

ENVIRONMENTAL MANAGEMENT APPROACHES FOR THE KUPE SOUTH DEVELOPMENT

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Abstract

Western Mining Corporation took over the management of the Kupe oil and gas field in April 1992. At about the same time the Resource Management Act (RMA) became the lead Environmental Act in New Zealand. The effect of the promulgation of the RMA was to remove any relevant precedent for the Kupe managers to draw upon when deciding upon an effective environmental management approach.

The closest precedent was the Maui B development. However the RMA had effectively rewritten the ground rules for development. The RMA has effect only out to the 12 mile limit. The Kupe development as originally proposed was to be totally outside the 12 mile limit. Revision of the proposal meant the inclusion of options to bring gas ashore. The approach adopted by the operator has been to assume that the RMA could have its coverage extended to beyond the 12 mile limit at any time by the government. It was also taken as a principle of development that gas would be brought ashore at some time in the future. Given these two assumptions the operator has approached the consent process with the RMA as its set of guiding principles.

The lessons learnt from experience in operating the Airlie oilfield were also applied in designing the environmental management programme for the Kupe development.

This paper traces the history of the Kupe developments environmental management and consent process to date. The rationale behind the proposed monitoring programme is detailed. The lessons learnt from this process are highlighted and discussed.

Introduction

The Kupe South gas and condensate field was discovered in 1986. In February 1992 Western Mining Corporation Limited (WMC) purchased 40% of the project to develop the field, and became the project operator. The field is located 31 km south of Hawera within the South Taranaki Bight in water approximately 35 m deep (figure 1). The structures proposed for the Kupe South development include a well platform, pipelines from the well to a shore-crossing point to the north of Wanganui, and processing facilities on shore. The continental shelf in the vicinity of the proposed site structures is primarily composed of well sorted iron-rich sands, except for a region of small boulders and gravelly sand at the shoreward end of the proposed pipeline route.

As operator of the Kupe South project, Western Mining Corporation is anxious that development of the field be undertaken in an environmentally sensitive manner. WMC believes that maintenance of the environmental integrity and sustainable economic development of the field are both simultaneously attainable objectives. WMC policy continues to consider environmental protection as a major objective, and the Kupe South project installation will be constructed and operated so as to minimise impact on the local environment. In keeping with these objectives, WMC Petroleum Division (Australasia), through WMC (NZ) Limited, has pursued a proactive approach to its environmental obligations in the development of the Kupe South field.

The environmental management of the Kupe South project by WMC commenced from the first day of operatorship, and was initiated with a review of current New Zealand environmental laws and regulations, and visits to the principal regulatory authorities. WMC's entry into New Zealand, however, coincided with the end of a period involving a comprehensive review of the laws governing the New Zealand environment, which culminated in the introduction of the Resource Management Act (1991) (RMA). This presented a number of challenges to WMC, since the process of obtaining resource consents following the guidelines of the Resource Management Act had not, at that stage, been fully tested. Further, the Resource Management Act has jurisdiction only over those activities of the Kupe South development that lie within the 12-mile territorial limit, i.e., the pipelines to shore, with attendant processing facilities onshore. Activities at the Kupe South field are therefore not governed by the Resource Management Act, and although they must comply with a variety of legislation, these do not contain environmental consent procedures.

This paper reviews the environmental management approach adopted by WMC to ensure that it not only gains resource consents for the development and operation of the Kupe South project, but also upholds its environmental policies.

Application for Resource Consents

Under the provisions of the Resource Management Act, WMC is required to obtain consents from appropriate

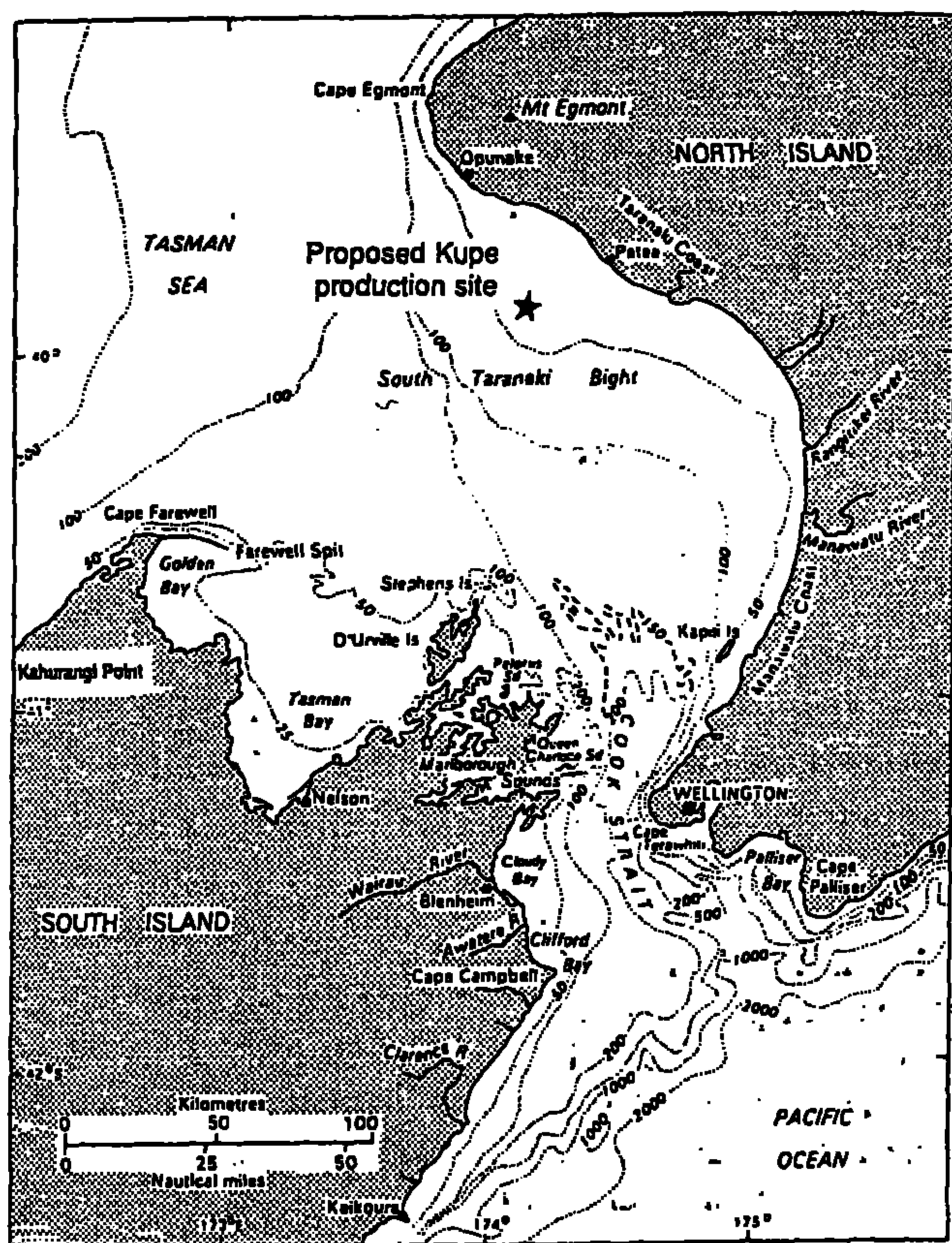


Fig. 1. Map of western Cook Strait, New Zealand, showing the position of the proposed Kupe South production site.

authorities to undertake development and operation of the Kupe South project within territorial waters. WMC has decided to exceed its statutory obligations, however, and apply the environmental management standards required under the RMA to its operations beyond the territorial limit. It believes that this strategy will not only afford improved environmental protection, but also meets the requirements of the company's environmental policies. As a requirement of the RMA, application for a resource consent must include an Assessment of Environmental Effects (AEE). The following section outlines the actions by WMC to enable an environmental management programme to be formulated, to ensure that it meets the requirements for the application of resource consents for the Kupe South development.

Environmental Management Programme

The primary objective in any environmental management programme is to ensure that industrial activities, associated with the development and operation of projects such as Kupe South, have minimal adverse impact on the natural environment. For Kupe South this required a thorough understanding of the environment in which WMC plan to construct and operate the project structures and facilities. In making the various decisions that lead to the implementation of a successful environmental management programme, WMC used the experience gained from the operation of its Airlie Oilfield operation in northwest Australia.

The sequence of actions undertaken by WMC to enable an environmental management program to be designed for the Kupe South projects was as follows:

1. Commission of an environmental assessment report on the potential effects of the project using existing data and information (NZOI, 1992).

2. Commission of a baseline environmental survey of the macrobenthic community at the proposed location of facilities at the field (Page et al., 1992).
3. Arising out of (1) and (2), design of an environmental monitoring programme at the field that incorporates statically vigorous survey designs.
4. Commission of a survey on the socio-economic effects of the proposed Kupe South development.
5. Design of an interactive oil-spill trajectory numerical model for the Kupe South region.
6. Concurrent consultation with individuals and groups within the local community, likely to be affected by the project, to enable their input into the development of the project at all possible stages.

As a consequence of the community consultative process, a further report was commissioned on the likely effects of the development and operation of the proposed Kupe South facilities on local fishing activities (Murdoch, 1993). Consultation with the local community continues to be maintained. Further, while all of the above actions were in progress, the original development concepts of the projects were altered. The major proposed change in the development was to construct and use a pipeline from the field to shore facilities sooner in the life of the field than previously planned. As a consequence of these changes, an assessment of the environmental effects of the pipeline at the shore crossing point was commissioned (Murdoch et al., 1993). It should be noted that all of these actions were also clearly consistent with the preparation of an AEE for the project, as required by the Resource Management Act.

Results of Environmental Studies

In general, all surveys to date have indicated that the environmental effects of the development and operation of the Kupe South field and associated facilities will be minimal. The brief conclusions of these studies are as follows:

- Disturbance of local macrobenthic community by the Kupe South field facilities will be contained to the immediate vicinity of the site structures. The community has low species diversity, and species are common to the New Zealand continental shelf. Disturbance to this community is expected to be negligible, and recovery rapid.
- The platform and associated facilities will act as an artificial reef, locally enhancing species diversity and biomass, especially fishes.
- Discharge waters from the platform facilities will have a negligible impact on receiving waters, even in close proximity to the platform, due to the low concentrations and volume of discharged substances and dilution effects.
- The presence of the Kupe South platform and pipelines will not adversely affect either the abundance or migration patterns of commercially important fish species in the South Taranaki Bight. Proposed restrictions to commercial fishing activities in the immediate vicinity of Kupe South structures will be minimal, and highly unlikely to significantly affect the viability of the South Taranaki Bight fishing industry.
- The proposed pipeline ashore would eventually self-bury, and the impact of the laying and presence of the pipeline on marine communities along the pipeline route, including the shore crossing point, is expected to be negligible.

- In the event of a major spill of condensate from the Kupe South development, the impact of the spill on the local marine flora and fauna, and also commercial fishing activities, is likely to be short term and minimal.

Environmental Monitoring

In accordance with WMC environmental policy, WMC has commissioned consultants (NIWA Marine (NZOI)) to design appropriate environmental monitoring programmes to survey the impact of the Kupe South facilities on the marine benthic communities. A pilot study has been conducted, and baseline data collected, regarding the benthic communities at the sites of the proposed Kupe South facilities. The monitoring programme is to be implemented once the project is operational to ensure that:

- the predicted environmental effects of the project on the benthic communities are confirmed
- information is available that will enable effective corrective action to be implemented should the programme detect an undesirable trend in the environmental effects of the project

Based on its experience with the environmental management of the Airlie project in northwest Australia, WMC is mindful of the fact that monitoring programmes must be capable of correctly attributing changes in local communities to either natural biological variability or possible impacts from the development. WMC recently observed high mortality in the oyster (*Saccostrea cucullata*) populations on Airlie Island (a site of facilities associated with the Airlie project oilfield), for example, that was only detected after changes to the established monitoring programmes. In addition, not only did the oyster mortality go undetected for at least one year, the programme was unable to determine whether the observed mortality was induced by the oil field activities or natural causes. Further studies have now established that the oyster mortality was caused by a protozoan parasite. Nevertheless, this example highlights the need for appropriate sampling designs within environmental monitoring programmes. Results of the pilot study of the marine communities at the site of the Kupe South development, commissioned by WMC, will enable the company to design and implement statistically rigorous sampling surveys within the monitoring programme. These surveys will be based on a balanced nested analysis of variance design. Within these surveys, the scale and degree of sample replication (based on the pilot study results) will be set to optimise statistical test power, and suitable control sites will be established.

Conclusions

WMC has adopted a proactive approach to the environmental management of the Kupe South development. The company believes that this will be cost effective in the long term (i.e. a shift from quadrant B to quadrant A, figure 2). This approach is also consistent with the WMC policy that environmental protection should be a primary objective of

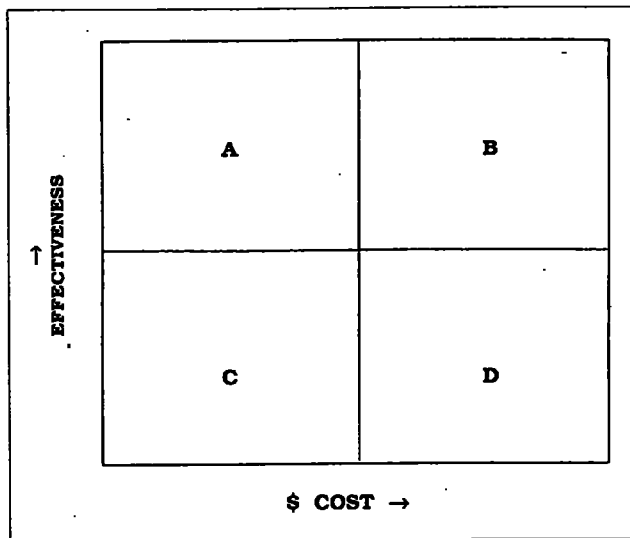


Fig. 2. Diagram of cost effectiveness. Planning of environmental management programmes should be directed towards a result in quadrants A and B.

such developments. It also believes that application of the environmental management standards required under the RMA to WMC's operations beyond the territorial limit affords greater protection to the local environment. It is the company's view and experience, however, that to maintain this protection, it is essential to implement statistically rigorous well designed sampling surveys as part of on-going environmental monitoring. Such monitoring programmes must be capable of distinguishing between natural biological variability and possible impact from the development, to also ensure that the developer is not wrongly accused of negative impacts on the environment.

References

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