

NATURAL and CULTURAL ENVIRONMENT

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Chapter 2

NATURAL ENVIRONMENT

Climate

The South-East has mild dry summers and cold wet winters. Rainfall ranges from 500 to 850 mm. In the winter months, large areas are waterlogged or temporarily inundated due to the combination of high rainfall, high watertable and flat topography (Fig. 2.1). Consequently, onshore activities are generally restricted to the summer and autumn months of December through to April in most years. It is possible to prepare drillsites in advance during the drier months to allow drilling year round.

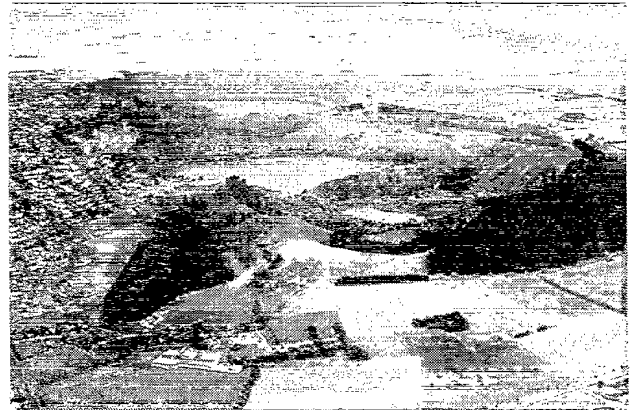
Offshore, the progression of low pressure systems from late autumn to late spring-early summer makes seismic recording and drilling difficult due to rough seas.



Fig. 2.1 Average rainfall chart for Mount Gambier (for all years of record to end 1992; source—ABS, 1994).

Landforms

The area is dominated by a suite of landforms which reflect the Pleistocene marine transgressions and regressions. The coastline is characterised by active dunes and extensive coast-parallel lagoons with sandy beaches and low cliffs. Inland, a series of stabilised dune ridges which rise 20-50 m above the surrounding plain dominate the landscape. The ridges are separated by interdune plains, which are seasonally inundated during the winter and spring, preventing seismic operations and limiting drilling to higher ground.



Mount Gambier. The underground aquifer has been breached and exposed at the surface due to explosive eruption of the maar-type volcanoes. Blue Lake (middle distance) is a major tourist attraction and is the main water supply for the city of Mount Gambier (at left). Photo 14277.

The South-East is largely underlain by limestone and there are numerous karst landforms such as sinkholes and caves which, whilst not preventing drilling or seismic, need to be taken into account in planning an activity. There are also a number of extinct volcanoes in the vicinity of Mount Gambier; the largest, Mount Burr, rises 239 m above sea level.

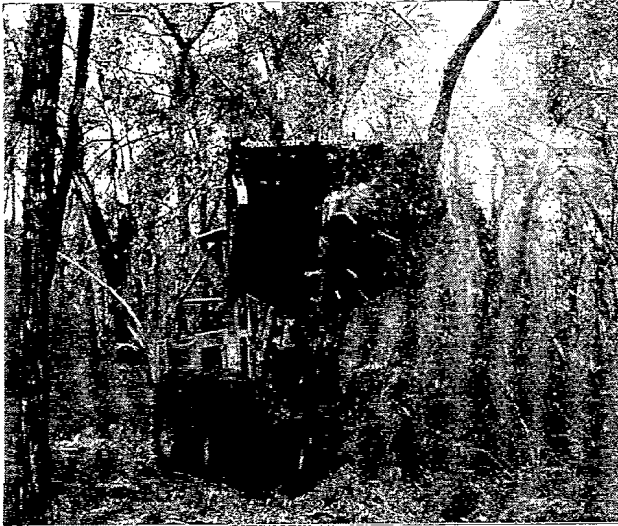
Groundwater

The South-East is characterised by a near-surface unconfined aquifer, the Gambier Limestone. This is the main source of water for the region's population and is used for both drinking and irrigation. The aquifer is spectacularly exposed in the extinct volcanic cone of Mount Gambier, from which the city draws its water. The aquifer is recharged by winter rainfall and water often rises to within a metre of the surface. This is a problem for drilling-mud sumps which will pollute the aquifer unless they are lined and the contents disposed of in an approved manner.

Native vegetation

Over 90% of the surface area of the Otway Basin has been cleared of native vegetation, and the patches and corridors which remain are important as habitats for native animals and plants. Due to the importance of the vegetation, clearance should be avoided wherever possible. In many cases it is possible to make use of existing tracks and fencelines for petroleum exploration. If clearance is necessary then techniques which minimise the impact on the vegetation must be

used. The best method of clearing a path for seismic recording is to hydro-axe the vegetation to create a suitable surface for vehicles. Hydro-axing also reduces the impact on vegetation to a level such that lines are generally indistinguishable from the surrounding vegetation within five years (Michael Williams and Associates Pty Ltd, 1993).



Hydro-ax clearing a seismic line through native bush. This process allows rapid regeneration. Photo 42322.

National Parks

There are 28 National Parks (Encl. 1) which have been created to conserve the best examples of vegetation and landforms in the area. Access is permitted to 13 of these. To date, access has not been necessary as their small size makes it possible to work around them. The conditions of access, should it be required, would vary from park to park, based on the activity proposed and the impact it is likely to have on the environment.

CULTURAL ENVIRONMENT

Aboriginal heritage

In South Australia it is an offence to disturb or destroy Aboriginal sites, objects or remains. Standard procedures for determining the presence of Aboriginal heritage prior to the commencement of activities have been determined. These involve consulting with the relevant Aboriginal organisation and maintaining a watch for sites, objects or remains during activities. The sites are generally no larger than a few hundred square metres and are easily avoided. Since the inception of the Aboriginal Heritage Act in 1988, there have been no conflicts between Aboriginal heritage sites and exploration or production activities.

European heritage

There are numerous sites of European heritage significance such as historic buildings and structures, shipwrecks and geological monuments. These are indicated on the *Environmental sensitivity maps* available from MESA. The majority of sites are small and easily avoided by exploration and production activities.

ENVIRONMENTAL REGULATION

A number of environmental issues are pertinent to petroleum exploration and production in the Otway Basin, all of which can be resolved by proper operational planning in the initial stages. MESA has produced model *Codes of environmental practice* for both exploration and production, which provide guidance to licensees on environmental issues that need to be taken into consideration in project planning. The Department has also produced *Environmental sensitivity maps* which indicate areas where particular care is required for specific exploration or production practices, and areas which in some cases should be avoided.

In order to ensure that activities are undertaken in a manner which minimises environmental impacts, a number of documents are required before approval to commence operations is given.

Onshore, a *Declaration of environmental factors* is required prior to commencement of activities. This is the licensee's assessment of the environmental impact of an activity. In addition to the DEF, a *Code of environmental practice* (CEP) is also required by regulation. This document describes the procedures that the proponent will adopt during the planning, assessment, field management, auditing and monitoring phases of an operation. Access to agricultural land is negotiated with the landowner. The most common issues are vehicle and plant hygiene to ensure that weeds and disease are not spread, fire, crop damage, and repair of any damaged fencing or gates. There are standard techniques for managing such issues and the landholders generally accept exploration and production activities.

Offshore, in addition to a DEF and a CEP, an *Oil spill contingency plan* is required. This document indicates what measures will be taken in the event of an oil spill. Fishing activities need to be taken into account when planning offshore programs to avoid problems such as damage to nets. To date, all problems have been avoided by prior communication with the fishing industry.

Although a number of documents are required, the approval process is not onerous. MESA is able to assist licensees by providing examples of the documentation and advising on their scope. To date there have been no problems with the regulatory system which has been in place since 1985.



Katnook 2 drillsite shortly after rig release, with christmas tree installed, and prior to flowline connection. The drillsite was in a swamp and has been elevated to avoid difficulties in access over the winter months. The site has since been cleared of rubbish and fully rehabilitated. Photo 42323.