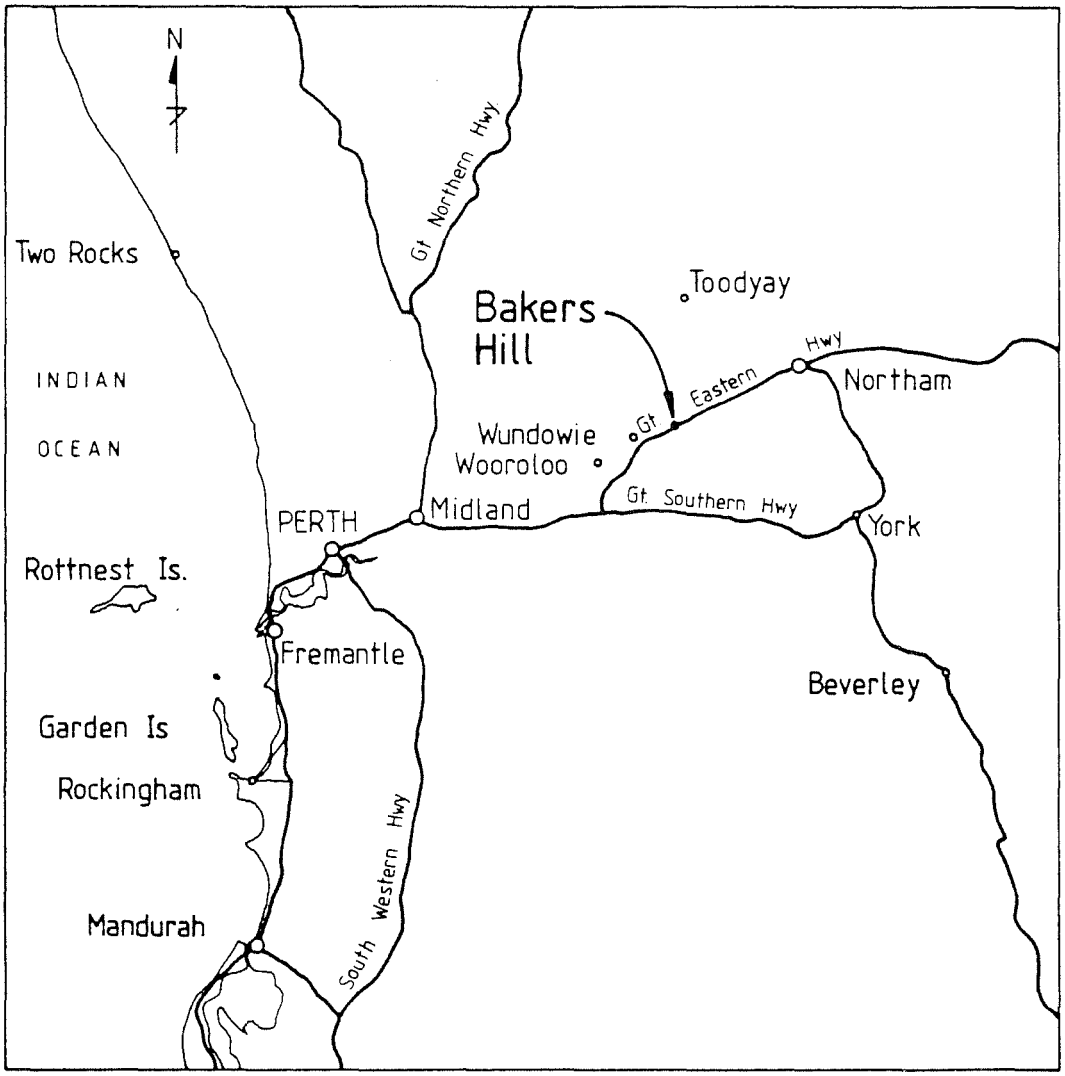

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Figure 1A. Regional Diagram Showing Bakers Hill (After NOI).

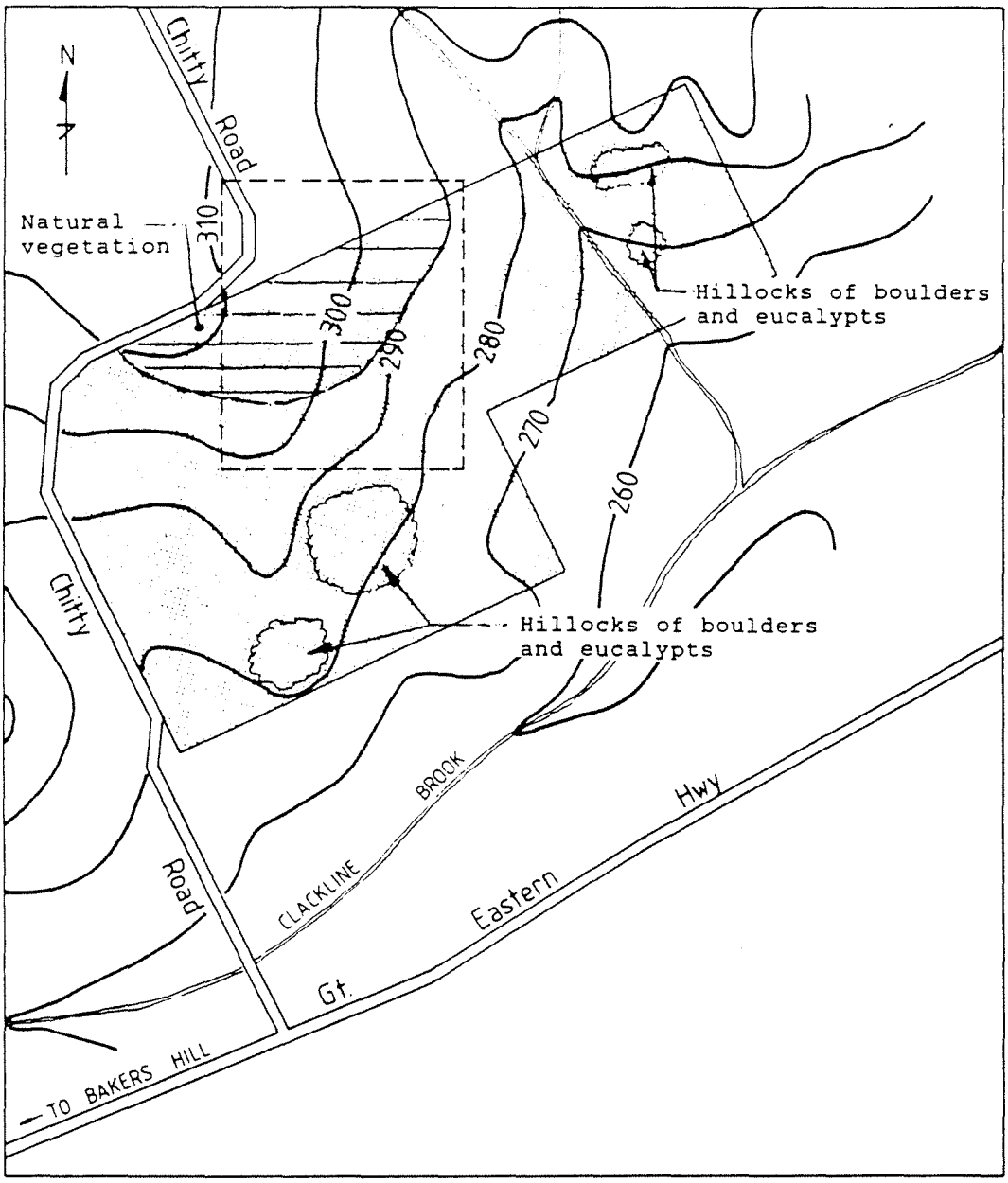

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Figure 1B. Site Location (After NOI).

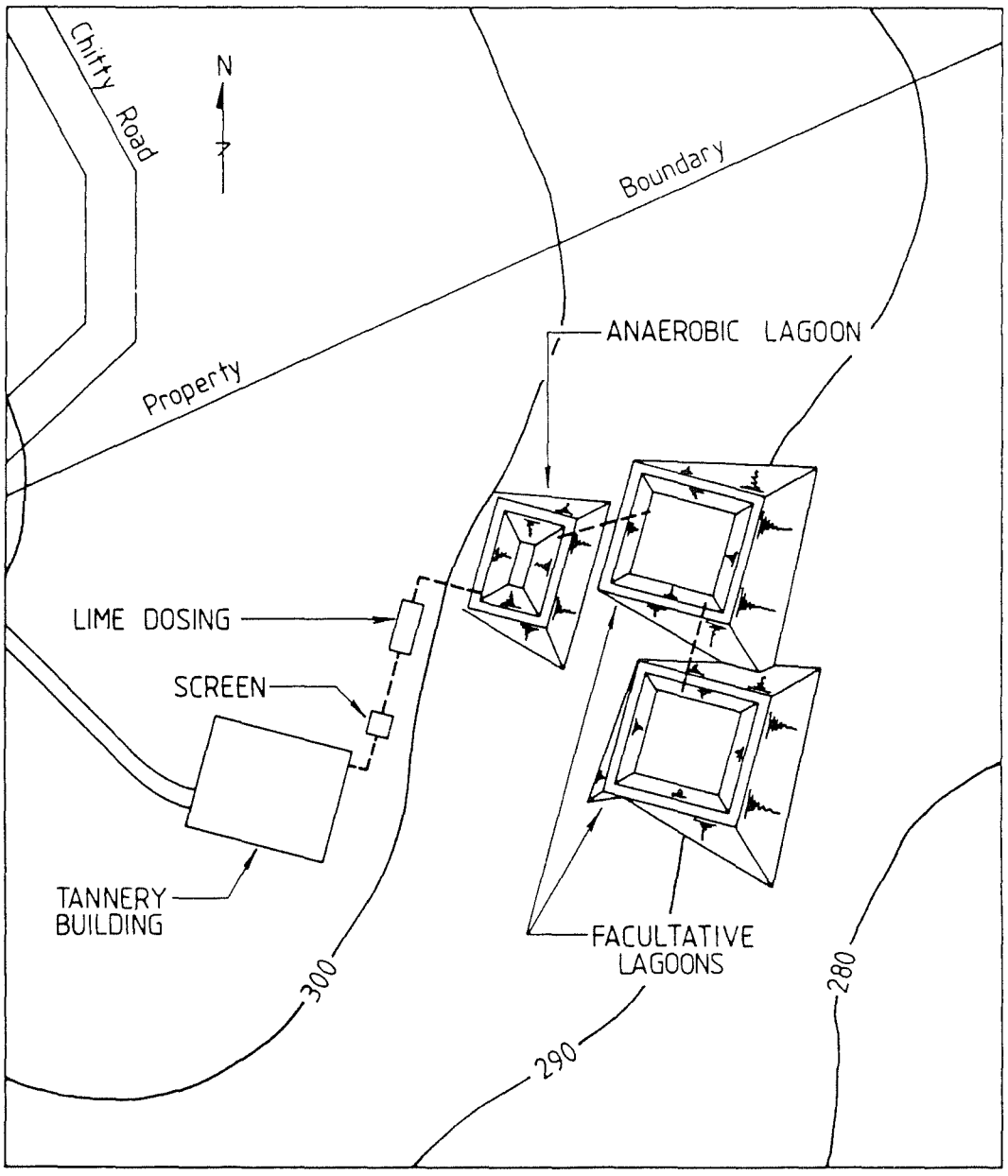


Figure 2. Proposed Location of Lagoons (After NOI).

2.3 SITE SELECTION

The proponent had a number of criteria for site selection, including proximity to an abattoir and other suppliers of skins, size and nature of site, separation from residential properties, availability of services such as water, power and transport. A number of sites were investigated and found to be unsuitable, as follows:

- coastal plain near Jandakot - unsuitable because of Water Authority concerns over the potential for groundwater pollution;
- sites in the wheatbelt - not suitable because of distance from the proponent's existing operations;
- a site in the Bakers Hill/Chidlow area- not suitable because it was too large and expensive.

The proposed site was selected as the fall in the land is suitable for a gravity feed treatment system. The the site is suitable for tree planting, establishment of a showrooms for passing trade and the installation of picnic areas to encourage tourism. In addition, the site has access to services, supplies and markets.

2.4 LIQUID WASTES

Waste streams will include waters from soaking baths, scouring baths, syntan process solution, chrome padding rinse waters, dyeing rinse waters and drainage from dyeing. The wastewater from the soaking and scouring process will be the principal source of wastewater for evaporation. The remaining four waste streams will be treated and recycled.

2.5 POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED IN NOI

The NOI identified the following potential impacts from the project:

(a) Spillages of Chemicals

The chemical storage area will be designed to contain accidental spillage within a separate concrete-lined sump.

(b) Leakage from Treatment Lagoons

Lagoons will be constructed with impermeable clay with suitable compaction. The lagoons will have low side slopes to minimise chance of erosion of banks. Cut-off drains will be constructed around the toe of the banks to prevent stormwater entering the lagoons. Ample freeboard will be included to allow for emergency storage if it should be required.

A low levee has previously been constructed below the area in which the lagoons will be constructed. This levee will be strengthened and raised to ensure that the lagoon contents will be contained in the unlikely event of bank failure. Should any difficulty be experienced in operation of the lagoons (eg erosion or overflow), the proponent will construct one or more additional lagoons as necessary.

(c) Visual Amenity

The proponent intends to promote the tannery as a tourist attraction. Hence, the site will be extensively landscaped to provide an attractive rural setting.

(d) Odours

Under normal circumstances and proper management there should be little odour. In the initial stages of the establishment of the anaerobic pond there is potential for odour. Odour will be controlled by establishing a crust on the anaerobic pond as soon as possible and in a manner satisfactory to of EPA. The proponent notes he intends to use the development for tourism, and hence would naturally control odour.

3. SUMMARY OF PUBLIC AND GOVERNMENT AGENCIES' SUBMISSIONS

3.1 INTRODUCTION

A total of 15 public and Government submissions on this proposal were received by the Environmental Protection Authority. Names of contributors are given in Appendix 3. Submissions indicated that irrigation as originally proposed, pond leakage/rupture and odour caused the greatest concern. Hence the proponent has decided not to irrigate but dispose of treated water via evaporation. Whilst members of the public expressed a high level of concern about the project, no submission indicated that the project was unmanageable given the appropriate safeguards.

3.2 SPECIFIC ISSUES RAISED IN SUBMISSIONS BY THE PUBLIC AND GOVERNMENT AGENCIES

Comments from submissions are broadly classified as follows:

. salt and seepage problems, pollution of groundwater;

. skin drying, odour, noise and visual pollution;

. waste disposal, dogs and foxes;

. lagoon failure, slope of site and earthquakes;

. chemicals used in process;

. importation of seeds in skins;

. zoning, appropriate buffering and tree planting;

. irrigation, site inspection and monitoring;

. rainfall and runoff to adjacent properties;

. public assurance that problems will not occur and legal redress;

. distance from residence;

. failure of proponent to answer questions at public meeting;

. accuracy of proponent's comments;

. accuracy of NOI;

. scheme water and water used in the process;

. traffic, poor access and easements, and

. supervision of the proposal.

4. PROPONENT'S RESPONSE TO ISSUES RAISED

4.1 RESPONSES

The proponent believes that most of the environmental issues raised including odour, effluent treatment and disposal, salt, seepage, earthquakes, tree planting, solid waste disposal, and monitoring are answered in the NOI, Commitments (Appendix 1) and written responses (Appendix 2). It is pointed out that the major problem of irrigation has been avoided by the use of evaporation to dispose of treated effluent.

In addition, the proponent has made commitments to ensure that the proposal meets the requirements of the Health Department of Western Australia, the Water Authority of Western Australia, the Environmental Protection Authority and the Shire of Northam.

5. ENVIRONMENTAL IMPACTS

5.1 GENERAL INTRODUCTION

The Authority has identified the following aspects as those with potential to cause impacts: odour, treatment pond leakage, and salt and solid waste disposal.

The Authority considers the project to be environmentally acceptable and that it could proceed subject to the commitments given by the proponent in the NOI and in response to subsequent questions (Appendices 1 and 2), and to the Authority's recommendations in this report.

RECOMMENDATION 1

The Environmental Protection Authority concludes that the proposal, as outlined in the Notice of Intent, is environmentally acceptable, and recommends that the proposal could proceed subject to the Authority's recommendations in this report and the commitments made by the proponent which are:

. **maximum production will be approximately 100,000 skins/annum;**

. **the tannery will operate to the requirements of relevant Government agencies;**

. **imported skins will meet the requirements of the Department of Agriculture of Western Australia;**

. **skins will not be dried on site and will be tanned using the "syntan" and chrome hand padding system;**

. **The only wastewater generated will be from the soaking and scouring stages of the process. Wastewater treatment will be by screening,**

limedosing, lagooning and evaporation. No discharge to the surrounding environment will take place;

. treatment lagoons will be constructed to EPA's satisfaction;

. levee banks below the lagooning system area will be reconstructed;

. topsoil will be placed over the lagoon banks to encourage regrowth;

. additional lagoons will be constructed if necessary;

. leakage of lagoons will be corrected immediately;

. monitoring will be carried out by the Proponent to EPA's satisfaction;

. chemicals will be stored in a secure concrete lined sump area;

. trees will be planted to improve the appearance of the site;

. odour and noise will be controlled at all times; and

. salt management will be reviewed if an environmental impact is detected.

RECOMMENDATION 2

The Environmental Protection Authority recommends that the disposal of treated effluent via evaporation is environmentally acceptable. However, should detrimental environmental impacts be detected from monitoring, the EPA will require, as a condition of licence, that the proponent modify the operation to the satisfaction of EPA.

RECOMMENDATION 3

The Environmental Protection Authority recommends that prior to construction the proponent submit, and subsequently implement a monitoring programme to the satisfaction of EPA designed to detect any effluent treatment pond leakage.

The monitoring programme must include:

. initial baseline sampling period;

. details of parameters to be measured;

. sampling sites and times;

. reporting times to EPA, and

. commitment to modify the environment management programme, if necessary, to reduce the impact of pollution to the satisfaction of EPA.

5.2 ODOUR

Odour could be a problem as during the establishment of the anaerobic pond. In addition, if strict management practices regarding the disposal of waste is not adhered to odour may arise. The proponent intends to form a crust on the anaerobic pond as soon as possible so as to reduce the potential for odour and has made commitments to rectify immediately any plant failure which causes odour.

RECOMMENDATION 4

The Environmental Protection Authority recommends that odours be controlled by the proponent at all times to the satisfaction of EPA, and the Shire of Northam.

5.3 UNDERPOND LEAKAGE

All ponds will be lined with 225 mm clay to prevent leakage to the groundwater. Soil analysis indicates that the clay on which the lagoons will be established has low permeability of 3x10-8 m/s. It is general practice to use clay linings with low permeability (falling head permeability in the order of 1x10-8m/s) to prevent leakage. Hence the existing clay would be adequate after suitable earthworks and compaction. Whilst ponds have the potential to leak, the proponent has made a commitment to mend such leaks if they occur and meet licence conditions which would restrict export of pollutants from the site to the groundwater.

The proponent is committed to monitoring the groundwater to detect leaks and any other detrimental impacts.

5.4 SEEPAGE, SUPERFICIAL RUNOFF AND SALT

Whilst the proponent has agreed not to discharge any treated or untreated effluent to the site, it is noted that parts of the lower area of the site are salt affected and export of salt to lower lying adjacent properties already occurs. It is also noted that runoff to adjacent properties occurs during periods of high rainfall and that seepage occurs during summer. The Authority considers that this water and salt export to adjacent properties should be corrected so as to cause the minimum impact on local residents. The Shire of Northam is also concerned about the salt problem in the general area and specifically the export of salt from this property. The Shire has noted that one of its conditions of approval is that the proponent agrees to a tree planting programme.

RECOMMENDATION 5

The Environmental Protection Authority recommends that prior to commissioning the plant, the proponent should prepare and subsequently implement a tree planting programme to the satisfaction of EPA. This programme should be prepared in consultation with the Soil Conservation Division of the Department of Agriculture and the Shire of Northam.

5.5 DISPOSAL OF SOLID AND LIQUID WASTE

The solid waste produced in this process has the potential to produce odours. Hence regular solid waste disposal off site is essential.

RECOMMENDATION 6

The Environmental Protection Authority recommends that the proponent prepare detailed plans for the disposal of solid and liquid waste off site and these should be submitted to EPA for approval prior to commissioning the plant.

5.6 VISUAL AMENITY

Whilst the area is zoned for noxious industries, the area is basically rural in character. The Authority considers that visual intrusion of the proposed plant on local residents can be ameliorated by using a suitable tree planting programme to seclude the plant from local residents. This aspect of the tree planting programme is considered in Recommendation 6.

5.7 TRAFFIC AND SCHEME WATER

It is recognised by the EPA that there will be an increase in heavy duty traffic on the approach road to the tannery and that this road would require upgrading with time. The Authority regards the issue as a Local Government planning issue.

Given the environmental acceptability of the project, the Authority regards availability of scheme water access to the local subdivision as an issue for the local authority and the Water Authority of Western Australia.

6. CONCLUSIONS

Based on the information supplied in the NOI, additional information supplied by the proponent, and its own investigations, the Environmental Protection Authority has concluded that the project is environmentally acceptable and recommends that it could proceed subject to the commitments given in the NOI and recommendations in this report.

The project will use an evaporation lagooning treatment system to dispose of its liquid waste. Disposal of residues will be off site and will be to the satisfaction of EPA. Disposal of solid waste will be to the satisfaction of EPA, the Health Department of Western Australia and the Shire of Northam. Odour could be a problem for up to six month but like the rest of the effluent treatment system should not be a long term problem if managed properly. This can be managed by ensuring that the crust on the anaerobic pond is formed as quickly as possible.

Intrusion into other properties by chemicals should not be a problem as the system is self contained. Neither should visual pollution or salt export to lower lying properties be a problem due to the proposed tree planting programme and evaporation ponding system respectively.

APPENDIX 1

LIST OF COMMITMENTS

SUMMARY OF COMMITMENTS

The Proponent has made a number of commitments relevant to minimising waste discharge, monitoring the operation of the tannery, and managing any adverse environmental effects which are detected. These commitments have been made in the Notice of Intent and in answers to subsequent questions. At the request of the EPA, these commitments have been brought together in a list below.

1. The Proponent will construct a sheepskin tannery to process approximately 100,000 skins per year.

2. The tannery will be designed and operated to meet the requirements of all the relevant government agencies.

3. The main source of supply for green skins will be the Wooroloo abattoir.

4. Some salted skins may be purchased from the Eastern States. The Proponent will ensure that all requirements of the Department of Agriculture will be met for any imported skins.

5. No skin drying will be carried out at the tannery.

6. The tannery will employ modern processes to minimise the potential for adverse impacts on the environment.

7. Skins will be tanned using the 'syntan' and chrome hand padding systems, which avoids the need to dispose of large volumes of saline pickle liquor and chrome tan liquor which are associated with the older chrome bath tanning technique.

8. Wherever possible, process liquors will be recycled. The only wastewater to be discharged will be from the soaking and scouring stages.

9. The soaking and scouring wastewater will be treated by screening and lime dosing before being discharged to anaerobic and facultative lagoons for further treatment and disposal by evaporation.

10. The anaerobic and facultative lagoons will be lined with clay compacted to 90 percent modified maximum dry density to achieve a sufficiently low permeability.

11. The lagoons will be sized and constructed to achieve efficient treatment and disposal without causing pollution.

12. The tannery will produce a small volume of solid wastes from trimming, fleshing, screening and finishing. These wastes will be buried on site.

13. Additional solid wastes will be produced by lime dosing. The settled sludge will be dewatered on site by evaporation in clay lined pits then disposed of at a tip approved by the EPA.

14. Chemicals required for the process will be kept in a separate storage area which will be designed to contain any accidental spillages within a separate concrete-lined sump.

15. An existing levee below the area in which the lagoons will be constructed will be strengthened and raised as necessary to ensure that the lagoon contents will be contained in the unlikely event of a lagoon bank failure.

16. The lagoons will have low side slopes to minimise the possibility of erosion. Topsoil will be placed over the external batters of the lagoons to allow regrowth of grass to assist in control of erosion and to minimise any visual impact of the walls.

17. Cutoff drains will be constructed around the lagoons to prevent any stormwater flowing into the lagoons. Ample freeboard will be included to allow for emergency storage.

18. Should any difficulty be experienced in operation of the lagoons, the Proponent will quickly construct one or more additional lagoons as necessary.

19. Should one of the lagoons develop a leak which pollutes the surface water or groundwater, the Proponent will take whatever steps are required to overcome the problem. These steps could include repairing the clay liner, installing an impermeable membrane such as PVC, or abandoning the lagoon and constructing a new one.

20. The Proponent will install a number of monitoring bores and undertake a monitoring programme to the satisfaction of the EPA.

21. The Proponent intends to improve the appearance of the site by a programme of tree planting. The additional trees will screen the tannery building and lagoons from the property boundaries.

22. The tannery will be operated to minimise variation in the quality of wastewater flowing to the anaerobic lagoon and hence minimise the potential for odour generation.

23. The lagoons will be sited to provide a buffer zone of at least 0.5km to the nearest house.

24. The Proponent will investigate suitable emergency odour control methods and have available supplies of a suitable additive for the anaerobic lagoon in the unlikely event of odour emissions becoming a nuisance.

25. The tannery operations will not result in high noise levels. The tannery will meet all the requirements of the Neighbourhood Annoyance regulations.

26. No lighting of the tannery will cause a nuisance to local residents.

27. If the salt load from washing salted skins proves to be excessive, the Proponent will introduce manual or mechanical methods to separate salt from the skins before they are washed. The salt would be disposed of at a tip approved by the EPA.

28. If the Water Authority changes its policy on connection and if the tannery causes pollution of surface water or groundwater required by adjacent properties, the Proponent will allow an easement adjacent to the southern boundary of his property for the Water Authority to connect adjacent houses to the water supply main.

APPENDIX 2

QUESTIONS RAISED BY THE PUBLIC AND GOVERNMENT AGENCIES AND THE PROPONENTS RESPONSES

PREAMBLE

The Proponent prepared a Referral Report which described the proposed sheepskin tannery and was submitted to the Environmental Protection Authority (EPA) on January 19, 1988. On the basis of the Referral Report, the EPA decided that a Notice of Intent (NOI) should be prepared for the project. Following consultation with officers of the EPA, the Referral Report was revised and submitted as an NOI on March 22, 1988.

The NOI has been reviewed by the EPA, the Water Authority and other government departments, as well as by a number of concerned local residents to whom the NOI was released by the EPA. The EPA has compiled a list of 33 questions submitted by these people and forwarded them to the Proponent under covering letter 137/87:4837 Filt dated July 29, 1988. Subsequently, the EPA has requested additional information, identified here as questions (34) to (41). The questions are answered below, with reference to where they were answered in the NOI where appropriate.

Since preparing the NOI, the Proponent has decided not to dispose of some of the treated wastewater by irrigation. All of the wastewater will be disposed of by evaporation. This decision should remove the concern about the effects of irrigation which were evident in some of the questions.

Also, the Proponent has decided to re-use the second-stage washwater in the first wash, which will result in the wastewater volume being reduced from $40m^3/d$ to $30m^3/d$.

1(Q) **What quantity of salt will be washed out of each salted skin and what is the estimated total load of salt being discharged to the environment?**

1(A) It is estimated that each salted skin contributes 0.5kg to 1kg of salt. No salt will be discharged to the environment.

2(Q) **What management procedures will be employed to ensure water in lagoons does not flow into adjoining properties in the event of an earthquake?**

2(A) On page 16 of the NOI, the Proponent made a commitment that the lagoons will be constructed in accordance with sound engineering standards, to minimise the risk of failure in natural disasters such as earthquakes. In the unlikely event of a partial or total failure of one or more of the lagoons, the lagoon contents will be contained by a levee which is already present below the area in which the lagoons will be constructed. As stated on page 16 of the NOI, the Proponent has made a commitment to raise and/or strengthen this levee as necessary to ensure that the lagoon contents would be contained in the unlikely event of a lagoon bank failure.

3(Q) **Where is the proposed irrigation area?**

3(A) It is no longer proposed that treated wastewater will be disposed of by irrigation.

4(Q) **Will crops be grown on the proposed irrigation area?**

4(A) It is no longer proposed that treated wastewater will be disposed of by irrigation.

5(Q) **How will discharge be managed so that salt intrusion onto low lying properties does not occur?**

5(A) It is no longer proposed that treated wastewater will be disposed of by irrigation.

6(Q) **Will salt in irrigated water affect the receiving land?**

6(A) It is no longer proposed that treated wastewater will be disposed of by irrigation.

7(Q) **Is any part of the proposed site salt affected? If so, where and how much?**

7(A) Small areas of the site have been scoured due to surface runoff and groundwater discharge during part of winter and appear to be mildly sat affected. A soil sample was taken from the worst affected area and analysed for salt

content. As reported in the NOI, a salt content of 171mg/L was measured. The Department of Agriculture advise that this is only slightly affected by salt and would not affect growth of cereal crops such as barley or wheat; productivity of the subterranean clover presently on the site would be reduced by up to 10 percent.

The tannery operation will not increase the size of the area affected by salt since the wastewater will not be disposed of by irrigation. In fact, the Proponent intends to plant additional trees on the site to improve its appearance and to reduce the impact of saline groundwater.

8(Q) **Will there be much chromium in the irrigation water? If so, how much?**

8(A) It is no longer proposed that treated wastewater will be disposed of by irrigation.

9(Q) **If chromium is in the irrigated water, why can it not be washed down by rainwater or washed out of soils to lower properties during winter?**

9(A) It is no longer proposed that treated wastewater will be disposed of by irrigation.

10(Q) **Will skins be imported from the Eastern States?**

10(A) This question was answered on pages 2 and 6 of the NOI, as follows:

"It is proposed that green (fresh) and salted (preserved) skins would be purchased from the Wooroloo Abattoir, with the possibility that salted skins will be purchased also from the Eastern States".

11(Q) **If skins are imported from the Eastern States, will they have the potential to cause a weed problem? If not, why not?**

11(A) This question was answered on page 6 of the NOI, as follows:

"Any skins purchased from the Eastern States will undergo the normal inspection at the Department of Agriculture's Plant Inspection Point at Norseman". The Department of Agriculture inspects for seed which could otherwise introduce weeds. Any infested skins will not be allowed entry to the state.

12(Q) **What is the proposed capacity of the plant in terms of skins/year?**

12(A) This question was answered on pages 1 and 2 of the NOI, as follows:

"The tannery will process approximately 100,000 skins per year". It is not possible to give a more precise answer since the size of sheepskins varies.

13(Q) **Is the Proponent prepared to evaporate all wastewater if problems arise?**

13(A) This question was answered on page 14 of the NOI, as follows:

"In the event that the salinity of the wastewater is greater than has been assumed, due perhaps to a higher proportion of salted skins being processed, disposal by irrigation may prove to be impractical. In this case, the Proponent will construct one or more additional facultative lagoons to provide sufficient storage to allow for disposal of all the wastewater by evaporation."

Subsequent to submitting the NOI to the EPA, the Proponent has decided that disposal of all of the treated wastewater will be by evaporation.

14(Q) **How will the Proponent control superficial runoff water from its property?**

14(A) Construction of the tannery will not change the site in a way which will modify any superficial runoff water from the property.

15(Q) **Does the Proponent intend to put in diversion drains to control erosion and runoff?**

15(A) As stated on page 16 of the NOI, cutoff drains will be constructed to prevent surface runoff into the lagoons. Also on page 16 is a reference to the existing levee which controls erosion and runoff from the site.

16(Q) **What happens to the drips of water from the skins after syntanning?**

16(A) The syntan chemicals are very expensive, so the Proponent will recover all drips for re-use. The syntan area will be bunded and will drain to a self-contained sump from which the liquid can be pumped out.

17(Q) **What is the wastewater referred to in section 5.1.1?**

17(A) This question is answered on page 9 of the NOI, as follows:

"The treatment of the soaking and scouring wastewater will be more extensive since the treated wastewater will be disposed of rather than being recycled. The separate stages of treatment and disposal for this wastewater stream are discussed in the following sections:

5.1.1 Screening

The total volume of wastewater is expected to be $40m^3/d$. Approximately $36m^3/d$ of wastewater discharged from the soak and scour baths and $4m^3/d$ of washwater will flow by gravity to a static wedgewire screen, where coarse particles of wool, grease, and dirt will be separated."

18(Q) **More details are required regarding how effective mixing is in achieving coagulation (Section 5.1.2).**

Full details of the lime dosing equipment will not be available until the Proponent has completed detailed design. The Proponent proposes to use a lime dosing tank complete with mixer to ensure adequate mixing is achieved before the wastewater is discharged to the settling tank.

19(Q) **What are the effective buffer zones proposed between the waste treatment system and adjacent lots and reserve?**

19(A) A buffer zone of at least 500m will exist between the waste treatment system and the nearest house. The lagoons will be approximately 200m from the nearest boundary of the site.

20(Q) **The Proponent should supply a plan at 1:5000 or 1:10000 to show the relation between the treatment system to the Clackline Brook, the nearest house and dam on lot 1661.**

20(A) An amended Figure 2 from the NOI is attached.

21(Q) **How will the lime sludge be removed after settling?**

21(A) Lime sludge remaining from lime dosing of the scour and wash wastewater will be pumped out when necessary into a lined pit, where it will be left to dewater by evaporation. It was stated in the NOI that once the sludge is dewatered sufficiently, it would either be buried on site or removed to a suitable tip approved by the EPA and the Department of Health. From subsequent discussions with the Department of Health, it appears that disposal on site may not be acceptable. In this

case, the Proponent will dispose of the material at a suitable tip approved by the EPA and the Department of Health.

22(Q) **Given that the BOD levels govern the size of the treatment ponds, estimated BOD levels for untreated effluent and treated effluent should be given (5.1.3).**

22(A) Based on a review of this tannery by Mr Jim Thomas, an industrial chemist who is employed by the Department of Agriculture, and on the limited data available from other sheepskin tanneries, the Proponent believes that the BOD_5 load in the untreated wastewater will be about 100kg/d, or a concentration of about 3,500mg/L in a flow of $30m^3/d$. Following screening and lime dosing, the load entering the anaerobic lagoon is expected to be about 55kg/d. Assuming a 60 percent reduction in BOD_5 in the anaerobic lagoon, the BOD_5 load entering the facultative/evaporative lagoons will be about 22kg/d. The facultative/evaporative lagoons will be much larger than would be required purely to stabilise the wastewater by facultative biological treatment since a larger surface area is required for evaporative disposal.

23(Q) **In the case of pond leakage, is the Proponent prepared to use Bentonite to ensure that the ponds are properly sealed?**

23(A) The Proponent has given a commitment on page 16 of the NOI to take whatever steps are necessary to overcome any adverse effects of the tannery operations, including a leak from the lagoons. On the same page, the Proponent gave a commitment to construct the lagoons in accordance with good engineering practice in impermeable clay material which will be compacted as necessary. In view of this commitment and the results of the soils tests, the Proponent believes that the potential for leakage from the lagoons will be minimal. However, in the event of any lagoon leakage being detected, the Proponent gives a commitment to seal any leaking lagoons by an appropriate method, to the satisfaction of the EPA. Such methods could include the use of Bentonite or the installation of a synthetic membrane liner.

24(Q) **If a total evaporation system is used, what will be the size of the ponds?**

24(A) As discussed previously, the Proponent has decided to adopt evaporation as a means of disposal of all the scour and wash wastewater. The lagoons have been sized on the basis of the average evaporation and rainfall data for Northam assuming the salinity (TDS) of the scour and wash wastewater will be 5,000mg/L and that the net evaporation will be 0.64 of the pan evaporation due to the effects of scaling up from the size of the pan to the size of a lagoon and the reduction in evaporation

which occurs as salinity increases. An evaporative area of 0.96ha has been determined. The Proponent expects that this will be provided in three lagoons approximately 70m long by 50m wide by 1.5m deep located in the general area of the facultative lagoons shown on Figure 4 of the NOI. The exact dimensions and location of the lagoons would be refined following more detailed survey of the site.

25(Q) What total quantity of water will be used daily by the Proponent?

25(A) This question was answered on page 5 of the NOI, as follows:

"The tannery is expected to use approximately $40m^3/d$ of water in the tanning process, principally for washing and scouring. A small additional quantity will be required for domestic purposes (eg toilets) and for steam generation."

Subsequently the Proponent has decided to modify the process by re-using some of the washwater. This will result in a reduction of water demand by $10m^3/d$, resulting in an estimated wastewater volume of $30m^3/d$.

26(Q) How will the chromium waste be disposed?

26(A) The majority of the chromium (Cr^{3+}) used in the tanning process will be recovered in the tanning process effluent and will be recycled. This effluent will be treated by lime dosing, which will result in the chromium settling out. Only a small volume of solids will result from this process. The solids will be allowed to build up in the treatment tank for about a year before it will be necessary to dispose of them. In accordance with normal practice, the solids will be added to a cement mortar mix, which effectively fixes the chromium so that it cannot be leached out. The cement mortar will be disposed of at a landfill site approved by the EPA and the Department of Health.

A small quantity of chromium is likely to escape to the scour and wash wastewater due to washing down of equipment and floors. Most of this chromium will be removed by lime dosing before the wastewater enters the lagoons. As discussed above, the settled solids will be dewatered before disposal at a tip approved by the EPA and the Department of Health.

27(Q) What type and level of noise pollution will occur?

27(A) The only noise to be generated will be from small electric motors, most if not all of which will be located inside buildings. The tannery will easily meet the requirements of the Neighbourhood Annoyance regulations.

28(Q) **What type of visual pollution will occur from the whole operation and how does the Proponent intend to minimise it?**

28(A) As explained on pages 2, 16 and 17 of the NOI, the Proponent is committed to providing an attractive rural setting for the tannery. The tannery buildings and lagoons will be located on the site in areas which are not visible from most readily accessible positions around the boundary. It is expected that the tannery could be visible only from the south-eastern corner of the property. The Proponent has made a commitment on page 12 of the NOI to plant trees to screen the tannery buildings and lagoons so that they will not be visible from the property boundaries. The net result will be that the site will be more visually attractive than it is at present.

29(Q) **Will security lighting or other lighting be seen at night by local residents?**

29(A) No security lighting or other lighting will cause a nuisance to local residents.

30(Q) **What will be the increase in traffic per day of light and heavy vehicles because of the project?**

30(A) It is expected that the increase in traffic resulting from the tannery will be, on average, one truck per day delivering or removing sheepskins or else delivering chemicals, plus about 10 cars per day for the staff. If the Proponent is successful in promoting the tannery as a tourist destination, this may result in an estimated two tourist bus visits per week on average.

The Shire of Northam has stated that the capacity of Chitty Road is more than adequate for this projected increase in traffic. The Shire do not have a recent traffic count for Chitty Road, but estimates that it is presently used by about 35 cars per day.

31(Q) **Will there be weekend work causing noise?**

31(A) There will not be any weekend work causing high noise levels.

32(Q) **Is the Proponent aware of a dog problem in the area and how does the Proponent ensure that dogs will not be attracted due to odour.**

32(A) The Proponent is aware that the Shire has received a letter from a local resident claiming that sheep have been killed by wild dogs. As stated on page 17 of the NOI, the Proponent does not believe that the tannery

will normally cause any odour nuisance for nearby residences. Hence there will not be sufficient odour generated to attract dogs.

It should be noted that, under the Dog Act, the responsibility for the control of dogs lies with their owner, not any third party.

33(Q) **The information supplied in the NOI on the levels of phosphorus indicate that the loading to the receiving environment maybe excessive. This should be clarified with Mr Kevin McAlpine of the Investigations Division of EPA.**

33(A) It is no longer proposed that treated wastewater will be disposed of by irrigation.

34(Q) **Has the revised proposal (using evaporation for wastewater disposal) been discussed with the Water Authority of WA?**

34(A) The revised proposal has been discussed with the Water Authority. WAWA is satisfied with the change to evaporative disposal.

35(Q) **What will be the permeability of the clay lining the lagoons?**

35(A) This question was answered on page 10 of the NOI. Samples of clay were taken from test pits dug in the proposed location of the lagoons. The samples were compacted to 90 percent of modified maximum dry density and tested for permeability. The soils testing results were presented as Appendix C of the NOI. The compacted clay was found to have the low permeability of 3×10^{-8} m/s. Compaction of 90 percent of MMDD is easily achieved with proper earthmoving techniques.

36(Q) **Will all water from the chrome tanning process be recycled?**

36(A) This question was answered on page 9 of the NOI, as follows:

"The tanning wastewater stream, comprising wastewater from rinsing, dyeing and drying, will be treated by lime dosing for solids and chrome separation before being recycled."

37(Q) **Will green skins be dried on site?**

37(A) No skin drying will be carried out on site.

38(Q) **Is it feasible to remove salt from salted skins before they are washed?**

38(A) It may be feasible to do so, but it is not practical or necessary.

39(Q) **Is it feasible to separate salty washwater from scouring washwater and discharge the salty water directly to an evaporation lagoon to allow salt recovery for re-sale to the abattoirs?**

39(A) Washwater from washing salted skins will be contaminated by dirt, faecal matter and other substances. Hence the salt deposited in the lagoons could not be re-used.

If the salty washwater was discharged directly to the facultative lagoons, the faecal matter and other organic material may produce too high a loading on the facultative lagoon, resulting in anaerobic conditions. This possibility is removed by giving the wastewater preliminary treatment by screening, lime dosing and discharge to an anaerobic lagoon.

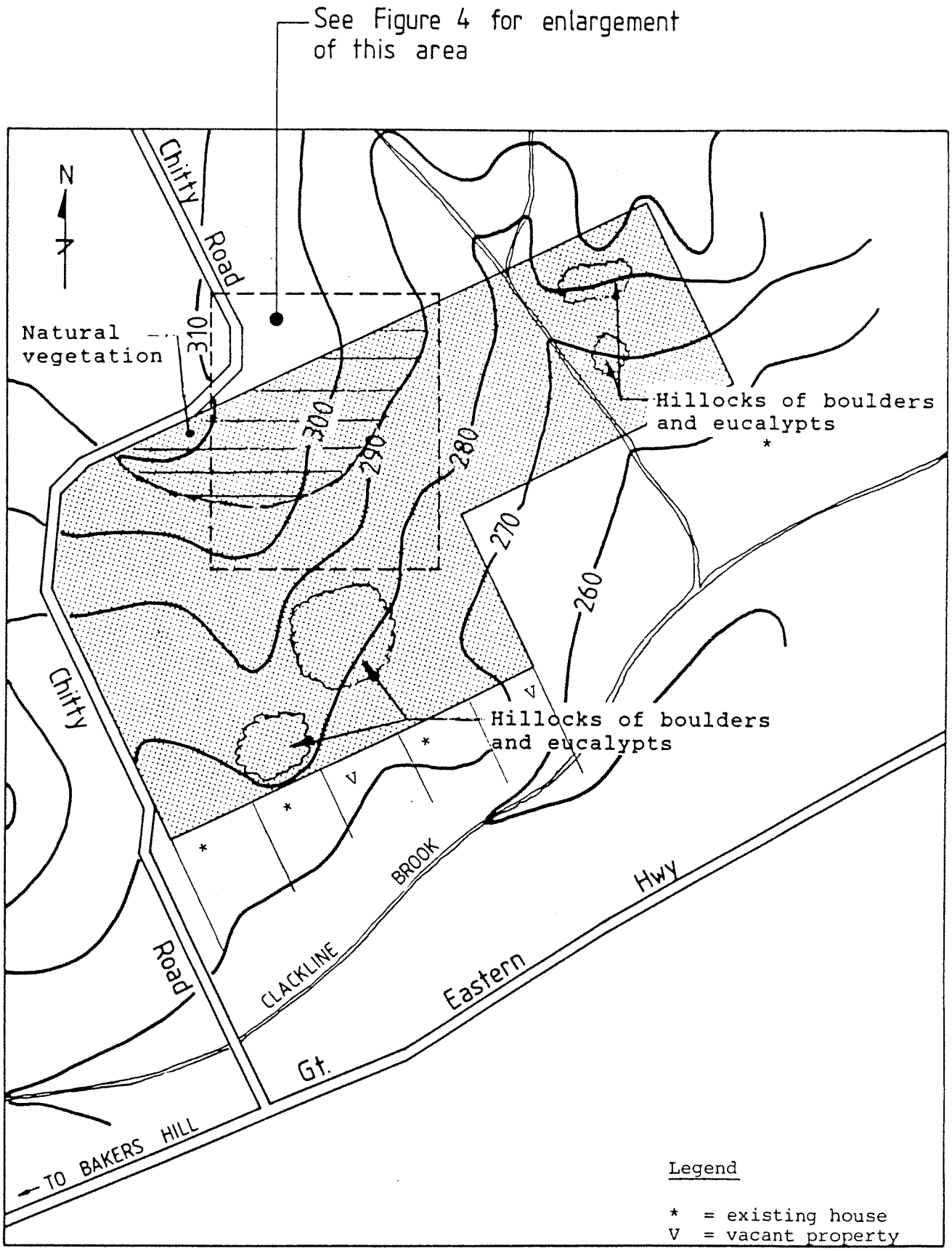
40(Q) **Will the Proponent provide a buffer of trees around salt-affected areas on the property?**

40(A) This question was answered as part of the answer to Question 7.

41(Q) **If the tannery causes pollution of the surface water and groundwater used by adjacent properties, will the Proponent allow an easement across his property to allow mains water supply to be connected?**

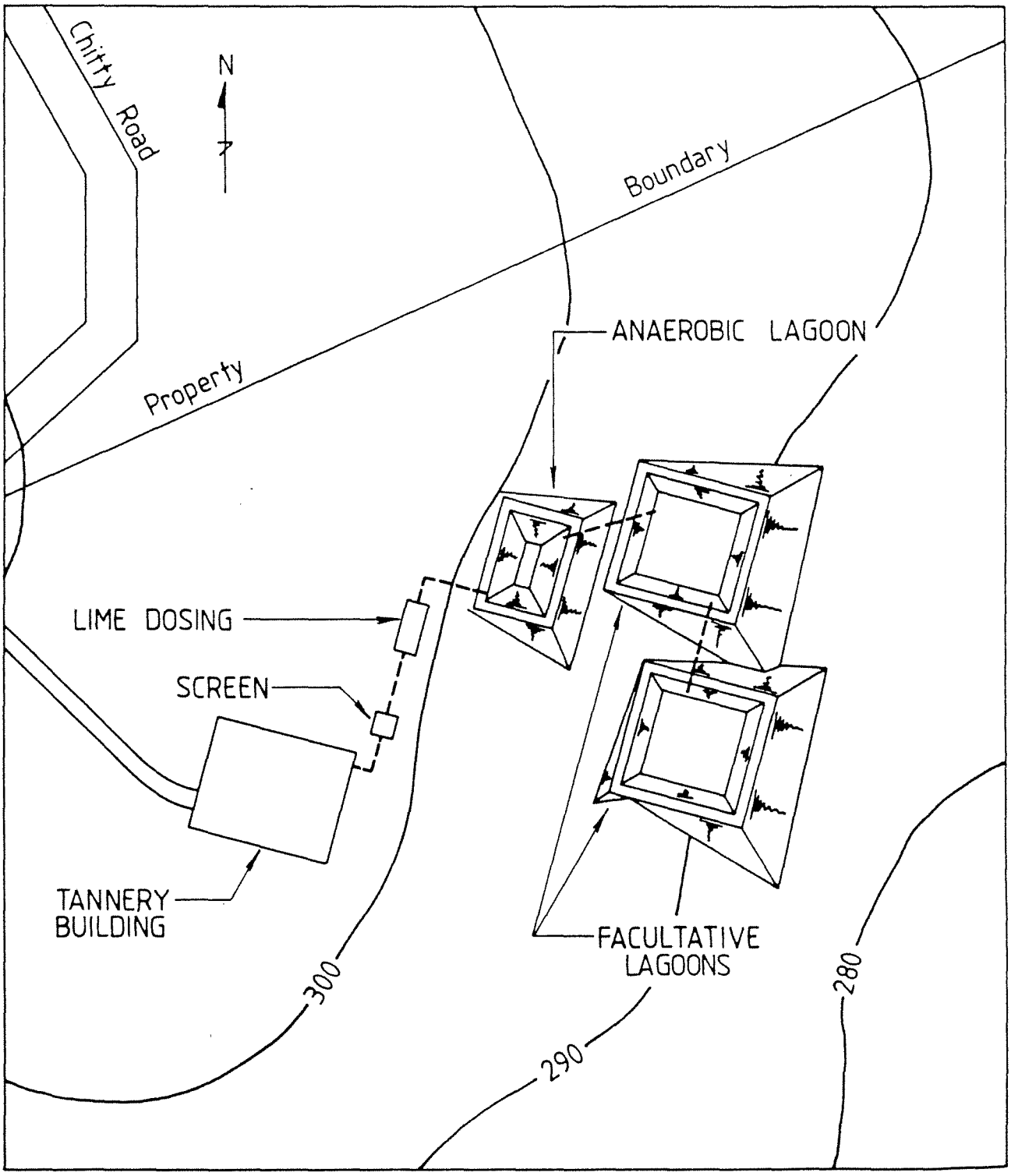
41(A) A water supply main runs along Chitty Road and continues south-east in a straight line across Great Eastern Highway. The main does not adjoin any of the relevant properties. Hence, under Water Authority guidelines, these houses are not eligible for connection to the water supply main.

However, if the Water Authority changes it policy and if the tannery causes pollution of the surface water or groundwater required by adjacent properties, the Proponent will allow an easement adjacent to the southern boundary of his property for the Water Authority to connect those houses to the water supply main.



Scale : 1 : 10 000

BINNIE & PARTNERS PTY. LTD. CONSULTING ENGINEERS	SITE PLAN Rev A - 22.8.88	FIGURE 2



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BINNIE & PARTNERS PTY. LTD. CONSULTING ENGINEERS	POSSIBLE LAYOUT OF TREATMENT SYSTEM FIGURE 4

APPENDIX 3

LIST OF ORGANISATIONS AND INDIVIDUALS WHO MADE WRITTEN SUBMISSIONS

APPENDIX 3

LIST OF ORGANISATIONS AND INDIVIDUALS
WHO MADE WRITTEN SUBMISSIONS

. Water Authority of Western Australia;

. Shire of Northam;

. Health Department of Western Australia;

. Mr. and Mrs. K. Bridges, Bakers Hill;

. Mr. and Mrs. M. Moore, Bakers Hill;

. Mrs. D. Brown, Bakers Hill;

. Mr. and Mrs. S. Narangon, Bakers Hill;

. Mr. and Mrs. R.B. Anderson, Bakers Hill;

. Mr. And Mrs. S. Thorp, Bakers Hill;

. Mr. W. Dunstan, Bakers Hill;

. Mr. and Mrs. Van Dyke, Bakers Hill;

. Mr and Mrs S. Harding, Bakers Hill;

. Mrs. B. H. Viveash, Bakers Hill, and

. Mr. M. Trenorden, MLA, Northam.