Proposed offshore petroleum exploration drilling in EP TP/7 and TL/2, North West Shelf

Western Mining Corporation Ltd

Report and recommendations of the Environmental Protection Authority

Environmental Protection Authority
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Summary and recommendations

In August 1990 Western Mining Corporation Limited - Petroleum Division (Australasia) (WMC) submitted a proposal for drilling within petroleum exploration permit areas TL/2 and TP/7, to the south west of Barrow Island (see Figure 1).

The Authority has previously assessed several offshore petroleum exploration proposals in the region and wishes to maintain a consistent policy toward subsequent proposals. The Authority's general position on this sort of proposal may thus be summarised as follows:

- land-based petroleum exploration proposals can usually be made to be environmentally acceptable;
- land-based petroleum exploration proposals in Marine Parks will be assessed for environmental acceptability on their merits;
- marine-based petroleum exploration proposals in Marine Parks are environmentally unacceptable;
- in environmentally sensitive areas other than Marine Parks, petroleum exploration proposals need to clearly show the capacity to cope with environmental impacts, especially possible oil spills in terms of credible events, their likely frequency and contingency planning and;
- outside environmentally sensitive areas exploration proposals normally could proceed, subject to standard environmental protection conditions including an approved oilspill contingency plan.

Many areas in the region of WMC's permit areas are regarded as being environmentally sensitive, with several locations having high conservation values. As such, it closely compares with the Authority's recent assessment of another exploration proposal located at the north end of the Exmouth Gulf. These types of proposal have the potential to affect environmentally sensitive areas such as coral reefs, seagrass banks and beaches around and within the Exmouth Gulf.

Accordingly the proponent was required to prepare a Consultative Environmental Review (CER) for public review and formal assessment, and undertook to prepare sufficient documentation to enable the assessment of a permit-wide drilling programme.

This assessment is designed to provide for a formal assessment procedure to be initiated for a programme of several wells, instead of for each separate well. This is expected to lead to savings in time and resources for proponents, involved agencies, the public and the Environmental Protection Authority.

In the case of this proposal WMC has identified six drill targets for initial investigation. However, there are a number of possible additional targets within the permit areas and under these circumstances the Authority would wish to be assured that the environmental management provisions will be applied in a site specific manner. The Authority has recommended that an appropriate mechanism for achieving this be put in place.

The three initial locations proposed for drill testing within the next five years are fully developed drill targets for which the locations are known. The first (Ginseng) is proposed at a point 7km to the west south west of Airlie island. WMC will use a jack-up rig which is specially designed to operate in these shallow waters for these and subsequent wells, so as to keep clear of islands and reefs in the permit areas.

The region is subject to strong winds and currents and lies within the cyclone-affected belt of Australia. The shallow waters and intertidal zones support a diverse range of biota which give the area its high conservation, commercial fishing and tourist values.

Concerns raised in public submissions centre around the fate of drill cuttings, domestic wastes and oil spills, the impacts of each of these on the wildlife and resources of the permit areas and the potential loss of earnings of industries associated with these resources.

WMC as operator of the existing production licence facilities has monitored and researched the environmental sensitivities of the permit areas and modelled the likely spread of spills of oil from several locations. Tests have shown that oil from this area and spilt in this region typically evaporates and degrades relatively quickly, due to the high ambient temperatures and its characteristic lightness or volatility. Thus, if a spill were to reach a shoreline, it would not persist as a heavy dark sludge as do spills in many other parts of the world. Statistics of oil spills indicate that, although small spills are reasonably common, they are relatively easy to control and unlikely to have a significant impact if the appropriate equipment is on hand. Larger spills are a more serious problem but are rare, and none is known to have occurred in the history of drilling offshore from Australia. Routine discharges from the rig consist of domestic waste water, drill cuttings and drill muds.

Recommendation 1

The Environmental Protection Authority concludes that the proposal to conduct an offshore exploration drilling programme in the area covered by permits TP/7 and TL/2, as described in the Consultative Environmental Review, is environmentally acceptable.

In reaching this conclusion, the Environmental Protection Authority identified the main factors requiring detailed consideration as the effects of routine and accidental discharges arising from the drilling operations upon the environment and the industries dependant upon it.

The Environmental Protection Authority considers that these and other issues have been addressed by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.

Accordingly the Environmental Protection Authority recommends that the proposal could proceed, subject to:

- **the proponent's commitments; and**
- **the Environmental Protection Authority's recommendations in this report.**

This assessment is a proposal to drill several wells, of which only the first few have been precisely located as yet. Specific wellsite data will be required to ensure that potential impacts to the site and any adjacent environmentally sensitive areas will be minimised and appropriately managed. The Environmental Protection Authority is aware that this proposal is a programme to access several wells and that only three have been accurately located and specified at this stage. A number of additional wells may be drilled within the permit.

Recommendation 2

The Environmental Protection Authority recommends that, at least three weeks before the commencement of drilling of wells subsequent to the initial three proposed, each exploration well proposal within this programme be forwarded to the Environmental Protection Authority with additional details of the exact location and its environment, and any proposed site-specific modifications to environmental management provisions, and that the proposals be implemented to the satisfaction of the Environmental Protection Authority.

Recommendation 3

The Environmental Protection Authority recommends that the proponent be required to refer details of future testing or development plans resulting from this exploration drilling proposal to the Environmental Protection Authority.

The proponent, in clarification of a response to a question in a submission, has indicated that it will be responsible for any adverse environmental impacts arising from this drilling proposal, and the Environmental Protection Authority endorses this commitment.

Recommendation 4

The Environmental Protection Authority endorses the proponent's commitments to accept responsibility for any adverse environmental impacts which may occur because of the proposal proceeding, and recommends that the arrangements for meeting this condition should be in place prior to positioning the rig for drilling of the first well, and be to the satisfaction of the Minister for the Environment after consultation with the Minister for Mines.

A variable that has not been considered here is the type of rig to be used. WMC has indicated that its preference is for a jack-up style rig.

Recommendation 5

The Environmental Protection Authority recommends that the proponent, prior to the use of a land-based rig, forwards plans for its use and environmental management to the Environmental Protection Authority for further evaluation, and subsequently implements appropriate environmental management plans for that rig to the satisfaction of the Environmental Protection Authority.

The proponent, in its oilspill contingency plan for this proposal, has indicated that there will be the capacity to contain an oil spill of at least $20m^3$, which the Environmental Protection Authority regards as satisfactory.

Recommendation 6

The Environmental Protection Authority is aware that the proponent includes in the Oil Spill Contingency Plan the capability for containment of small oil spillages on or adjacent to the rig, and that a suitable boom and skimmer, or other satisfactory oil recovery device, together with operators skilled in their deployment, will be placed on the rig before the commencement of drilling, and stay there permanently until demobilisation of the rig. The Environmental Protection Authority recommends that this approach should be adopted to the satisfaction of the Environmental Protection Authority, on advice from the Department of Mines.

Recognising that the boom has only limited application (ie under optimal sea and weather conditions) the Environmental Protection Authority makes the following recommendation for refuelling:

Recommendation 7

To maximise recovery of spilled oil where an environmentally sensitive location is close enough to the rig to be within its zone of influence from an oil spill, the Environmental Protection Authority recommends that the proponent should only refuel the rig when weather and sea state conditions are sufficiently calm to permit containment and recovery of any fuel oil which may be spilt, as recommended by the Department of Mines and acceptable to the Environmental Protection Authority.

Recommendation 8

The Environmental Protection Authority recommends that, prior to the drilling out of the conductor pipe of the top section of the first well, the proponent successfully trial runs a simulated Oil Spill Contingency Plan up to the point of deployment of resources, to ensure that the plan is workable to the satisfaction of the Environmental Protection Authority. The Environmental Protection Authority also recommends that while drilling is occurring, further simulated Oil Spill Contingency drills be run at least once a year, or for each change of drilling rig, whichever is sooner, to maintain a high level of preparedness among all involved personnel.

Recommendation 9

The Environmental Protection Authority recommends that the proponent be responsible for decommissioning the rig and each well, and rehabilitating each site and its environs to the satisfaction of the Environmental Protection Authority, on advice from the Department of Mines, within a timeframe which is satisfactory to the Environmental Protection Authority.

1. Introduction

In August 1990 Western Mining Corporation Limited - Petroleum Division (Australasia), referred to hereafter as WMC, submitted a proposal for drilling within petroleum exploration permit areas TL/2 and TP/7, in coastal waters between Onslow and Barrow Island (see Figure 1). WMC is the manager of the joint venture which owns the interests in the permit areas. The joint venturers and their respective interests in each permit are as follows:

TP/7	
Western Mining Corporation Limited (Operator)	49.896%
Ampol Exploration Limited	12.474%
Muswellbrook Petroleum Limited	8.525%
OGE Limited	6.237%
Bridge Oil Limited	18.711%
Pan Pacific Petroleum NL	4.157%
TL/2	
Western Mining Corporation Limited (Operator)	40.000%
Pacific Oil & Gas Limited	19.833%
Bridge Oil Limited	15.000%
Ampolex (PPL) Pty Limited	10.000%
Muswellbrook Petroleum Limited	6.834%
OGE Limited	5.000%
Pan Pacific Petroleum NL	3.333%

The proposal seeks to drill test several leads defined by seismic data and previous exploration drilling within the permits (as shown in Figure 1).

The Authority has previously assessed several offshore petroleum exploration proposals in the region and wishes to maintain a consistent policy toward subsequent proposals. Assessments have included proposals adjacent to the Ashburton River mouth and, more recently, an area surrounding the Muiron Islands and across the open end of Exmouth Gulf to the mainland which has the potential to impact environmentally sensitive areas around islands and reefs in the Gulf. The Authority's general position on this sort of proposal may thus be summarised as follows:

- land-based petroleum exploration proposals can usually be made to be environmentally acceptable;
- land-based petroleum exploration proposals in Marine Parks will be assessed for environmental acceptability on their merits;
- marine-based petroleum exploration proposals in Marine Parks are environmentally unacceptable;
- in environmentally sensitive areas, petroleum exploration proposals need to clearly show the capacity to cope with environmental impacts, especially possible oil spills in terms of credible events, their likely frequency and contingency planning and;

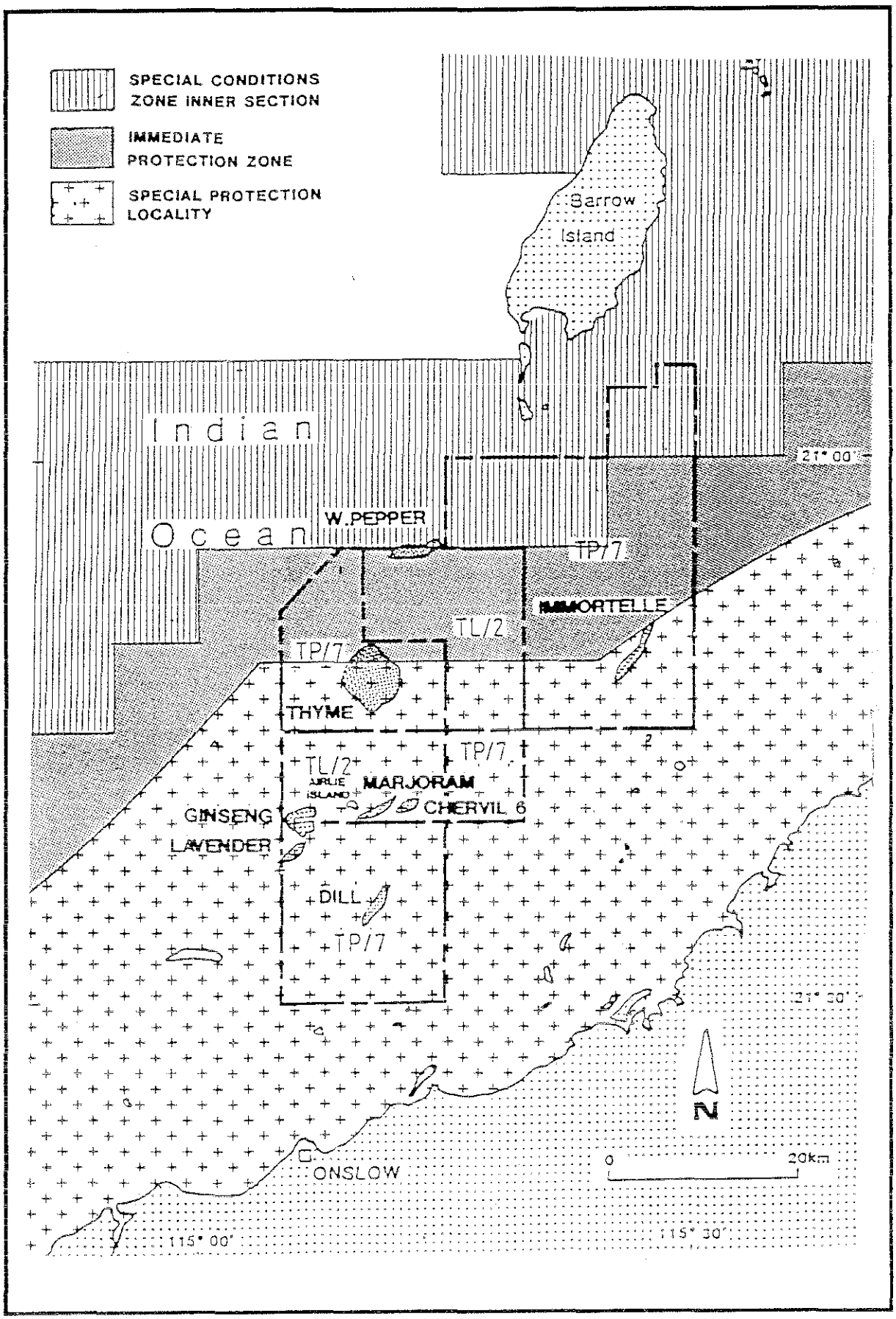


Figure 1. Location of permit areas and possible drill targets

- outside environmentally sensitive areas exploration proposals normally could proceed, subject to standard environmental protection conditions including an approved oilspill contingency plan.

WMC's permit areas fall largely within the Special Protection Locality Zone, as shown in Figure 2 and derived from DCE Bulletin 104, (1984). This category recognises the high environmental sensitivity of this shallow, nearshore area and includes coral reefs, seagrass beds, beaches and mangrove-lined creeks on the mainland.

The Environmental Protection Authority accordingly determined that a formal assessment at the level of Consultative Environmental Review would be required. The proponent was asked in the CER to define the environmental sensitivity of the areas likely to be within the zone of influence of the proposed drilling; to assess the likelihood and potential impacts of an oil spill; and to demonstrate that routine and credible accidental discharges from the offshore drilling platform could be properly managed at the proposed sites to ensure no significant impacts in environmentally sensitive areas.

While this proposal concentrates on exploration, it could lead to an extension of the existing production facilities if further economic petroleum reserves are discovered. With regard to an extension of production facilities it should be emphasised that a separate development proposal would be required.

2. Project description

Two initial wells are proposed immediately following approval, followed by a minimum of four exploration wells over the next five years. To improve the efficiency of the formal assessment process and reduce repetition it has been agreed that, instead of submitting proposals for one well at a time, it would be acceptable to submit a proposal for a programme to address the entire permit area, provided that the CER adequately addressed all the relevant issues and that the site-specific data would be submitted at a later stage, prior to the drilling of each well.

Recommendation 2

The Environmental Protection Authority recommends that, at least three weeks before the commencement of drilling of wells subsequent to the initial three proposed, each exploration well proposal within this programme be forwarded to the Environmental Protection Authority with additional details of the exact location and its environment, and any proposed site-specific modifications to environmental management provisions, and that the proposals be implemented to the satisfaction of the Environmental Protection Authority.

The total number of wells that may be drilled within the permit areas as the programme develops is currently undefined. These will be planned upon review of the initial drill results and further seismic interpretation. Also, WMC has indicated that there may be a number of development and appraisal wells proposed over the next five years at both the newly identified leads and near existing oilfields within the permits. These would be the subject of separate proposals and would need to be referred to the Environmental Protection Authority at the appropriate time.

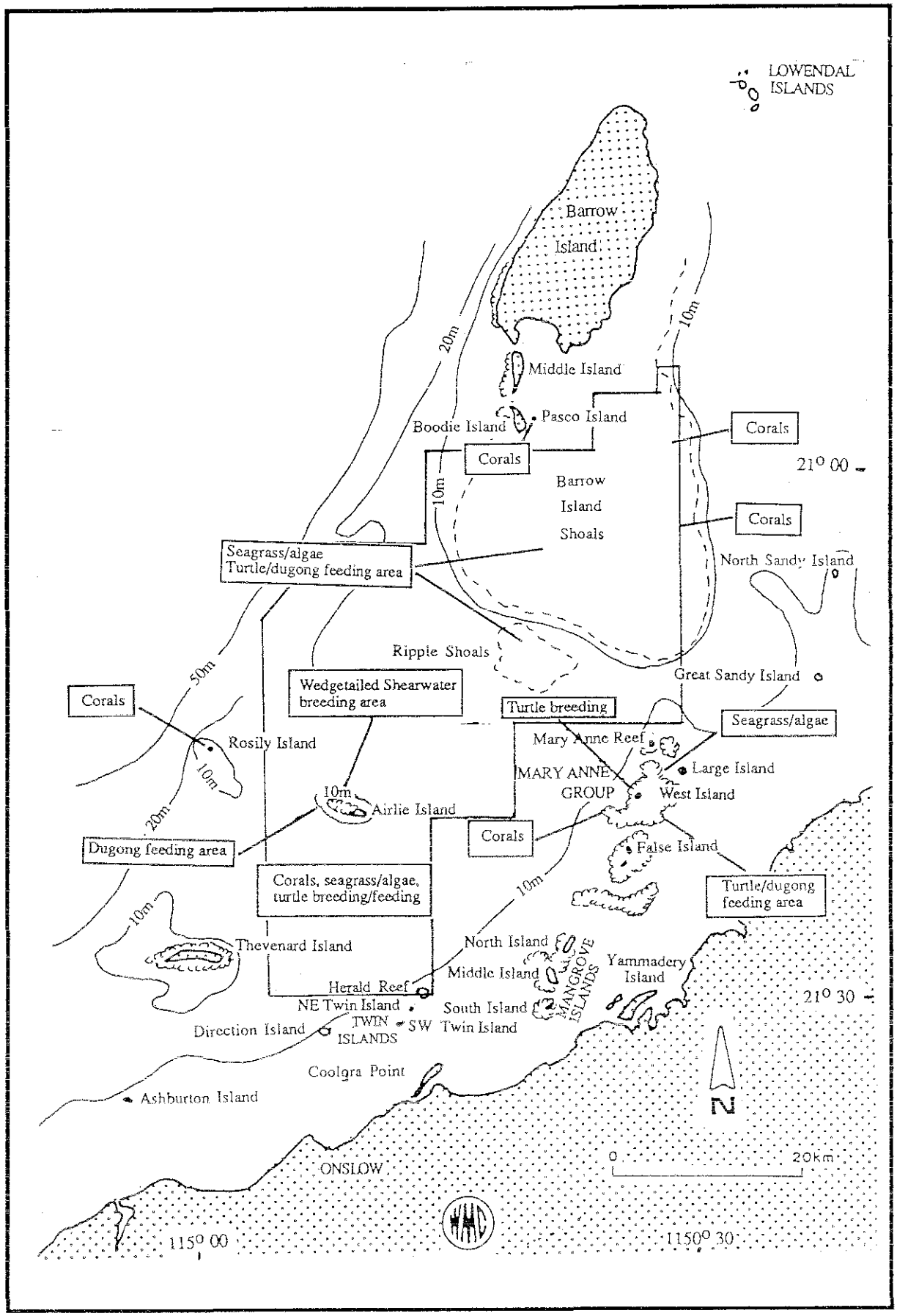


Figure 2. Habitats at risk

Recommendation 3

The Environmental Protection Authority recommends that the proponent be required to refer details of future testing or development plans resulting from this exploration drilling proposal to the Environmental Protection Authority.

Information regarding the locations of the first three wells has been made available to the Environmental Protection Authority. The locations are shown in Figure 1. The first well in the program is Ginseng No 1, which is planned for June 1991. It's location is about 7 km west south west of Airlie Island. At this site the water depth is around 15m and the sea floor consists of silts and sands over cemented substrate. The nearest environmentally sensitive location is the fringing reef at Airlie Island which is 6.5km to the east north east. At this stage the next well proposed is Chervil No 6, located 2.9km east north east of Airlie Island. It is located 1120m west south west of Taunton Reef, the nearest environmentally sensitive site. The third well (Lavender) is to be sited 7.5km west south west of the reef at Airlie Island, however, operational considerations could result in other leads with more potential being identified which could be drilled ahead of the already specified locations within the permits.

WMC anticipates using a jack-up drill rig for the entire programme. This will be useful where drill targets are located next to or underneath islands and reefs, as is the case with some of WMC's selected sites around Airlie Island. By using specialised directional drilling techniques the rig can be positioned such that minimum impact is made to sensitive areas, while the target can be drilled and fully evaluated.

Two supply boats will be used to service the rig. They will operate from Port Hedland and Onslow, where there are established facilities. A helicopter operating from Onslow will be used for crew changes and supplementary provisioning of the rig. The normal crew compliment of the rig will be around 60 personnel, but as many as 80 personnel could be accommodated.

3. Existing environment

The permit areas lie in open waters to the south south west of Barrow Island. In these shallow waters (<20 metres in depth) the winds play an important part in modifying the movement of surface waters, which are primarily driven by semi-diurnal tidal movements. Oil spills, being largely restricted to the top few centimetres of the water column, are subject to the same influences.

The prevailing winds are westerly to south-westerly at most times of the year barring the winter months, when winds off the mainland are most common. In summer diurnal effects act to raise wind speed in the afternoon to about 20-25 knots and to reduce it during the night and early morning. Winter winds from the mainland can also be strong. Analysis of the occurrence of cyclones shows that an average of 1.2 cyclones per year occur within 150km of the permit area. These may be accompanied by strong tidal surges and winds from any direction. (It is company practice to close down drilling operations and plug and secure the well during a cyclone Red Alert. Details of these procedures are given in the CER).

Due to the smaller tidal variation, tidal currents tend to be slower in the Onslow region than further north in the Pilbara. However, there are localised strong currents in tidal channels near the Mary Anne passage and in other areas proposed for drilling. This has obvious management

implications for spills in these areas.

The eastern portion of the permit areas has diverse and sensitive marine and intertidal environments (Figure 2) which include turtle, amphipod and bird nesting areas, intertidal rock platforms and reefs, and some small coral reefs. The bulk of the permit is basically a limestone floor with a sand covering of varying thickness, with low concentrations of marine life.

The main activities in the region concentrate on its marine resources. Recreational and commercial fisheries and tourism-based activities are centred around Onslow. The prawn fishery season begins in late March and continues through until November with the prawn fishing activity generally confined to the southern portion of the permit areas. The petroleum industry uses Onslow to a limited degree to support offshore bases and drilling activities.

4. Public submissions

A total of three submissions were received, all from government agencies.

The main concerns raised were:

- the large size of the area covered in this assessment;
- effects on the environment of drill cuttings and muds;
- effects on the environment of oil spills;
- the need for adequate compensation for fishermen in the event of impacts.

WMC's responses to questions raised are included as Appendix 2.

5. Management of environmental impacts

Impacts on the marine environment from drilling activities can arise either from routine or from accidental discharges. Depending on how environmentally sensitive the rig location is and how activities on the rig are managed, there could be a range of effects varying from insignificant to potentially serious, at least in the short-term.

In order to minimise the likelihood of failure of the well casing, it is important that the proponent should, prior to drilling ahead, pressure test each string of casing. This requirement is adequately covered in Clause 503(14) of the Petroleum (Submerged Lands) Acts Schedule of Specific Requirements as to Offshore Petroleum Exploration and Production-1990.

Drilling over the last 30 years within the north-west shelf region has shown there is a low risk of wells entering abnormally pressured reservoirs in WMC's permit areas, thus minimising the risk of blowouts. WMC's own experience is that overpressure in exploration wells in the area is not a problem. The permit area has produced oil of light grade crude petroleum (API gravity from 38 to 45 degrees) which evaporates and biodegrades quickly in the warm waters and high ambient temperatures common to the region leaving, in some cases, little sign of its passing after a few days. Accordingly, it generally does not need the use of dispersants, in contrast with heavy and waxy crudes from overseas which can be transported over long distances by wind and tide action because they do not readily break up or disperse. Observations of spilt oil from the North West Shelf area show that up to 75% would be likely to evaporate within 24 hours.

WMC has discussed these potential impacts in its CER. The results of modelling simulated

spills show that the risks of impact of spills to sensitive areas in the region are very small, and then only after at least 24 hours on the sea, thus allowing for most of the oil to have evaporated or degraded to less toxic components. WMC states that to date it has not experienced a spill in the permit areas from either exploration or production activities that has required cleanup action.

There are several marine-based industries potentially at risk from uncontrolled spills. These include the prawn trawling, recreational fishing and tourist industries. The possible problems regarding these sectors have been addressed in the CER and in the proponent's responses to submissions. WMC's commitments to manage the drilling operations closely, and to be held responsible for any adverse impacts to the commercial fishery and the tourist and recreation industries are endorsed.

Recommendation 4

The Environmental Protection Authority endorses the proponent's commitments to accept responsibility for any adverse environmental impacts which may occur because of the proposal proceeding, and recommends that the arrangements for meeting this condition should be in place prior to positioning the rig for drilling of the first well, and be to the satisfaction of the Minister for the Environment after consultation with the Minister for Mines.

The Authority is aware of the submission requesting that insurance covers loss of profits and interruptions to third party operations and has previously found that policies which include these clauses are satisfactory.

A variable that is not considered here is the type of drill rig to be used. WMC has indicated that its preference is for a jack-up style rig which is the most suitable environmentally and logistically for the area. The Environmental Protection Authority is in favour of this approach. Due to the very different type of impact to the environment expected from a land based approach (such as with a terrestrial rig drilling from a nearby island) the Authority would regard this as requiring further review.

Recommendation 5

The Environmental Protection Authority recommends that the proponent, prior to the use of a land-based rig, forwards plans for its use and environmental management to the Environmental Protection Authority for further evaluation, and subsequently implements appropriate environmental management plans for that rig to the satisfaction of the Environmental Protection Authority.

5.1 Routine discharges

These can be grouped into domestic and drilling-associated wastes. Treated sewage, "grey" water and galley wastes are pulverised and disinfected before discharge into the sea. No significant environmental impacts are expected because of the biodegradability of the product, short period of drilling activities and large dilution factor, unless the rig is to be set up in a basin with restricted natural circulation.

Drilling generates rock cuttings with residual amounts of drilling muds adhering to the chips. Depending on the local environment and the type of mud these wastes can have a significant impact and may need to be managed appropriately. WMC has recognised these requirements and made acceptable proposals to ensure that environmentally sensitive locations would not be significantly impacted. Briefly these include:

- routinely using low toxicity, water-based drilling muds;
- conducting a pre-drilling site assessment in consultation with the Environmental Protection Authority to identify sea floor communities and prevailing winds and currents. On the basis of this assessment WMC would manage the disposal of solids in a site-appropriate manner including:
- for environmentally sensitive drill sites, solids and excess muds would be discharged via a pipeline to the seafloor when tidal and wind currents are strong and moving away from these sensitive areas.

5.2 Accidental discharges

Accidental oil spills can occur, in order of increasing size, from the rig refuelling operation, from a production test, or because of a blowout of crude oil from the well. WMC discusses each of these scenarios in its CER, to ensure that the risk of these events is minimised and that spills will be managed appropriately if they occur.

The most common type of spill is a minor spill of up to $20m^3$ arising from refuelling. Refuelling of the rig usually occurs once every 14 days on average. The proponent has committed to containing and collecting spills of this order with a locally made oil boom. The Authority notes and endorses WMC's commitments to place the boom at the drilling location, ready for immediate deployment at all times during drilling.

Recommendation 6

The Environmental Protection Authority is aware that the proponent includes in the Oil Spill Contingency Plan the capability for containment of small oil spillages on or adjacent to the rig, and that a suitable boom and skimmer, or other satisfactory oil recovery device, together with operators skilled in their deployment, will be placed on the rig before the commencement of drilling, and stay there permanently until demobilisation of the rig. The Environmental Protection Authority recommends that this approach should be adopted to the satisfaction of the Environmental Protection Authority, on advice from the Department of Mines.

However, for a reasonable chance of a successful recovery of oil spilt, weather conditions need to be near optimal (current speed <0.7 knot, wind speed <15 knots and wave height <1 m). As waves and currents become progressively larger, increasing amounts of oil would be lost beneath or over the top of the boom; so that the attendant oil recovery unit would collect progressively less of the spill. A mitigating factor is that, under more severe weather conditions the oil evaporates far more quickly. The doubling of wind velocity, to the onset of whitecapping (around 35km/h) causes the rate of evaporation to increase by a factor of 1.7 (Mackay and Matsugu, 1973) and with the onset of extensive whitecapping the rate increases

by a factor of 5 to 10 (Harrison et al, 1975). Additionally, deploying the boom in rough conditions is a dangerous operation that will place personnel at risk. Recognising that the boom has only limited application the Environmental Protection Authority makes the following recommendation for refuelling in environmentally sensitive locations:

Recommendation 7

To maximise recovery of spilled oil where an environmentally sensitive location is close enough to the rig to be within its zone of influence from an oil spill, the Environmental Protection Authority recommends that the proponent should only refuel the rig when weather and sea state conditions are sufficiently calm to permit containment and recovery of any fuel oil which may be spilt, as recommended by the Department of Mines and acceptable to the Environmental Protection Authority.

Partly controlled or uncontrolled well blowouts are less common but can lead to much greater loss of oil. Little of this flow can be recovered in most cases and thus, the impacts of such an accident are likely to be extensive, although not necessarily long-term. Whilst there has never been such a spill documented in Australia, and there is a low risk of abnormally pressured reservoirs in WMC's permit areas, it is clearly important that the best policy is minimisation of the risks and avoidance of the events leading to an oil spill, with a well rehearsed Oil Spill Contingency Plan to deal with accidents.

Recommendation 8

The Environmental Protection Authority recommends that, prior to the drilling out of the conductor pipe of the top section of the first well, the proponent successfully trial runs a simulated Oil Spill Contingency Plan up to the point of deployment of resources, to ensure that the plan is workable to the satisfaction of the Environmental Protection Authority. The Environmental Protection Authority also recommends that while drilling is occurring, further simulated Oil Spill Contingency drills be run at least once a year, or for each change of drilling rig, whichever is sooner, to maintain a high level of preparedness among all involved personnel.

Recommendation 9

The Environmental Protection Authority recommends that the proponent be responsible for decommissioning the rig and each well, and rehabilitating each site and its environs to the satisfaction of the Environmental Protection Authority, on advice from the Department of Mines, within a timeframe which is satisfactory to the Environmental Protection Authority.

6. Discussion and conclusion

This drilling proposal has raised concerns for the environment based on widely held perceptions about the damage that can arise from oil spills. It is becoming apparent, as more is learned about the characteristics of north-west shelf crude oil and its reaction with the local environment, that many previously held assumptions are not accurate. This is particularly true for the fate of oil spilled in the region. The "lightness" of the crude, allied with the generally

high ambient temperatures, brisk winds and related sea conditions, combine to minimise the risk of a spill impacting on sensitive environments. Badly oiled beaches and birds which have resulted from tanker spills of heavy oils elsewhere around the world do not accurately represent the likeliest impacts of a spill of local crude oil in the northwest shelf area. Coupled with this is the fact that the great majority of oil spilled into the oceans comes from sources other than drilling or production facilities. The risk of a medium to large spill occurring from exploration or production is low in Australian waters, and small spills can be managed much more effectively.

The transfer and transport of produced oil represents a greater risk, and any development or production proposals would be subject to additional assessment by the Environmental Protection Authority.

WMC's' experience as operator in the permit areas is that there have been no major problems in managing an exploration and production operation with little impact on the environment.

WMC has answered the questions raised in submissions and made acceptable commitments. The Environmental Protection Authority considers that the proposal, subject to the commitments given by WMC and the Environmental Protection Authority's recommendations in this report, could be implemented in an environmentally acceptable manner.

Recommendation 1

The Environmental Protection Authority concludes that the proposal to conduct an offshore exploration drilling programme in permit areas TP/7 and TL/2, as described In the Consultative Environmental Review is environmentally acceptable.

In reaching this conclusion, the Environmental Protection Authority identified the main factors requiring detailed consideration as the effects of routine and accidental discharges arising from the drilling operations upon the environment, and the industries which are dependant on it.

The Environmental Protection Authority considers that these and other issues have been addressed by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed, subject to:

- **the proponent's commitments; and**
- **the Environmental Protection Authority's recommendations in this report.**

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

The Authority notes that during the detailed implementation of proposals, it is often necessary or desirable to make minor and non-substantial changes to the design and specification which have been examined as part of the Authority's assessment. The Authority believes that subsequent statutory approvals for this proposal could make provision for such changes, where it can be shown that the changes are unlikely to have a significant effect on the environment.

The Authority believes that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Authority.

7. References

Jones H E, Field R A, and Hancock D A, 1984. Procedures for Protection of the Western Australian Marine Environment from Oil Spills. Department of Conservation and Environment Bulletin 104.

Harrison W, Winnik M A, Kwong P T, Mackay D, 1975. Crude oil spills: Disappearance of aromatic and aliphatic components from small sea-surface slicks. Environmental Science and Technology, 9 (3), 231-234.

Mackay D and Matsugu R S, 1973. Evaporation of liquid hydrocarbon spills on land and water. Canadian Journal of Chemical Engineering, 51 (8), 434-439.

Appendix 1

Proponent's commitments

1. Relevant government departments will be given full details of each proposed well before drilling commences, (page 13). Exact details of well locations, seafloor communities, adjacent marine resources and nearby communities at risk from a large spill will be obtained, (page 49), and will be forwarded to the EPA prior to the drilling of each well, (page 50).
2. Drilling locations will be chosen to maximise the distance from sensitive locations within TP/7 and TL/2, (page 39).
3. Should any particularly sensitive areas be found as a consequence of the site survey, a new monitoring site will be established and a post-drilling survey made to confirm the predictions of the CER, (page 49).
4. Support for drilling rigs will be identical to the arrangements currently used for the production facility, (page 16).
5. Separate support vessels to that used for the "Vicksburg" operation will be employed for the drilling program, (page 16).
6. Discharge of cuttings will be done when currents are strong to ensure that turbidity in the immediate vicinity of the rig is minimised, (page 38). If a well is located near a reef or other sensitive community, drilling solids will be pumped directly to the sea floor via a flexible pipeline, (page 39).
7. The company's Environment and Safety Engineer will monitor all routine discharges, (page 39).
8. All personnel involved in the drilling program will be given an environmental and safety indoctrination. A brief pamphlet will be produced specifically for the purpose and will be distributed during face-to-face indoctrination, (page 44).
9. EPA, CALM and Department of Mines will be kept fully informed of the environmental impact of the drilling program through the inclusion of a separate section in the existing annual report that is produced as part of the conditions for existing production facilities, (page 50).

* Page numbers refer to the proponent's CER.

Appendix 2

Summary of submissions and proponent's responses

1. **Submission: It is considered appropriate to consider multiple drilling applications in a single 'programme' assessment, providing the location is relatively small. However as the prospective areas of TP/7 and TP/2 cover some 3,500 km^2 there is some concern that the location is not small and that environmental conditions and conservation values vary over the area. The document itself outlines locally confused water movement and significantly different tidal ranges, currents and sea floor topography over the programme area. Area TP/2 alone would sufficiently cover South Pepper, North Herald and Chervil oilfields, plus the facilities storage and loading terminal at Airlie Island.**

Response: The area quoted for TP/7 and TL/2 is incorrect. The actual area of the combined permit area is 1660 km2. This comment seems to confuse the application with a production application in its reference to the adequacy of area coverage for the various oilfields. This application is for a drilling application. If oil was to be found a separate application would be required in order to develop the field or fields that may be found.

2. **Submission: Any approval of this exploration programme, should in no way presuppose approval of any proposal to extend island facilities in the area.**

Response: The application was for approval for a drilling programme within the existing structure. No extension of island facilities in the area is required to support the drilling programme. Airlie Island is covered under a separate licence.

3. **Submission: Containment and collection should be the primary aim for any oil spill even when shallow marine habitats are not immediately affected.**

Response: Agreed, however the lightness of the oils found in the area makes it almost impossible to collect any oil from small spills. Diversion of oil from sensitive areas shall be our main aim in the event of a spill. Where possible any spilled oil would be contained and collected.

4. **Submission: Oil slicks on active turtle beaches should be cleaned by a work team using steel rakes. This leaves the bulk of the sand <u>in situ</u>, reduces impacts on nests and minimises the volume of the oil/sand mixture requiring disposal. The use of machinery on other beaches is acceptable, though attempts should be made to minimise the volume of sand that is removed in the cleanup.**

Response: Agreed.

5. **Submission: Oil slicks on rocky shores should be left to degrade naturally, The proposed use of water jets may contribute to the emulsification of oil in water and increase the risk to adjacent coral/algal communities.**

Response: In the unlikely event of an oil spill sufficiently large, threatening any rocky shores WMC will have made contact with the appropriate authorities. Advice as to appropriate actions at the time would be sought at that time. WMC agrees that the use of water jets as described would be inappropriate and would probably not utilise them, however they remain an option for

potential use depending upon the circumstances. WMC is constantly reviewing its oil spill contingency plans and an updated oil spill contingency plan is required to be in place before each exploration well is commenced.

6. **Submission: Booms should be mounted on the flat top barge and the barge should be standing by as drilling operations proceed on the prospects.**

The time lag that would result if the barge had to return to Airlie, load equipment and return to the drilling site (a round trip perhaps as far as 80km) would be excessive.

It would appear, however that if Airlie Island booms were to be on standby at a drilling prospect then Airlie Island be would unprotected. Perhaps more booms are required by WMC.

Response: WMC does not agree that it is necessary to have a boom placed on a standby barge for the period of the drilling programme. The time saved by this practice is not justified. It is proposed that an oil boom will be placed on the drilling rig for immediate loading on to a workboat for deployment, should the need arise. Thus there is minimum time lag in boom deployment.

The placement of the oil boom on the drilling rig is an acceptable way in which to maintain quick access to an oil boom in the event that one is needed. There are only two situations when a boom on the rig would not be available for immediate deployment, these being 1) A blowout and fire on the rig and 2) The weather is too rough to load a workboat from the rig.

In the case of the former situation the first priority would be to save personnel from the rig, fight the fire and shut in the well to prevent further oil spills. A standby barge carrying only oil spill equipment would be seconded to rescue work. By the time the situation was resolved to a point whereby booms could be deployed and be effective, other oil spill equipment would have been brought in from outside to combat and contain the spill.

In the case of the second point above, if the weather is too rough to load a boom on to a workboat from the rig it will be too rough to deploy a boom from a workboat or barge, in any event condition of the sea would render a boom ineffective.

The best oil spill prevention is competent drilling supervision and trained drilling personnel. WMC seeks to use only experienced and competent personnel in the field. WMC has already drilled thirty wells in the permit area to date since 1982 and therefore has an excellent understanding of the geology and expected reservoir pressures likely to be encountered. Experience has shown that reservoir pressures are low and in some cases so low as to prevent any oil flowing to the surface even though oil was encountered (e.g. Nares 1) therefore the likelihood of a blow out and consequent oil spill is very small.

Only selected equipment is kept at Airlie Island. The oil booms are generally kept on the production platform 'Vicksburg' and loaded on to a standby boat for each tanker loading. WMC also has access to oil spill equipment through cooperative arrangements that are put in place from time to time with other oil exploration companies that operate in the area.

WMC has initiated work on oil boom assembly through local plastic welding companies. Several designs have been tested to the point where WMC is satisfied that the local product meets the required standard. WMC will be purchasing more boom lengths in the near future.

7. **Submission: The oil spill contingency planning and oil spill trajectory predictions have been prepared for simulated oil releases at the South Pepper, North Herald and tanker loadout locations. It should be noted that it is assumed that no further drilling will be carried out either to the extreme south or north of TP/7. (See 5.3.5)**

Response: Paragraph 5.3.5 of the CER makes no such assumption. The simulated oil spills were made at production points. The model showed that the oil slick that would develop would generally flow in a SW to NE direction depending upon tidal flow. This was confirmed through the tracking of specially designed floats from the various sites.

The model does not account for weathering of oil, so the 48 hour oil envelopes grossly overstate what would happen in reality. It is WMC's intention to revise the oil spill model so that it will account for the weathering properties of Airlie oil. WMC will be undertaking more float tracking from a number of possible well locations to further verify model predictions and to provide information so that the model can be refined.

8. **Submission: Areas potentially threatened from a spill from a drilling operation include Herald Reef, Twin Islands, Thevenard Island and Rosily Island.**

Response: Agreed, however the risk of a spill actually impacted on any of these locations depends upon the circumstances that will exist at the time. It is for this reason that WMC is pursuing the acquisition of a real time PC based spill trajectory model as discussed in issue 9.

9. **Submission: Oil spill envelopes are provided only for existing fields. Potential oil spills from proposed prospects are not shown or discussed.**

Response: It is not possible to delineate all possible well sites that will ultimately make up the total program this early. The indicated sites are potential sites which may prove up to be actual exploration well sites. WMC does not believe that the general behaviour of oil spills from other parts of the lease area will differ markedly from that which has already been determined. However, to improve the efficiency of oil spill planning, WMC has sourced and is examining the possibility of obtaining a copy of the PC based computer model which was used to successfully predict the track of the Exxon Valdez spill. The advantage in obtaining this program will be in being able to predict a real time path of any spill or potential spill for all conditions and all sites across the permit area. Ground truthing will be carried out using floats.

10. **Submission: The discussion on weathering of crude oil is confined to light oils which are the most common type in the region. However, it should be noted that the nearby Roller field contains heavier oil which would not disappear so quickly. Contingency planning should therefore be related to the possibility of a spill of such heavier oil.**

Response: WMC has written to CALM requesting up to date information. The information will be of more use should any of the possible sites result in a commercial find and a proposal then has to be prepared to develop any new field.

Exploration is essentially transient in nature with each well in this program only taking approximately one month to complete. Therefore, the potential impact at each site is very small. WMC currently monitors turtle activity on Airlie Island, this information can be made available to any bona fide researcher who requires it.

11. Submission: The oil spill envelopes are given for the three oil fields. However, according to Figure 2 there is a site for exploration to the east of Thevenard Island, which is where prawning takes place. Some attention should therefore, be given to the possibility of an oil spill at this site.

Response: See above.

12. Submission: Sewage and liquid wastes from kitchen, showers, laundry, etc. may be discharged after passing through a sewage plant. Biodegradable detergents only must be used for cleaning functions.

Response: This is already current practice. WMC has no intention of doing otherwise.

13. Submission: Deck Drainage and drainage from other 'dirty' work areas should be ducted to an 'oily water separator' and the oil drawn off for shipment ashore.

Response: The drilling rigs that are currently used in the area operate to accepted environmental standards. The standards currently in place will be adhered to.

14. Submission: Flushed viscous mud and engine cooling water should also meet set discharge criteria.

Response: The operational standards already in place will be adhered to.

15. Submission: Clause 616(6) of the Petroleum (Submerged Lands) Act, i.e. that, "the concentration of petroleum in any formation water discharged into the sea shall not be greater than 50mg/l at any one time and the average content over each 24 hours shall be less than 30mg/l..." should be rigorously adhered to and no increase in discharge concentrations should be permitted.

Response: WMC has always, and always intends to, comply with the requirements of the Petroleum (Submerged Lands) Act.

16. Submission: The use of broad spectrum algaecides or biocides should be avoided.

Response: Algaecides or biocides are not normally used during an exploration drilling program.

17. Submission: More up to date information is available in regard to WA turtle distribution and biology, WMC should contact CALM which maintains a turtle database.

Similarly, many recent references are available in regard to the responses of marine organisms to oil pollution (Appendix C)

Response: WMC has written to CALM requesting up to date information. The information will be of more use should any of the possible sites result in a commercial find and a proposal then has to be prepared to develop any new field.

Exploration is essentially transient in nature with each well in this program only taking approximately one month to complete. Therefore, the potential impact at each site is very small. WMC currently monitors turtle activity on Airlie Island, this information can be made available to any bona fide researcher who requires it.

18. **Submission: Cuttings must meet specified limits for oil content prior to discharge. A high level of solids separation for drill cuttings should be established by multi-stage treatment.**

Response: No oil based drilling muds will be used during the proposed drilling program. The bulk of the cuttings will come from non oil bearing formations. Due to the light crudes that are expected to be encountered very little oil is retained in the cuttings.

19. **Submission: Should site specific surveys (P49 of CER) locate extremely sensitive areas adjacent to proposed drilling sites, then consideration should be given to the retention of the cuttings for disposal in a less sensitive area.**

The most eastern prospect location (Figure 2) is close to an extremely productive and diverse area of the Barrow Shoals and may fall into this category.

Response: The CER stated that the results of each site survey would be forwarded to the EPA prior to drilling of each site.

20. **Submission: Drilling fluid toxicity should also be examined more closely if drilling is to occur adjacent to a sensitive location.**

Response: As before the advice of the EPA will be sought in situations as described here. Generally, the mud system that will be used will be a sea water polymer system which has very low toxicity.

21. **Submission: Discharge of oil based drilling muds is not permitted. Drilling muds should be water (seawater) based. If oil based muds are used, they should be stored for re-use or returned to shore for approved disposal.**

Response: No oil based drilling muds will be used during this program.

22. **Submission: All combustible material (e.g. packing cases, sacks, cardboard) should be burnt on site. All non-combustible material (eg, rubber, plastic, food scraps) should be returned to the shore base for disposal.**

Response: Food scraps are mascerated and processed through the sewage system as per (EPA Assessment) Bulletin 210.

23. **Submission: Noisy activity and lights may require modifications in environmentally sensitive drill locations.**

Response: Most operations will not be near any turtle nesting areas, unless a site is chosen directly adjacent to Airlie Island, and therefore, noise and lights from a drilling rig will have little effect on the habitat or fauna activities. In fact, marine activity usually increases around the immediate vicinity of an offshore drilling rig. WMC will be guided by advice from the EPA when the results of each site survey are reported.

24. **Submission: CALM has expressed some concern with the existing monitoring programme. By superimposing CER Figures 2, 11, 12 and 13 onto Figure 10 it is apparent that few of the existing monitoring sites fall anywhere near predicted 48 hour spill envelopes and that there**

are very few monitoring sites adjacent to prospect locations, particularly in the south west and north west of the lease.

Clearly, further monitoring sites need to be established if the monitoring studies are to meet their objectives.

Finding suitable shallow marine habitats in the vicinity of the prospect locations should be achievable.

Response: WMC believes that the design of any monitoring program should be flexible enough to allow modification to the parameters and methodology behind the monitoring program. To this end, WMC whilst discussing an issue not related to this CER suggested to the EPA that the monitoring program be revised. The EPA has agreed and in a letter dated 5th February 1991 the EPA requested that WMC meet with officers of the Marine Branch of the EPA to discuss the monitoring program with a view to revising it.

In addition, the tender package for the 1991 annual monitoring has in it a requirement that the successful tenderer is to make recommendations as to the future directions of the marine monitoring program.

25. **Submission: It was requested that the Ashburton Shire Council should have absolute control over any activity associated with the approved drilling programme that may be required to be carried out onshore to the low water mark on the Onslow coast.**

Response: The boundaries of the permit area do not touch the coast and apart from loading and unloading workboats, which is carried out in the ports of Onslow and Port Hedland, no onshore activity will be required to be carried out on the Onslow coast to support the programme. This request is in direct contravention of the Petroleum (Submerged Lands) Act and is therefore, unrealistic. WMC is committed to keeping the Shire of Ashburton informed of its activities within the permit areas.

26. **Submission: Although the major prawn catches are made near the mainland coast there are three areas in the bottom block of the revised TP/7 lease which are trawled for prawns.**

Response: Drilling at each location will only last for approximately one month, therefore the drilling activities will not be generally disruptive to the fishing industry. WMC will liaise with the WA Fishing Industry Council on this issue.

27. **Submission: It would be of interest to have figures for the hydrocarbon levels in oysters off Airlie Island.**

Response: These figures are published in the Annual Environmental Monitoring Report which is submitted to EPA and CALM. The reports have actually shown a decline in hydrocarbon levels in Oysters on Airlie Island, WMC attributes this to the restriction on fishing vessels operating in the vicinity since oil production began.

28. **Submission: The report should take notice of the revised spill publication mentioned for page 19 (Jones, Field and Hancock, 1984) as it gives information on the WA strategy for dealing with marine oil spills, including guidelines on usage of dispersants.**

Response: In WMC's latest oil spill contingency plan, the use of any dispersants is only undertaken after the approval of the EPA has been granted.

29. **Submission: Since exploration within the revised lease boundaries could be in areas where trawling for prawns occurs the company should ensure through liaison with the WA Fishing Industry Council that the fishermen are kept aware of any exploration developments within the region.**

Response: WMC has been in contact with WAFIC during the development of the CER and intends to maintain contacts with that association.

30. **Submission: If exploration does occur in the vicinity of prawn areas the company should ensure that it has sufficient insurance to cover loss of profits by the fishing industry in the event of an oil spill and should make this part of its exploration commitments.**

Response: WMC has always maintained adequate insurance cover for all its activities. This is a requirement of the Department of Mines. Approval to drill is not given until the Department of Mines is satisfied that adequate insurance cover is in place.

31. **Submission: The lack of general regional information in relation to dugongs and turtles was commented upon and suggestions made as to how this could be rectified, in a paper accompanying one submission.**

Response: WMC has been collecting environmental information since exploration for oil began in the permit area. All of this information is available to any bona fide researcher who wishes to use it. If there is a perceived lack of data quality or quantity, WMC wishes to be made aware of the deficiency and would welcome comments on the efficacy of the current monitoring programme. Any reasonable research proposals that need WMC support will be considered. WMC is committed to regular review of the environmental monitoring programme to ensure that the monitoring remains relevant.

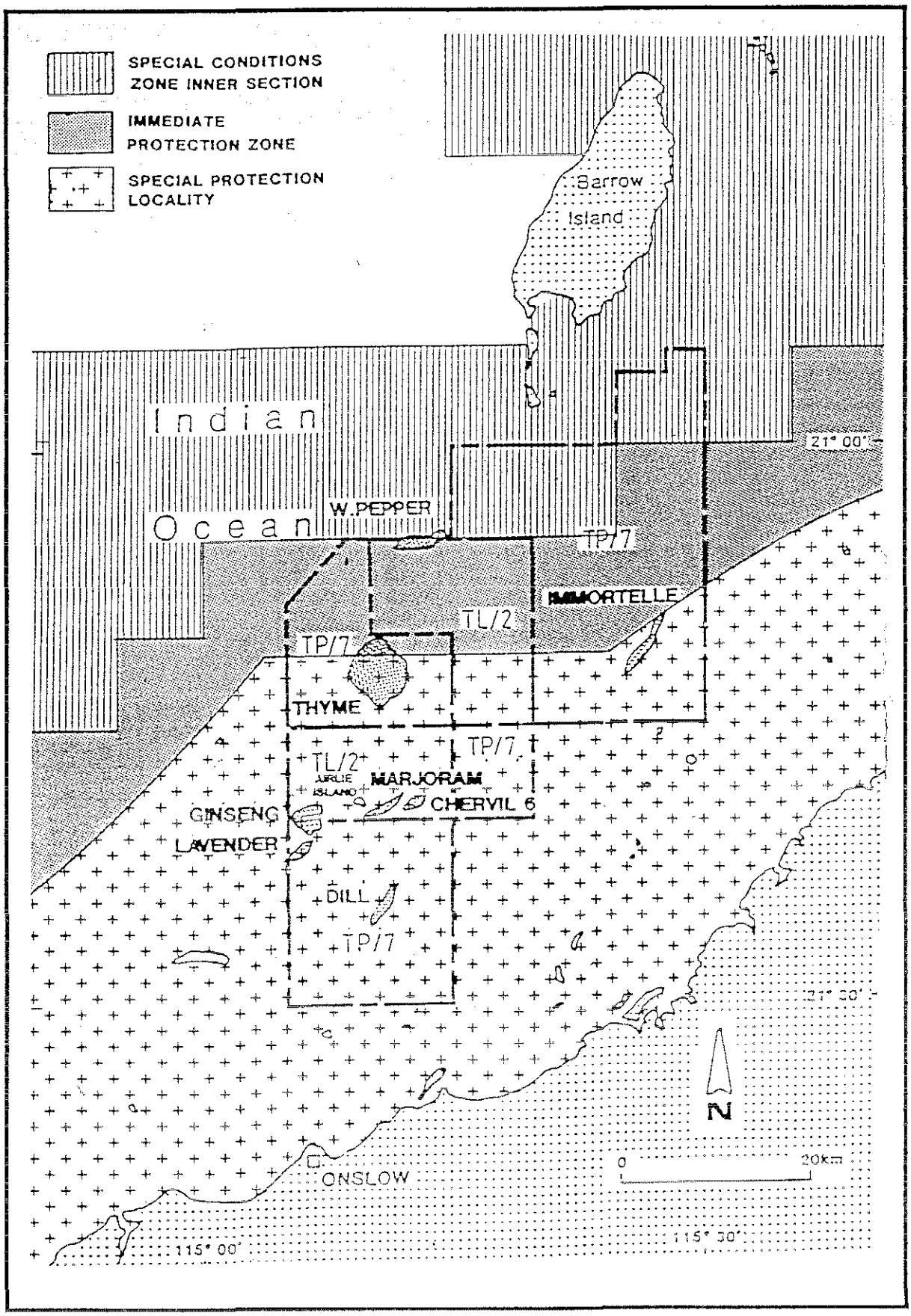
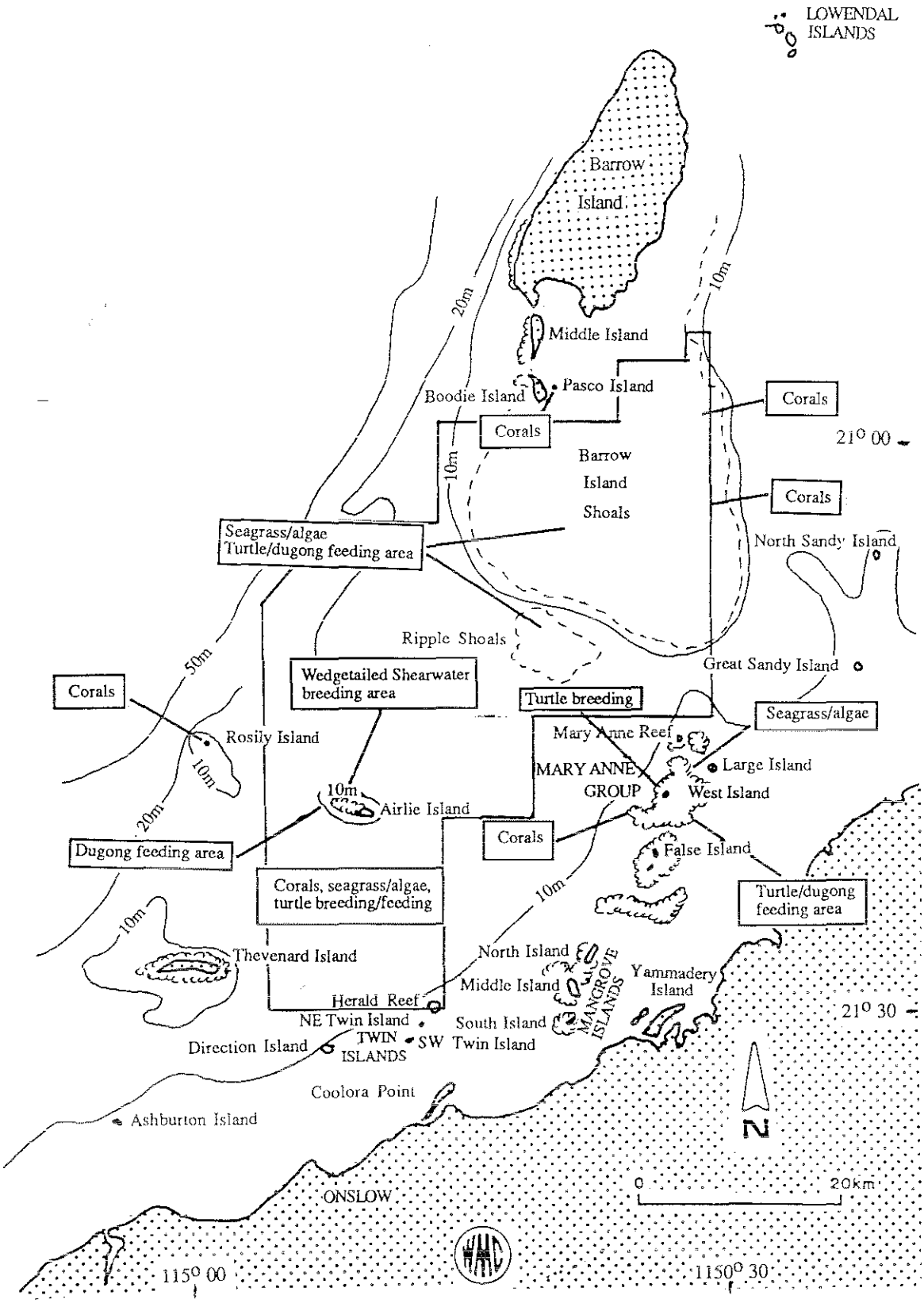


Figure 1. Permit location and environmentally sensitive areas


LOWENDAL ISLANDS
Barrow Island
Middle Island
Boodie Island
Pasco Island
Corals
Corals
Corals
Barrow Island Shoals
21° 00
20m
10m
10m
Seagrass/algae Turtle/dugong feeding area
North Sandy Island
Ripple Shoals
Great Sandy Island
Wedgetailed Shearwater breeding area
Turtle breeding
Seagrass/algae
Corals
50m
Rosily Island
10m
Mary Anne Reef
MARY ANNE GROUP
Large Island
West Island
10m
Airlie Island
20m
Dugong feeding area
Corals
False Island
Corals, seagrass/algae, turtle breeding/feeding
10m
Turtle/dugong feeding area
10m
Thevenard Island
North Island
Middle Island
MANGROVE ISLANDS
Yammadery Island
Herald Reef
NE Twin Island
South Island
21° 30
Direction Island
TWIN ISLANDS
SW Twin Island
Coolora Point
Ashburton Island
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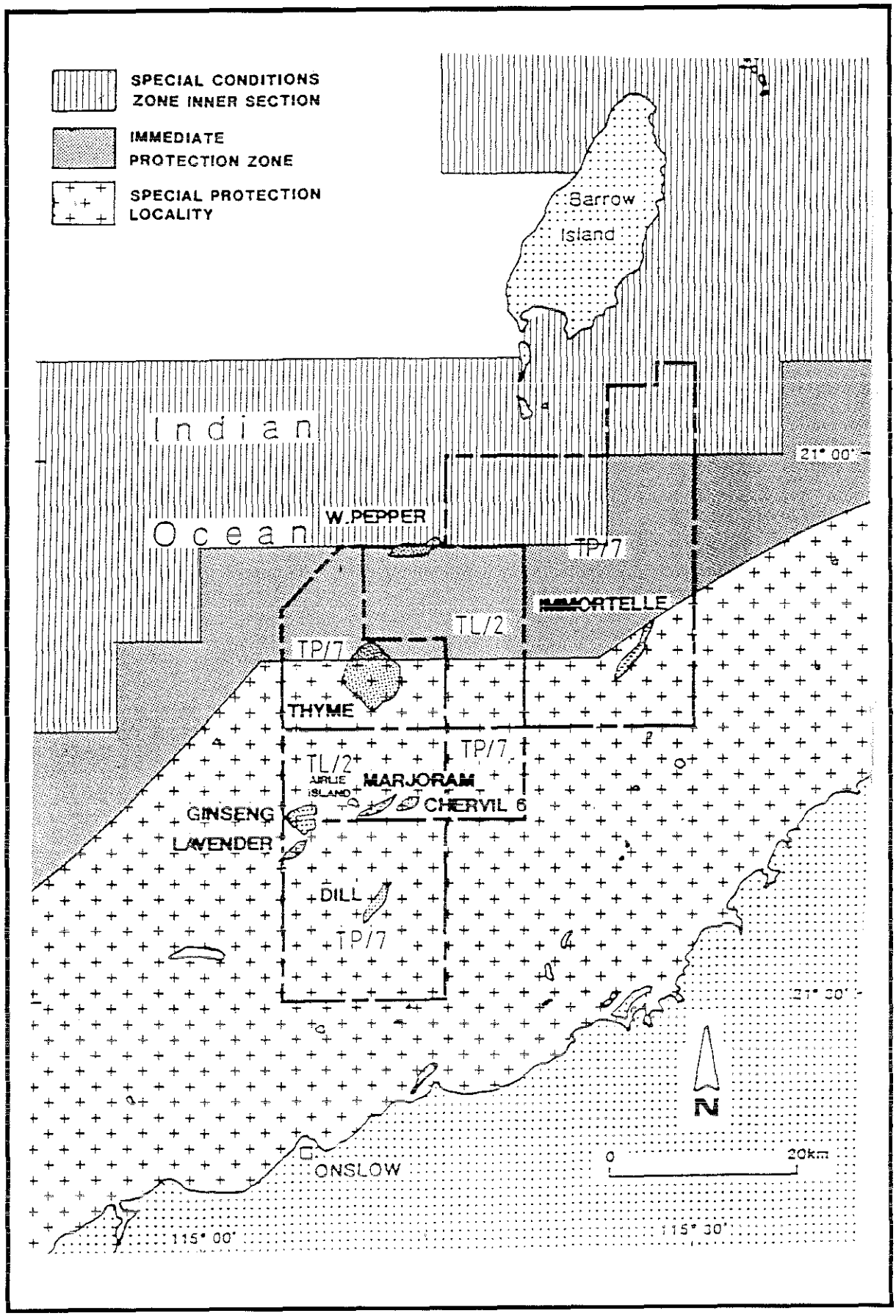
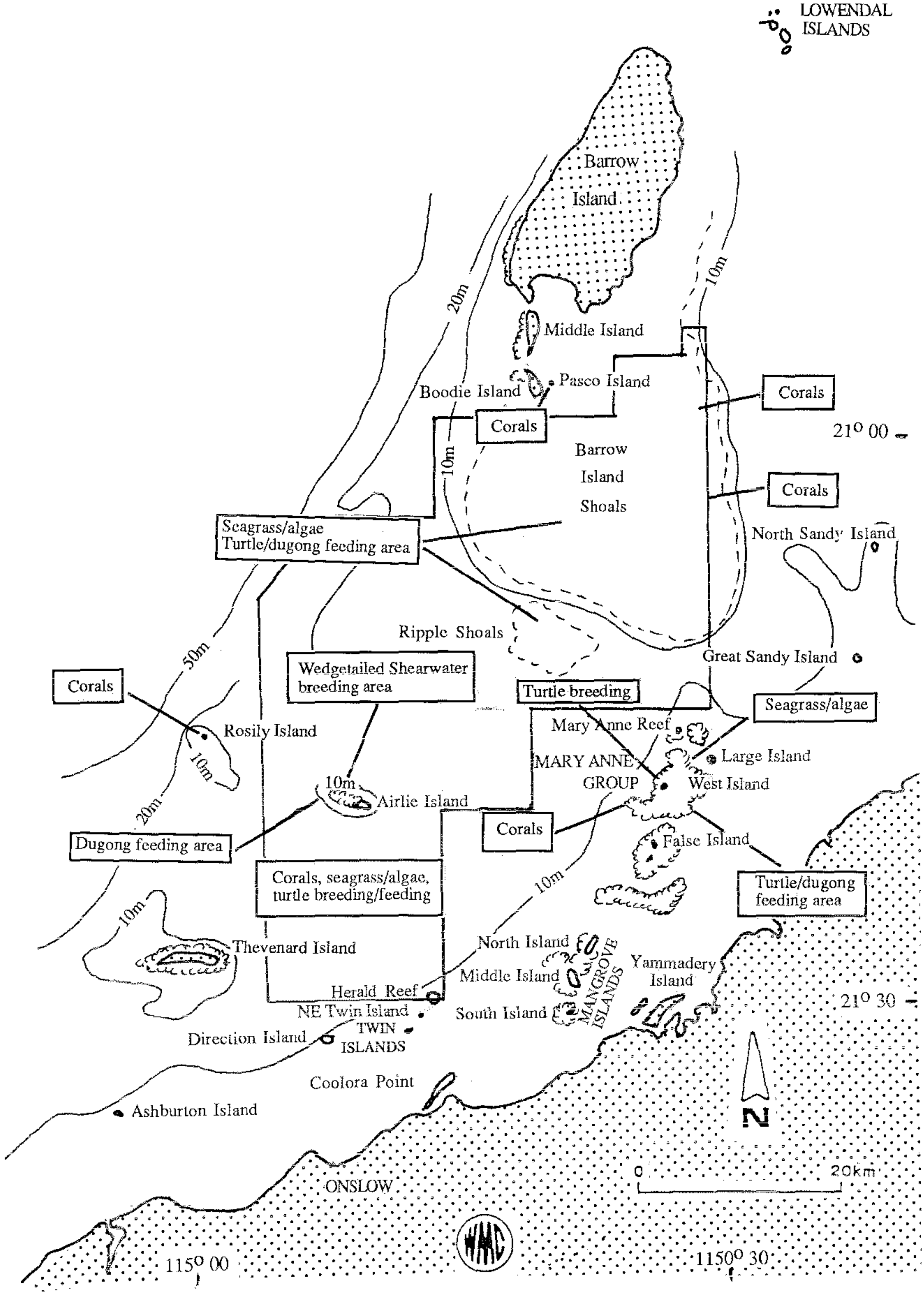


Figure 1. Location of permit areas and possible drill targets


LOWENDAL ISLANDS
Barrow Island
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Middle Island
Pasco Island
Boodie Island
Corals
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Barrow Island Shoals
Corals
Seagrass/algae Turtle/dugong feeding area
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Ripple Shoals
Great Sandy Island
50m
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10m
Airlie Island
20m
Corals
False Island
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115° 30

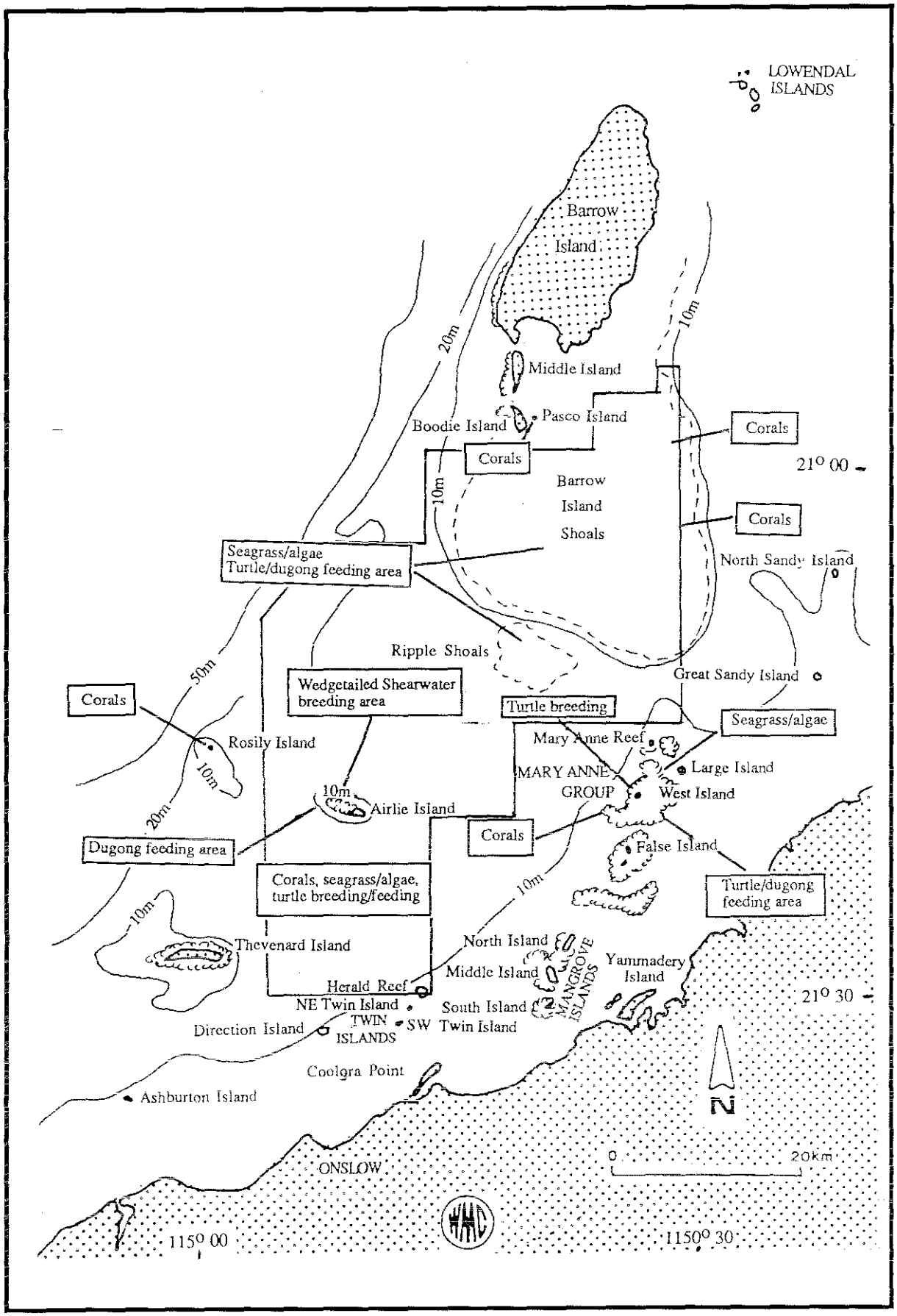
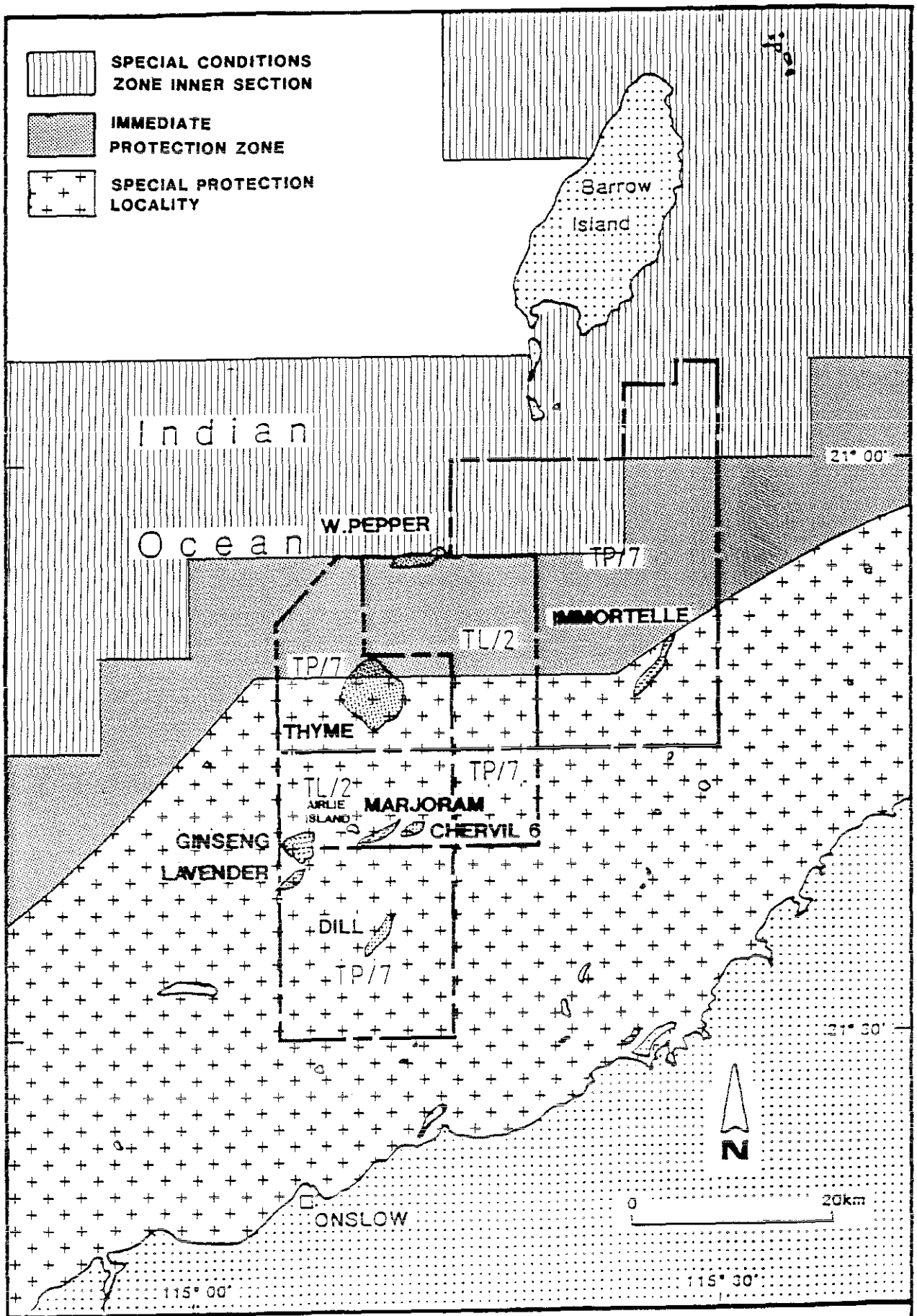


Figure 2. Habitats at risk



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ENVIRONMENTALLY SENSITIVE AREAS FIG. 1