POTENTIAL IMPACTS OF A MAJOR OIL DISCOVERY ON NEW ZEALAND

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It gives me a great deal of pleasure to be in this lovely country to discuss the petroleum industry. As attendees of the 1989 New Zealand Oil Exploration Conference, you represent a broad spectrum of professions; exploration, legal, educational, administrative, environmental; all with a common interest: the future of the petroleum business in this most scenic of lands.

Today I will take this opportunity to speak about the impact a major hydrocarbon discovery might have on your nation of three million people; from several different aspects. Using the North Slope of Alaska as an analogy, I will construct a scenario of the economic and social benefits, the environmental impacts and the governmental actions needed to sustain the development of a major oil discovery.

As background on the company I represent, ARCO is the eighth largest oil company in the U.S. We have exploration and production licenses in eighteen countries and employ more than 25 000 people worldwide. ARCO successfully operates in some of the harshest and most environmentally sensitive regions of the world, including the North Sea, Greenland and the North Slope of Alaska. ARCO (in conjunction with Exxon) discovered three of the four largest fields on the North Slope including the super giant Prudhoe Bay. So, we have first-hand experience at developing large oil fields in environmentally sensitive, lightly populated areas of the world and have observed first-hand the impacts of such development.

WHY IS ARCO EXPLORING IN NEW ZEALAND?

The petroleum industry is the largest industry in the world and will continue to be for years. There is still a lot of oil and gas to be found. ARCO is now putting more emphasis on the international aspect of our business, and for good reason. We, along with most of the industry, are finding it generally more difficult to find oil in the heavily-explored North American and European regions. We have therefore turned to countries, such as New Zealand, which are traditionally not considered to be significant oil-producing nations but contain areas with potential for major hydrocarbon accumulations.

Two years ago ARCO opened its first office in this country; today ARCO either operates or participates in nine exploration licenses involving a total of two million acres, and we are under application with joint venturers for a mining license.

ARCO sees exploration potential in New Zealand and is using technical expertise gained worldwide to achieve its exploration goal: a major oil find.

ECONOMIC IMPACT

How would a 300 000 barrels of oil per day discovery affect the economy of New Zealand? If the Maui Gas Field had been oil, it would have been about this size. Let us first look at the regional petroleum aspects of this part of the world. Australasia accounts for 10% of the world's oil production, 18% of its consumption while containing 4% of its reserves. This means any major petroleum find which can be exported has ready markets nearby, not only in Australia and Japan, but also Korea and Taiwan.

The petroleum industry of New Zealand is small by world standards, but is a significant element of the national economy. Total production of liquid hydrocarbons (including gasoline from the Synthetic Fuels Plant) is approximately 42 000 B/D. New Zealand's production is expected to peak in the mid-1990s and meet about half of its domestic demand for these products.

Let us dramatically change the current picture by introducing a major oil find. Once on stream, New Zealand would be self-sufficient and able to export petroleum for the first time. Immediate consequences on a national level would include: lower trade deficits or greater trade surpluses, increased employment, less stress on financial institutions, more flexibility in foreign policy and general economic security on a national level.

To achieve a sudden increase in production would mean expansion of existing construction, refining and transportation facilities or building additional ones. An analogy with the Synfuel plant can be made, where up to 1800 workers were employed during the construction phase and the population of North Taranaki consequently rose by about 12 000 in the early 1980s. Such projects tend to benefit thousands more by a multiplier effect along the chain of distribution from production platform to refinery to consumer.

Following the construction phase, a range of permanent job opportunities would be available, which would reduce the general 1decline in employment of your country which has been affected by industry deregulation and the lowering of its own trade barriers. New energy projects would broaden the nation's infrastructure, allow individuals a greater range of choices in developing new skills, and their higher income would stimulate an increase in the range of imported and indigenously produced products.

As a project shifts from construction to production, employment would stabilize below peak construction levels, but above current levels. Governmental royalty and tax revenues would begin to increase economic security and

reduce pressure on financial institutions. Inflationary pressures would ultimately stabilize, and exports would begin to offset trade deficits.

The point is clear: the economic benefits from a major oil find would be generally favourable and extremely significant to the country and to every citizen in it; many of whom may never recognize the motivating force positively affecting them. Each barrel of oil produced domestically can contribute to lower imports and a more efficient economy or to the production of more goods and services, leading to a higher standard of living for all New Zealand citizens. Thus government policy should be directed to encouraging oil exploration.

OIL AND THE ENVIRONMENT

New Zealand is one of the most scenic countries in the world (the location of this conference is testimony to that). The combination of sea, land, and sky and of its abundant natural resources makes New Zealand an extremely desirable place to live and visit; therefore, the protection of its environment is paramount. After the events of the last several months, including the *Exxon Valdez* oil spill in Alaska, it is clear that oil development can hurt the environment if not handled properly.

In the emotion of the Valdez spill, it is easy to overlook that in excess of six billion barrels of crude have been safely developed, produced and transported more than 800 miles in one of the most environmentally sensitive areas of the world. The positive economic and political effects those five billion barrels have had on the citizens of the state and nation is sometimes forgotten. I cannot say that a tanker spill will not happen again. New Zealand needs petroleum to run its economy, and its ports will always be at risk whether it is importing, as now, or exporting. There is, and always will be, some conflict between the desire for an unspoiled environment and the need for energy to fuel the economy.

Our industry is working hard to learn what we can from Exxon's spill, and to put that knowledge into effect. As I mentioned earlier, I have chosen to compare ARCO's operations in Alaska to New Zealand because ARCO was there in the beginning and continues to be one of the two major operators on the North Slope twenty years later. ARCO, along with others, pioneered the development of the North Slope in one of the most ambitious and expensive construction projects ever undertaken. We continue to learn from our experiences. The industry has, for the most part, operated safely and with minimal harm to the environment.

The spill in Prince William Sound was tragic, but not irreparable. According to the coast guard monitoring the clean up, most of the 240 000 barrels spilled have been recovered, evaporated, or oxidized. The major job remaining for the thousands of people mobilized by Exxon is the cleaning of hundreds of miles of shoreline. Estimated cost of this effort to Exxon and its insurers is $1.3 billion. Judging from previous spills, most of the affected areas are likely to recover in less than five years. Some low-energy environments may take longer.

The industry has responded to the spill by installing an excellent program to prevent future spills and react quickly if one occurs again. The environment will recover; more oil will be produced and transported. The main point is that the world will continue to be fueled by petroleum and accidents will continue to happen despite the best efforts and most stringent preventive measures. Policy should be based on mutual consideration of the economic benefits and the environmental impact; trade-offs which best benefit the country.

Here are some slides (see Plates 1 to17) of the Alaskan development which emphasize, although not without risk, that man can coexist with the environment if proper consideration is applied.

King Salmon Platform Cook Inlet

ARCO began operating in Alaska in 1958. Since that time our operations have moved into Cook Inlet in the southern part of the State. This production platform is designed to withstand the 25 foot tides, four feet thick floating ice sheets and Zone 4 earthquake conditions.

Field Party: Brooks Range

Starting with our initial exploratory efforts such as field parties; we try to have as little impact on the environment, with equipment and personnel, as is necessary.

Ice Beard

The hardest aspect of our operation is helping our employees adapt to the cold, dark winters. We keep the safety of our people uppermost in our minds. ARCO is proud of its Arctic operations. All of our equipment has been adapted to the harsh climate in which we operate.

Doyon Rig Shot: Orange and Red

ARCO utilizes state of the art drilling equipment and technology. This rig (Doyon 14) is owned by an Alaskan North Slope native corporation. Arctic rigs have been custom designed to affect small amounts of tundra and can be completely disassembled, transported to nearby locations and reassembled in 2-3 hours.

Drillsite

Each development drillsite encompasses no more than five acres, and contains anywhere from 25-32 wells. With increased technology, we have been able to design our newer drillsites on three acres or less of land.

Permanent buildings have also been designed to affect as little tundra as possible and to protect the permafrost. Much equipment is prefabricated at the most cost efficient offsite locations and is barged to location during open water season.

Caribou on Tundra with Drillsite in Background

Contrary to initial fears, field noises rarely startle the caribou. Generations return to the field area year after year and have been studied intensively, but observers have not seen any detrimental characteristics as a result of being an oil field caribou. Studies have shown that the Central Arctic caribou herd has increased five-fold since 1972.

Caribou and Pickup and Tank Truck

Employees have a healthy respect for the locals, and we maintain strict regulations on interaction with the birds and animals.

ARCO annually spends large sums of money on animal and bird research within the areas. Employees feel privileged to observe these wonderful creatures in their natural habitats.

Five to ten percent of Arco Alaska's annual operating budget is spent on environmental protection.

Red Fox Family

Red Fox shown here were originally considered rare animals to the area, while the Arctic fox was the most prevalent. These kits were born to an aggressive set of parents who ran off the Arctic fox and took over their den.

All of the indigenous wildlife, except for most birds, stay on the North Slope year round.

Polar Bear

We occasionally have a curious, but awesome visitor seen here from a vantage point at the loading dock of the Seawater Treatment Plant. But they usually go about their business.

Native Hire

The State of Alaska and the oil industry put a priority on the training of indigenous Alaskans. Many of the native people employed on the North Slope commute from nearby villages.

Trans Alaska Pipeline System

We're proud of our investment in the Trans Alaska Pipeline System and its record of delivering over six billion barrels of oil to Valdez, the terminus of the 806 mile long pipeline. The pipeline utilizes only fifty feet operational right of way. The specially designed vertical support members shown here will not conduct heat to avoid melting the sensitive permafrost.

Port of Valdez

Eighteen tanks, capable of holding five hundred ten thousand barrels of oil each, are available at the Valdez terminal and used only when tanker schedules are disrupted.

Arco Tanker at Sea

Arco has responded to the *Exxon Valdez* disaster with more stringent tanker operating guidelines in the Prince William Sound area.

Exxon Valdez

You have just seen Valdez in a better light, but I would be remiss if I did not mention the *Exxon Valdez* disaster. Within 60 hours of the catastrophe, ARCO Alaska began reviewing and updating its contingency plans for all its operations throughout Alaska. We have all learned from this spill.

Cleanup Operations

Cleanup operations are on-going, but there continues to be concern expressed that environmental damage has been remedied to an acceptable level. The State of Alaska has insisted on a zero tolerance policy concerning the amount of oil left for nature to remove.

Cleanup Crew

This policy, requiring draconian methods, has led to a raging debate as to whether this high pressure washing is doing more damage than etting nature take its course. There is concern that the high pressure washing at the shoreline may be more damaging to intertidal life forms than the oil residue.

Community Development

Eighty-five to ninety percent of Alaska State revenues are generated by the oil industry. These slides show community developments, including a convention centre, public library, performing arts centre and an indoor sports arena, that are a direct result of oil taxes and royalties.

In 1988, ARCO Alaska paid $474 MM in severance taxes and an additional $180 MM in royalties to the State of Alaska. These monies have also raised the socio-economic and educational standards of indigenous Alaskans living in remote villages.

ROLE OF THE GOVERNMENT

What can the Government of New Zealand do to encourage petroleum companies to continue the very expensive search for more oil? Some governments worldwide have demonstrated a fundamental knowledge of the oil industry and its economics and appreciate the impact it has had on their economies. These governments have maintained a consistent and reasonable taxation and royalty regimen and have routinely offered incentives for exploration and production. This point cannot be emphasized enough. A fair and stable business and tax climate is a very important factor in enticing companies to invest in the expensive, long term projects necessary to produce oil in environmentally sensitive areas. These projects must compete with shorter term, less costly projects elsewhere in the world. They must also compete for investment capital in less risky businesses.

The risk of petroleum exploration in New Zealand is acknowledged to be relatively high from a geological standpoint. If the Government rules out profits commensurate with that risk by constantly restructuring royalties and taxes, the exploring companies will correspondingly avoid high risk exploration. Increased taxation also forces the industry to scale down marginal development and enhanced technology projects. I implore you to understand the economics of our industry. Don't take our word for it, and don't make set decisions that will directly and immediately affect our investments in your country.

The second critical positive response of the Government is the establishment of one agency to administer and regulate the petroleum policy on behalf of your Government. A governmental agency with the authority to fairly administer resource policy creates an environment of stability important to the development of long-term projects. Dealing with numerous government agencies on expensive projects leads to a bureaucratic quagmire, causing costly delays and cancellations. The goal of the Government should be to achieve a resource management policy which economically benefits the citizens of New Zealand with minimal environmental impact.

The spirit of co-operation between the Ministry of Energy and the producers/contractors will, I hope, remain much as it has been as we proceed together into this new energy era and as the new Ministry of Commerce takes over. With time fields deplete and some elements of existing contracts may change, even as the fields change. Adjustments may be necessary to make it attractive for the producers to operate in the country, and particularly to apply the highly prospective but costly new secondary and tertiary recovery technologies being used worldwide.

Finally, the Government does have a responsibility to define and promulgate environmental laws and regulations. It is a duty the Government has to its citizens and a role we in the industry should welcome. The rules of the game need to

be reasonable, balancing the need for, and benefits of, economic activity against some level of environmental risk. The industry needs to know the ground rules. To consider these issues in our early planning, these rules must be clear from the beginning and not subject to substantial change. I believe the industry can objectively provide data that the Government needs to formulate workable laws and regulations. Producers and operators can and should be active in the debate, but the Government must ultimately decide. I urge you and the New Zealand oil industry to make sure that your citizens are informed and recognize the delicate balance that must be achieved.

I also encourage the Government, through its designated authority, to continue the lines of communication with the industry in formulating and revising any petroleum regulations. Regulations should be designed to minimize any distortion on the investment and production decisions of the industry. Providing a forum to exchange ideas with representatives of the petroleum industry is most effective. The voice of the oil business in the U.S. is the American Petroleum Institute. In the UK: the United Kingdom Offshore Operators Association. And in New Zealand, the Petroleum Exploration Association of New Zealand represents both domestic and foreign companies operating in this country.

Although the New Zealand Government is now in the midst of a total re-evaluation of its mineral and petroleum resource policies (the third such review this decade) we view the economic and regulatory climate as favourable. Maintaining this climate, especially after major hydrocarbon accumulations are on stream, is vitally important for further investments by the industry. For example, the State of Alaska recently enacted an onerous tax bill in the wake of the Valdez oil spill which has delayed development of the West Sak accumulation on the North Slope of Alaska, estimated to contain more than 15 billion barrels of oil in place. The petroleum industry feels that wise energy policies can enhance the economic value to the country and forestall a repetition of the economic shocks of the 1970s by avoiding haphazard policy actions that overlook long-term energy posture.

WHAT IS THE INDUSTRY'S RESPONSIBILITY TO PEOPLE OF NEW ZEALAND?

First, we must recognize that it is your country, your resources, and that companies such as ARCO are your guest, and as a good guest we should leave things better than we found them.

Second, we should be very forthright, candid and honest in providing you with the information you need to know about our industry. As I stated earlier, you need to be informed about our industry if you are to regulate us in a responsible manner. We can, and should, be a source of such information.

Finally, we should run our operation in a safe, efficient, environmentally sound manner. It is your environment and your people. We should benefit your people with our activities and minimally affect your environment. As one of our old time drillers on the North Slope stated "When we're gone, we should leave it just like God laid her down".

CONCLUSION

Economic growth cannot happen without secure, affordable energy supplies. This growth, if planned, managed, and regulated properly, can be extremely beneficial to the national economy.

Fossil fuels are the life blood of many economies and will remain so for many years. We in the energy industry, who have operated in environmentally sensitive areas for years, know that our industry can be responsible and willing to make the protection of New Zealand's natural resources primary in our planning. The industry must continue to show that we are determined to operate carefully, conscientiously and professionally. Energy and environment can and must exist together; they are not mutually exclusive.
The Government of New Zealand is of primary importance in the petroleum equation. It must know that a consistent tax and royalty regimen, efficient administrative processes, and ongoing communication with the petroleum industry are critical for a healthy industry.

I would like to express my appreciation to the organizers and sponsors of this petroleum conference for inviting me here today. Each of us at this meeting has a vested interest in the future of the petroleum industry in New Zealand. We know a major petroleum discovery can be extremely favourable to this country's economy and social climate. With proper planning and constant attention, possible negative factors can be mitigated. The challenge that lies ahead for us as an industry is to maintain exploration momentum in a cost-efficient and safety-conscious manner while protecting the national health and environment in which we are operating.

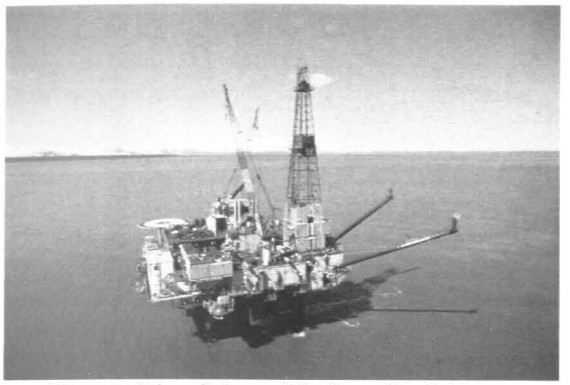

Plate 1: King Salmon Platform Cook Inlet.

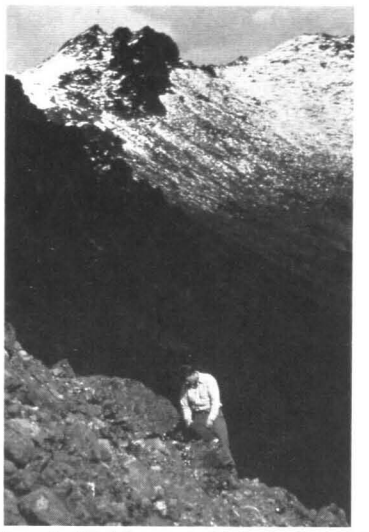

Plate 2: Field party - Brooks Range.

Plate 3: Ice beard.

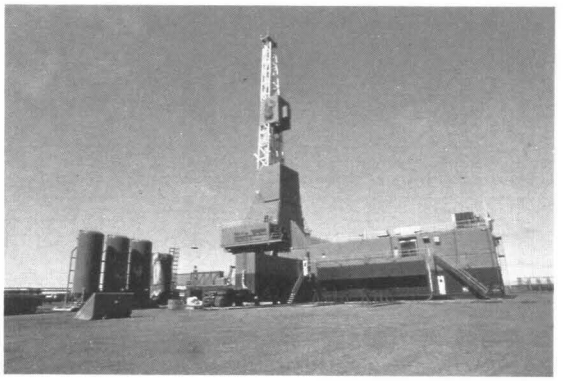

Plate 4: Doyon Rig shot - orange and red

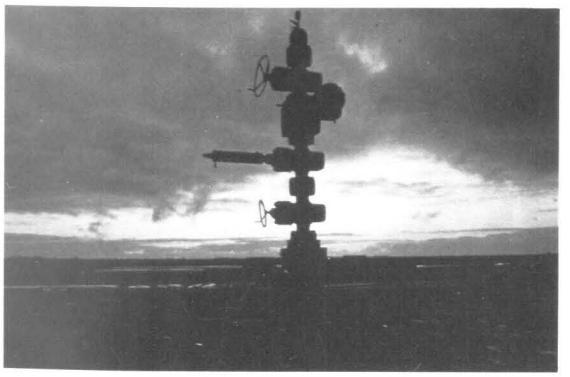

Plate 5: Drillsite

Plate 6: Caribou on tundra with drillsite in background.

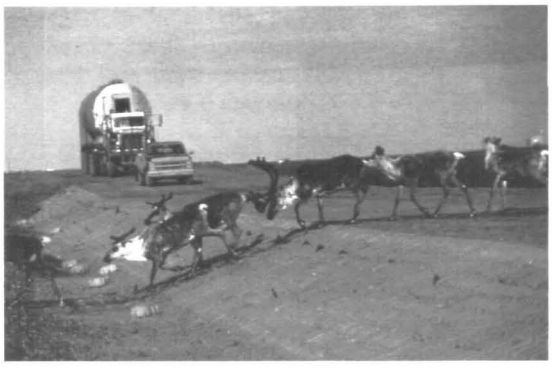

Plate 7: Caribou and pickup and tank truck.

Plate 8: Red fox family.

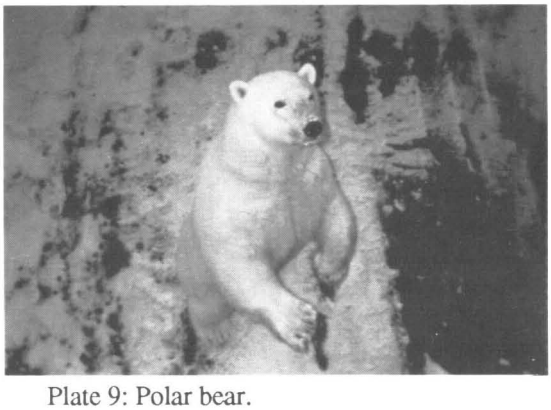

Plate 9: Polar bear.

Plate 10: Native hire.

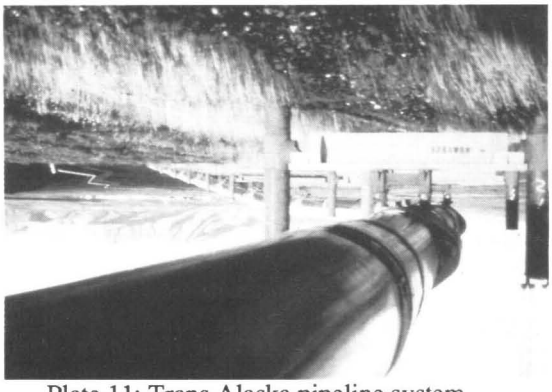

Plate 11: Trans Alaska pipeline system.

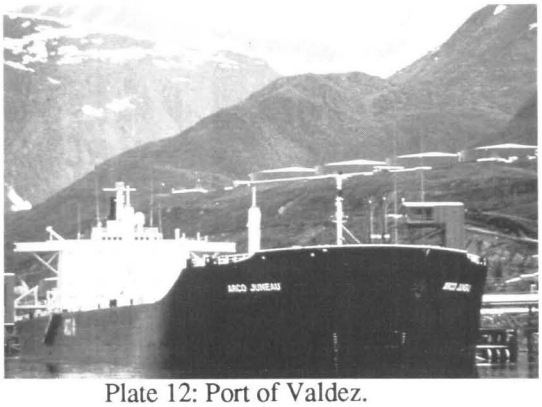

Plate 12: Port of Valdez.

Plate 13: Arco tanker at Sea.

Plate 14: *Exxon Valdez.*

Plate 15: Cleanup operations.

Plate 16: Cleanup crew.

Plate 17: Community development.