

Exploration programme in the D'Entrecasteaux National Park

Cable Sands (WA) Pty Ltd

**Report and recommendations
of the Environmental Protection Authority**

**Environmental Protection Authority
Perth, Western Australia
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THE PURPOSE OF THIS REPORT

Cable Sands (WA) Pty Ltd proposes to explore for mineral sands in the gazetted parts and the proposed additions to the D'Entrecasteaux National Park, which is on the south coast of Western Australia south of Pemberton.

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 recommendations.

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

APPEALS

If you disagree with any of the assessment report recommendations, you may appeal in writing to the Minister for the Environment, outlining the environmental basis for your concerns, and enclosing the appeal fee of \$10.

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

ADDRESS

Hon Minister for the Environment
18th Floor, Allendale Square
77 St George's Terrace
PERTH WA 6000

CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 p.m. on 22 November 1991.

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Summary and recommendations

The Environmental Protection Authority has assessed a proposal by Cable Sands (WA) Pty Ltd (the proponent) to explore for mineral sands in both the gazetted parts and the proposed additions to the D'Entrecasteaux National Park, which lies on the south coast extending eastwards for about 130km from Black Point to just east of Broke Inlet (Figure 1). The declaration of the additions to the park have been delayed because of the possible mineral sands deposits which the proponent has identified. Action is currently proceeding to allow the gazettal of the complete park as soon as possible.

The exploration programme proposal was submitted to the Environmental Protection Authority in response to the Government's "Resolution of Conflict" policy on mining in national parks. The policy states that exploration in the D'Entrecasteaux National Park is allowed for three years from 13 November, 1990. Following that period, if economic deposits of mineral sands are discovered, the policy states that up to 1% of the area of the complete park could be excised for mining, and replacement areas would be acquired and incorporated into the D'Entrecasteaux National Park.

The exploration programme, as described in the proponent's Public Environmental Review and subsequent document Response to Issues (Appendix 1), did not provide detailed information on the location and the conservation values of any particular area where it was proposed to explore. Instead the proponent provided a general prescriptive framework of how the exploration would be conducted and commitments to avoid sensitive areas. The Authority is concerned with the lack of detailed information which has made the assessment of the exploration programme more difficult.

The proposed exploration activity includes geological mapping and geophysical surveys, by vehicle on existing tracks, or on foot if off-track access is required, and drilling with a four-wheel-drive-mounted drilling rig, both on and off the existing tracks. The proponent seeks to access the existing tracks throughout the park and to seek access off the existing tracks at specific locations where geological, geophysical and on-track drilling information indicates that mineral sands may be present. The proponent estimates that the on-ground activity would directly affect an area of no more than 5% of the park, about half of which is on existing tracks.

The provisions of the Mining Act 1978-1987 and Regulations empower the Minister for Mines to set conditions and to regulate the exploration programme. The Department of Mines has provided the Environmental Protection Authority with a schedule of proposed conditions (Appendix 2) which would be set by the Minister for Mines in concurrence with the Minister for the Environment (in his capacity as the Minister responsible for the Department of Conservation and Land Management).

The Environmental Protection Authority considers that the proposal, as described in the proponent's Public Environmental Review and Response to Issues, is not environmentally acceptable. The Authority has proposed changes to the exploration programme proposal which, if implemented by the proponent, would make the proposal environmentally acceptable.

The Environmental Protection Authority concludes that the proposal to explore for mineral sands in D'Entrecasteaux National Park would only be environmentally acceptable if changes to the proposal are made. The Authority was guided in this conclusion by the principle that exploration for mineral sands should be managed to have no greater environmental impact than current activities by the general public and normal park management operations.

Any proposal for mining in any excisions from the park, consistent with Government policy, would require referral to the Environmental Protection Authority for assessment and would be judged on its merits.

Major issues raised

The key environmental issues that were identified from the assessment were :

- whether exploration in national parks should be allowed in principle;
- the location of the exploration activity;
- the spread of dieback disease;
- access for exploration activity on existing tracks, both open and closed to the public, and off-track access, by foot/helicopter and by vehicles;
- the protection of the nature and heritage conservation values of the park;
- the development of an Environmental Management Programme for off-track vehicle activity; and
- the provision of environmental services by the Department of Conservation and Land Management.

A summary of the Environmental Protection Authority's conclusions and recommendations about each of the key issues is presented below.

Exploration in national parks

One of the main issues that was raised in public submissions was the policy issue of whether mining, including exploration, should be allowed in national parks. Public debate on the issue of mining in national parks has canvassed opinions from all sectors of the community. The Environmental Protection Authority has given advice on this general issue in the past.

The Environmental Protection Authority considers that the Government has already adopted a policy on the issue as it affects this proposal. **The Environmental Protection Authority therefore concluded that no further policy advice would be provided to Government within the context of the assessment of this proposal.**

Location of the exploration activity

The proponent only gave a generalised indication of the location of the proposed exploration activity despite being advised by the Environmental Protection Authority that more specific information was needed. Under the proponent's prescription for accessing the park, the proponent is committed to notifying regulatory agencies of the proposed locations of exploration and will therefore need to seek approval for each location on a case-by-case basis.

The Environmental Protection Authority considers that the details of the location of exploration, along with specific environmental information about the area, should be provided to Government regulatory agencies in advance and made public (Recommendation 2).

Following an assessment of the environmental information for each location, the regulatory agencies' advice to the proponent may be either that exploration activity at that location is approved, under certain specific conditions, or that it may be either temporarily not approved or, subject to a decision by the Minister for the Environment, permanently not approved. In circumstances when the Department of Conservation and Land Management (CALM) and the proponent cannot reach agreement about the conditions for access to a particular area, the matter would be referred to the Minister for the Environment for resolution.

Spread of dieback disease

The Department of Conservation and Land Management has advised the Environmental Protection Authority that the control of dieback disease is critical in order to maintain the nature conservation values of the park. The disease already occurs in parts of the park and the management strategy is to restrict its spread into the dieback-free parts of the park.

The proponent has prescribed a dieback hygiene programme which would be to the satisfaction of the Regional Manager, CALM, under the Department of Mines proposed conditions (Condition 8). CALM has advised the Environmental Protection Authority that the programme is generalised and requires better definition to relate to the forms of access throughout the park. A better defined programme could be acceptable under CALM supervision and should achieve the objective of ensuring that the exploration activity will minimise the risk of distributing dieback disease any further throughout the park. Such a programme can be developed by the proponent and implemented under the Department of Mines proposed conditions.

The Environmental Protection Authority considers that access by foot into wet areas is not acceptable because of the risk of the spread of dieback disease. CALM has advised the Authority that, under some circumstances, access by helicopter, with limited foot access around each landing site, for exploration, including drilling, may be acceptable. Dieback hygiene procedures would have to be implemented and the approval of the Regional Manager, CALM, would be required.

The Environmental Protection Authority notes the advice of CALM that a better defined dieback hygiene programme, under CALM supervision, can minimise the risk to the park from the further spread of dieback disease.

Access for exploration activity

The proponent seeks to access the existing tracks throughout the park and to seek access off the existing tracks at specific locations where geological, geophysical and on-track drilling information indicates that mineral sands may be present. The existing tracks of the park include both those open to the public and those currently closed to the public, as designated by CALM in accordance with the National Parks and Nature Conservation Authority's Management Plan for the park.

The Environmental Protection Authority considers that the exploration activity and the environmental management prescriptions and approval processes should be structured to relate to the forms of access, for example, on the publicly open tracks, the closed tracks and off-track access by foot/helicopter or by vehicle. Appropriate recommendations have been made (Recommendations 3 and 4).

The Environmental Protection Authority considers that off-track access, particularly by vehicles, has the potential for the severest impact on the conservation values of the park. It is the objective of the Authority to keep off-track vehicle activity to a minimum consistent with protecting the environment. The proponent's proposals and prescriptions for off-track vehicle activity for scout and grid drilling are generalised and lack sufficient detail to allow an assessment of the potential environmental impacts and, therefore, are not acceptable. This form of access for exploration is not acceptable until an Environmental Management Programme is approved by the Minister for the Environment.

The Environmental Protection Authority considers that off-track exploration activity would only be acceptable if conducted in two phases, initially by foot or helicopter access with the use of portable drilling equipment and, secondly, for areas confirmed by the initial phase to be of significant prospectivity, by vehicle access. In locations where portable drilling equipment is unable to take samples (for example, a layer of ferricrete in the soil profile preventing the penetration of the drill), then a grid drilling programme involving off-track access by vehicle may be approved subject to the additional requirement that the State Mining Engineer (or his nominee) and the Regional Manager, CALM, are satisfied that the portable drilling equipment is inadequate.

The Environmental Protection Authority considers that, to be environmentally acceptable, the exploration programme proposal should be changed to incorporate the above conclusions and the following prescriptions for the four forms of access.

(a) tracks open to the public

The Environmental Protection Authority considers that the potential impacts of drilling on the tracks open for public access can be managed to protect the environment. The Authority concludes that access would be acceptable if the proponent develops a specific prescription which includes the following key points:

- approval of location and timing of exploration activity by CALM; and
- access under dry soil conditions.

(b) tracks closed to the public

The Environmental Protection Authority, on the advice of CALM, considers that access on closed tracks can be managed to protect the environment under approved conditions. The Authority concludes that access to closed tracks would be acceptable if the proponent develops a specific prescription which includes the following key points:

- approval of location and timing of exploration activity by CALM;
- access under dry soil conditions;
- prior mapping of dieback distribution, if considered necessary by CALM;
- approval of a dieback hygiene programme by CALM;
- maintenance or provision, if approved by CALM, of barriers to prohibit public access; and
- rehabilitation, if considered necessary by CALM, of any disturbed areas.

(c) Off-track access by foot/helicopter

The Environmental Protection Authority considers that off-track access by foot or by helicopter and the use of portable drilling equipment can be managed to protect the environment under approved conditions. The proponent has conducted geoscientific surveys in the area under similar procedures with minimal, short-term impact. The Environmental Protection Authority has been advised that suitable portable drilling equipment is available.

The Authority concludes that off-track access by foot/helicopter methods would be acceptable if the proponent develops a specific prescription for this form of access for exploration which includes the following key points:

- approval of location and timing of exploration activity by CALM;
- no access into wet areas where soil movement may occur;
- dieback hygiene procedures being applied as required by CALM; and
- no clearing of vegetation (no damage to root stock or lignotuber).

(d) Off-track access by vehicle

The Environmental Protection Authority considers that, firstly, this form of access for exploration should be kept to a minimum to protect the conservation values of the park and, secondly, that off-track access by vehicle should only be used for the proponent's grid drilling phase which is to establish the presence or extent of a mineral sands deposit. The Authority considers that the proponent's proposed multiple vehicle access for scout and subsequent grid drilling phases could cause unacceptable environmental damage.

The Environmental Protection Authority considers that off-track access by vehicle would only be acceptable following approval of an Environmental Management Programme which details general environmental management prescriptions and approval processes for this form of access for exploration activity. An appropriate recommendation has been made (Recommendation 4).

The Authority considers that the proponent should develop a specific prescription for this form of access for exploration which includes the following key points:

- prior establishment of prospectivity via foot/helicopter access and the use of portable drilling equipment;
- dieback mapping, botanical surveys and archaeological surveys being conducted on foot and access routes approved;
- approval of location and timing of exploration activity by CALM;
- access under dry soil conditions;
- approval of a dieback hygiene programme by CALM;
- no clearing of vegetation (no damage to root stock or lignotuber);
- establish visual or physical barriers to prevent public access; and
- rehabilitation, if considered necessary by CALM, of any disturbed areas.

For all forms of access, when the Department of Conservation and Land Management and the proponent cannot reach agreement about the location specific conditions for access to a particular area, the matter would be referred to the Minister for the Environment for resolution.

Protection of the conservation values of the park

The protection of the conservation values of the park is the responsibility of the National Parks and Nature Conservation Authority and, in operational terms, the Department of Conservation and Land Management. The proponent has identified a list of areas which would not be explored. The list includes areas where there is no possibility of the occurrence of mineral sands deposits, such as Mt Chudalup and Black Point, and areas where there is no possibility of mining being acceptable, such as the permanent waterbodies. Some of these areas have particular conservation value because of their natural features, fragile plant species/communities, heritage values or erodibility.

In the National Parks and Nature Conservation Authority's Management Plan for the park, CALM identified other significant and fragile natural features and areas (Map 13, Management Plan No.6, Department of Conservation and Land Management, 1987). The map includes areas of poorly represented or fragile plant communities near Black Point and in the Shannon River catchment. These features and areas are of particular conservation value and require special protection. CALM may identify other areas in the future during the term of the exploration programme.

CALM may wish to set specific conditions for exploration activity at a particular location in order to protect the conservation values of that area. For certain areas CALM and the proponent may not be able to agree on the conditions for approval to explore because CALM considers that the conservation values of an area cannot be adequately protected from exploration activity. For all forms of access, when the Department of Conservation and Land Management and the proponent cannot reach agreement about the location specific conditions for access to a particular area, the matter would be referred to the Minister for the Environment for resolution.

In the course of approval for access throughout the park, particularly for off-track vehicle access, the Department of Conservation and Land Management, on behalf of the vesting authority, the National Parks and Nature Conservation Authority, would be able to enforce provisions to protect the nature and heritage conservation values of the park.

The Environmental Protection Authority notes that the Department of Conservation and Land Management, under the approval procedure in Condition 2 of the Department of Mines proposed conditions, could set specific conditions on the exploration programme for any areas which require protection.

Environmental management programme

The proponent's prescriptions for all phases of the exploration programme are described in the proponent's Public Environmental Review and Response to Issues, but are generalised and not structured in terms of the on-track access (open and closed tracks), off-track foot/helicopter access and off-track vehicle access activities as described above. The changes proposed by the Authority to make the exploration proposal environmentally acceptable relate mainly to the off-track access by vehicle form of exploration. This form of access for exploration is not acceptable until an Environmental Management Programme is approved by the Minister for the Environment.

The Environmental Protection Authority considers that an Environmental Management Programme is necessary to collate and expand the proponent's prescriptions and to incorporate the changes proposed by the Authority for off-track vehicle activity, and an appropriate recommendation has been made (Recommendation 4).

Provision of environmental services

For the proposal to proceed within the time frame under the policy, the Department of Conservation and Land Management will need to commit resources to provide environmental services such as dieback management advice, biological information and park management advice. CALM has advised the Environmental Protection Authority and the proponent that the environmental services would be chargeable on a cost recovery basis. However, not all the services which would be involved with the exploration proposal can currently be itemised and costed.

The Environmental Protection Authority notes the advice of CALM that the provision of environmental services requires agreement with the proponent, and an appropriate recommendation has been made (Recommendation 5).

Declaration of the park

The Environmental Protection Authority has previously recommended on numerous occasions that the D'Entrecasteaux National Park should be declared in its entirety, and this recommendation is repeated (Recommendation 6). In addition to the desire to progress the conservation reserves system of Western Australia, the Authority notes that the Government policy implies that the park would need to be declared in its entirety to enable the possible excisions of up to 1% in area for mining.

Public consultation

Public interest in the exploration proposal was substantial and many submissions provided detailed scientific information and a discussion of the environmental issues. The number of public submissions was so large (about 600) that the Environmental Protection Authority will not list each submitter in the normal, preferred manner as an appendix in this Bulletin. A summary of the key issues is provided in the text and, along with the proponent's Response to Issues, in Appendix 1.

Recommendations

The Environmental Protection Authority considers that the proposal, as described in the proponent's Public Environmental Review and Response to Issues (Appendix 1), is not environmentally acceptable. The Environmental Protection Authority has a role in assisting proposals to be made environmentally acceptable. The Authority has proposed changes to the exploration programme proposal which, if implemented by the proponent, would make the proposal environmentally acceptable. The changes could be implemented by the environmental conditions set by the Minister for the Environment and derived from the Authority's recommendations.

The changes recommended by the Authority in summary are:

- the initial phases of the exploration programme should be structured to prescribe access on publicly open tracks, closed tracks and off-track by foot/helicopter methods;
- an Environmental Management Programme for exploration activity by off-track access by vehicle must be submitted to the Minister for the Environment for approval;
- the exploration programme phase involving off-track vehicle access at specific locations would only be approved following the establishment of prospectivity by low impact access by foot/helicopter methods and the use of portable drilling equipment;
- details of the location of exploration activity must be publicly available prior to approval for the commencement of activity at a specific location;
- a dieback hygiene programme must be defined and implemented under CALM supervision; and
- the conditions for the protection of the conservation values of the park would be set by CALM, on behalf of the National Parks and Nature Conservation Authority, on a case-by-case basis.

Environmental acceptability of proposal

The Environmental Protection Authority considers that the proposal to explore for mineral sands in the D'Entrecasteaux National Park would only be environmentally acceptable if the changes to the proposal which are described above are implemented. Recommendations to implement the changes are as follows :

Recommendation 1

The Environmental Protection Authority concludes that the proposal to explore in the gazetted and proposed additions to the D'Entrecasteaux National Park, as described in the proponent's Public Environmental Review and Response to Issues (Appendix 1), would only be environmentally acceptable if the proposal is modified to reflect the proposed changes and recommendations in this report. In reaching this conclusion, the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as:

- the location of the exploration activity;
- the spread of dieback disease;
- access on existing tracks, both open and closed to the public, and off-track access, by foot/helicopter and by vehicles;
- the protection of the nature and heritage conservation values of the park;
- the development of an Environmental Management Programme; and
- the provision of environmental services by CALM.

The Environmental Protection Authority considers that these and other issues and the changes to the proposal could be addressed and implemented by the recommendations in this report, the Department of Mines proposed conditions (Appendix 2) and the environmental management commitments given by the proponent (Appendix 3). Accordingly, the Authority considers that a modified exploration proposal could proceed subject to these provisions being implemented.

Recommendation 2

The Environmental Protection Authority recommends that the information provided by the proponent in accordance with the Department of Mines proposed conditions (Condition 2) should be provided to the Environmental Protection Authority, and, also, should be made available for public inspection at the Pemberton District Office of the Department of Conservation and Land Management and the Environmental Protection Authority's reading room in Perth, to the satisfaction of the Environmental Protection Authority.

Recommendation 3

The Environmental Protection Authority recommends that on-track access by vehicle and off-track access by foot/helicopter for exploration within the gazetted and proposed areas of the D'Entrecasteaux National Park should only be permitted under environmental management prescriptions which include the following:

- 1) tracks open to the public -
 - approval of location and timing of exploration activity by CALM; and
 - access under dry soil conditions.
- 2) tracks closed to the public -
 - approval of location and timing of exploration activity by CALM;
 - access under dry soil conditions;
 - prior mapping of dieback distribution, if considered necessary by CALM;
 - approval of a dieback hygiene programme by CALM;
 - maintenance or provision, if approved by CALM, of barriers to prohibit public access; and
 - rehabilitation, if considered necessary by CALM, of any disturbed areas.
- 3) off-track access by foot/helicopter -
 - approval of location and timing of exploration activity by CALM;
 - no access into wet areas;
 - dieback hygiene procedures being applied as required by CALM; and
 - no clearing of vegetation (no damage to root stock or lignotuber).

The Authority further recommends that in circumstances when CALM and the proponent cannot reach agreement about the conditions for access to a particular area, the matter is referred to the Minister for the Environment for resolution.

Recommendation 4

The Environmental Protection Authority recommends that, prior to the approval of the phase of the exploration programme which involves off-track access by vehicle, the proponent should submit an Environmental Management Programme, which describes the general environmental management prescriptions and approval processes, to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management. The prescription should include the following key points:

- prior establishment of prospectivity via access by foot/helicopter and the use of portable drilling equipment;
- dieback mapping, botanical surveys and archaeological surveys being conducted on foot and access routes approved;
- approval of specific location and timing of exploration activity by CALM;
- access under dry soil conditions;
- approval of a dieback hygiene programme by CALM;
- no clearing of vegetation (no damage to root stock or lignotuber);
- establish visual or physical barriers to prevent public access; and
- rehabilitation, if considered necessary by CALM, of any disturbed areas.

The Authority further recommends that in circumstances when CALM and the proponent cannot reach agreement about the conditions for access to a particular area, the matter is referred to the Minister for the Environment for resolution.

Recommendation 5

The Environmental Protection Authority recommends that the proponent should reach agreement with the Department of Conservation and Land Management on the provision of environmental services, prior to the commencement of each form of access under the exploration programme, to the satisfaction of the Minister for the Environment.

Recommendation 6

The Environmental Protection Authority recommends that the declaration of the complete D'Entrecasteaux National Park be implemented as soon as possible.

1. Introduction

The Environmental Protection Authority has assessed a proposal by Cable Sands (WA) Pty Ltd (the proponent) to explore for mineral sands in the D'Entrecasteaux National Park, which lies on the south coast extending eastwards for about 130km from Black Point to just east of Broke Inlet (Figure 1). The area of the park is defined in the Shannon Park and D'Entrecasteaux National Park Management Plan 1987-1997 (Management Plan No.6, Department of Conservation and Land Management, 1987).

About half the area of the park has been declared for the purpose of national park and is vested with the National Parks and Nature Conservation Authority. Most of the rest of the area recommended for the park has been acquired by the State but the declaration of these additions to the park has been delayed because of the possible mineral sands deposits which the proponent has identified. Action by the Department of Land Administration is currently proceeding to declare these additions and complete the park. For the purpose of this report on the assessment of the mineral sands exploration proposal, the area defined in the Management Plan, comprising both the gazetted parts and the proposed additions to the D'Entrecasteaux National Park, is referred to as the park.

The proposal was assessed at a level of Public Environmental Review. The proponent prepared a proposal document, the Public Environmental Review, which was released for an eight week public submission period in July and August, 1991. Some 600 submissions were received of which there were 435 form letters opposing the proposal in principle, 45 form letters in support of the proposal and 120 submissions from government agencies and the public which raised various issues. A summary of the issues was submitted to the proponent which responded with additional information in a document titled Response to Issues (Appendix 1).

The exploration proposal was submitted to the Environmental Protection Authority in response to the Government's "Resolution of Conflict" policy on mining in national parks. The policy states that exploration in the D'Entrecasteaux National Park is allowed for three years from 13 November, 1990. Following that period, if economic deposits of mineral sands are discovered, the policy states that up to 1% of the area of the park could be excised for mining, and replacement areas would be acquired and incorporated into the D'Entrecasteaux National Park.

The provisions of the Mining Act 1978-1987 and Regulations empower the Minister for Mines to set conditions and to regulate the exploration activity. The Department of Mines has provided the Environmental Protection Authority with a schedule of proposed conditions (Appendix 2) which would be set by the Minister for Mines in concurrence with the Minister for the Environment (in his capacity as the Minister responsible for the Department of Conservation and Land Management).

2. The proposal

The exploration programme proposal is to explore for mineral sands and to compile geoscientific data using geophysical, geological and drilling techniques at locations throughout the length and breadth of the park. The area has been explored from the air using remote sensing geophysical techniques, such as airborne magnetometer surveys, and a number of magnetic anomalies, which may represent mineral sands deposits, have been identified.

The proponent has also conducted some on-ground investigations under geoscientific survey permits, issued under the previous Government policy "Balancing the Scales", which involved some drilling with portable drilling equipment. The information from this activity, in addition to the knowledge gained from evaluating the proponent's Jangardup mineral sands deposit (on the boundary of the park), indicates that there are numerous target zones, possibly mineral sands deposits, which the proponent wishes to investigate.

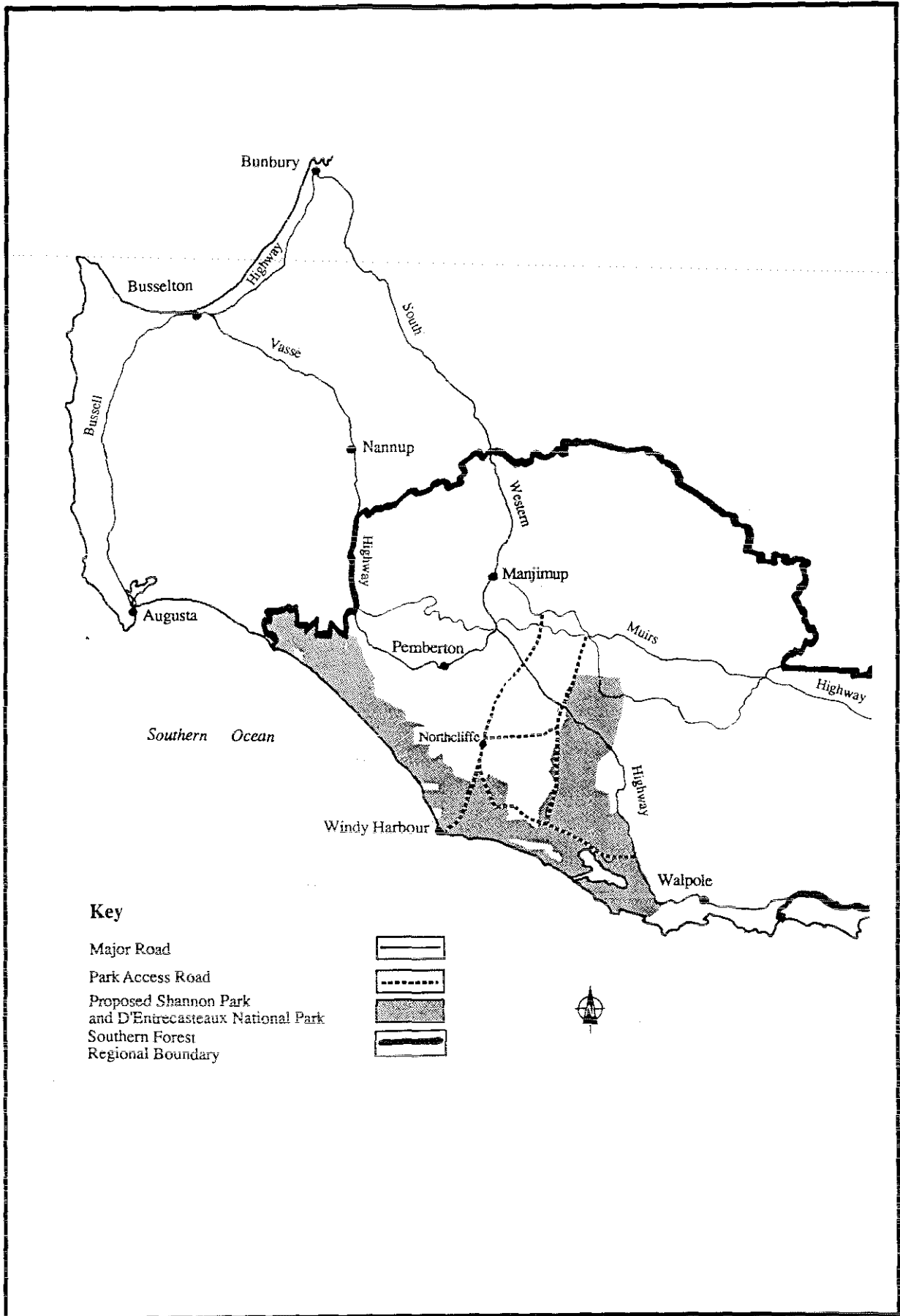


Figure 1. Location of the proposed and existing D'Entrecasteaux National Park

The proposed exploration activity includes geological mapping and geophysical surveys, by vehicle on existing tracks or on foot if off-track access is required, and drilling with a four-wheel-drive-mounted drilling rig, both on and off the existing tracks. The proponent seeks to access the existing tracks throughout the park and to seek access off the existing tracks at specific locations where geological, geophysical and on-track drilling information indicates that mineral sands may be present. The proponent estimates that the on-ground activity would directly affect an area of no more than 5% of the park, about half of which is on existing tracks.

The beneficial aspects of the proposal are considered by the proponent to be:

- the ground truthing of the Australian-designed airborne geophysical technology used to locate the possible mineral sands deposits;
- the provision of geoscientific data to the Department of Mines about the mineralogy and geological history of the area;
- the provision of dieback disease interpretation data and biological information to the Department of Conservation and Land Management, which would assist in the management of the park; and
- the resolution of the conflict, in terms of future land use, between the conservation values and mineral resource values of the park.

The Environmental Protection Authority makes no comment about these benefits and has, instead, confined itself to the assessment of the environmental impacts of the exploration proposal and to recommendations on the necessary management prescriptions.

The proponent's Public Environmental Review and Response to Issues documents provide a description of the proposal, the existing environment, the impacts and the environmental management commitments.

3. Environmental impacts and management

The environmental issues raised in the Environmental Protection Authority's assessment of the Public Environmental Review for the exploration programme proposal are discussed below. The key issues which were identified are:

- whether exploration in national parks should be allowed in principle;
- the location of the exploration activity;
- the spread of dieback disease;
- access for exploration activity on existing tracks, both open and closed to the public, and off-track access, by foot/helicopter and by vehicles;
- the protection of the nature and heritage conservation values of the park;
- the development of an Environmental Management Programme for off-track vehicle activity; and
- the provision of environmental services by the Department of Conservation and Land Management.

A discussion of the Environmental Protection Authority's conclusions and recommendations about each of the key issues is presented below.

3.1 Exploration in national parks

The issue of mining, including exploration, in national parks has been intensely debated in public forums over the years. The most recent policy position adopted by the Government is that there should be no mining in national parks. The current Government policy, "Resolution of Conflict", released on 13 November 1990, adopts this principle but with the proviso that the conflict, in terms of future land use, between the mineral resource values and the conservation values for five of Western Australia's national parks would be resolved by various mechanisms prior to the full implementation of the principle.

The declaration of the complete D'Entrecasteaux National Park has been delayed because of the known and suspected mineral sands deposits in the area. Action is currently proceeding to allow the gazettal of the complete park as soon as possible. Under the policy, the mechanism for resolving the conflict is that exploration in D'Entrecasteaux National Park would be allowed for three years from 13 November 1990; following that period, if economic deposits of mineral sands were discovered, the policy states that up to 1% of the area of the complete park could be excised for mining and that replacement areas would be acquired and incorporated into the D'Entrecasteaux National Park. In addition, any approval to mine would require a commitment to secondary processing investment in Western Australia.

Public debate on the issue of mining in national parks has canvassed opinions from all sectors of the community. The Environmental Protection Authority has given advice on this general issue in the past. The Environmental Protection Authority considers that the Government has already adopted a policy on the issue as it affects this proposal. The Environmental Protection Authority therefore concluded that no further policy advice would be provided to Government within the context of the assessment of this proposal.

3.2 Location of the exploration activity

The proponent only gave a generalised indication of the location of the proposed exploration activity despite being advised by the Environmental Protection Authority that more specific information was needed. Under the proponent's prescription for accessing the park, the proponent is committed to notifying regulatory agencies of the proposed locations of exploration and will therefore need to seek approval for each location on a case-by-case basis.

The Environmental Protection Authority considers that the details of the location of exploration, along with specific environmental information about the area, should be provided to Government regulatory agencies in advance and made public (Recommendation 2).

Following an assessment of the environmental information for each location, the regulatory agencies' advice to the proponent may be either that exploration activity at that location is approved, under certain specific conditions, or that it may be either temporarily not approved or, subject to a decision by the Minister for the Environment, permanently not approved. In circumstances when the Department of Conservation and Land Management (CALM) and the proponent cannot reach agreement about the conditions for access to a particular area, the matter would be referred to the Minister for the Environment for resolution.

The conditions proposed by the Department of Mines describe an approval procedure for exploration at each specific location (Condition 2, Appendix 2). The procedure requires the proponent to provide details of the locations of proposed activities at least seven days before the proposed commencement date to allow time to receive the approval of the State Mining Engineer, Department of Mines, in agreement with the Regional Manager, (CALM).

The Environmental Protection Authority considers that, while this procedure would be acceptable, the information on locations of exploration should be more readily available to the public, and an appropriate recommendation has been made (Recommendation 2).

3.3 Spread of dieback disease

Dieback disease is the common term for the effect of the fungal pathogen *Phytophthora* sp., which infects the root systems of many native plants and may kill them through induced water stress. The seven species of *Phytophthora* are known to attack at least 1000 plant species, some of which are rare and endemic to the southwest of Western Australia, including some in the park. Hence, the objectives for the control of dieback in the park are to prevent the introduction of the disease into currently dieback-free areas and to minimise its spread from infected areas. The control of the disease is critical in order to maintain the nature conservation values of the park.

The Department of Conservation and Land Management has advised the Environmental Protection Authority that the control of dieback disease is critical in order to maintain the nature conservation values of the park. The disease already occurs in parts of the park and the management strategy is to restrict its spread into the dieback-free parts of the park.

The proponent has prescribed a dieback hygiene programme which would be to the satisfaction of the Regional Manager, CALM, under the Department of Mines proposed conditions (Condition 8). CALM has advised the Environmental Protection Authority that the programme is generalised and requires better definition to relate to the forms of access throughout the park. A better defined programme could be acceptable under CALM supervision and should achieve the objective of ensuring that the exploration activity will minimise the risk of distributing dieback disease any further throughout the park. Such a programme can be developed by the proponent and implemented under the Department of Mines proposed conditions.

The Environmental Protection Authority considers that access by foot into wet areas is not acceptable because of the risk of the spread of dieback disease. CALM has advised the Authority that, under some circumstances, access by helicopter, with limited foot access around each landing site, for exploration, including drilling, may be acceptable. Dieback hygiene procedures would have to be implemented and the approval of the Regional Manager, CALM, would be required.

The Environmental Protection Authority notes the advice of CALM that a better defined dieback hygiene programme, under CALM supervision, can minimise the risk to the park from the further spread of dieback disease.

3.4 Access for exploration activity

The proponent seeks to access the existing tracks throughout the park and to seek access off the existing tracks at specific locations where geological, geophysical and on-track drilling information indicates that mineral sands may be present. The existing tracks of the park include both those open to the public and those currently closed to the public, as designated by CALM in accordance with the National Parks and Nature Conservation Authority's Management Plan for the park.

The Environmental Protection Authority considers that the exploration activity and the environmental management prescriptions and approval processes should be structured to relate to the forms of access, for example, on the publicly open tracks, the closed tracks and off-track access by foot/helicopter or by vehicle. Appropriate recommendations have been made (Recommendations 3 and 4).

The Environmental Protection Authority considers that off-track access, particularly by vehicles, has the potential for the severest impact on the conservation values of the park. It is the objective of the Authority to keep off-track vehicle activity to a minimum consistent with protecting the environment. The proponent's proposals and prescriptions for off-track vehicle activity for scout and grid drilling are generalised and lack sufficient detail to allow an assessment of the potential environmental impacts and, therefore, are not acceptable. This form of access for exploration is not acceptable until an Environmental Management Programme is approved by the Minister for the Environment.

The Environmental Protection Authority considers that off-track exploration activity would only be acceptable if conducted in two phases, initially by foot or helicopter access with the use of portable drilling equipment and, secondly, for areas confirmed by the initial phase to be of significant prospectivity, by vehicle access. In locations where portable drilling equipment is unable to take samples (for example, a layer of ferricrete in the soil profile preventing the penetration of the drill), then a grid drilling programme involving off-track access by vehicle may be approved subject to the additional requirement that the State Mining Engineer (or his nominee) and the Regional Manager, CALM, are satisfied that the portable drilling equipment is inadequate.

The Environmental Protection Authority considers that, to be environmentally acceptable, the exploration programme proposal should be changed to incorporate the above conclusions and the following prescriptions for the four forms of access.

(a) tracks open to the public

The Environmental Protection Authority considers that the potential impacts of drilling on the tracks open for public access can be managed to protect the environment. The Authority concludes that access would be acceptable if the proponent develops a specific prescription which includes the following key points:

- approval of location and timing of exploration activity by CALM; and
- access under dry soil conditions.

(b) tracks closed to the public

The Environmental Protection Authority, on the advice of CALM, considers that access on closed tracks can be managed to protect the environment under approved conditions. The Authority concludes that access to closed tracks would be acceptable if the proponent develops a specific prescription which includes the following key points:

- approval of location and timing of exploration activity by CALM;
- access under dry soil conditions;
- prior mapping of dieback distribution, if considered necessary by CALM;
- approval of a dieback hygiene programme by CALM;
- maintenance or provision, if approved by CALM, of barriers to prohibit public access; and
- rehabilitation, if considered necessary by CALM, of any disturbed areas.

(c) Off-track access by foot/helicopter

The Environmental Protection Authority considers that off-track access by foot or by helicopter and the use of portable drilling equipment can be managed to protect the environment under approved conditions. The proponent has conducted geoscientific surveys in the area under similar procedures with minimal, short-term impact. The Environmental Protection Authority has been advised that suitable portable drilling equipment is available.

The Authority concludes that off-track access by foot/helicopter methods would be acceptable if the proponent develops a specific prescription for this form of access for exploration which includes the following key points:

- approval of location and timing of exploration activity by CALM;
- no access into wet areas;
- dieback hygiene procedures being applied as required by CALM; and
- no clearing of vegetation (no damage to root stock or lignotuber).

(d) Off-track access by vehicle

The Environmental Protection Authority considers that, firstly, this form of access for exploration should be kept to a minimum to protect the conservation values of the park and, secondly, that off-track access by vehicle should only be used for the proponent's grid drilling phase which is to establish the presence or extent of a mineral sands deposit. The Authority considers that the proponent's proposed multiple vehicle access for scout and subsequent grid drilling phases could cause unacceptable environmental damage.

The Environmental Protection Authority considers that off-track access by vehicle would only be acceptable following approval of an Environmental Management Programme which details general environmental management prescriptions and approval processes for this form of access for exploration activity. An appropriate recommendation has been made (Recommendation 4).

The Authority considers that the proponent should develop a specific prescription for this form of access for exploration which includes the following key points:

- prior establishment of prospectivity via foot/helicopter access and the use of portable drilling equipment;
- dieback mapping, botanical surveys and archaeological surveys being conducted on foot and access routes approved;
- approval of location and timing of exploration activity by CALM;
- access under dry soil conditions;
- approval of a dieback hygiene programme by CALM;
- no clearing of vegetation (no damage to root stock or lignotuber);
- establish visual or physical barriers to prevent public access; and
- rehabilitation, if considered necessary by CALM, of any disturbed areas.

For all forms of access, when the Department of Conservation and Land Management and the proponent cannot reach agreement about the location specific conditions for access to a particular area, the matter would be referred to the Minister for the Environment for resolution.

In locations where portable drilling equipment is unable to take samples (for example, a layer of ferricrete in the soil profile preventing the penetration of the drill), then a grid drilling programme involving off-track access by vehicle may be approved subject to the additional requirement that the State Mining Engineer (or his nominee) and the Regional Manager, CALM, are satisfied that the portable drilling equipment is inadequate.

3.5 Protection of conservation values of the park

The protection of the conservation values of the park is the responsibility of the National Parks and Nature Conservation Authority and, in operational terms, the Department of Conservation and Land Management. The proponent has identified a list of areas which would not be explored. The list includes areas where there is no possibility of the occurrence of mineral sands deposits, such as Mt Chudalup and Black Point, and areas where there is no possibility of mining being acceptable, such as the permanent waterbodies. Some of these areas have particular conservation value because of their natural features, fragile plant species/communities, heritage values or erodibility.

The proponent's list of areas which would not be explored includes:

- all perennial wetlands (permanent waterbodies), such as Lakes Quitjup, Jasper, Florence, Samuel, Doggerup, Wilson, Smith and Maringup; Broke Inlet; the Warren, Donnelly, Shannon, Gardner and Meerup Rivers; and Doggerup Creek;
- the steep, vegetated, seaward-facing dunes of the Quindalup shoreline together with the frontal dune nearest the beach;
- all the rocky headlands along the coast, such as Black Point, Black Head, Point D'Entrecasteaux and Clifty Head; and
- granitic basement highpoints such as Mt Chudalup.

In the National Parks and Nature Conservation Authority's Management Plan for the park, CALM identified other significant and fragile natural features and areas (Map 13, Management Plan No.6, Department of Conservation and Land Management, 1987). The map includes areas of poorly represented or fragile plant communities near Black Point and in the Shannon River catchment. These features and areas are of particular conservation value and require special protection. CALM may identify other areas in the future during the term of the exploration programme.

CALM may wish to set specific conditions for exploration activity at a particular location in order to protect the conservation values of that area. For certain areas CALM and the proponent may not be able to agree on the conditions for approval to explore because CALM considers that the conservation values of an area cannot be adequately protected from exploration activity. For all forms of access, when the Department of Conservation and Land Management and the proponent cannot reach agreement about the location specific conditions for access to a particular area, the matter would be referred to the Minister for the Environment for resolution.

In the course of approval for access throughout the park, particularly for off-track vehicle access, the Department of Conservation and Land Management, on behalf of the vesting authority, the National Parks and Nature Conservation Authority, would be able to enforce provisions to protect the nature and heritage conservation values of the park.

The Environmental Protection Authority notes that the Department of Conservation and Land Management, under the approval procedure in Condition 2 of the Department of Mines proposed conditions, could set specific conditions on the exploration programme for any areas which require protection.

3.6 Environmental management programme

The proponent's prescriptions for all phases of the exploration programme are described in the proponent's Public Environmental Review and Response to Issues, but are generalised and not structured in terms of the on-track access (open and closed tracks), off-track foot/helicopter access and off-track vehicle access activities as described above. The changes proposed by the Authority to make the exploration proposal environmentally acceptable relate mainly to the off-track access by vehicle form of exploration. This form of access for exploration is not acceptable until an Environmental Management Programme is approved by the Minister for the Environment.

The Environmental Protection Authority considers that an Environmental Management Programme is necessary to collate and expand the proponent's prescriptions and to incorporate the changes proposed by the Authority for off-track vehicle activity, and an appropriate recommendation has been made (Recommendation 4).

The Environmental Management Programme should also collate the prescriptions for all phases of exploration and incorporate the Authority's key prescriptions for all four forms of access of exploration. This would enable the efficient and effective processing and supervision of the exploration programme.

3.7 Provision of environmental services

For the proposal to proceed within the time frame under the policy, the Department of Conservation and Land Management will need to commit resources to provide environmental services such as dieback management advice, biological information and park management advice. The proponent is committed, and would be required by the Department of Mines proposed conditions, to have approval by the State Mining Engineer in agreement with the Regional Manager, CALM, for each phase of exploration at each location. This is to ensure that the exploration activity does not interfere with public use, fire management, dieback management, protection of flora and fauna, protection of Aboriginal sites and fragile, erodible areas.

CALM has advised the Environmental Protection Authority and the proponent that the environmental services would be chargeable on a cost recovery basis. However, not all the services which would be involved with this proposal can currently be itemised and costed.

The Environmental Protection Authority accepts the advice of CALM that the provision of environmental services requires agreement with the proponent, and an appropriate recommendation has been made (Recommendation 5).

3.8 Other issues

Other issues raised during the assessment process involved matters related to the protection of flora and fauna, the impact on landscape values, the potential spread of plant pathogens other than *Phytophthora*, the potential impact on the archaeological sites particularly at Lake Jasper, the rehabilitation of new and currently closed tracks, the designation of wilderness areas, the extent and impact of previous forestry and oil exploration activities in the park, the extent of recreational use, the climatic factors influencing dry soil conditions and the declaration of the complete park.

The proponent provided a response to these and other issues (Appendix 1), which was taken into account in the assessment of the proposal. The Environmental Protection Authority considers that the proponent's Response to Issues, the recommendations in this report, the proponent's commitments and the Department of Mines proposed conditions adequately address the issues.

Declaration of the park

The Environmental Protection Authority has previously recommended on numerous occasions that the D'Entrecasteaux National Park should be declared in its entirety, and this recommendation is repeated (Recommendation 6). In addition to the desire to progress the conservation reserves system of Western Australia, the Authority notes that the Government policy implies that the park would need to be declared in its entirety to enable the possible excisions of up to 1% in area for mining.

4. Public submissions

The public review period and the proponent's public consultation programme was "aimed at providing a comprehensive explanation of the proposed exploration activities and an assessment of both the potential environmental impacts and the associated environmental management programme." It was also aimed at "providing an opportunity for affected individuals, groups and the community to obtain answers to questions and to provide constructive input which may improve the effectiveness of the environmental management."

Shires, local community groups and conservation groups were provided with information and a series of information days, presentations and meetings were conducted. Issues arising from these consultations were listed in the Public Environmental Review and comment provided by the proponent.

Public submissions raised a number of points about the public consultation programme, specifically, the reliability of the statistics regarding public support for the proposal quoted in the Public Environmental Review, and that the wider community of Western Australia (especially Perth) was not directly consulted.

Public interest in the exploration proposal was substantial and many submissions provided detailed scientific information and a discussion of the environmental issues. The quantity of public submissions was so large that the Environmental Protection Authority will not list each submitter in the normal, preferred manner as an appendix in this Bulletin. A summary of the key issues is provided below and, along with the proponent's Response to Issues, in Appendix 1.

The summary and queries from the key issues raised is as follows:

1. Measures to prevent the spread of dieback disease by other means than vehicles, such as by footwear and drill stems, should be described.
2. Certain submissions query the evidence, or lack thereof, for the generalisation that "it is probable that much of the flora has been severely reduced" (pg13, para3).
3. The use and rehabilitation of the tracks closed to the public should be adequately described.

4. Measures for the protection and identification of unknown flora, which almost certainly would be discovered, should be described.
5. Certain submissions query the statement that flattened shrubs will recover in 1 - 2 years.
6. Figure 1 of the Public Environmental Review is inaccurate in showing the extent of the existing park and should be corrected. For example, Point D'Entrecasteaux and the surrounding area is gazetted and named as the D'Entrecasteaux National Park.
7. The lack of detail about the specific sites of the off-track exploration activity has made it difficult to assess the potential environmental impact.
8. Submissions claimed that Section 4.8 of the PER is quite inadequate as it is quite likely from current known fauna distributions that as many as five species of vertebrates listed on Schedule 1 and one species from Schedule 2 of the Wildlife Conservation Act could occur in the area. The statement that "the fauna is neither rich nor abundant", when there has been no detailed fauna surveys and no review of current literature and Museum records, requires justification. At the least a commitment should be made that should any information about a fauna species become known which indicates that it, or its habitat, requires protection from the exploration activity, that the proponent would implement appropriate measures. Numerous endangered species possibly occur in the park — the Southern Brown Bandicoot, the Western Quoll, the Brush Tailed Phascogale, the Yellow Footed Antechinus, the Western Pygmy Possum, the Tammar Wallaby and the Honey Possum. An attempt to identify such fauna and describe measures to protect them and their habitats should be made.
9. Other diseases apart from Phytophthora, such as Canker fungi, Botryospheria and Armillaria, are not discussed and protective measures may be required to control their spread.
10. Submissions said that the PER failed to address certain of the guidelines and this should be rectified — the need for the proposal, mechanisms/options/commitment/impact assessment for excision and replacement areas, the regional/state/national context of the biological values of the park, alternatives to exploration and possibly mining in this area, identification of areas of high conservation value (including wilderness) that would not be explored (cross referenced to CALM's Management Plan maps, for example, map 13) and the provision for on-going plans for public information (to allay social concerns) and public access management during the programme.
11. The interpretation of the landscape values of the park (Section 4.17) is exceedingly simplistic and not in accord with CALM's description of the landscape values. In a regional sense, the landscape character type, the Scott Coastal Plain, extends from Augusta to Albany. What proportion of this character type is within secure conservation reserves?
12. Certain submissions questioned the estimation of the public support for the proposal at 80% as being misleading in the extreme.
13. Submissions claimed that Section 4.12 of the PER is misleading in referring to "large areas of forest were cleared" and "extensive damage to vegetation" (from exploration activity) because, in the former case, the timber industry were largely outside the park area (little forest occurs in the park), and, in the latter case, the damage was localised to a miniscule proportion of the park area.
14. Section 4.13 of the PER was said to significantly understate the current and future recreational use of the area, especially because of its wilderness qualities.
15. Submissions said that Section 4 of the PER should have included a description of the climate of the area so an assessment of the possibility of dry-field conditions can be done. Certain submissions indicate that dry-field conditions in the wetlands of the park are rarely possible.
16. The proposed exploration programme was considered in some submissions to understate the potential for off-track damage from the potential spread of dieback, protection of flora and vegetation, protection of fauna, etc.

The public availability of the document and the call for submissions was advertised twice in the State-wide press and also in the regional press. In addition to the eight week public review, the proponent's public consultation programme was substantial, as described in the Public Environmental Review. The Environmental Protection Authority concludes from the number and quality of submissions received that public consultation was adequate.

5. Conclusions and recommendations

The Environmental Protection Authority considers that the proposal, as described in the proponent's Public Environmental Review and Response to Issues (Appendix 1), is not environmentally acceptable. The exploration programme proposal lacked appropriate structure and detail and failed to use available scientific information, and, therefore, made the assessment of the proposal more difficult.

The Environmental Protection Authority has a role in assisting proposals to be made environmentally acceptable. The Authority has proposed changes to the exploration programme proposal which, if implemented by the proponent, would make the proposal environmentally acceptable. The changes could be implemented by the environmental conditions set by the Minister for the Environment and derived from the Authority's recommendations.

The changes recommended by the Authority in summary are:

- the initial phases of the exploration programme should be structured to prescribe access on publicly open tracks, closed tracks and off-track by foot/helicopter methods;
- an Environmental Management Programme for exploration activity by off-track access by vehicle must be submitted to the Minister for the Environment for approval;
- the exploration programme phase involving off-track vehicle access at specific locations would only be approved following the establishment of prospectivity by low impact access by foot/helicopter methods and the use of portable drilling equipment;
- details of the location of exploration activity must be publicly available prior to approval for the commencement of activity at a specific location;
- a dieback hygiene programme must be defined and implemented under CALM supervision; and
- the conditions for the protection of the conservation values of the park would be set by CALM, on behalf of the National Parks and Nature Conservation Authority, on a case-by-case basis.

Environmental acceptability of proposal

The Environmental Protection Authority considers that the proposal to explore for mineral sands in the D'Entrecasteaux National Park would only be environmentally acceptable if the changes to the proposal which are described above are implemented. Recommendations to implement the changes are as follows:

Recommendation 1

The Environmental Protection Authority concludes that the proposal to explore in the gazetted and proposed additions to the D'Entrecasteaux National Park, as described in the proponent's Public Environmental Review and Response to Issues (Appendix 1), would only be environmentally acceptable if the proposal is modified to reflect the proposed changes and recommendations in this report. In reaching this conclusion, the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as:

- the location of the exploration activity;
- the spread of dieback disease;
- access on existing tracks, both open and closed to the public, and off-track access, by foot/helicopter and by vehicles;

- the protection of the nature and heritage conservation values of the park;
- the development of an Environmental Management Programme; and
- the provision of environmental services by CALM.

The Environmental Protection Authority considers that these and other issues and the changes to the proposal could be addressed and implemented by the recommendations in this report, the Department of Mines proposed conditions (Appendix 2) and the environmental management commitments given by the proponent (Appendix 3). Accordingly, the Authority considers that a modified exploration proposal could proceed subject to these provisions being implemented.

Recommendation 2

The Environmental Protection Authority recommends that the information provided by the proponent in accordance with the Department of Mines proposed conditions (Condition 2) should be provided to the Environmental Protection Authority, and, also, should be made available for public inspection at the Pemberton District Office of the Department of Conservation and Land Management and the Environmental Protection Authority's reading room in Perth, to the satisfaction of the Environmental Protection Authority.

Recommendation 3

The Environmental Protection Authority recommends that on-track access by vehicle and off-track access by foot/helicopter for exploration within the gazetted and proposed areas of the D'Entrecasteaux National Park should only be permitted under environmental management prescriptions which include the following:

1) tracks open to the public -

- approval of location and timing of exploration activity by CALM; and
- access under dry soil conditions.

2) tracks closed to the public -

- approval of location and timing of exploration activity by CALM;
- access under dry soil conditions;
- prior mapping of dieback distribution, if considered necessary by CALM;
- approval of a dieback hygiene programme by CALM;
- maintenance or provision, if approved by CALM, of barriers to prohibit public access; and
- rehabilitation, if considered necessary by CALM, of any disturbed areas.

3) off-track access by foot/helicopter -

- approval of location and timing of exploration activity by CALM;
- no access into wet areas;
- dieback hygiene procedures being applied as required by CALM; and
- no clearing of vegetation (no damage to root stock or lignotuber).

The Authority further recommends that in circumstances when CALM and the proponent cannot reach agreement about the conditions for access to a particular area, the matter is referred to the Minister for the Environment for resolution.

Recommendation 4

The Environmental Protection Authority recommends that, prior to the approval of the phase of the exploration programme which involves off-track access by vehicle, the proponent should submit an Environmental Management Programme, which describes the general environmental management prescriptions and approval processes, to the satisfaction of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management. The prescription should include the following key points:

- ~~prior establishment of prospectivity via access by foot/helicopter and the use of portable drilling equipment;~~
- dieback mapping, botanical surveys and archaeological surveys being conducted on foot and access routes approved;
- approval of specific location and timing of exploration activity by CALM;
- access under dry soil conditions;
- approval of a dieback hygiene programme by CALM;
- no clearing of vegetation (no damage to root stock or lignotuber);
- establish visual or physical barriers to prevent public access; and
- rehabilitation, if considered necessary by CALM, of any disturbed areas.

The Authority further recommends that in circumstances when CALM and the proponent cannot reach agreement about the conditions for access to a particular area, the matter is referred to the Minister for the Environment for resolution.

Recommendation 5

The Environmental Protection Authority recommends that the proponent should reach agreement with the Department of Conservation and Land Management on the provision of environmental services, prior to the commencement of each form of access under the exploration programme, to the satisfaction of the Minister for the Environment.

Recommendation 6

The Environmental Protection Authority recommends that the declaration of the complete D'Entrecasteaux National Park be implemented as soon as possible.

Appendix 1

**Cable Sands (WA) Pty Ltd
Response to Issues**

EXPLORATION IN THE
D'ENTRECASTEAUX NATIONAL PARK

PUBLIC ENVIRONMENTAL REVIEW

RESPONSE TO ISSUES NOMINATED BY
BY THE ENVIRONMENTAL PROTECTION
AUTHORITY AND THE DEPARTMENT OF
CONSERVATION AND LAND MANAGEMENT

SUMMARY OF ISSUES AND QUESTIONS RAISED

1. Measures to prevent the spread of dieback disease by other means than vehicles, such as by footwear and drill stems, should be described.
2. Certain submissions query the evidence, or lack thereof, for the generalisation that "it is probable that much of the flora has been severely reduced" (pg13, para3). Could you provide supporting evidence.
3. The use and rehabilitation of the tracks closed to the public should be adequately described.
4. Measures for the protection and identification of unknown flora, which almost certainly would be discovered, should be described. Reference should have been made to publications such as - Rare and Threatened Australian Plants. CSIRO, 1988.
5. Certain submissions query the statement that flattened shrubs will recover in 1 - 2 years. Could you provide evidence supporting the statement.
6. Figure 1 of the Public Environmental Review is inaccurate in showing the extent of the existing park and should be corrected. For example, Point D'Entrecasteaux and the surrounding area is gazetted and named as the D'Entrecasteaux National Park.
7. The lack of detail about the specific sites of the off-track exploration activity have made it difficult to assess the potential environmental impact. Can the proponent identify at least a typical location of initial activity and provide sufficient detail about the characteristics of that site and the probable exploration activity? For example, has sufficient knowledge been gained from the geoscientific survey activity about the area south of Jangardup to allow this exercise to be done?
8. Section 4.8 is quite inadequate as it is quite likely from current known fauna distributions that as many as five species of vertebrates listed on Schedule 1 and one species from Schedule 2 of the Wildlife Conservation Act could occur in the area. The statement that "the fauna is neither rich nor abundant", when there has been no detailed fauna surveys and no review of current literature and Museum records, requires justification. At the least a commitment should be made that should any information about a fauna species become known which indicates that it, or its habitat, requires protection from the exploration activity, that the proponent would implement appropriate measures. Numerous endangered species possibly occur in the park - the Southern Brown Bandicoot, the Western Quoll, the Brush Tailed Phascogale, the Yellow Footed Antechinus, the Western Pygmy Possum, the Tammar Wallaby and the Honey Possum. An attempt to identify such fauna and describe measures to protect them and their habitats should be made.
9. Other diseases apart from Phytophthora, such as Canker fungi, Botryosphaeria and Armillaria, are not discussed and protective measures may be required to control their spread.
10. The PER failed to address certain of the guidelines and this should be rectified - the need for the proposal, mechanisms/options/commitment/impact assessment for excision and replacement areas, the regional/state/national context of the biological values of the park, alternatives to exploration and possibly mining in this area, identification of areas of high conservation value (including wilderness) that would not be explored (cross referenced to CALM's Management Plan maps, for example, map 13) and the provision for on-going plans for public information (to allay social concerns) and public access management during the programme. Also, there is a mistake in the guideline in Section 5 relating to identifying the direct and indirect environmental impacts: the word "qualifications" has been substituted for "quantification". No attempt at quantification of the impacts has been made.
11. The interpretation of the landscape values of the park (Section 4.17) is exceedingly simplistic and not in accord with CALM's description of the landscape values. In a regional sense, the landscape character type, the Scott Coastal Plain, extends from Augusta to Albany. What proportion of this character type is within secure conservation reserves?
12. Certain submissions questioned the estimation of the public support for the proposal at 80% as being misleading in the extreme. Could the basis for the estimation be provided or further information to support the proponent's statement on this important social issue.
13. Section 4.12 is misleading in referring to "large areas of forest were cleared" and "extensive damage to vegetation" (from exploration activity) because, in the former case, the timber industry were largely outside the park area (little forest occurs in the park), and, in the latter case, the damage was localised to a miniscule proportion of the park area. If you do not agree

with this synopsis, could you provide more evidence to quantify your interpretation of the historical use of the land.

14. Section 4.13 is considered to significantly understate the current and future recreational use of the area, especially because of its wilderness qualities. Could you provide quantification for your estimate that "the level of recreational use is low".

15. Section 4 of the PER should have included a description of the climate of the area so an assessment of the possibility of dry-field conditions can be done. Certain submissions indicate that dry-field conditions in the wetlands of the park are rarely possible. Could you describe the procedure for determining dry field conditions.

16. The bibliography lists a reference by How, R. A., *et al*, 1987, as being "in press". It has been available since late 1987.

17. The proposed exploration programme is considered to understate the potential for off-track damage from the potential spread of dieback, protection of flora and vegetation, protection of fauna, etc. Taking account of the issues raised above, could you upgrade the off-track part of the programme to reflect the increased level of environmental investigation and control which would be necessary.

EPA ISSUES

1. Measures to prevent the spread of dieback by means other than vehicles will be taken at the same location and time that vehicle hygiene is carried out. The vehicle hygiene procedures described at pages 36 and 37 of the Public Environmental Review will be applied to all components of the exploration vehicles which might potentially come in contact with the pathogen. This includes for example the drill stems which will be used in the sample drilling programme. With regard to the footwear of the exploration staff and any other tools or sampling equipment used by them, the same procedures will be applied. The positioning of the vehicle in the hygiene area will allow as a final stage the washdown or blowdown of footwear of personnel immediately prior to them climbing into their cleaned vehicle and moving out of the hygiene area. Drilling crew activity will be managed so that no human movement occurs across boundaries between dieback infected and dieback free areas. Drilling personnel activity will thus be associated directly with the movement of vehicles so that no hygiene measures will need to be applied to drilling personnel separate from or without access to the hygiene facilities carried on the exploration vehicles.
2. The statement that "it is probable that much of the flora has been severely reduced" refers to the seasonally inundated areas and the impact of the dieback fungus. In this context it is a general statement expressed in probable, not definite terms. The probability of this being the case, in the absence of detailed and complete botanical surveys of the Park, is based on the following information.

In CALM's Management Plan (1987), Map 9 at page 72 shows large areas affected or at risk of infection by dieback disease. The marked areas correspond approximately to the seasonally inundated plains behind the coastal dunes. This is further amplified at page 82 by the statement that the flats and swamp areas are both highly susceptible and have a high risk of infection.

Detailed dieback surveys carried out at the Jangardup mine site adjacent to the D'Entrecasteaux National Park can also be referred to. The Jangardup ERMP (1989) describes at page 22, that of thirty three samples from dead or dying Banksia species, ten were found to contain Phytophthora cinnamomi demonstrating the very high levels of infection. The low lying areas were found to contain few species which appear to be highly susceptible and at Figure 6 the mapping of dieback infected areas clearly shows the widespread extent of the infection. Similar vegetation occurs in the existing and proposed areas of the D'Entrecasteaux National Park and

it is reasonable to draw general conclusions about similar areas in the Park by referring to Jangardup.

More recently Dr Ray Hart (Dieback in Mineral Exploration, Australia Institute of Geoscientists, Bulletin No. 11 1991 pages 113-116) has described the catastrophic impact of the fungi on the high susceptible Banksia woodlands and heaths of the south coast and gives specific references to studies carried out on the extent of the impact.

3. Reference is made in pages 38 and 44 of the Public Environmental Review to the use of tracks closed to the public, or old tracks.

The use of these tracks will be preceded by consultation with local CALM officers and the tracks will be managed in terms of dieback, rare flora, soil conditions, fauna, and other environmental impacts as described in the Public Environmental Review and where appropriate in this response document.

In particular, barriers preventing public use of the tracks will be replaced or created if CALM considers this to be desirable, so that no public use can occur.

Some but not all of these tracks will be overgrown. In such cases the same environmental management will be applied as for off-track areas, namely barriers will be created; bends will be designed in the route near the entry from existing tracks to reduce outside visibility; avoid high ground wherever possible; minimise vehicle movements; minimise damage to vegetation; minimise soil damage. These measures will result in the quick regeneration of the natural vegetation.

It should be noted that the construction and maintenance of barriers preventing the use of closed tracks is considered feasible for the gazetted areas of the Park.

Based on informal discussions with CALM officers, it is clear that problems exist in terms of the maintenance of such barriers in the proposed extensions to the Park. This is because the public is often aware that until the Park is gazetted, there is no legal authority preventing the removal or destruction of these barriers and the use of the tracks. Clearly, without any legal authority in existence it will not be possible to guarantee the maintenance of these barriers.

There will be some instances where due to the location and design of a new track, the creation of a barrier will only attract unwarranted attention and public activity. In these

circumstances a decision may be made in consultation with CALM not to erect any barriers.

4. The Public Environmental Review describes in section 7.2(a) the methodology to be used to identify rare flora in the field. There is no intention to conduct a comprehensive Park-wide botanical survey of rare flora. Botanical field work is proposed in specific relation to the design and location of the access routes to be used off-track for exploration purposes.

The EPA has referred to the protection and identification of unknown flora.

Most poorly described or unknown species are discovered during specific biological surveys when extensive collections are obtained and processed by comparison with Western Australia Herbarium specimens. As already indicated, it is not proposed to take extensive collections during the exploration programme. However, in determining access routes, the vegetation will be described in terms of structural units and botanical composition and unusual or uncommon plant species will be opportunistically collected and their taxonomic and conservation status will be determined. This will involve checking with the Western Australia Herbarium to determine the species name and conservation status.

After sampling, the access routes for exploration will be located so that outstanding stands of vegetation and the flora species under investigation are avoided totally by the exploration activity. It is proposed to use the following sources in the above identification process:

- CALM records, Western Australia Herbarium,
- Reserve List of Plants Considered for Declaration as Rare Flora. Unpublished report Department of Conservation and Land Management (1991),
- Western Australia's Endangered Flora. Hopper, van Leeuwen, Brown and Patrick, Department of Conservation and Land Management (1990).

5. The statement that flattened shrubs will recover in one to two years following use of a front end loader bucket or bush rake is primarily based on field observations and local knowledge. The proponent has observed such regrowth in State Forest areas immediately adjacent to the National Park and 4WD users in the heathland areas of the Park confirm the recovery of vegetation within the timeframe indicated.

The reference to shrubs confines the observation to understorey and groundcover. Small trees and saplings damaged in this way would not recover within one to two years. As indicated elsewhere in the Public Environmental Review the off-track access will be designed to minimise the impact on such stands of vegetation. The situation is conveniently summarised in a recent paper on Management of Exploration Impacts on Natural Ecosystems in the South West by B K Masters (Australian Institute of Geoscientists Bulletin No. 11, 1991: 121-127). He states that physical damage to vegetation is akin to damage from burning - new growth is produced from below ground and broken branches create new growing tips close to the damage site. This regrowth is sustainable in the Park because of the high rainfall.

Masters goes on to state the importance of ensuring that damage to vegetation is superficial and that absolutely minimal damage is done to the root system and lignotuber. He endorses the method of clearing described in the Public Environmental Review utilising above ground removal of dead branches by raking with a rake attached to a 4WD tractor and adjusted about 15cm above soil level and concludes that in this way plant regrowth is virtually guaranteed.

The process of regrowth will be greatly assisted by minimising the number of vehicle passes in off-track areas. The environmental impact management plan outlined in the Public Environmental Review is based on minimising such vehicular traffic.

6. A comparison of Figure 1 of the Public Environmental Review with Map 2 of the CALM Management Plan (1987) shows that two errors have been incorporated into the Public Environmental Review. Firstly, the area of Point D'Entrecasteaux and its surrounds should be shown in dark green (existing Park) not light green (proposed Park). Secondly, an area on the coast at Warren Beach, south of the mouth of the Warren River should be shown in dark green (existing Park) and not in light green (proposed Park).

These errors are acknowledged and regretted. It should be noted that the environmental impact assessment and management prescriptions set out in the Public Environmental Review apply identically to both the gazetted Park and the areas of the proposed extensions.

7. The Public Environmental Review does not contain specific site detail as it is not possible, without being misleading, to describe in exact terms what will occur at each site. This will depend on the outcome of the field surveys and the results of the various stages of exploration. In order to respond to the issue raised by the EPA, three examples are

set out based on available information. It must be stated that there is a degree of hypothesis in each of the following descriptions which will either be verified or varied once field work commences.

In each case the description of the probable activity off-track has been based on:

- the need to map dieback in advance of off-track vehicular access,
- the use of existing tracks as much as possible,
- minimising damage to vegetation,
- minimising the number of vehicle impacts off-track.

The type of information set out here will be made available to and discussed as appropriate with local CALM officers.

7a. Proposed Magnetometer Survey and Scout Drilling Conceptual Program West Quitjup

Cable Sands (WA) Pty Ltd proposes to carry out further exploration for heavy minerals in the West Quitjup area. This area was subject to a limited programme in 1990 when a Geoscientific Survey Permit was applied for and granted. The work involved several ground magnetometer traverses, the results of which verified the location of a previously identified aeromagnetic anomaly. A single hand auger and sludge hole was attempted but failed to locate any source for the anomaly as it did not reach the required depth. Further magnetometer lines and holes were planned but not undertaken due to the expiry of the survey permit.

The proposed exploration for the area involves additional magnetometer lines and scout drilling. The magnetometer lines will aim at further delineating the extent and orientation of the anomaly on the ground and will involve crews of two or three persons working on foot with hand held equipment. The likely position of the proposed magnetometer lines are shown in Figure 2.

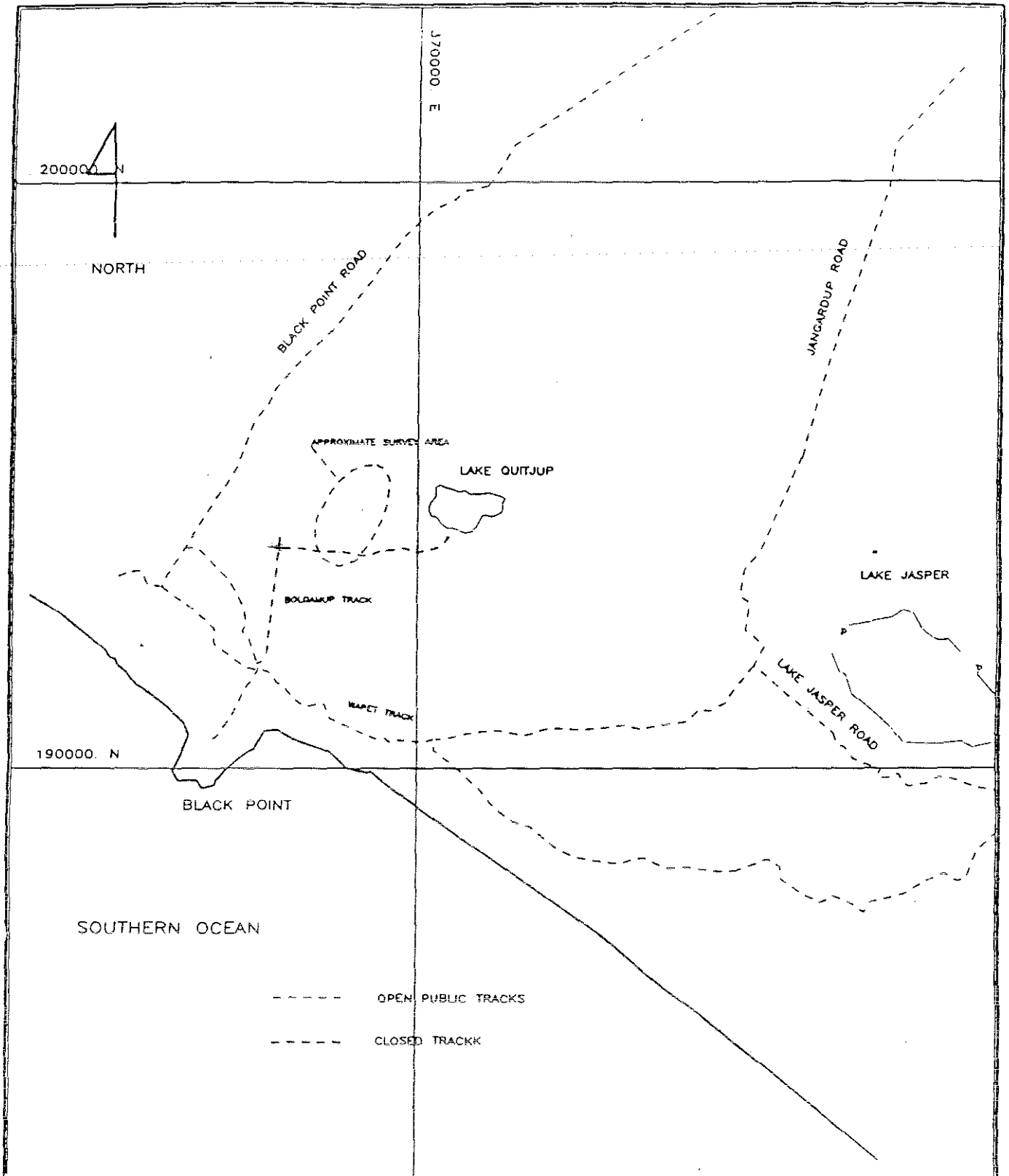
The results obtained from all magnetometer lines will then be used to determine the positioning of widely spaced scout drill holes. Drill holes will be roughly spaced on a 500m x 200m grid. The main aim of these drill holes will be to locate the source of the anomaly. If the source is found to be a deposit of heavy minerals, scout drilling will give a rough idea of the deposit's grade and extent. Any geological information gained will also prove useful for further exploration in the area. For display purposes only some likely drill hole positions, based on the magnetometer

lines done in 1990, are shown in Figure 2. Drilling equipment and procedures will be as described in the Public Environmental Review document.

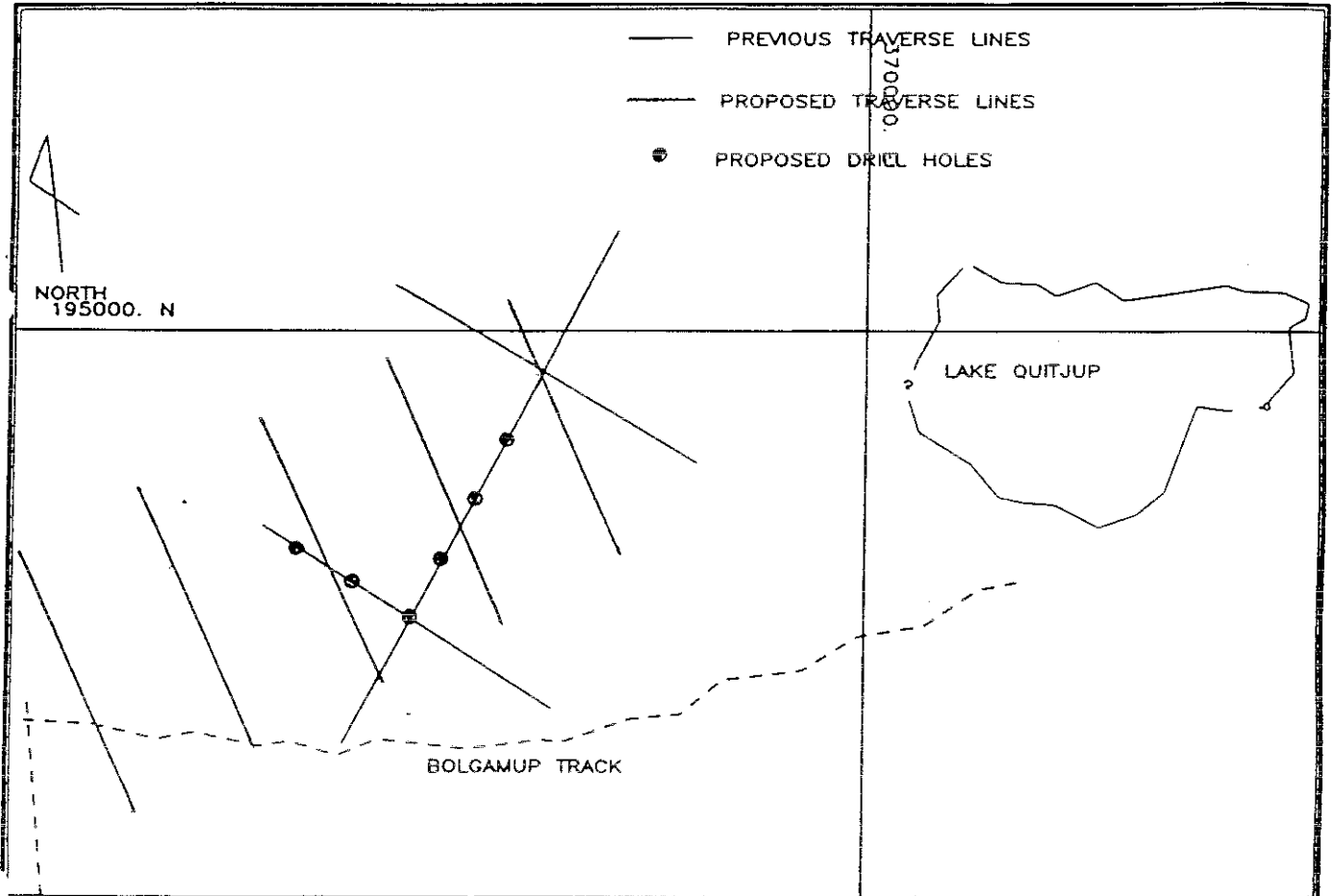
Access to the area is shown in Figure 1. Access can be achieved to the area either along Black Point Road and then Bolgamup Track or along Jangardup Road, Lake Jasper Road, Wapet Road, Black Point Road and then Bolgamup Track. All access roads mentioned are currently open to the public except Bolgamup Track which is closed. This track was closed just prior to the previous exploration programme in 1990, access being prevented by a wooden gate which was erected by Cable Sands. Authorised access by vehicle is restricted to dry conditions only to prevent the spread of dieback along the track. Access along Black Point Road is dependent on seasonal conditions because it is subject to flooding during winter months.

Based on survey's at Jangardup to the north east of Lake Quitjup, and a preliminary literature survey, it is likely that the area concerned will comprise heath and scrub thickets, particularly in the vicinity of the Lake. The early Geoscientific Survey Permit work undertaken in consultation with CALM was on the basis that the area was dieback free but that a dieback hygiene point should be established at the entry to the Bolgamup Track and, subject to survey, at the off-track exit point. Following ground magnetometer work, the first off-track activity will be by a botanist and an assisting dieback interpreter on foot from the track in order to describe and confirm vegetation units following an earlier mapping based on aerial photographs, map the distribution of dieback, search opportunistically for rare flora, and take botanical samples as required.

After a vegetation map has been prepared, complete with dieback distribution and terrain information, a dieback hygiene programme will be established for the exploration of the area. Dieback hygiene locations will be shown on the map complete with recommended routes. When this has been prepared the botanist will return to the field in advance of any drilling activities but in the company of a geologist if necessary, and on foot mark out the off-track access routes and the grid lines. During this visit the botanist will concentrate on rare flora to ensure that no rare flora will be damaged or destroyed by the use of these routes. He will also avoid damage to outstanding stands of vegetation. Subject to a predictive model based on aerial photos, literature surveys and museum records, an archeological survey may be carried out at the same time. Thus the location of the access routes will take into account dieback, significant vegetation, rare flora and archeological sites.



<i>CABLE SANDS (WA) Pty Ltd</i>		
WEST QUITJUP PROPOSED EXPLORATION ACCESS TRACKS		
DRAWN : GPH	SCALE 1 : 75000	FIGURE 1
DATE : 9-Sep-91	CHECKED :	



CABLE SANDS (WA) Pty Ltd

WEST QUITJUP PROPOSED EXPLORATION
MAGNETOMETER LINES AND DRILL HOLES

DRAWN : GPH	SCALE 1 : 20000	FIGURE 2
DATE : 5-Sep-91	CHECKED :	

The drilling crew, will then follow, drilling along the access tracks as marked in the field.

It should be noted that at nearest the proposed activity is approximately 600 metres away from Lake Quitjup. Based on the earlier work undertaken it is most likely that a front-end loader, as described in the Public Environmental Review will be used to flatten the very dense undergrowth in some parts in order to provide access for the drilling vehicles.

In summary, access to the survey area from the Bolgamup Track will be on foot in the case of the magnetometer and botanical surveys, and by vehicle along predetermined routes for scout drilling. Access by the drill rig and support vehicle to drill hole sites will, in this area, involve the use of a small rubber tyred front end loader or tractor. The procedures that will be used in choosing the route and then travelling along it will be as described in the Public Environmental Review document.

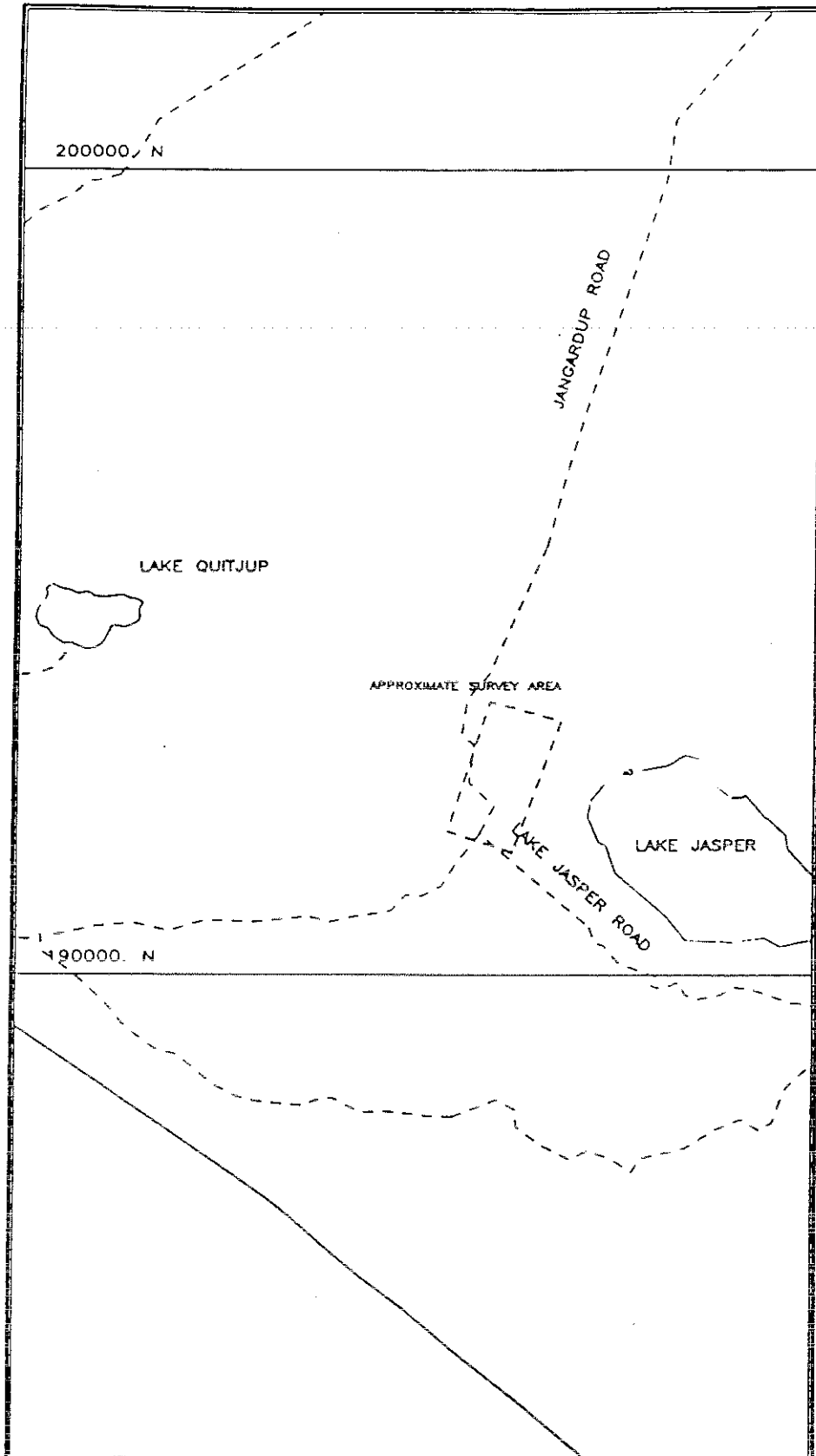
7b. Proposed Drilling Conceptual Program South Jangardup

Cable Sands (WA) Pty Ltd proposes to carry out further exploration for heavy minerals in the South Jangardup area. This area was subject to a limited exploration programme in 1990 when a Geoscientific Survey Permit was applied for and granted. The work involved several ground magnetometer traverses and hand drilling. The location of the survey area is shown in Figure 3.

Eight magnetometer lines were completed and the results indicated an anomalous zone, thought to be caused by an accumulation of heavy minerals. Augering and sludging of twenty four holes confirmed the presence of a deposit of heavy minerals. The locations of the magnetometer lines and the sites of hand drilling as completed in 1990 are shown in Figure 4.

It is proposed that further drilling be undertaken to establish the grade and extent of the accumulation of heavy minerals discovered in the previous work. The drilling will involve the use of a drilling rig mounted on a Toyota 4WD and a support vehicle. Drill lines will be 300m apart with drill holes spaced about every 100m. Initial drilling will be confined to this grid but subsequent drilling will be closer spaced and concentrate on the mineralised zone as its exact position becomes evident.

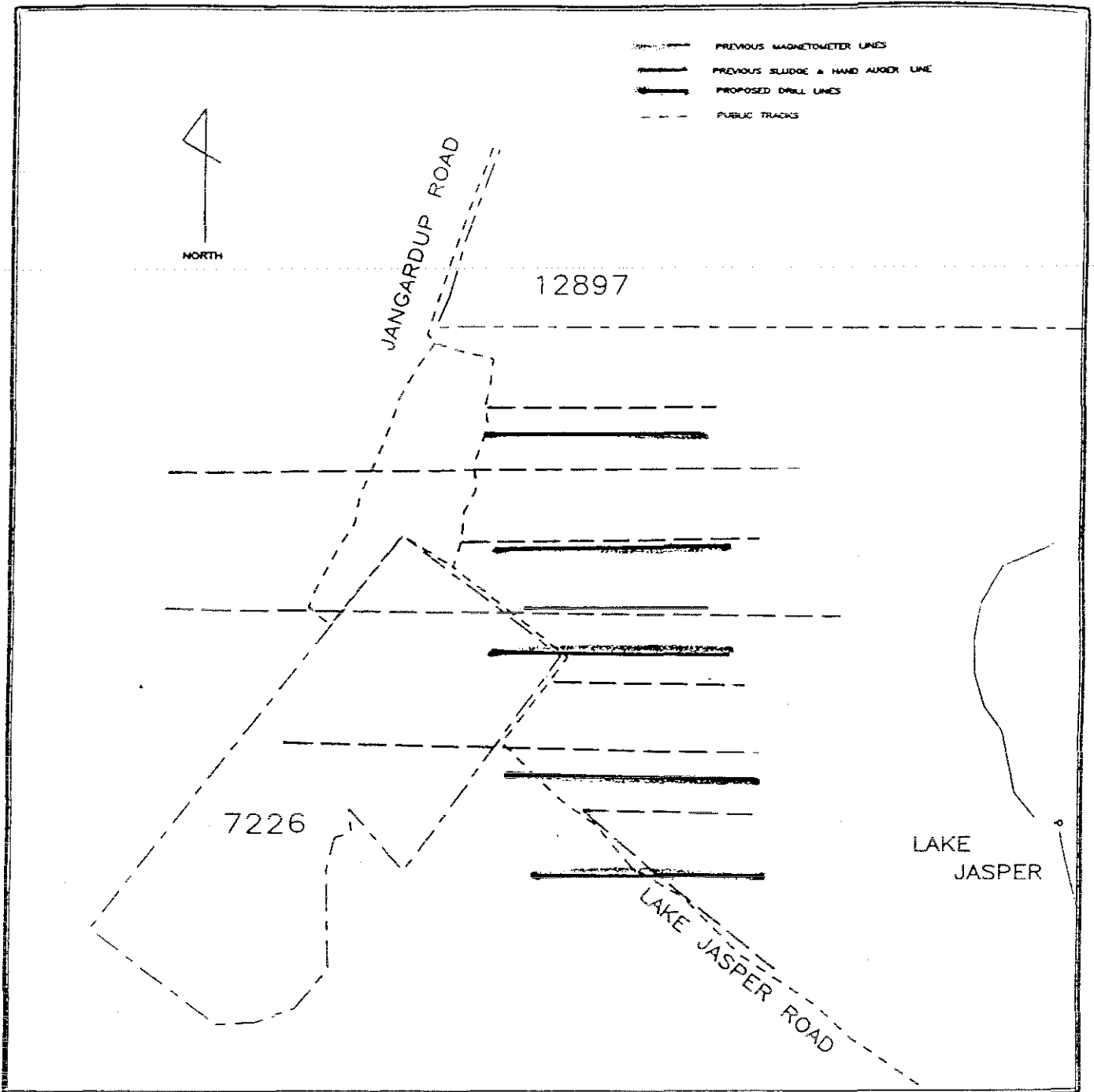
Access to the area will be along Jangardup Road and Lake Jasper Road. Access to drill sites will be from existing tracks and then by "picking" a way through the vegetation to avoid larger trees and shrubs. It is unlikely that a rubber



CABLE SANDS (WA) Pty Ltd

SOUTH JANGARDUP PROPOSED EXPLORATION
LOCATION AND ACCESS TRACKS

DRAWN : GPH	SCALE 1 : 70000	FIGURE 3
DATE : 9-Sep-91	CHECKED :	



CABLE SANDS (WA) Pty Ltd

SOUTH JANGARDUP PROPOSED EXPLORATION
PREVIOUS WORK AND PROPOSED DRILLING

DRAWN : CPH	SCALE 1 : 15000	FIGURE 4
DATE : 9-Sep-91	CHECKED :	

tyred front end loader or tractor will be required to obtain access due to the openness of the vegetation. This area is vegetated by low heath with dense thickets occurring close to Lake Jasper. The proposed exploration activity is approximately 500m and more away from Lake Jasper.

Botanical and archeological surveys and the drilling activity will take place in the same sequence and the same manner as described for the West Quitjup area.

It should be noted that this area will be inaccessible in winter due to the proximity to Lake Jasper and the inundation which typically occurs in this area during the winter. Even in the drier months the soil may be damp and thus the dieback mapping, location and implementation of hygiene procedures will be carefully implemented.

7c. Location of Ancient Shorelines Conceptual Programme

The Jangardup and Jangardup South deposits are located along an ancient shoreline, the Donnelly shoreline, which was deposited when sea levels were some 35 metres higher than present.

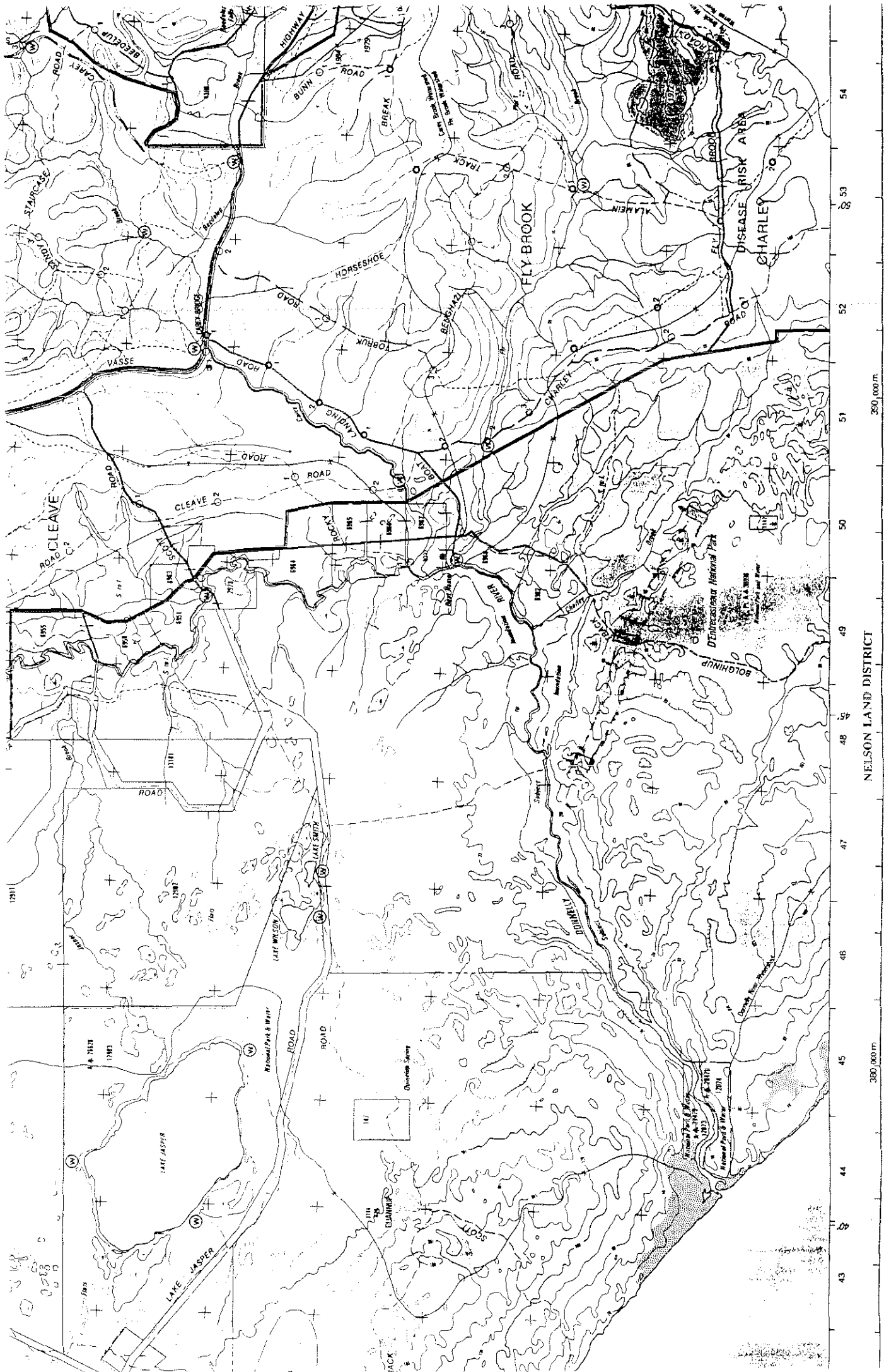
The potential to locate further deposits along the Donnelly shoreline is considered good.

There are no obvious geomorphic features to indicate the presence of the Donnelly shoreline or other ancient shorelines. Consequently their locations can only be determined by drilling to locate a drop off in the basement sands of the Yarragadee Formation (see Jangardup cross sections-Figure 5).

The proponent will use scout drilling to identify the location of shorelines and follow up magnetometer surveys to check for the presence of minerals along the shorelines. Target areas will then be subject to scout drilling.

An example of how this approach will be applied is given for an area to the east of the Donnelly River (refer Figure 6).

- Scout drill down Bolghinup Track as shown in green on the attached plan. This track is closed to the public and blocked by a CALM gate at the Boat Ramp Road end.
- Should the shoreline be crossed and identified at, for example the area marked in red, then further lines of scout drilling will be drilled as shown in yellow. This drilling will be intended to pick up the orientation of the shoreline. Drilling will require off-track access (dotted yellow line).



NELSON LAND DISTRICT

380,000 m

43

44

45

46

47

48

49

50

51

52

53

54

390,000 m

- Results of the magnetometer survey (blue lines) will indicate the location of follow up drilling which will indicate if this area warrants upgrading to grid drilling or whether it should be abandoned.

In this hypothetical example a botanical survey will be carried out on foot on both sides of the track and a dieback map will be produced. Rare flora will be identified opportunistically at this time.

Based on topographical maps this area appears to be more undulating than the other examples and possibly contains a number of low dunes. Hypothetically, there may be a need to establish a number of off-track dieback hygiene points to enable clean downs before traversing over crests which are likely to be dieback free and down into swales which may be dieback infected. Access routes will be designed to minimise such crossovers. There are unlikely to be forests or woodland which need to be traversed by vehicle although it can be anticipated that depending on the distance of exploration from the existing track denser vegetation will be encountered to the west and that this vegetation will require the use of a front-end loader complete with a bush rake or shovel.

Botanical and archeological surveys and the drilling activity will be undertaken in the same sequence as described for the West Quitjup area.

8. Section 4.8 of the Public Environmental Review is brief and should be read in the context of the proposed exploration programme and the environmental management prescriptions. It is concluded that mortality of fauna will be avoided and faunal habitats will not be significantly affected because: off-track exploration is relatively limited in area, vehicular impacts are minimised, stands of significant vegetation are avoided, vehicles will be driven slowly and carefully, the noise and vibration created will cause birds and animals to move away, ground disturbance will be minimal and drill holes will be filled in immediately on completion of drilling.

The prescriptions set out in the Public Environmental Review are, for example, consistent with the description of exploration management in terms of its impact on fauna in the south west as set out in B K Masters, Australian Institute of Geoscientists, Bulletin No. 11, 1991: 121-127.

A commitment is given to implement appropriate management and design of the exploration programme so as to protect any rare fauna species or its habitat if encountered that would otherwise be impacted by the exploration activity.

9. In section 7.2 b) of the Public Environmental Review it is recognised that vehicles, machinery and drilling rigs have the potential to spread dieback and other pathogens and consequently a hygiene programme is described. No other pathogen was specifically identified in the Public Environmental Review. The EPA and CALM have indicated the need to refer particularly to the Canker fungi (Botryosphaeria sp) and Armillaria sp. These diseases do not spread in the same way as dieback; they are wind-borne fungi which attack plants via breaks, woodborers and other wounds.

The consideration of canker is particularly relevant for Banksia species. The fungi are transported by air currents and as yet there is no specific management policy to prevent its spread except that mechanical damage to vegetation should be minimised and the transfer of the infection in the form of roots and other plant material should be avoided.

The exploration programme described in the Public Environmental Review is based on minimising off-track activity and avoiding significant stands of vegetation. Damage to vegetation will be kept to an absolute minimum by the design of off-track access routes following botanical surveys which will take these factors into account. The clearance of areas of dense vegetation will occur above ground by flattening and not uprooting vegetation and all vehicles used will be subject to the hygiene procedures outlined elsewhere.

10. We believe the Public Environmental Review has largely addressed the guidelines nominated and our response and elaboration is set out below:
- a) The need for the proposal: Page 5 of the Public Environmental Review describes the economic context and benefits which are associated with the proposal as well as a description of the scientific basis for the specific exploration technology proposed. We believe this information canvasses the need for the exploration programme.
 - b) Mechanisms/options/commitment/impact assessment for excision and replacement areas: Pages 8 and 9 of the Public Environmental Review refer to this issue in the context of the Government of Western Australia's stated policy. It is difficult to be more definitive as there is no certainty that applications for excision will be made in the first place. If applications are made, the number, size and locations are not known and the number, size and locations of replacement land can not therefore be considered. Even if this detail were available at this time it would clearly require a negotiation with appropriate government authorities the

outcome of which can not be predicted. Any excision requires the approval of both Houses of Parliament which can not be predicted and any approval for mining will clearly involve the EPA's assessment process and the identification of all relevant environmental impacts. Full details of replacement land will form part of any excision application made by the proponent in the future when the relevant facts are known.

- c) The regional/state/national context of the biological values of the Park: Pages 6, 7 and 8 of the Public Environmental Review describe a statutory and policy framework for consideration of the proposal. Within this description references are made to various regional and state studies which have considered the importance of the Park and its biological values, the history of its gazettal and the proposals to extend the Park. Particular reference is made to the relevant State and Federal legislation which apply to the Park and its conservation status and importance.
- d) Alternatives to exploration and possibly mining in this area: Page 33 of the Public Environmental Review makes brief reference to the availability and likelihood of prospectivity for heavy minerals outside the area. During the last two decades parts of the State considered prospective have been explored in detail. As a result of this exploration mineable deposits have only been located on the Swan and Scott Coastal Plains. The Swan Coastal Plain is currently being mined at several locations between Geraldton and Cape Naturaliste.

The Public Environmental Review summarises this issue, based on this geological knowledge and aerial surveys of the Scott Coastal Plain.

- e) Identification of areas of high conservation value, including wilderness, that would not be explored (cross referenced to CALM's Management Plan maps, for example, Map 13): Page 31 and 32 of the Public Environmental Review refers to this issue and specific areas are detailed. The original guidelines did not specifically refer to wilderness which is defined in a recent CALM discussion paper about Zoning for National Parks in Western Australia, as "special areas in which the influence of man is reduced to a minimum and in which the expression of nature can be readily seen." The paper goes on to state that "if wilderness areas should be declared, they should be seen for what they are, selected parts of a few national parks." The nature and extent of the proposed exploration activity as described in the Public Environmental Review and the

environmental management programme outlined are consistent with this definition.

The total context of the Public Environmental Review should be read to deal with the elements and components which underlay the high conservation value of the Park.

Reference to CALM Management Plan Map 13 highlights some areas containing delicate and unusual geological features. The areas of Point D'Entrecasteaux and Black Point are referred to in the Public Environmental Review. A third area near Black Head will also be included as a high conservation area not to be explored.

The map also includes areas of fragile and rare plant communities and where there is susceptibility to soil erosion and degradation. These are widespread throughout the Park and the Public Environmental Review describes a management plan to avoid environmental impacts in these areas on a localised basis relating to specific exploration activity.

- f) Provision for on-going plans for public information (to allay social concerns): It should be recognised and accepted that there is an amount and level of social concern reflected in the submissions received in response to the Public Environmental Review which will only be allayed by the total prohibition of exploration in the Park. On-going public information about progress and the extent of exploration to date may confine that public concern to specific areas of the Park but it will not allay such concerns.

At a meeting with EPA staff on 3 July 1991 following the release of the Public Environmental Review, the proponent agreed to provide regular (3 monthly) reports to the EPA about progress (eg. numbers of days of activity, numbers of holes drilled on and off tracks, areas discarded, environmental surveys and management). That commitment is re-stated here. The proponent is willing to discuss the form, detail and circulation of that information. The Public Environmental Review describes the proposed relationship with CALM in terms of proposed field activities. It may be for example that CALM would not want certain information about off-track activity publicly available so that public access is not encouraged. Pages 29 and 30 of the Public Environmental Review deal with the provision of geological information to CALM, the Department of Mines and the EPA.

- g) Public access management during the programme: Page 40 of the Public Environmental Review refers the impact of the exploration activity on recreational use and enjoyment of the land by the public. Management of any other form of public access will be carried out lawfully and consistent with CALM's own management of the Park.
- h) No attempt at quantification of the impacts has been made: A typographical error occurred in Section 5 referring to qualifications instead of quantification. The Public Environmental Review deals with quantification of impacts at various points. The extent of exploration is referred to at page 23; the proportion on and off-tracks at page 21, the number and location of magnetic anomalies at figure 3; the location of tracks at figure 4; estimates of the scope of scout and grid drilling at pages 23 and 24, tables 3 and 4; specific examples of areas where no exploration will occur at page 31.

As has been explained in the Public Environmental Review the nature of exploration is such that a definitive description of actual impacts on vegetation, flora, archeological sites, dieback and soil conditions is not possible until activity occurs in the field and the actual exploration programme is planned in detail for a particular area. Thus a management programme has been devised dealing with these environmental issues and setting out how they will be quantified (eg. dieback maps) as a result of the field work which will precede the exploration drilling.

11. Section 7.2(m) of the Public Environmental Review addresses the guideline included in Section 5 of the EPA guidelines which refers to a landscape analysis of the impacts. Section 4.17 refers in general terms to the landscape values of the existing environment (Section 4 of the EPA guidelines refers) and we consider this section to be consistent with CALM's description of landscape values. More detailed descriptions of vegetation and landforms are given in pages 11 and 12 of the Public Environmental Review.

CALM's Management Plan refers to six major landscape types represented in the Park, namely: Forest; Savannah Woodland; Coastal Scrubland; Wetlands/Waterscapes' Coastal; and Other. The diversity of the landscape is emphasised and the landscape quality is often a function of the interaction between the different elements. The Management Plan also indicates that the landscape is subject to change from natural and human forces but large areas still retain their natural character.

The EPA has made available a preliminary draft of a paper compiled by A Stuart-Street and B Kirkpatrick, about Landscape Character Types of Western Australia. This paper begins the process of management of these important and visual, landscape resources which exist throughout the State.

The paper includes a detailed description of an example landscape character type - the Scott Coastal Plain. This narrow coastal strip incorporating a distinct dunal subtype stretches from Augusta to east of Albany and largely encompasses the D'Entrecasteaux National Park and the proposed extensions to the Park. It is one of 44 landscape character types identified State-wide. In addition to the D'Entrecasteaux National Park this landscape character type is also represented in other secure conservation reserves along the south coast including the Walpole-Nornalup National Park, Scott National Park, Torndirrup National Park and Two Peoples Bay Sanctuary. These are described in the EPA's Redbook for Systems 1, 2, 3 and 5.

Clearly the landscape character type for the D'Entrecasteaux National Park is well represented and secured in other conservation reserves.

12. The reference to 80% public support in pages 28 and 29 of the Public Environmental Review must not be taken out of context. It will be misleading if this occurs. The Public Environmental Review specifically states that no quantitative conclusions were drawn from the numbers of people attending the public information days. Each person attending the displays was spoken to by a staff member from either the proponent or the consultant. After they left, based on the discussion, a note was taken not only of the numbers attending but also whether they were against or in favour of the proposal as presented. An approximate categorisation was then made into those in favour, those against and those who did not indicate either way. The results of this categorisation are included in the Public Environmental Review.

This is not a formal survey and has not been portrayed as such. It forms part of the description of the public participation programme carried out as part of the EPA's assessment process.

13. There may be some unintentional ambiguity in Section 4.12 which describes the historical use of the land as the initial reference to "the area" is meant to consider the Park and its surrounds. This should be clarified as the early history pre-dates the definition of the Park boundaries and while the information is intended to be relevant to the Park itself, some of the description relates

to surrounding areas. Hence the reference to large areas of forest being cleared is in relation to the group land settlement scheme in the 1920's which did impact on the forested areas adjacent to the current Park boundaries.

The reference to extensive damage to natural vegetation should be read in the context of the total sentence in which it is used. It is not a reference to extensive damage through the entire Park, but refers to the type of damage caused (extensive) by the particular type of exploration activity (blasting, bulldozing) at the sites where that exploration took place. We agree that this damage was localised to a small proportion of the Park area and did not intend to indicate otherwise.

In fact, this historic exploration is comparable to the current proposal to explore in approximately 5% of the Park initially and then more intensively in 0.5-1.0% of the Park. Using modern exploration techniques as applied to heavy minerals far less damage to the vegetation will occur in comparison to the earlier oil exploration.

14. Section 4.13 summarises the nature and type of recreational use of the Park and is based on the description contained in the CALM Management Plan in pages 41 and 42. The statement that the level of recreational use is low is a judgement made in terms relative to other National Parks and conservation areas which are closer to major population centres and/or more accessible in terms of tracks, roads and weather conditions. This description is consistent with the CALM Management Plan where page 3 states: "At present the Park is not extensively used by the general public, although the beaches are used, particularly by local people".
15. The climate of the D'Entrecasteaux National Park is described in the CALM Management Plan as being characterised by warm, dry summers and cool, wet winters. The annual rainfall is amongst the highest in the State (1300mm in the central parts of the Park) with 75% occurring between April and October. Heavy rainfall (over 20mm per day) occurs mainly in winter but can occur throughout the year with summer rain more consistently experienced on the coast than on inland areas.

Temperature ranges are more moderate near the coast than inland. So that the average daily temperature in summer on the coast is 19°C, while inland at Pemberton it is 25°C. As a result of these temperatures and the low summer rainfall, a relatively low humidity level is experienced in summer falling from about 65% in the morning to 40% in the afternoon.

17. The description of off-track activity has been expanded by reference to three examples of probable exploration in the field in off-track areas. This has been dealt with in the response to issue 7 above.

Prevailing winds are described in the Management Plan as being of high speed decreasing with distance from the coast. In the period November to April the prevailing winds are from the south-east.

The climatic description above focuses on the summer months when the proposed exploration programme will be concentrated. As indicated in the Public Environmental Review (pages 20, 30, 37 and 38) the use of dry soil conditions will be optimised.

The climatic records for the Park show that the average number of rain days during the drier summer months are 9 in December, 6 in January, 6 in February and 8 in March. These statistical records indicate clearly there will be considerable scope for dry field conditions. The normal test for determining dry field conditions is those soil conditions where soil particles do not stick by moisture to vehicle wheels passing over them.

There are areas of the Park in which because of the climatic conditions, the low lying nature and the proximity to permanent waterbodies, there may never be dry soil conditions. Such areas will be carefully evaluated in the field in terms of dieback, vegetation and soil conditions. As already stated in the Public Environmental Review, liaison with local CALM officers will take place to determine the acceptability of the timing and location of the exploration activity. It can also be noted that in some instances due to the nature and density of vegetation off-track the vehicle wheels will sit on the vegetation above the soil. This issue is also discussed in the response to CALM Issue 10. The CALM submission in page 2 in referring to Section 5.2 (Pages 19-21) states that "in certain extreme cases where soil may be damp even during summer, access may be possible if stringent dieback hygiene precautions are carried out". In past exploration activity in accordance with Geoscientific Survey Permit's, regular consultation with local CALM officers has been carried out which has allowed exploration to proceed in these conditions.

16. The bibliographical listing of How, RA et al was transposed in error from an earlier report prepared by W G Martinick and Associates and used as one of the sources for the Public Environmental Review. The correct listing is:

How, RA, J Dell and WF Humphreys (1987).
The ground vertebrate fauna of coastal areas between Busselton and Albany, Western Australia. Records WA Museum, 13(4): 553-574.

Appendix 2

**Department of Mines
Proposed Conditions**

1. The authorised explorer undertaking exploration and environmental management activities as described in the document titled "Exploration in the D'Entrecasteaux National Park, Public Environmental Review", prepared in June 1991 by W. G. Martinick & Associates Pty. Ltd., for Cable Sands (WA) Pty. Ltd., and filed on Department of Mines file MF744/91. The authorised explorer shall comply with the commitments in that document, in the letter from W. G. Martinick & Associates to the Environmental Protection Authority dated 10th October 1991 and filed on Department of Mines file MF744/91, and as approved by the Environmental Protection Authority, and any further commitments as specified.

2. Prior to commencing any operations within the authorised area, including drilling or off-road vehicular activity, the authorised explorer preparing a program, including allowances for contingencies, for each phase of proposed exploration for approval of the State Mining Engineer in agreement with the Regional Manager, Department of Conservation and Land Management. Details of each phase shall be provided at least seven days prior to the proposed commencement date. The program shall include:

(1) Maps and/or aerial photographs showing the proposed locations of all routes and any sites of potential disturbance;

(2) The purpose, specifications and techniques of emplacement of temporary routes and life of such disturbances, etc;

(3) Descriptions of all vegetation types (in general terms), land forms, and unusual features likely to be disturbed by such proposed disturbances. The Regional Manager, Department of Conservation and Land Management, specifying the level of vegetation description;

(4) Proposals which may disturb any declared rare or geographically restricted flora and fauna;

(5) Techniques, prescriptions, and timetable for rehabilitation of all proposed disturbances;

(6) An undertaking to apply corrective measures for failed rehabilitation;

(7) Details of water requirements from within the authorised areas;

(8) Details of refuse disposal and methods;

(9) Proposals for instruction and supervision of authorised personnel and contractors in respect to environmental conditions; and

(10) Description of any anticipated environmental impacts, and programs for their management.

Operational changes to the program, other than those normally expected in mineral exploration activities, shall only be made after giving at least 24 hours notice to, and receiving approval from the State Mining Engineer and the Regional Manager, Department of Conservation and Land Management. Prior to commencing any component of the operations, the authorised explorer preparing an itinerary for submission to the Regional Manager, Department of Conservation and Land Management, and advising that officer at the earliest practical time of modifications to the itinerary.

3. Notwithstanding Regulation 97 of the Mining Regulations 1981 to the Mining Act 1978, there shall be no long-term blocking of other vehicle's movements on tracks, and co-operation shall be given to enable such vehicles to pass at the earliest practical time.
4. The authorised explorer, at their expense, filling all holes drilled and rehabilitating all areas disturbed during the term of the authority to explore to the satisfaction of the State Mining Engineer in agreement with the Regional Manager, Department of Conservation and Land Management. Rehabilitation being conducted no later than six months after disturbance, or as otherwise approved in writing by the State Mining Engineer. Drill holes are to be filled immediately after completion.
5. At agreed intervals the authorised explorer reporting to the State Mining Engineer and the Regional Manager, Department of Conservation and Land Management, on the progress of the operation and the rehabilitation program.
6. Within six months of expiry of the authority to explore, a geoscientific report shall be submitted to the Director General of Mines detailing all activities conducted within or related to the authorised area. The report is to describe areas visited, samples collected, collection methods, instruments and equipment used and detailed maps showing sampling sites, plus the results of all field activities and subsequent laboratory work, geological plans, assessments and conclusions of the work done.
7. The authorised explorer complying with and ensuring that all persons under its control operating in the authorised area are aware of and comply with the provisions of:

(1) the Conservation and Land Management Act, 1984, and the Regulations thereunder;

(2) the Bush Fires Act, 1954, and the Regulations thereunder;

(3) the Wildlife Conservation Act, 1950, as amended, and the Regulations thereunder (excepting the Regulations 46 a, b, c, d, g 1, L and O, insofar as non-compliance occurs as an unavoidable incident or reasonable consequence in the performance of the approved exploration program).

(4) the Aboriginal Heritage Act 1972 and regulations.

8. Prior to accessing the authorised area the authorised explorer shall consult with the Regional Manager, Department of Conservation and Land Management, and ensure that, where required, all vehicles and equipment entering designated areas are washed or blown down to remove soil and plant propagules, and adhering to such conditions specified by the Regional Manager, Department of Conservation and Land Management, for the prevention of the spread of water- or soil-borne plant diseases.
9. Air will be the usual drilling circulation medium, although water injection will be permitted if necessary but without containing drilling additives. All water used shall be treated with sodium hypochlorite or other approved fungicide at a concentration as specified by the Regional Manager, Department of Conservation and Management.
10. Access to and from, and the movement of vehicles within the authorised area being restricted to ground or seasonal conditions and routes approved under the program or as otherwise agreed by the Regional Manager, Department of Conservation and Land Management.
11. Prior to the cessation of the exploration activity, the authorised explorer notifying the State Mining Engineer and the Regional Manager, Department of Conservation and Land Management, and arranging an inspection as required.
12. All waste material, rubbish, plastic sample bags, and equipment being removed from the authorised area prior to, or at the termination of, the exploration program.
13. The authorised explorer making provisions to prevent spillage of fuel and discharge of pollutants, and for all exploration sites being kept free from any rubbish and being left in a clean and tidy state.
14. The authorised explorer not establishing any camp on the area unless the site and access has received prior approval of the Regional Manager, Department of Conservation and Land Management.
15. The authorised explorer not refuelling vehicles inside the authorised area unless otherwise approved by the Regional Manager, Department of Conservation and Land Management.

16. No soap, detergent or other foaming agent being used in any watercourse or rockhole nor any rubbish or other polluting material being deposited in any watercourse or rockhole.
17. Domestic animals, traps or firearms not being taken onto the authorised area.
18. If the authorised explorer defaults in making good any injury to the surface of the land or any disturbance thereon, the Executive Director, Department of Conservation and Land Management may carry out the work necessary to do so and recover the cost thereof in a court of competent jurisdiction from the authorised explorer.
19. The authorised explorer shall lodge with the Minister for Mines a security in the form of an unconditional performance bond in accordance with Section 126 of the Mining Act 1978 to cover the probable cost of the work referred to in paragraph 18 of these conditions.
20. Such further conditions for protection of the land and environment and rehabilitation of the land as the Minister for Mines with the concurrence of the Minister responsible for the Department of Conservation and Land Management may from time to time impose.

Appendix 3

Cable Sands (WA) Pty Ltd Environmental Management Commitments

SUMMARY OF COMMITMENTS

1. The proposed exploration programme will conform to the requirements of the Mining Act, the Environmental Protection Act, the Aboriginal Heritage Act, the Conservation and Land Management Act, the Heritage of Western Australia Act and the Wildlife Conservation Act.
2. Areas subject to subsequent mining application will be kept open for normal Park use until mining commences.
3. The Company will liaise with Department of Mines and the Department of Conservation and Land Management to keep them informed as to the location and level of exploration activity at any particular time.
4. Access routes for drilling will be marked out following botanical and archeological surveys to ensure avoidance of rare flora, significant vegetation and sites of cultural significance.
5. Wherever possible access routes will be located to avoid areas susceptible to soil compaction or erosion.
6. Areas subject to exploration will be mapped for dieback and hygiene points will be located at dieback boundaries.
7. Access routes, dieback boundaries, rare flora and culturally significant sites will be marked in the field using biodegradable materials.
8. Access routes for drilling will utilise existing and old tracks wherever possible.
9. Exploration activity will be conducted mainly during the dry seasons. Any exploration during the wetter periods will require the prior consent of the Department of Conservation and Land Management and will take into account all relevant environmental aspects especially control of the spread of dieback.
10. Access routes where possible will avoid high ground and will be designed to screen them from public view.
11. Drill sites on tracks will where possible, be chosen to allow other vehicles to pass.
12. Drill holes will be backfilled.
13. No overnight camping will occur inside the Park without the Department of Conservation and Land Management's prior knowledge and approval.

14. All refueling of vehicles will take place outside the Park boundaries unless otherwise approved by the Department of Conservation and Land Management.
15. All litter will be collected and taken away to the local Shire rubbish tips.
16. Additional suitable personnel required for the exploration programme will be employed from within local communities.
17. Geological survey information will be provided to the Department of Mines.
18. Any archeologically significant sites which are found will be reported to the Western Australian Museum.
19. Information obtained regarding rare flora and dieback mapping will be provided to the Department of Conservation and Land Management.
20. No drilling will occur in permanent water bodies or other environmentally significant features including Black Point, Black Head, Mount Chudalup and the limestone cliffs at Windy Harbour. An exclusion zone of 100 metres will be implemented for drilling near permanent waterbodies.

In additional there will be no exploration of rocky headlands, the steep vegetated seaward facing dunes of the Quindalup shoreline together with the frontal dune nearest the beach.

21. The implementation of appropriate management and the design of the exploration programme so as to protect any rare fauna species or its habitat that, if encountered, would otherwise be impacted by the exploration activity.
22. Regular (3 monthly) reports will be provided to the Environmental Protection Authority about progress (eg. numbers of days of activity, numbers of holes drilled on and off tracks, areas discarded, environmental surveys and management). The proponent is willing to discuss the form, detail and circulation of that information.
23. Barriers preventing public use of tracks will be replaced or created if the Department of Conservation and Land Management considers this to be desirable, so that no public use can occur.
24. No exploration activity will take place in areas of high public use during periods of peak recreation use such as long weekends.

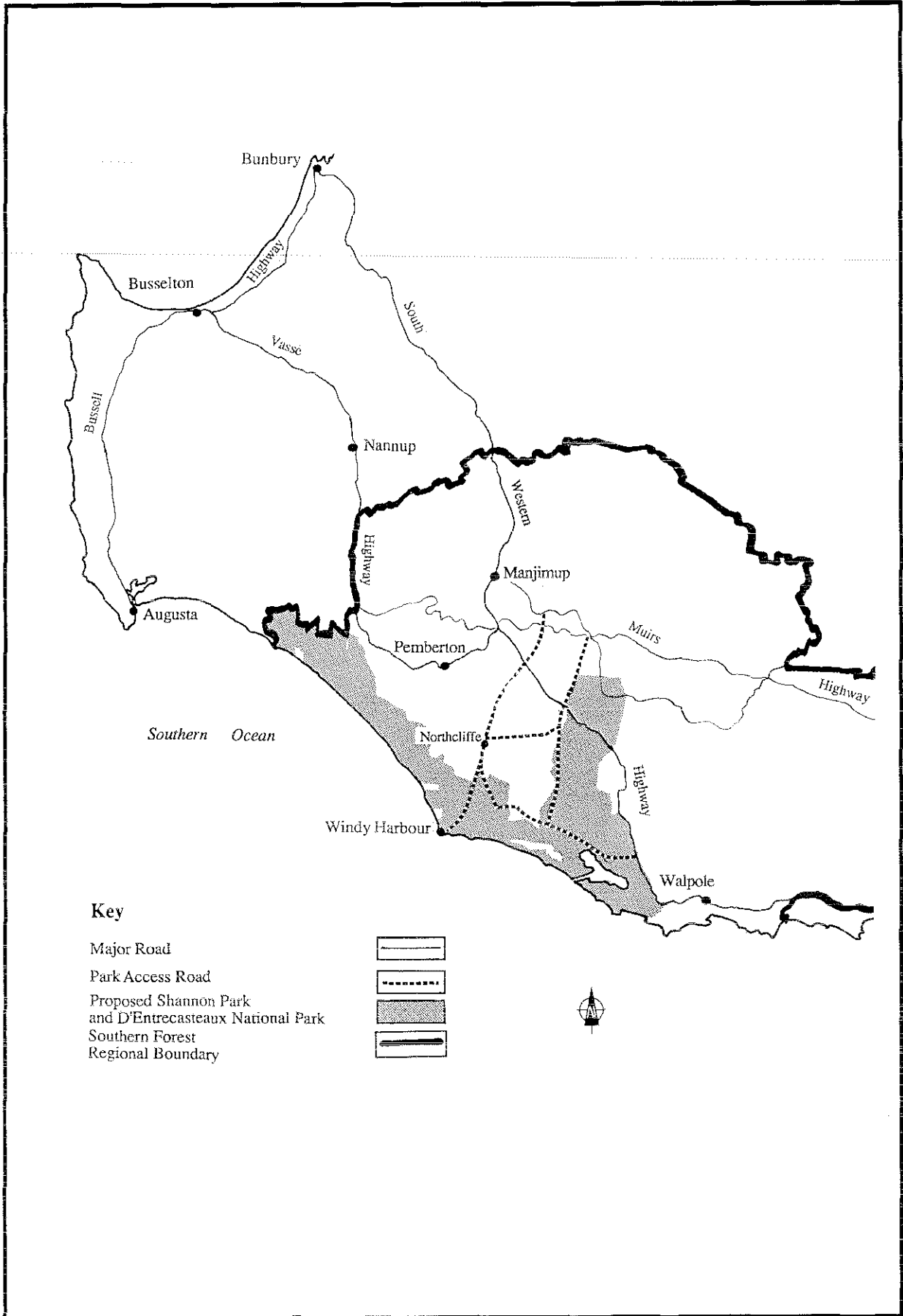


Figure 1. Location of the proposed and existing D'Entrecasteaux National Park

EXPLORATION IN THE
D'ENTRECASTEAUX NATIONAL PARK

PUBLIC ENVIRONMENTAL REVIEW

RESPONSE TO ISSUES NOMINATED BY
BY THE ENVIRONMENTAL PROTECTION
AUTHORITY AND THE DEPARTMENT OF
CONSERVATION AND LAND MANAGEMENT

SUMMARY OF ISSUES AND QUESTIONS RAISED

1. Measures to prevent the spread of dieback disease by other means than vehicles, such as by footwear and drill stems, should be described.
2. Certain submissions query the evidence, or lack thereof, for the generalisation that "it is probable that much of the flora has been severely reduced" (pg 13, para 3). Could you provide supporting evidence.
3. The use and rehabilitation of the tracks closed to the public should be adequately described.
4. Measures for the protection and identification of unknown flora, which almost certainly would be discovered, should be described. Reference should have been made to publications such as - Rare and Threatened Australian Plants. CSIRO, 1988.
5. Certain submissions query the statement that flattened shrubs will recover in 1 - 2 years. Could you provide evidence supporting the statement.
6. Figure 1 of the Public Environmental Review is inaccurate in showing the extent of the existing park and should be corrected. For example, Point D'Entrecasteaux and the surrounding area is gazetted and named as the D'Entrecasteaux National Park.
7. The lack of detail about the specific sites of the off-track exploration activity have made it difficult to assess the potential environmental impact. Can the proponent identify at least a typical location of initial activity and provide sufficient detail about the characteristics of that site and the probable exploration activity? For example, has sufficient knowledge been gained from the geoscientific survey activity about the area south of Jangardup to allow this exercise to be done?
8. Section 4.8 is quite inadequate as it is quite likely from current known fauna distributions that as many as five species of vertebrates listed on Schedule 1 and one species from Schedule 2 of the Wildlife Conservation Act could occur in the area. The statement that "the fauna is neither rich nor abundant", when there has been no detailed fauna surveys and no review of current literature and Museum records, requires justification. At the least a commitment should be made that should any information about a fauna species become known which indicates that it, or its habitat, requires protection from the exploration activity, that the proponent would implement appropriate measures. Numerous endangered species possibly occur in the park - the Southern Brown Bandicoot, the Western Quoll, the Brush Tailed Phascogale, the Yellow Footed Antechinus, the Western Pygmy Possum, the Tamar Wallaby and the Honey Possum. An attempt to identify such fauna and describe measures to protect them and their habitats should be made.
9. Other diseases apart from Phytophthora, such as Canker fungi, Botryospheria and Armillaria, are not discussed and protective measures may be required to control their spread.
10. The PER failed to address certain of the guidelines and this should be rectified - the need for the proposal, mechanisms/options/commitment/impact assessment for excision and replacement areas, the regional/state/national context of the biological values of the park, alternatives to exploration and possibly mining in this area, identification of areas of high conservation value (including wilderness) that would not be explored (cross referenced to CALM's Management Plan maps, for example, map 13) and the provision for on-going plans for public information (to allay social concerns) and public access management during the programme. Also, there is a mistake in the guideline in Section 5 relating to identifying the direct and indirect environmental impacts: the word "qualifications" has been substituted for "quantification". No attempt at quantification of the impacts has been made.
11. The interpretation of the landscape values of the park (Section 4.17) is exceedingly simplistic and not in accord with CALM's description of the landscape values. In a regional sense, the landscape character type, the Scott Coastal Plain, extends from Augusta to Albany. What proportion of this character type is within secure conservation reserves?
12. Certain submissions questioned the estimation of the public support for the proposal at 80% as being misleading in the extreme. Could the basis for the estimation be provided or further information to support the proponent's statement on this important social issue.
13. Section 4.12 is misleading in referring to "large areas of forest were cleared" and "extensive damage to vegetation" (from exploration activity) because, in the former case, the timber industry were largely outside the park area (little forest occurs in the park), and, in the latter case, the damage was localised to a miniscule proportion of the park area. If you do not agree

with this synopsis, could you provide more evidence to quantify your interpretation of the historical use of the land.

14. Section 4.13 is considered to significantly understate the current and future recreational use of the area, especially because of its wilderness qualities. Could you provide quantification for your estimate that "the level of recreational use is low".

15. Section 4 of the PER should have included a description of the climate of the area so an assessment of the possibility of dry-field conditions can be done. Certain submissions indicate that dry-field conditions in the wetlands of the park are rarely possible. Could you describe the procedure for determining dry field conditions.

16. The bibliography lists a reference by How, R. A., *et al*, 1987, as being "in press". It has been available since late 1987.

17. The proposed exploration programme is considered to understate the potential for off-track damage from the potential spread of dieback, protection of flora and vegetation, protection of fauna, etc. Taking account of the issues raised above, could you upgrade the off-track part of the programme to reflect the increased level of environmental investigation and control which would be necessary.

EPA ISSUES

1. Measures to prevent the spread of dieback by means other than vehicles will be taken at the same location and time that vehicle hygiene is carried out. The vehicle hygiene procedures described at pages 36 and 37 of the Public Environmental Review will be applied to all components of the exploration vehicles which might potentially come in contact with the pathogen. This includes for example the drill stems which will be used in the sample drilling programme. With regard to the footwear of the exploration staff and any other tools or sampling equipment used by them, the same procedures will be applied. The positioning of the vehicle in the hygiene area will allow as a final stage the washdown or blowdown of footwear of personnel immediately prior to them climbing into their cleaned vehicle and moving out of the hygiene area. Drilling crew activity will be managed so that no human movement occurs across boundaries between dieback infected and dieback free areas. Drilling personnel activity will thus be associated directly with the movement of vehicles so that no hygiene measures will need to be applied to drilling personnel separate from or without access to the hygiene facilities carried on the exploration vehicles.
2. The statement that "it is probable that much of the flora has been severely reduced" refers to the seasonally inundated areas and the impact of the dieback fungus. In this context it is a general statement expressed in probable, not definite terms. The probability of this being the case, in the absence of detailed and complete botanical surveys of the Park, is based on the following information.

In CALM's Management Plan (1987), Map 9 at page 72 shows large areas affected or at risk of infection by dieback disease. The marked areas correspond approximately to the seasonally inundated plains behind the coastal dunes. This is further amplified at page 82 by the statement that the flats and swamp areas are both highly susceptible and have a high risk of infection.

Detailed dieback surveys carried out at the Jangardup mine site adjacent to the D'Entrecasteaux National Park can also be referred to. The Jangardup ERMP (1989) describes at page 22, that of thirty three samples from dead or dying Banksia species, ten were found to contain Phytophthora cinnamomi demonstrating the very high levels of infection. The low lying areas were found to contain few species which appear to be highly susceptible and at Figure 6 the mapping of dieback infected areas clearly shows the widespread extent of the infection. Similar vegetation occurs in the existing and proposed areas of the D'Entrecasteaux National Park and

it is reasonable to draw general conclusions about similar areas in the Park by referring to Jangardup.

More recently Dr Ray Hart (Dieback in Mineral Exploration, Australia Institute of Geoscientists, Bulletin No. 11 1991 pages 113-116) has described the catastrophic impact of the fungi on the high susceptible Banksia woodlands and heaths of the south coast and gives specific references to studies carried out on the extent of the impact.

3. Reference is made in pages 38 and 44 of the Public Environmental Review to the use of tracks closed to the public, or old tracks.

The use of these tracks will be preceded by consultation with local CALM officers and the tracks will be managed in terms of dieback, rare flora, soil conditions, fauna, and other environmental impacts as described in the Public Environmental Review and where appropriate in this response document.

In particular, barriers preventing public use of the tracks will be replaced or created if CALM considers this to be desirable, so that no public use can occur.

Some but not all of these tracks will be overgrown. In such cases the same environmental management will be applied as for off-track areas, namely barriers will be created; bends will be designed in the route near the entry from existing tracks to reduce outside visibility; avoid high ground wherever possible; minimise vehicle movements; minimise damage to vegetation; minimise soil damage. These measures will result in the quick regeneration of the natural vegetation.

It should be noted that the construction and maintenance of barriers preventing the use of closed tracks is considered feasible for the gazetted areas of the Park.

Based on informal discussions with CALM officers, it is clear that problems exist in terms of the maintenance of such barriers in the proposed extensions to the Park. This is because the public is often aware that until the Park is gazetted, there is no legal authority preventing the removal or destruction of these barriers and the use of the tracks. Clearly, without any legal authority in existence it will not be possible to guarantee the maintenance of these barriers.

There will be some instances where due to the location and design of a new track, the creation of a barrier will only attract unwarranted attention and public activity. In these

circumstances a decision may be made in consultation with CALM not to erect any barriers.

4. The Public Environmental Review describes in section 7.2(a) the methodology to be used to identify rare flora in the field. There is no intention to conduct a comprehensive Park-wide botanical survey of rare flora. Botanical field work is proposed in specific relation to the design and location of the access routes to be used off-track for exploration purposes.

The EPA has referred to the protection and identification of unknown flora.

Most poorly described or unknown species are discovered during specific biological surveys when extensive collections are obtained and processed by comparison with Western Australia Herbarium specimens. As already indicated, it is not proposed to take extensive collections during the exploration programme. However, in determining access routes, the vegetation will be described in terms of structural units and botanical composition and unusual or uncommon plant species will be opportunistically collected and their taxonomic and conservation status will be determined. This will involve checking with the Western Australia Herbarium to determine the species name and conservation status.

After sampling, the access routes for exploration will be located so that outstanding stands of vegetation and the flora species under investigation are avoided totally by the exploration activity. It is proposed to use the following sources in the above identification process:

- CALM records, Western Australia Herbarium,
- Reserve List of Plants Considered for Declaration as Rare Flora. Unpublished report Department of Conservation and Land Management (1991),
- Western Australia's Endangered Flora. Hopper, van Leeuwen, Brown and Patrick, Department of Conservation and Land Management (1990).

5. The statement that flattened shrubs will recover in one to two years following use of a front end loader bucket or bush rake is primarily based on field observations and local knowledge. The proponent has observed such regrowth in State Forest areas immediately adjacent to the National Park and 4WD users in the heathland areas of the Park confirm the recovery of vegetation within the timeframe indicated.

The reference to shrubs confines the observation to understorey and groundcover. Small trees and saplings damaged in this way would not recover within one to two years. As indicated elsewhere in the Public Environmental Review the off-track access will be designed to minimise the impact on such stands of vegetation. The situation is conveniently summarised in a recent paper on Management of Exploration Impacts on Natural Ecosystems in the South West by B K Masters (Australian Institute of Geoscientists Bulletin No. 11, 1991: 121-127). He states that physical damage to vegetation is akin to damage from burning - new growth is produced from below ground and broken branches create new growing tips close to the damage site. This regrowth is sustainable in the Park because of the high rainfall.

Masters goes on to state the importance of ensuring that damage to vegetation is superficial and that absolutely minimal damage is done to the root system and lignotuber. He endorses the method of clearing described in the Public Environmental Review utilising above ground removal of dead branches by raking with a rake attached to a 4WD tractor and adjusted about 15cm above soil level and concludes that in this way plant regrowth is virtually guaranteed.

The process of regrowth will be greatly assisted by minimising the number of vehicle passes in off-track areas. The environmental impact management plan outlined in the Public Environmental Review is based on minimising such vehicular traffic.

6. A comparison of Figure 1 of the Public Environmental Review with Map 2 of the CALM Management Plan (1987) shows that two errors have been incorporated into the Public Environmental Review. Firstly, the area of Point D'Entrecasteaux and its surrounds should be shown in dark green (existing Park) not light green (proposed Park). Secondly, an area on the coast at Warren Beach, south of the mouth of the Warren River should be shown in dark green (existing Park) and not in light green (proposed Park).

These errors are acknowledged and regretted. It should be noted that the environmental impact assessment and management prescriptions set out in the Public Environmental Review apply identically to both the gazetted Park and the areas of the proposed extensions.

7. The Public Environmental Review does not contain specific site detail as it is not possible, without being misleading, to describe in exact terms what will occur at each site. This will depend on the outcome of the field surveys and the results of the various stages of exploration. In order to respond to the issue raised by the EPA, three examples are

set out based on available information. It must be stated that there is a degree of hypothesis in each of the following descriptions which will either be verified or varied once field work commences.

In each case the description of the probable activity off-track has been based on:

- the need to map dieback in advance of off-track vehicular access,
- the use of existing tracks as much as possible,
- minimising damage to vegetation,
- minimising the number of vehicle impacts off-track.

The type of information set out here will be made available to and discussed as appropriate with local CALM officers.

7a. Proposed Magnetometer Survey and Scout Drilling Conceptual Program West Quitjup

Cable Sands (WA) Pty Ltd proposes to carry out further exploration for heavy minerals in the West Quitjup area. This area was subject to a limited programme in 1990 when a Geoscientific Survey Permit was applied for and granted. The work involved several ground magnetometer traverses, the results of which verified the location of a previously identified aeromagnetic anomaly. A single hand auger and sludge hole was attempted but failed to locate any source for the anomaly as it did not reach the required depth. Further magnetometer lines and holes were planned but not undertaken due to the expiry of the survey permit.

The proposed exploration for the area involves additional magnetometer lines and scout drilling. The magnetometer lines will aim at further delineating the extent and orientation of the anomaly on the ground and will involve crews of two or three persons working on foot with hand held equipment. The likely position of the proposed magnetometer lines are shown in Figure 2.

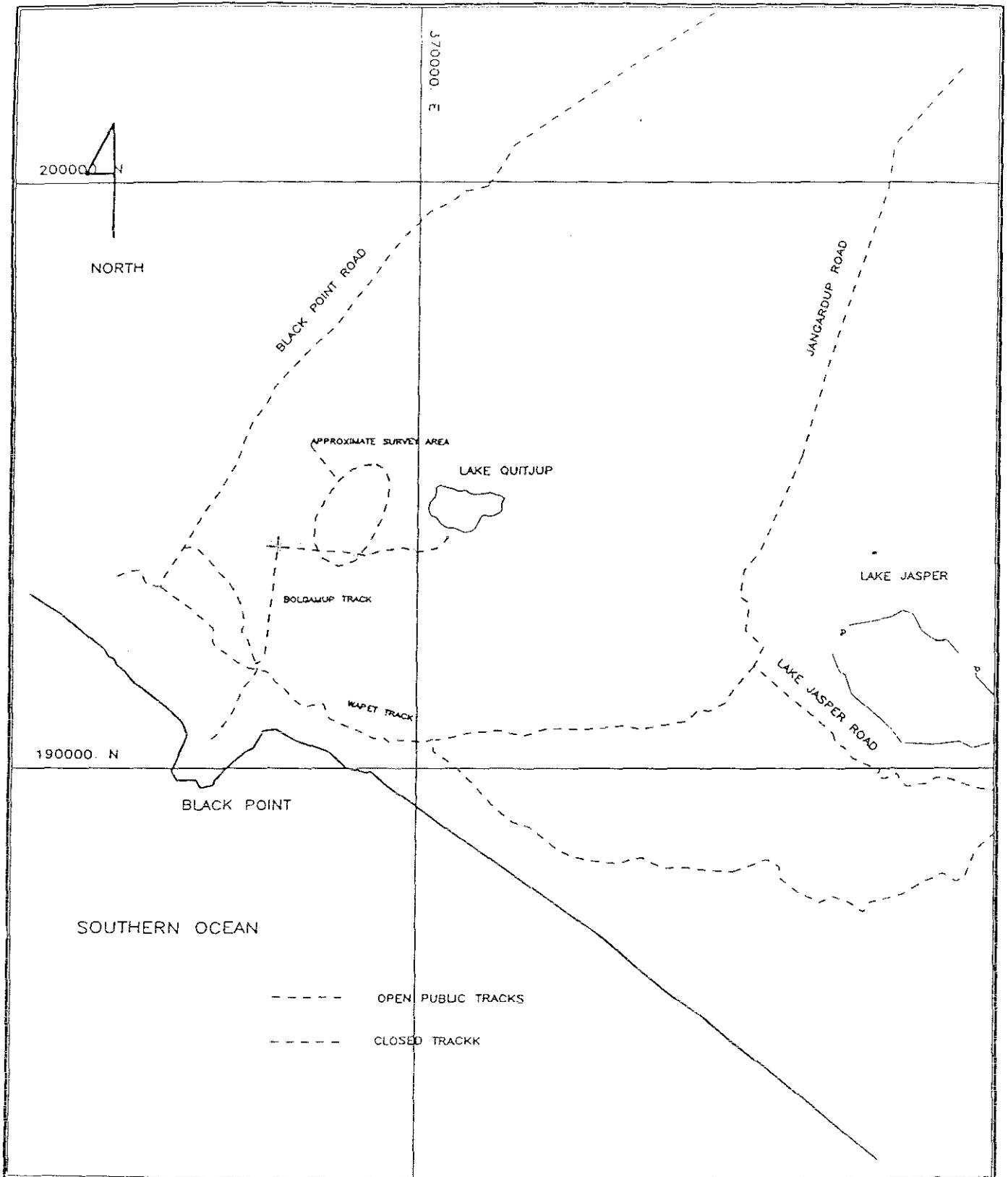
The results obtained from all magnetometer lines will then be used to determine the positioning of widely spaced scout drill holes. Drill holes will be roughly spaced on a 500m x 200m grid. The main aim of these drill holes will be to locate the source of the anomaly. If the source is found to be a deposit of heavy minerals, scout drilling will give a rough idea of the deposit's grade and extent. Any geological information gained will also prove useful for further exploration in the area. For display purposes only some likely drill hole positions, based on the magnetometer

lines done in 1990, are shown in Figure 2. Drilling equipment and procedures will be as described in the Public Environmental Review document.

Access to the area is shown in Figure 1. Access can be achieved to the area either along Black Point Road and then Bolgamup Track or along Jangardup Road, Lake Jasper Road, Wapet Road, Black Point Road and then Bolgamup Track. All access roads mentioned are currently open to the public except Bolgamup Track which is closed. This track was closed just prior to the previous exploration programme in 1990, access being prevented by a wooden gate which was erected by Cable Sands. Authorised access by vehicle is restricted to dry conditions only to prevent the spread of dieback along the track. Access along Black Point Road is dependent on seasonal conditions because it is subject to flooding during winter months.

Based on survey's at Jangardup to the north east of Lake Quitjup, and a preliminary literature survey, it is likely that the area concerned will comprise heath and scrub thickets, particularly in the vicinity of the Lake. The early Geoscientific Survey Permit work undertaken in consultation with CALM was on the basis that the area was dieback free but that a dieback hygiene point should be established at the entry to the Bolgamup Track and, subject to survey, at the off-track exit point. Following ground magnetometer work, the first off-track activity will be by a botanist and an assisting dieback interpreter on foot from the track in order to describe and confirm vegetation units following an earlier mapping based on aerial photographs, map the distribution of dieback, search opportunistically for rare flora, and take botanical samples as required.

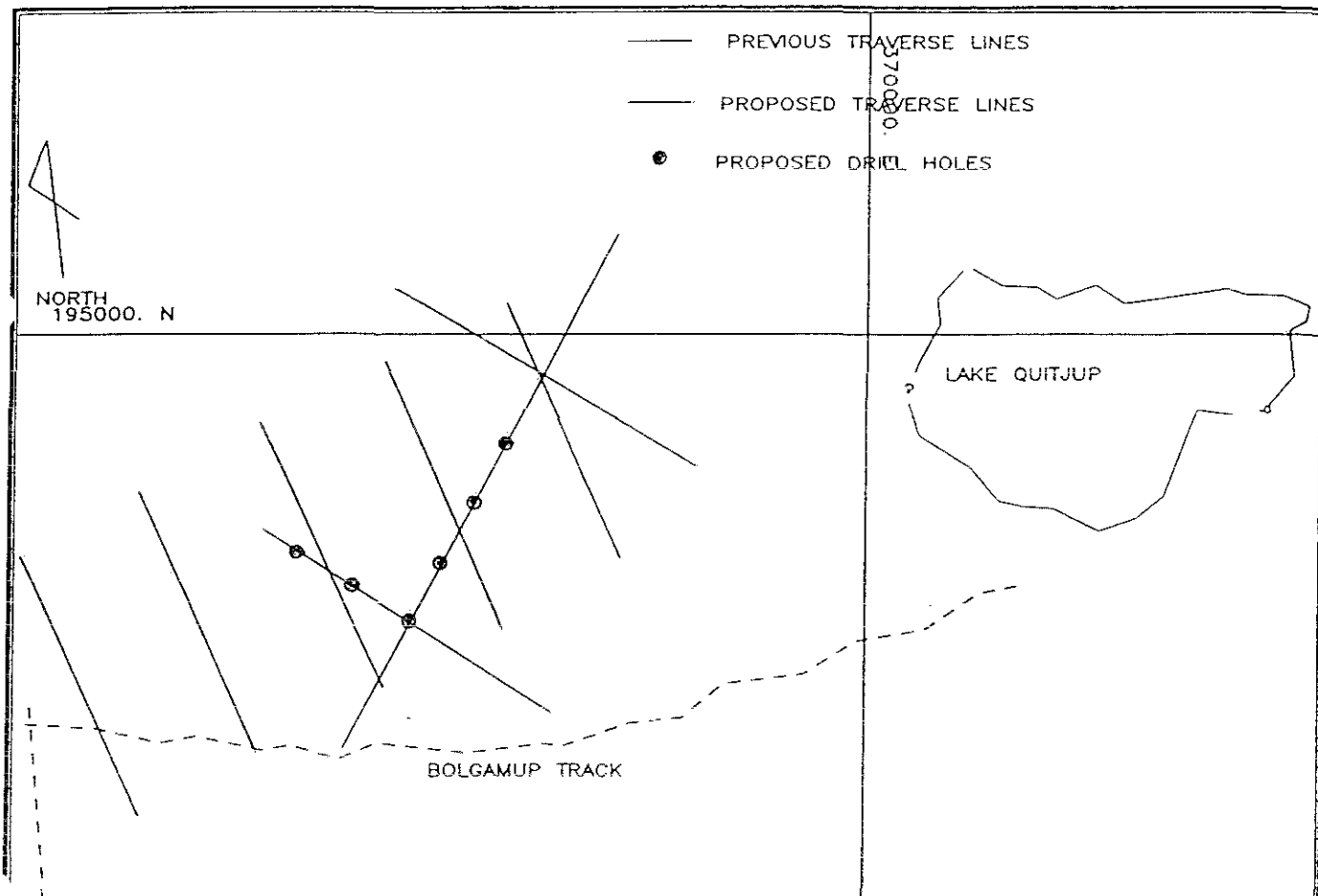
After a vegetation map has been prepared, complete with dieback distribution and terrain information, a dieback hygiene programme will be established for the exploration of the area. Dieback hygiene locations will be shown on the map complete with recommended routes. When this has been prepared the botanist will return to the field in advance of any drilling activities but in the company of a geologist if necessary, and on foot mark out the off-track access routes and the grid lines. During this visit the botanist will concentrate on rare flora to ensure that no rare flora will be damaged or destroyed by the use of these routes. He will also avoid damage to outstanding stands of vegetation. Subject to a predictive model based on aerial photos, literature surveys and museum records, an archeological survey may be carried out at the same time. Thus the location of the access routes will take into account dieback, significant vegetation, rare flora and archeological sites.



CABLE SANDS (WA) Pty Ltd

WEST QUITJUP PROPOSED EXPLORATION
ACCESS TRACKS

DRAWN : GPH	SCALE 1 : 75000	FIGURE 1
DATE : 9-Sep-91	CHECKED :	



CABLE SANDS (WA) Pty Ltd

WEST QUITJUP PROPOSED EXPLORATION
 MAGNETOMETER LINES AND DRILL HOLES

DRAWN : GPH	SCALE 1 : 20000	FIGURE 2
DATE : 6-Sep-91	CHECKED :	

The drilling crew, will then follow, drilling along the access tracks as marked in the field.

It should be noted that at nearest the proposed activity is approximately 600 metres away from Lake Quitjup. Based on the earlier work undertaken it is most likely that a front-end loader, as described in the Public Environmental Review will be used to flatten the very dense undergrowth in some parts in order to provide access for the drilling vehicles.

In summary, access to the survey area from the Bolgamup Track will be on foot in the case of the magnetometer and botanical surveys, and by vehicle along predetermined routes for scout drilling. Access by the drill rig and support vehicle to drill hole sites will, in this area, involve the use of a small rubber tyred front end loader or tractor. The procedures that will be used in choosing the route and then travelling along it will be as described in the Public Environmental Review document.

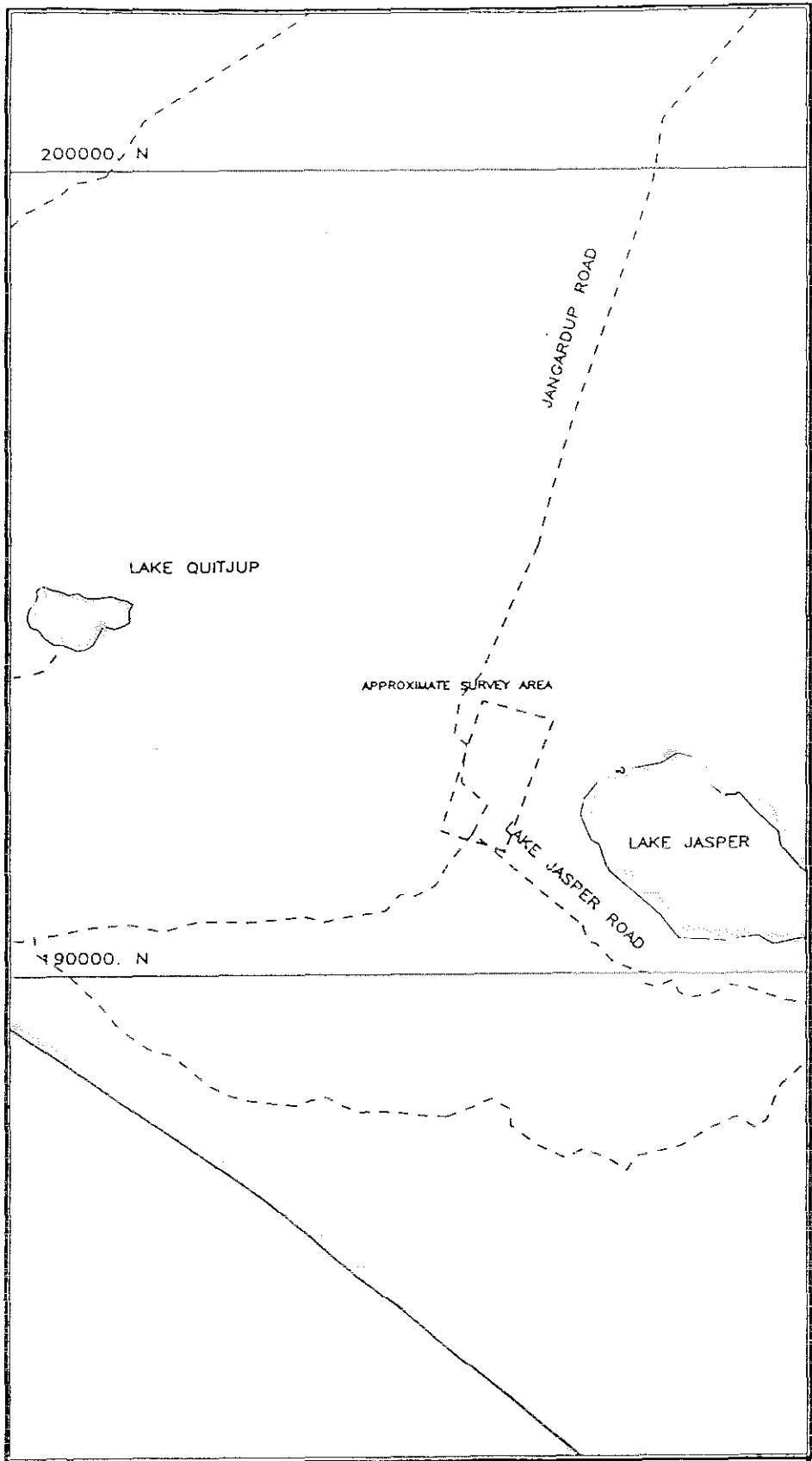
7b. Proposed Drilling Conceptual Program South Jangardup

Cable Sands (WA) Pty Ltd proposes to carry out further exploration for heavy minerals in the South Jangardup area. This area was subject to a limited exploration programme in 1990 when a Geoscientific Survey Permit was applied for and granted. The work involved several ground magnetometer traverses and hand drilling. The location of the survey area is shown in Figure 3.

Eight magnetometer lines were completed and the results indicated an anomalous zone, thought to be caused by an accumulation of heavy minerals. Augering and sludging of twenty four holes confirmed the presence of a deposit of heavy minerals. The locations of the magnetometer lines and the sites of hand drilling as completed in 1990 are shown in Figure 4.

It is proposed that further drilling be undertaken to establish the grade and extent of the accumulation of heavy minerals discovered in the previous work. The drilling will involve the use of a drilling rig mounted on a Toyota 4WD and a support vehicle. Drill lines will be 300m apart with drill holes spaced about every 100m. Initial drilling will be confined to this grid but subsequent drilling will be closer spaced and concentrate on the mineralised zone as its exact position becomes evident.

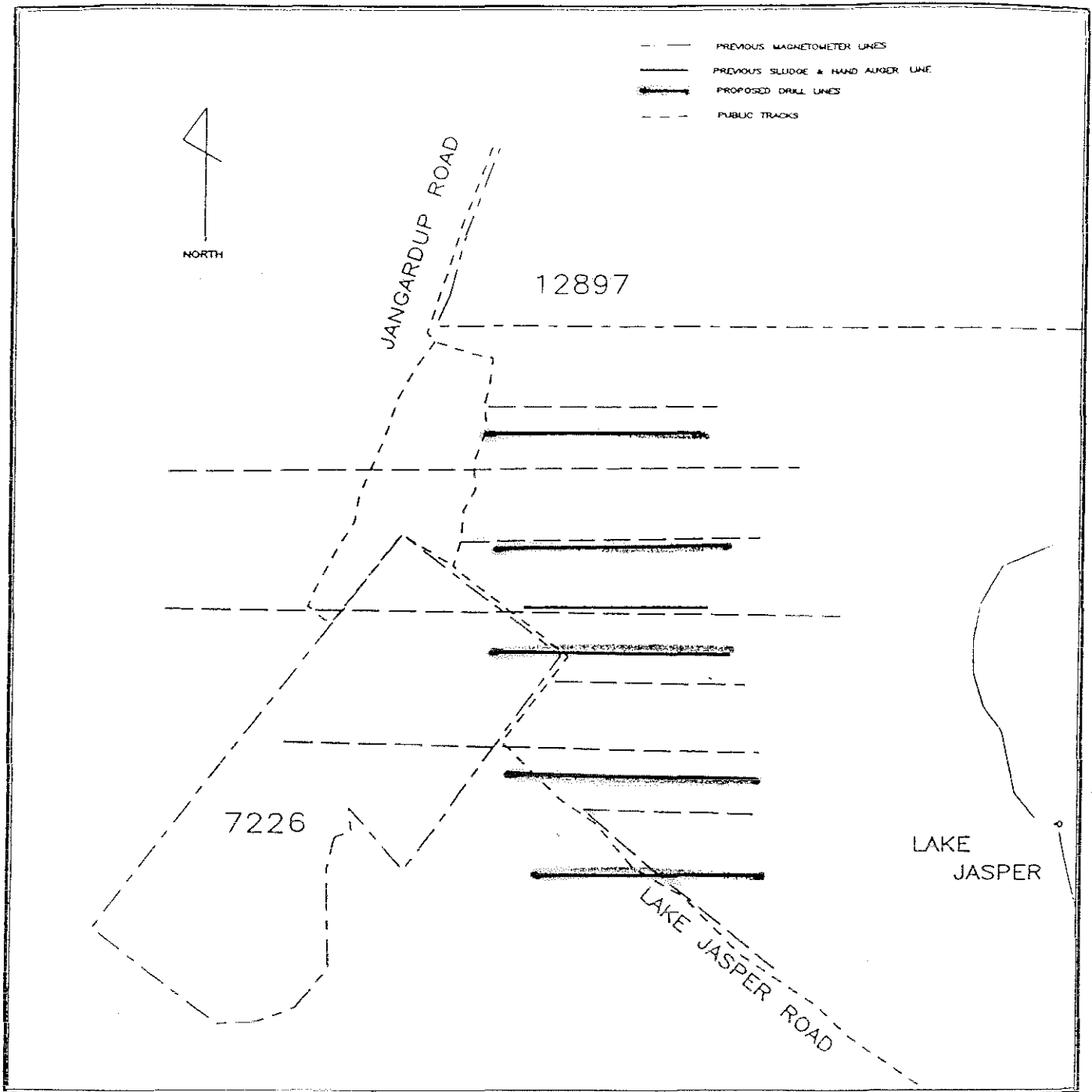
Access to the area will be along Jangardup Road and Lake Jasper Road. Access to drill sites will be from existing tracks and then by "picking" a way through the vegetation to avoid larger trees and shrubs. It is unlikely that a rubber



CABLE SANDS (WA) Pty Ltd

SOUTH JANGARDUP PROPOSED EXPLORATION
LOCATION AND ACCESS TRACKS

DRAWN : GPH	SCALE 1 : 70000	FIGURE 3
DATE : 9-Sep-91	CHECKED :	



CABLE SANDS (WA) Pty Ltd

SOUTH JANGARDUP PROPOSED EXPLORATION
 PREVIOUS WORK AND PROPOSED DRILLING

DRAWN : GPH	SCALE 1 : 15000	FIGURE 4
DATE : 9-Sep-91	CHECKED :	

tyred front end loader or tractor will be required to obtain access due to the openness of the vegetation. This area is vegetated by low heath with dense thickets occurring close to Lake Jasper. The proposed exploration activity is approximately 500m and more away from Lake Jasper.

Botanical and archeological surveys and the drilling activity will take place in the same sequence and the same manner as described for the West Quitjup area.

It should be noted that this area will be inaccessible in winter due to the proximity to Lake Jasper and the inundation which typically occurs in this area during the winter. Even in the drier months the soil may be damp and thus the dieback mapping, location and implementation of hygiene procedures will be carefully implemented.

7c. Location of Ancient Shorelines Conceptual Programme

The Jangardup and Jangardup South deposits are located along an ancient shoreline, the Donnelly shoreline, which was deposited when sea levels were some 35 metres higher than present.

The potential to locate further deposits along the Donnelly shoreline is considered good.

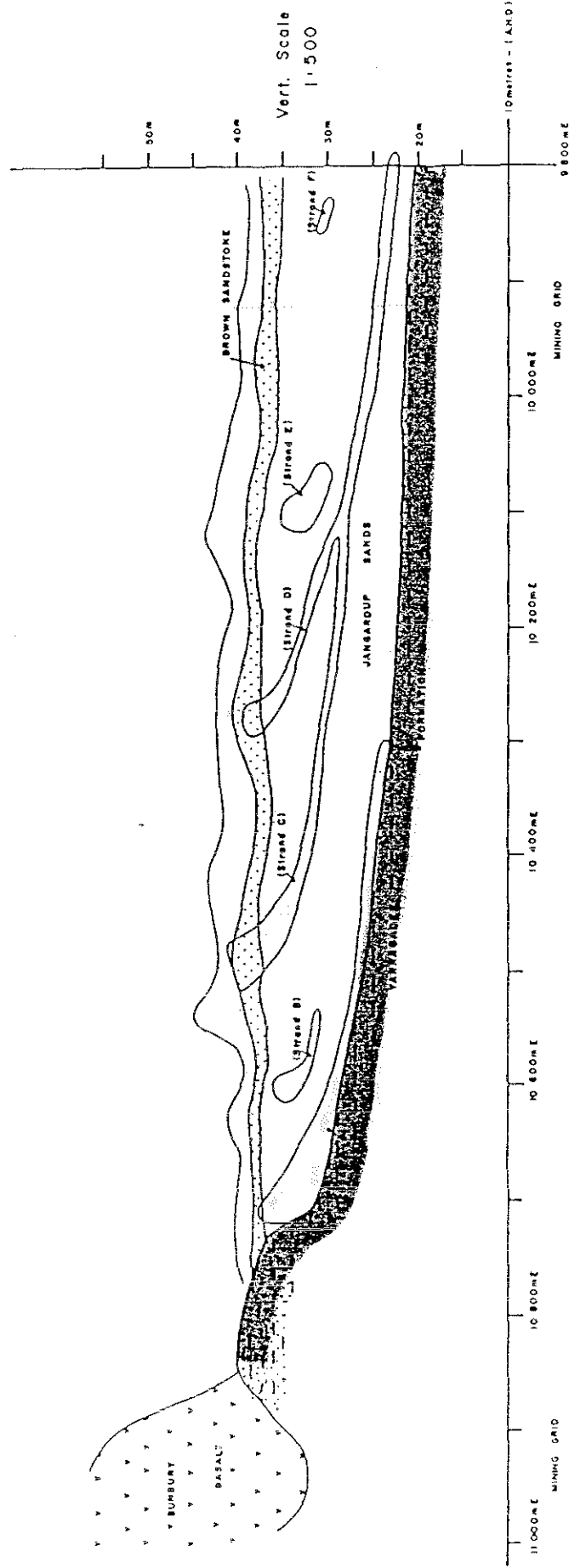
There are no obvious geomorphic features to indicate the presence of the Donnelly shoreline or other ancient shorelines. Consequently their locations can only be determined by drilling to locate a drop off in the basement sands of the Yarragadee Formation (see Jangardup cross sections-Figure 5).

The proponent will use scout drilling to identify the location of shorelines and follow up magnetometer surveys to check for the presence of minerals along the shorelines. Target areas will then be subject to scout drilling.

An example of how this approach will be applied is given for an area to the east of the Donnelly River (refer Figure 6).

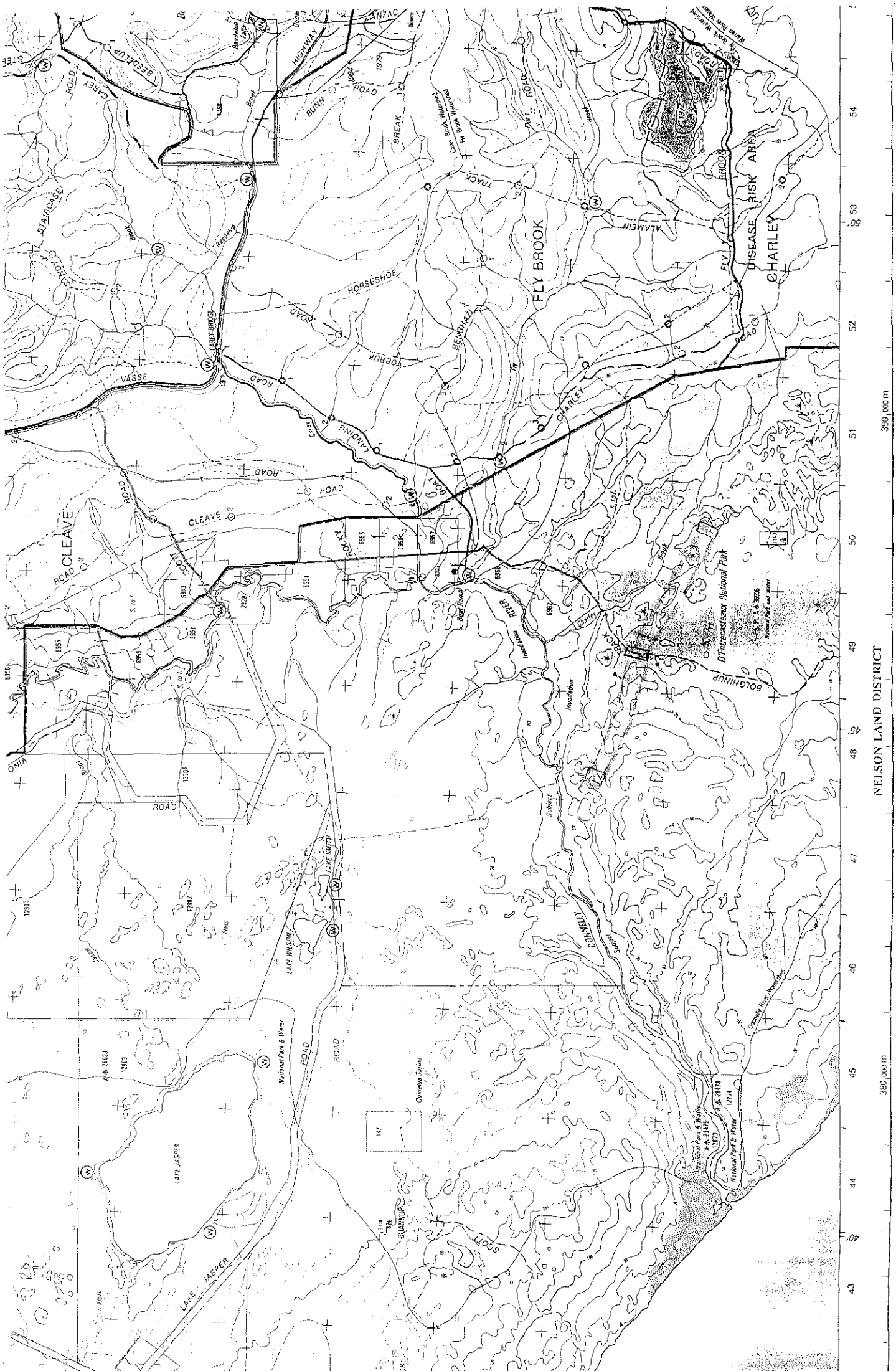
- Scout drill down Bolghinup Track as shown in green on the attached plan. This track is closed to the public and blocked by a CALM gate at the Boat Ramp Road end.
- Should the shoreline be crossed and identified at, for example the area marked in red, then further lines of scout drilling will be drilled as shown in yellow. This drilling will be intended to pick up the orientation of the shoreline. Drilling will require off-track access (dotted yellow line).

JANGARDUP
 SCHEMATIC CROSS SECTION OF OREBODY
 (LOOKING SOUTH)



Author: S.J.C.
 Drawn: C.M.A.
 Date: 8-11-66

FIGURE 5



NELSON LAND DISTRICT

350,000 m

43 44 45 46 47 48 49 50 51 52 53 54

- Results of the magnetometer survey (blue lines) will indicate the location of follow up drilling which will indicate if this area warrants upgrading to grid drilling or whether it should be abandoned.

In this hypothetical example a botanical survey will be carried out on foot on both sides of the track and a dieback map will be produced. Rare flora will be identified opportunistically at this time.

Based on topographical maps this area appears to be more undulating than the other examples and possibly contains a number of low dunes. Hypothetically, there may be a need to establish a number of off-track dieback hygiene points to enable clean downs before traversing over crests which are likely to be dieback free and down into swales which may be dieback infected. Access routes will be designed to minimise such crossovers. There are unlikely to be forests or woodland which need to be traversed by vehicle although it can be anticipated that depending on the distance of exploration from the existing track denser vegetation will be encountered to the west and that this vegetation will require the use of a front-end loader complete with a bush rake or shovel.

Botanical and archeological surveys and the drilling activity will be undertaken in the same sequence as described for the West Quitjup area.

8. Section 4.8 of the Public Environmental Review is brief and should be read in the context of the proposed exploration programme and the environmental management prescriptions. It is concluded that mortality of fauna will be avoided and faunal habitats will not be significantly affected because: off-track exploration is relatively limited in area, vehicular impacts are minimised, stands of significant vegetation are avoided, vehicles will be driven slowly and carefully, the noise and vibration created will cause birds and animals to move away, ground disturbance will be minimal and drill holes will be filled in immediately on completion of drilling.

The prescriptions set out in the Public Environmental Review are, for example, consistent with the description of exploration management in terms of its impact on fauna in the south west as set out in B K Masters, Australian Institute of Geoscientists, Bulletin No. 11, 1991: 121-127.

A commitment is given to implement appropriate management and design of the exploration programme so as to protect any rare fauna species or its habitat if encountered that would otherwise be impacted by the exploration activity.

9. In section 7.2 b) of the Public Environmental Review it is recognised that vehicles, machinery and drilling rigs have the potential to spread dieback and other pathogens and consequently a hygiene programme is described. No other pathogen was specifically identified in the Public Environmental Review. The EPA and CALM have indicated the need to refer particularly to the Canker fungi (Botryosphaeria sp) and Armillaria sp. These diseases do not spread in the same way as dieback; they are wind-borne fungi which attack plants via breaks, woodborers and other wounds.

The consideration of canker is particularly relevant for Banksia species. The fungi are transported by air currents and as yet there is no specific management policy to prevent its spread except that mechanical damage to vegetation should be minimised and the transfer of the infection in the form of roots and other plant material should avoided.

The exploration programme described in the Public Environmental Review is based on minimising off-track activity and avoiding significant stands of vegetation. Damage to vegetation will be kept to an absolute minimum by the design of off-track assess routes following botanical surveys which will take these factors into account. The clearance of areas of dense vegetation will occur above ground by flattening and not uprooting vegetation and all vehicles used will be subject to the hygiene procedures outlined elsewhere.

10. We believe the Public Environmental Review has largely addressed the guidelines nominated and our response and elaboration is set out below:

a) The need for the proposal: Page 5 of the Public Environmental Review describes the economic context and benefits which are associated with the proposal as well as a description of the scientific basis for the specific exploration technology proposed. We believe this information canvasses the need for the exploration programme.

b) Mechanisms/options/commitment/impact assessment for excision and replacement areas: Pages 8 and 9 of the Public Environmental Review refer to this issue in the context of the Government of Western Australia's stated policy. It is difficult to be more definitive as there is no certainty that applications for excision will be made in the first place. If applications are made, the number, size and locations are not known and the number, size and locations of replacement land can not therefore be considered. Even if this detail were available at this time it would clearly require a negotiation with appropriate government authorities the

outcome of which can not be predicted. Any excision requires the approval of both Houses of Parliament which can not be predicted and any approval for mining will clearly involve the EPA's assessment process and the identification of all relevant environmental impacts. Full details of replacement land will form part of any excision application made by the proponent in the future when the relevant facts are known.

- c) The regional/state/national context of the biological values of the Park: Pages 6, 7 and 8 of the Public Environmental Review describe a statutory and policy framework for consideration of the proposal. Within this description references are made to various regional and state studies which have considered the importance of the Park and its biological values, the history of its gazettal and the proposals to extend the Park. Particular reference is made to the relevant State and Federal legislation which apply to the Park and its conservation status and importance.
- d) Alternatives to exploration and possibly mining in this area: Page 33 of the Public Environmental Review makes brief reference to the availability and likelihood of prospectivity for heavy minerals outside the area. During the last two decades parts of the State considered prospective have been explored in detail. As a result of this exploration mineable deposits have only been located on the Swan and Scott Coastal Plains. The Swan Coastal Plain is currently being mined at several locations between Geraldton and Cape Naturaliste.

The Public Environmental Review summarises this issue, based on this geological knowledge and aerial surveys of the Scott Coastal Plain.

- e) Identification of areas of high conservation value, including wilderness, that would not be explored (cross referenced to CALM's Management Plan maps, for example, Map 13): Page 31 and 32 of the Public Environmental Review refers to this issue and specific areas are detailed. The original guidelines did not specifically refer to wilderness which is defined in a recent CALM discussion paper about Zoning for National Parks in Western Australia, as "special areas in which the influence of man is reduced to a minimum and in which the expression of nature can be readily seen." The paper goes on to state that "if wilderness areas should be declared, they should be seen for what they are, selected parts of a few national parks." The nature and extent of the proposed exploration activity as described in the Public Environmental Review and the

environmental management programme outlined are consistent with this definition.

The total context of the Public Environmental Review should be read to deal with the elements and components which underlay the high conservation value of the Park.

Reference to CALM Management Plan Map 13 highlights some areas containing delicate and unusual geological features. The areas of Point D'Entrecasteaux and Black Point are referred to in the Public Environmental Review. A third area near Black Head will also be included as a high conservation area not to be explored.

The map also includes areas of fragile and rare plant communities and where there is susceptibility to soil erosion and degradation. These are widespread throughout the Park and the Public Environmental Review describes a management plan to avoid environmental impacts in these areas on a localised basis relating to specific exploration activity.

- f) Provision for on-going plans for public information (to allay social concerns): It should be recognised and accepted that there is an amount and level of social concern reflected in the submissions received in response to the Public Environmental Review which will only be allayed by the total prohibition of exploration in the Park. On-going public information about progress and the extent of exploration to date may confine that public concern to specific areas of the Park but it will not allay such concerns.

At a meeting with EPA staff on 3 July 1991 following the release of the Public Environmental Review, the proponent agreed to provide regular (3 monthly) reports to the EPA about progress (eg. numbers of days of activity, numbers of holes drilled on and off tracks, areas discarded, environmental surveys and management). That commitment is re-stated here. The proponent is willing to discuss the form, detail and circulation of that information. The Public Environmental Review describes the proposed relationship with CALM in terms of proposed field activities. It may be for example that CALM would not want certain information about off-track activity publicly available so that public access is not encouraged. Pages 29 and 30 of the Public Environmental Review deal with the provision of geological information to CALM, the Department of Mines and the EPA.

- g) Public access management during the programme: Page 40 of the Public Environmental Review refers the impact of the exploration activity on recreational use and enjoyment of the land by the public. Management of any other form of public access will be carried out lawfully and consistent with CALM's own management of the Park.
- h) No attempt at quantification of the impacts has been made: A typographical error occurred in Section 5 referring to qualifications instead of quantification. The Public Environmental Review deals with quantification of impacts at various points. The extent of exploration is referred to at page 23; the proportion on and off-tracks at page 21, the number and location of magnetic anomalies at figure 3; the location of tracks at figure 4; estimates of the scope of scout and grid drilling at pages 23 and 24, tables 3 and 4; specific examples of areas where no exploration will occur at page 31.

As has been explained in the Public Environmental Review the nature of exploration is such that a definitive description of actual impacts on vegetation, flora, archeological sites, dieback and soil conditions is not possible until activity occurs in the field and the actual exploration programme is planned in detail for a particular area. Thus a management programme has been devised dealing with these environmental issues and setting out how they will be quantified (eg. dieback maps) as a result of the field work which will precede the exploration drilling.

- 11. Section 7.2(m) of the Public Environmental Review addresses the guideline included in Section 5 of the EPA guidelines which refers to a landscape analysis of the impacts. Section 4.17 refers in general terms to the landscape values of the existing environment (Section 4 of the EPA guidelines refers) and we consider this section to be consistent with CALM's description of landscape values. More detailed descriptions of vegetation and landforms are given in pages 11 and 12 of the Public Environmental Review.

CALM's Management Plan refers to six major landscape types represented in the Park, namely: Forest; Savannah Woodland; Coastal Scrubland; Wetlands/Waterscopes' Coastal; and Other. The diversity of the landscape is emphasised and the landscape quality is often a function of the interaction between the different elements. The Management Plan also indicates that the landscape is subject to change from natural and human forces but large areas still retain their natural character.

The EPA has made available a preliminary draft of a paper compiled by A Stuart-Street and B Kirkpatrick, about Landscape Character Types of Western Australia. This paper begins the process of management of these important and visual, landscape resources which exist throughout the State.

The paper includes a detailed description of an example landscape character type - the Scott Coastal Plain. This narrow coastal strip incorporating a distinct dunal subtype stretches from Augusta to east of Albany and largely encompasses the D'Entrecasteaux National Park and the proposed extensions to the Park. It is one of 44 landscape character types identified State-wide. In addition to the D'Entrecasteaux National Park this landscape character type is also represented in other secure conservation reserves along the south coast including the Walpole-Nornalup National Park, Scott National Park, Torndirrup National Park and Two Peoples Bay Sanctuary. These are described in the EPA's Redbook for Systems 1, 2, 3 and 5.

Clearly the landscape character type for the D'Entrecasteaux National Park is well represented and secured in other conservation reserves.

12. The reference to 80% public support in pages 28 and 29 of the Public Environmental Review must not be taken out of context. It will be misleading if this occurs. The Public Environmental Review specifically states that no quantitative conclusions were drawn from the numbers of people attending the public information days. Each person attending the displays was spoken to by a staff member from either the proponent or the consultant. After they left, based on the discussion, a note was taken not only of the numbers attending but also whether they were against or in favour of the proposal as presented. An approximate categorisation was then made into those in favour, those against and those who did not indicate either way. The results of this categorisation are included in the Public Environmental Review.

This is not a formal survey and has not been portrayed as such. It forms part of the description of the public participation programme carried out as part of the EPA's assessment process.

13. There may be some unintentional ambiguity in Section 4.12 which describes the historical use of the land as the initial reference to "the area" is meant to consider the Park and its surrounds. This should be clarified as the early history pre-dates the definition of the Park boundaries and while the information is intended to be relevant to the Park itself, some of the description relates

to surrounding areas. Hence the reference to large areas of forest being cleared is in relation to the group land settlement scheme in the 1920's which did impact on the forested areas adjacent to the current Park boundaries.

The reference to extensive damage to natural vegetation should be read in the context of the total sentence in which it is used. It is not a reference to extensive damage through the entire Park, but refers to the type of damage caused (extensive) by the particular type of exploration activity (blasting, bulldozing) at the sites where that exploration took place. We agree that this damage was localised to a small proportion of the Park area and did not intend to indicate otherwise.

In fact, this historic exploration is comparable to the current proposal to explore in approximately 5% of the Park initially and then more intensively in 0.5-1.0% of the Park. Using modern exploration techniques as applied to heavy minerals far less damage to the vegetation will occur in comparison to the earlier oil exploration.

14. Section 4.13 summarises the nature and type of recreational use of the Park and is based on the description contained in the CALM Management Plan in pages 41 and 42. The statement that the level of recreational use is low is a judgement made in terms relative to other National Parks and conservation areas which are closer to major population centres and/or more accessible in terms of tracks, roads and weather conditions. This description is consistent with the CALM Management Plan where page 3 states: "At present the Park is not extensively used by the general public, although the beaches are used, particularly by local people".
15. The climate of the D'Entrecasteaux National Park is described in the CALM Management Plan as being characterised by warm, dry summers and cool, wet winters. The annual rainfall is amongst the highest in the State (1300mm in the central parts of the Park) with 75% occurring between April and October. Heavy rainfall (over 20mm per day) occurs mainly in winter but can occur throughout the year with summer rain more consistently experienced on the coast than on inland areas.

Temperature ranges are more moderate near the coast than inland. So that the average daily temperature in summer on the coast is 19°C, while inland at Pemberton it is 25°C. As a result of these temperatures and the low summer rainfall, a relatively low humidity level is experienced in summer falling from about 65% in the morning to 40% in the afternoon.

17. The description of off-track activity has been expanded by reference to three examples of probable exploration in the field in off-track areas. This has been dealt with in the response to issue 7 above.

Prevailing winds are described in the Management Plan as being of high speed decreasing with distance from the coast. In the period November to April the prevailing winds are from the south-east.

The climatic description above focuses on the summer months when the proposed exploration programme will be concentrated. As indicated in the Public Environmental Review (pages 20, 30, 37 and 38) the use of dry soil conditions will be optimised.

The climatic records for the Park show that the average number of rain days during the drier summer months are 9 in December, 6 in January, 6 in February and 8 in March. These statistical records indicate clearly there will be considerable scope for dry field conditions. The normal test for determining dry field conditions is those soil conditions where soil particles do not stick by moisture to vehicle wheels passing over them.

There are areas of the Park in which because of the climatic conditions, the low lying nature and the proximity to permanent waterbodies, there may never be dry soil conditions. Such areas will be carefully evaluated in the field in terms of dieback, vegetation and soil conditions. As already stated in the Public Environmental Review, liaison with local CALM officers will take place to determine the acceptability of the timing and location of the exploration activity. It can also be noted that in some instances due to the nature and density of vegetation off-track the vehicle wheels will sit on the vegetation above the soil. This issue is also discussed in the response to CALM Issue 10. The CALM submission in page 2 in referring to Section 5.2 (Pages 19-21) states that "in certain extreme cases where soil may be damp even during summer, access may be possible if stringent dieback hygiene precautions are carried out". In past exploration activity in accordance with Geoscientific Survey Permit's, regular consultation with local CALM officers has been carried out which has allowed exploration to proceed in these conditions.

16. The bibliographical listing of How, RA et al was transposed in error from an earlier report prepared by W G Martinick and Associates and used as one of the sources for the Public Environmental Review. The correct listing is:

How, RA, J Dell and WF Humphreys (1987).
The ground vertebrate fauna of coastal areas between Busselton and Albany, Western Australia. Records WA Museum, 13(4): 553-574.