

# THE PETROLEUM ACT AS A CONSERVATION CODE

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## Abstract

Public discussion and Parliamentary debate during the course of the Resource Management Bill led to the creation of a separate proposal for a Crown Minerals Bill that would broadly govern the process of exploring for and producing all mineral interests over which the Government of New Zealand claimed ownership. The pivotal point in the adoption of the Crown Minerals Bill was the decision that the concept of "sustained management" under the Resource Management Bill could not be equated to depletable minerals. Regardless of whether the Crown Minerals Bill, with its attendant minerals programme for petroleum, supplants the Petroleum Act of 1937 and the 1978 Petroleum Regulations, the conservation of oil and gas resources and their development in a manner that resolves perceived conflicts with ecological interests and surface owners will receive increasing emphasis. This paper will compare and contrast the two regimes and demonstrate that the general standard of "good oilfield practice" is consistent with prevention of waste, maximising recovery of the resource and properly applied environmental accounting.

## Introduction

This paper examines the Petroleum Act 1937 and the newly enacted Crown Minerals Act 1991 as expressions of conservation policy whose specific objective is the management of oil and gas resources. It also addresses statutory and philosophical impediments to the application of conservation criteria to petroleum operations that is inherent in these regimes.

It is always helpful to have terms of reference and orientation in mind for such an overworked term as "conservation". One eminent scholar has described "Conservation Policy" as "actions of governments at different levels with reference to intertemporal use rates of resources"<sup>1</sup>. However, it may not be too advisable to become comfortable with that definition because "sustainable development" has become the new international catch phrase. This term has been defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs"<sup>2</sup>. While this concept has been incorporated into the Resource Management Act 1991 as "sustainable management" partly in recognition of their depletable character, minerals are excepted from the operative portion of the definition.<sup>3</sup> There is no requirement to sustain the potential of petroleum resources to meet the reasonably foreseeable needs of future generations. Allocation of petroleum resources will be determined under the Crown Minerals Act 1991.

Conservation is, of course, a relative matter. When the concept is applied to the petroleum industry we are speaking in terms of maximum recovery of the resource and preventing waste. This is where the relative certainty and predictability

of petroleum and reservoir engineering highlights the lack of real substance behind the notion of sustainable development. The fact that some international majors have equated sustainable development with accepted conservation practices, only emphasises the problem that conservation can mean all things to all people.<sup>4</sup>

## Physical Law of Recovery

Regulatory regimes must be compatible with laws of the physical universe and recognise that oil and gas within the reservoir is not in the same state at the surface. The basic goal of conservation is achieved by the most efficient utilization of reservoir energy. This can include the familiar practices of requiring maximum possible recovery of liquid hydrocarbons from casing head and natural gas with the reinjection or sale of the dry gas; early institution of secondary recovery; pooling and unitisation under common plans; and adequate well spacing which prevents both excessive rates of withdrawal and unnecessary drilling costs.

Oil itself possesses no inherent energy by which it can be produced from a reservoir. Its production occurs by the action of some energy associated with the reservoir oil or by secondarily imposed energy. This energy is derived from:

- solution gas under pressure;
- free gas under pressure;
- water under pressure;
- compression of the oil itself; or
- gravity drainage.

Any one or more of these natural occurring energies may be present in a single reservoir. Energy may also be induced into a reservoir by the injection of water or gas under

<sup>1</sup>S.V. Ciriacy-Wantrup, Resource Conservation: Economics and Policies, University of California Press (1968) at 223.

<sup>2</sup>World Commission on Environment and Development, Our Common Future (Oxford: OVP, 1987).

<sup>3</sup>s.5(a) Resource Management Act 1991.

<sup>4</sup>"Implementing a Sustainable Development Policy in Shell Canada Limited", 4 September 1990.

pressure in operations that are known as enhanced recovery or pressure maintenance.

It makes no difference whether the energy for oil displacement comes from that naturally supplied or is injected into the reservoir. Water, for example, may be injected to supplement a partially active natural water drive, or to furnish a water drive where no such primary energy is present. Gas may be injected to augment primary gas energy before the pressure is depleted, or it may be injected to supply additional energy when natural pressures are depleted. In any case, and with either fluid, the net effect is to obtain a greater yield of oil by supplying added energy.

To have production of oil it is necessary that the energy naturally associated with or secondarily imposed upon the reservoir oil be operative. This is accomplished by drilling a well and creating a pressure differential between the well bore and the reaches of the reservoir, either by lowering the pressure in the well bore below that in the formation, or by pressuring the formation to a level above that in the well bore.

### Reservoir Characteristics

Reservoirs are ordinarily classified according to the type of energy that predominates. Three distinct groups are recognised: solution gas drive; gas cap expansion; and water drive reservoirs. Perhaps further elaboration would be useful.

#### Solution gas drive

Solution gas drive denotes that the oil is propelled to the well bore by an expansion of the gas, which in turn is evolved from solution by a decrease in pressure. The gas separates from the reservoir liquid as movement occurs towards the well bore. This mechanism, therefore, involves the concurrent flow of gas and liquid within common channels.

#### Gas cap expansion

Gas cap expansion is differentiated from solution gas drive by the fact that the oil is displaced, not by gas flowing with it, but by gas pushing it in the manner of a piston. When the gas saturation within the oil zone reaches approximately 10 percent of the pore space, the piston displacement action breaks down to become concurrent flow. In this respect free gas cap expansion as a separate means of displacement occurs effectively only when conditions are such as to promote gravity drainage.

#### Water drive

The term water drive denotes that situation in which water is the displacing fluid.

Upon its discovery a reservoir:

- (i) is of a definite physical nature;
  - (ii) is under the imposition of a definite pressure and temperature; and
  - (iii) its fluids have definite inherent physical characteristics.
- As a result of these natural circumstances the reservoir might be expected to have a definite performance under any one of the three general energizing classifications. However this is not the case. The manner in which it will ultimately perform will depend upon the operating principles which are applied. These principles include:

- (i) the number of wells drilled;
- (ii) their position on the reservoir structure;

- (iii) the manner in which they are completed;
- (iv) the rate at which they produce;
- (v) the relative amounts of gas, oil and water withdrawn;
- (vi) the amount of energy reinjected.

It is possible, by varying the manner of operations, to change a reservoir from one type of performance to another.

## Statutory Regulation

Under both the Petroleum Act 1937 and Crown Minerals Act 1991, the Minister of Energy is empowered to issue permits, impose conditions and approve work programmes. However, the enabling legislation does not expressly integrate the fundamental conservation considerations into such actions. These considerations only arise by implication when the permit holder submits a work programme for Ministerial approval, in terms of Section 14A of the Petroleum Act 1937 or Sections 43 and 44 of the Crown Minerals Act 1991.

Other than unitisation, neither the Petroleum Act 1937 nor the Crown Minerals Act 1991 have much to say on conservation beyond the rather vague reference to "recognized good oilfield practice". Even then, this catch-all standard is not an affirmative obligation of either the regulator or the industry so much as it is a factual basis for contesting the Minister's decision not to approve work programmes.<sup>5</sup> The current Petroleum Regulations 1978 attempt to fill in the gaps in the underlying legislation through Rule 101 - Avoidance of Waste of Petroleum Resources. This provision actually makes the Secretary of Commerce the Chief Conservation Officer.

The modifications which the Crown Minerals Act 1991 makes to the existing unitisation statute should be seen as an improvement in several contexts. First, the reference to national interest is deleted in favour of increased emphasis on conservation criteria such as prevention of waste; avoidance of unnecessary drilling; and maximising ultimate recovery of the resource. As a cautionary note, however, it is doubtful that all the objectives of unitisation could, (or for that matter should) be achieved without an entirely voluntary agreement by the licensees. Given the exclusivity of rights which a petroleum permit or licence confers on its holder, determination of unit participation factors cannot be totally compulsory.

Perhaps the principle reason that the Petroleum Act 1937 has not developed as a conservation code (which it justifiably should have) is due to the fact that government has been preoccupied with perfecting its claim of resource ownership to the exclusion of other policy goals that are equally, if not more, socially beneficial in the long run. In reviewing the history of petroleum legislation in New Zealand three distinct stages of policy development are evident. They are:

- encouragement and regulation;
- participation and regulation; and
- allocation and regulation.

### Encouragement and Regulation

First, there was the stage of "Encouragement and Regulation"- as expressed in the statement of purpose for the Petroleum Act 1937. At this time, it was the intent of the New Zealand Parliament to assert ownership over the resource for the purpose of providing private explorers (who would assemble the technical and financial resources needed for development)

practice" only after being so determined by arbitration under s.99 of the Act.

<sup>5</sup>s.44(4) Crown Minerals Act allows approval of a work programme as not being "contrary to recognised good exploration and mining

with the certainty of title and access. This was referred to as the “right to investigate and security of tenure”. The debate in the House stated:

“We want to remove every obstacle and give private enterprise the right to come here, with all its technical knowledge and most modern plant, in order to join with us in endeavouring to liberate oil that may exist under the crust.”<sup>6</sup>

Even the infamous Section 36 which the Minister of Energy invoked in 1988 to claim title to the unlicensed area believed to form a portion of the Waihapa oilfield was not envisioned by the framers of the Act as being used in that fashion. It was understood at the time the Act was passed that a company’s security of tenure to what it had discovered could only be upset by parliamentary amendment of existing law.

### Participation and Regulation

The second phase of petroleum policy came in the form of the Petroleum Amendment Bill (No.2) which was enacted in 1975. This amending legislation inaugurated the era of “Participation and Regulation”. According to the Minister of Mines the principal purpose was to “enable the financial participation that in specific situations will be called for under the new policy”. The 1975 amendments recognised that in specific situations the national interest would be able to override the objectives of the petroleum industry. Ministerial action in the national interest was specifically sanctioned in the following situations:

- Refusal to approve work programmes (s.14A);
- Postponing development of a discovery (s.14B);
- Direct refinement of domestic petroleum (s.19); and
- Notification of unit development (s.40).

In addition to a mandate for direct financial participation, the national interest was most directly reflected in the requirement that a discovery be developed diligently, continuously and in accordance with good oilfield practice under an approved work programme. Moreover, the Minister was constrained in timing his decision to participate by having to make that election when the prospecting licence was granted. This, of course, is the regime under which the industry currently conducts its activities, under the Petroleum Act 1937.

After more than a decade under this system signs that government wanted to move in the direction of greater emphasis on outright ownership had become evident. The Cabinet completed a comprehensive review of how the Crown could improve its “take” from direct participation, royalties, resource levies and taxes. Expiration of the Taranaki prospecting licence PPL 38034 and discovery of oil in the Tikorangi limestone formation under a mining licence originally issued on the basis of a discovery of natural gas in the Kaimiro sandstone put the Crown in direct confrontation with its co-venturers. Perhaps the most perplexing factor in the entire Waihapa case was the fact that in making his decision the Minister of Energy gave absolutely no consideration to conserving and maximising recovery of

the resource.<sup>7</sup> It was almost two years after the Minister had taken the licence for himself that a notice to unitise the two licences as a single oil field was issued.<sup>8</sup>

This dispute took on two dimensions that fall within the scope of this presentation. To begin with there was the question of disputed title as to unlicensed lands. This issue was fully adjudicated with the claim of the Crown being upheld. The second aspect concerned the question of whether the original licensees’ rights were limited to the formation in which the initial discovery was made. This is the so-called “strata title” argument. While the Crown prevailed in the High Court on the argument strata title was permissible under the Petroleum Act, this ruling was reversed on appeal. Although the Solicitor-General had made written submissions on this point to the Privy Council, the Crown withdrew the point less than two weeks before that appellate argument. This manoeuvre left the decision of the New Zealand Court of Appeal as the controlling law. In this regard, the President of the Court opined that petroleum mining operations (which includes further exploration and testing) are “carried out in respect of a particular field or reservoir; but it is still an area of land, not a reservoir or field, over which the mining licence is to be granted”.<sup>9</sup> Industry must have sighed with relief that this point of law had been settled. This apparent stability was not to be long lived.

### Allocation and Regulation - Crown Minerals Act 1991

Not unlike the motion picture *Jaws*; “just when you thought it was safe to go back in the water”, along comes an apparition from your worst nightmare - the Crown Minerals Act 1991. All Crown-owned minerals are to be regulated under a generic code with specific regulatory minerals programmes to be promulgated for petroleum, silver, uranium and gold.<sup>10</sup> There will be one minerals programme for petroleum setting out whether or not mining operations are permissible; the policies and procedures to be applied in granting minerals permits, Crown financial return and principal reasons for adopting such policies and procedures. It is unclear whether the specific provisions in these programmes will be controlling in the event of a conflict with the terms of the generic Act.

This Act becomes effective on 1 October 1991 and will usher in the third phase of petroleum law which we choose to call “Allocation and Regulation” with a capital “A” on Allocation. Curiously, the Crown Minerals Act 1991 has no statement of purpose to guide the overall interpretation of its goals and objectives.

Strata title is back in the form of grants of right called “non-exclusive permits”, in other words, while the Minister may not claim title for the Crown,<sup>11</sup> he can now deny the right to the party making the discovery so long as the limitation is included in the prospecting or exploration permits which precede the issuance of a mining permit. This concept is illustrated in Figure 1 which compares the two enactments.

The Minister of Energy has recently written to the authors of this paper explaining that: “The Crown chose not

<sup>6</sup>1937 New Zealand Parliamentary Debates, 1039.

<sup>7</sup>Among the factors considered in the Minister’s decision were the value and extent of the discovery; existing rights; legislative objections; that the discovery was different from that on which the mining licence was awarded; receipt of other bids; need for full economic evaluation; appropriateness of negotiation with the joint venture.

<sup>8</sup>The licence for PML 38141 was issued on 4 May 1988 and the Unit Development Notice was issued on 10 April 1990.

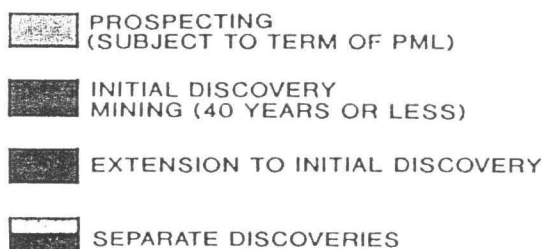
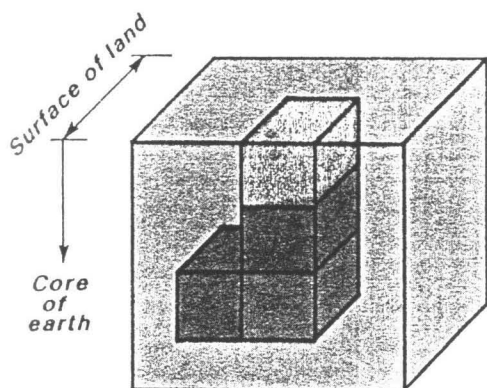
<sup>9</sup>*Petrocorp Exploration & Ors v Butcher*, NZLR 31 [1990] at 41.

<sup>10</sup>ss.12-21 Crown Minerals Act 1991.

<sup>11</sup>s.36 of the Petroleum Act 1937 is expressly repealed.

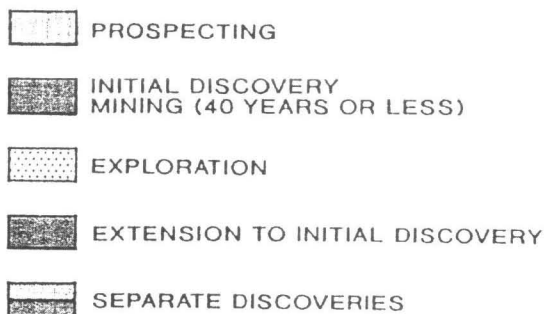
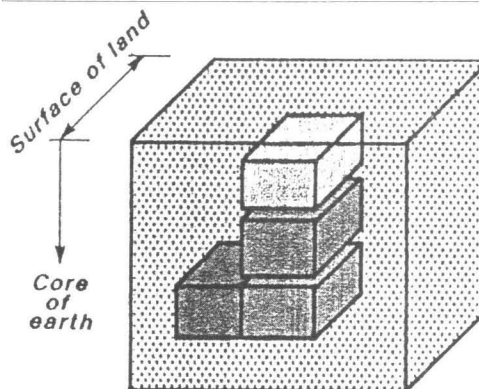
## Petroleum Act 1937

PML = ENTIRE LAND AREA FROM SURFACE OF LAND TO CORE OF EARTH



## Crown Minerals Act 1991

PML MAY EQUAL LAND AREA. PERMIT OR SIZE FOR MINING MAY SHRINK TO ANY NAMED STRATA IN GROUND IF PML ISSUED TO THAT EFFECT.



### Petroleum Act 1937

#### Rights - Exclusive Licence

1. To mine area of initial discovery.
2. To prospect in all areas.
3. To mine:
  - (i) extension to initial discovery area;
  - (ii) any new separate discovery within hatched area.

Subject to work programme approval.

### Crown Minerals Act 1991

#### Rights - Exclusive /Non-Exclusive Permits

1. Rights to mine/explore/prospect over land area defined in permit in accordance with permit conditions and minerals programme. Unless the permit provides otherwise, exclusive right to mine/explore/prospect all areas of land from surface to core of Earth.
2. It is likely that any new separate discovery will require a separate mining licence and new conditions.
3. What happens once the Exploration permit expires? If granted to someone else does that mean extensions will require unitisation.

Figure 1: Comparison between the Petroleum Act 1937 and the Crown Minerals Act 1991.

to take this matter [strata title] to the Privy Council, instead opting for the position that it was more appropriate to clearly define its position in existing legislation and the Crown Minerals Act". So much for settled law.

The prospect of "layered" mining permits stacked like building blocks within a single geographical area raises major questions about petroleum resource conservation; to say nothing of the additional concentration of surface impact and possible mineral trespass should one permittee penetrate and produce a zone permitted to another party. The minimum

requirements for these types of operations must include prior notice to other permittees in the area of the proposed well location and nature of operations; sealing production wells and plugging abandoned wells where they penetrate other permitted strata and possibly the prohibition of multiple completion wells. A multiple completion well makes it possible to produce from more than one zone through a single mechanical installation and is a progressive technique that is well suited for New Zealand conditions. It is a procedure which policy should be encouraging.

Rather than trying to restrict mining operations to specific strata through limiting conditions, the law should be flexible and encourage recompletion of wells in other zones that are more productive. This will eliminate excessive well drilling which is a key feature of oil and gas conservation.

Under the Crown Minerals Act 1991, there is an opportunity to remove much uncertainty by developing a Petroleum Minerals Programme that is compatible with the objectives of the industry. Clearly, the unique physical characteristics of each class of mineral and the specific operations involved in prospecting, exploration and mining must be addressed in the Minerals Programme. Once adopted the Minerals Programme should be scheduled to legislation so that it becomes a statutory document.

## Statutory Title

The evolution of the concept of Crown ownership has been discussed in some detail because, quite frankly, I believe that while government nearly "got it right" in 1937 it missed the path of conservation regulation in 1975 and in 1991 has tried to completely subjugate it to proprietary interests.

The statutory title which was asserted under the 1937 Act was put in place to assure the orderly development and conservation of the resource. It was adapted from the 1934 English legislation which one leading author has analogised to the "qualified ownership"<sup>12</sup> of onshore oil resources recognised by such jurisdictions as Pennsylvania and California. The qualified ownership theory has always been heavily influenced by conservation considerations.<sup>13</sup>

Legal scholars distinguish government ownership from the control of natural resources for promotion of the public interest *jus publicum* from purely proprietary interests *jus privatum* which are akin to common law ownership.<sup>14</sup> Under the doctrine of *jus publicum* natural resources are owned in trust and public rights restrain the sovereign's ability to freely alienate the resource; rule making is required; records are open to public inspection; decision making is done openly and on the record; judicial review is not limited. The business of public resources is public business. This is in contrast with the application of *jus privatum* where the management of the resource is seen as an internal affair; submissions from affected parties are not incorporated into decision-making; and when judicial review is taken of a decision, broad sway is given to the discretion of the government.

By seeking to make its ownership interest the paramount concern the Crown has given short shrift to three critical considerations that go to the root of conservation policy. First, the optimum development of the resource can come

<sup>12</sup>Daintith & Willoughby, United Kingdom Oil & Gas Law 2d Ed.s. 1-232 [London 1984].

<sup>13</sup>Williams & Meyers, Oil & Gas Law Vol.1 s.203.2. Under this legal theory the landowner has the right, to the exclusion of others, to seek to acquire natural gas and oil but does not have common law title until they are reduced to possession. Each owner of land lying

into conflict with any owner's desire to maximise the net present value of production. Interestingly, this is a point which private enterprise is most often criticised for rather than those in government to whom the general welfare is entrusted.

Second, industry has become the custodian of the application of conservation practices through the good oilfield practice standard. Don't get us wrong. We do not call for greater regulation. In fact, since the dismantling of the Ministry of Energy and privatisation of Petrocorp, the Crown no longer has direct access to experienced reservoir engineers and geophysicists. As long as a dearth exists in available technical resources, the industry must carry this responsibility. Moreover until ministerial licensing decisions are preceded by technical submissions with full opportunity for the licence holder to provide comment; factual presentations do not effectively counter balance administrative interpretations of the enabling legislation.

Finally, the whole approach short changes the general public because it fails to recognize that it is the willingness of industry to take on and manage the risk of petroleum exploration that is the real value-adder for the nation. Clever officials and novel politicians only think that they have found a way to make the pie bigger by cutting it into more slices. Only those who undertake investment increase the size of the economic pie.

## Conclusion

A correction of course is necessary for the future of petroleum exploration in New Zealand. In the last year alone two major investors have withdrawn from active exploration activity even though they held interests in productive mining licences. I am not speaking of simply fine tuning the present regime. I am talking about a correction that provides a regime which will encourage and promote petroleum exploration in New Zealand. Until such time as there are new technological breakthroughs, perhaps in solar and renewable energies, industrial society has only three primary clusters of alternatives on which to rely for its new power needs: oil, gas and coal; nuclear power; and conservation in the form of technological improvements and greater efficiency in the use of energy.<sup>15</sup>

Despite the increasing emphasis upon the control of and authorisation of rights to produce the resource, government has an equally fundamental role to see that good conservation practices are used. It must be made abundantly clear in the Petroleum Minerals Programme that ministerial discretion will be tempered by reference to sound, well understood conservation practices.

over a common reservoir has the right, without waste, to produce his equitable share.

<sup>14</sup>Wilkinson, "The Public Trust Doctrine in Public Land Law" 14, University California, Davis L. Rev 7 269 (1980).

<sup>15</sup>Daniel Yerson, The Prize: The Epic Quest for Oil, Money and Power [New York 1991] at 780.

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