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III. NORTH SEA OIL AND GAS DEVELOPMENT

A. INTRODUCTION

Geologists became interested in the North Sea as a source of oil and gas in 1959, shortly after the discovery of onshore natural gas field at Slochteren, Holland. Major geological and geophysical studies of the North Sea were undertaken in 1964 after the Convention on the Continental Shelf was approved. Under this agreement, Great Britain, Norway, Denmark and the Netherlands divided the continental shelf in accordance with the treaty provisions. Subsequent boundary disputes between Denmark, the Netherlands and West Germany were settled in 1969 following a decision by the International Court of Justice.

The United Kingdom issued the first series of drilling licenses in June 1964, and the first discovery of natural gas—the West Sole field—was made a year and a half later. Additional natural gas fields were discovered in the southern North Sea. Since 1966, when natural gas was first produced from offshore wells, consumption of natural gas in Great Britain has tripled.

Commercial fields have been located throughout the North Sea region. Ekofisk, the first major oil find in the North Sea (Figure 1), was discovered in the Norwegian sector in December 1969. While the British also located a commercial field in their sector in December 1969 (the Montrose field), it took another year before the British Petroleum Company (BP) discovered its largest field, the Forties Field. Between 1969 and 1974, eleven commercial fields and ten unproven fields have been reported (see Table 1). Most commercial natural gas fields are located in the southern sector of the North Sea, and the most promising oil fields have been found north of latitude 56° N. The Danish Dan field is the only commercial field south of 56 degrees.

I. FINDINGS

1. The oil and gas resources of the North Sea have become and will continue to be an integral part of energy supplies in the United Kingdom and other North Sea countries. The North Sea oil and gas resources are increasing with new fields being discovered each year.

2. The North Sea physical environment presents many unique and challenging problems for the development of oil and gas resources, with similarities to parts of the U.S. outer continental shelf which have been proposed for development.

3. The impact of North Sea oil and gas resources on the British economy is and will increasingly be significant. The increased price of imported crude and refined oil has heightened interest in making the United Kingdom self-sufficient through development of the North Sea.

4. North Sea oil and gas development offers an important source of future employment which could reverse the traditional trends of high unemployment and large out-migration in some parts of Scotland.

5. Scottish authorities hope to institute long-range planning which will diversify the economy to ensure continued employment after the North Sea oil and gas resources are depleted. However, the speed of oil development to date has resulted in a preoccupation with short-term planning.

6. Actions by the private sector to develop North Sea oil and gas appear to have outpaced the efforts of governments to plan for this development. The magnitude and nature of onshore facilities required to accommodate these activities also appear to have been underestimated by governments since development has taken place so quickly.

7. A lack of information on the needs and requirements of the oil industry appears to have contributed to delays in local and regional planning efforts. In many instances, neither the national government nor the oil industry has provided local governments with the information needed to implement effective planning measures.

8. Planning at all levels was and is hampered by the need to learn quickly the capabilities of existing technology and respond to new technological innovations, particularly in the area of offshore production platform design.

9. Aberdeen, Inverness, and other communities have had to expand both public and private facilities to meet the needs of oil and gas development. Shortages in labor, housing, public services, and other factors have become a major constraint on developemnt.

10. The impact of North Sea oil and gas development on communities has been significant. Increased population, in some cases a tripling of present levels, is anticipated for communities in Scotland as a result of oil development. Provision of adequate public services by local governments has become a problem.

FIGURE 1

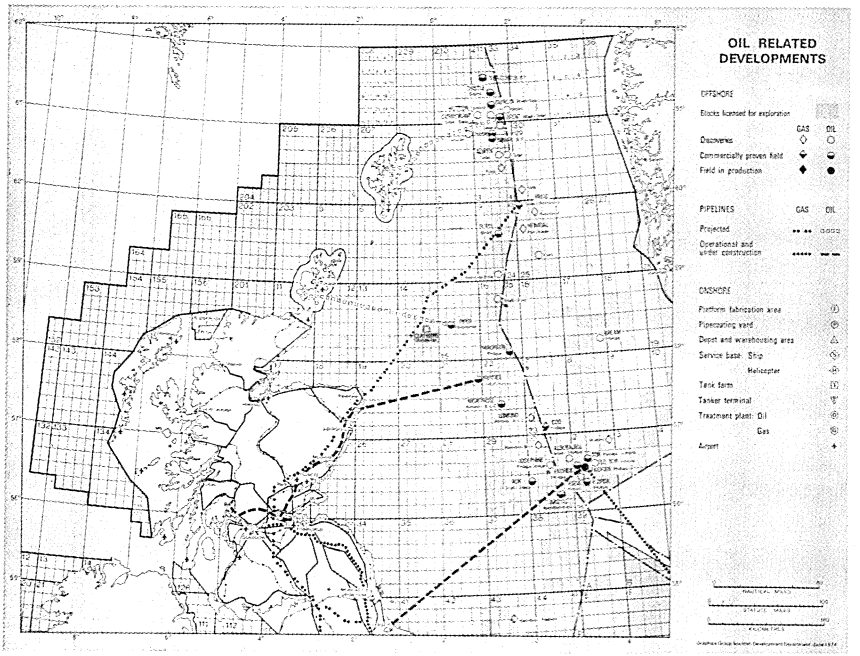

TABLE 1.—PROVED COMMERCIAL DISCOVERIES AND FINDS NOT YET PROVED OF OIL AND GAS IN THE NORTH SEA

Date of discovery	Company	Name of find	Block number	Plans for production
1. Commercial finds:				
December 1969	Gas Council/Amoco	Montrose	22/18	To begin 1976 using buoy and tanker system.
November 1970	BP	Forties	21/10	First deliveries expected early 1975 by undersea pipeline. Total cost of development £500m or more.
February 1971	Shell/Esso	Auk	30/16	Expected 1975: Oil to be taken by tanker to refinery at Teesside.
June 1971	Total/Petronord	Frigg	10/1 (U.K.) and 25/1 (Norwegian).	Gas field. To begin early 1976 by undersea pipeline.
August 1971	Hamilton Bros	Argyll	30/24	To begin autumn 1974 initially using a semisubmersible drilling rig loading into tankers through a buoy mooring system.
July 1971	Shell/Esso	Brent	211/29	To begin 1976—Cost over £300m. Initially the oil will be landed by tankers.
August 1973	Texaco	Brent	3/4	To begin 1976—Cost over £300m. Initially the oil will be landed by tankers.
September 1972	Burmash	Thistle	211/18	To come on stream in 1976.
Do	Mobil	Beryl	9/13	Plans not finalized but hoped to start 1976 using tanker and buoy system
January 1973	Occidental	Piper	15/17	Expected to begin 1975, probably by pipeline to Orkney.
July 1973	Shell/Esso	Dunlin	211/23	Thought to be commercial. Further evaluation necessary.
January 1974	BP	Ninian	3/8	Initial production using permanent facilities planned by late 1977–78. Separate plans for earlier production being evaluated.
February 1974	Burmah	Ninian	3/8	Initial production using permanent facilities planned by late 1977–78. Separate plans for earlier production being evaluated.
July 1974	BP/Burmah	Magnus	211/12	Plans for more drilling.

Sea is an enormous undertaking with significant risks involved for both public and private institutions. Third, the planning process has the potential for resolving conflicts in a pragmatic and reasoned manner. Fourth, while it is not always possible to compare the British experience with U.S. OCS development, there are numerous similarities, and significant insight was obtained, especially with respect to the coastal zone impacts of offshore oil and gas development. Finally, a deeper appreciation was obtained by the delegation for the real differences and real similarities between the U.S. and British experiences.

A major conclusion of the staff delegation was that the onshore coastal zone impacts of North Sea development present a particularly complex problem of which U.S. government decisionmakers should be aware. The North Sea development should aid efforts to reverse Scotland's traditionally high unemployment and out-migration. However, high wages in the oil industry could divert labor from traditional employment sectors (such as fishing and farming) and bring about important changes in the Scottish economy. In addition, the impact of North Sea development on urban centers has been significant. Increased populations, in some cases a tripling of present levels, is anticipated for northeast Scotland as a result of oil development. This has placed a significant strain on the provision of a wide range of public and private services. It is also placing a strain on the traditional Scottish way of life.

Scottish officials have attempted to deal with these problems through the use of existing planning statutes, such as the Town and Country Planning Act. While the Scottish planning system is highly developed and complex, the staff delegation was able to view it working on a small scale in the Shetland Islands. The Shetland experience, while unique, appears to have been successful in planning for onshore experience.

The members of the staff delegation offer the report of their investigation for the consideration of the Senate Committee on Commerce and the National Ocean Policy Study. I wish to emphasize that the findings and implications incorporated into this staff report, and which may prove to be controversial, have not been approved, disapproved, or considered by the Committee on Commerce or the National Ocean Policy Study. Additionally, the findings and implications do not necessarily represent the views of the Executive branch members of the staff delegation.

ERNEST F. HOLLINGS,
Chairman, National Ocean Policy Study.

TABLE 1.—PROVED COMMERCIAL DISCOVERIES AND FINDS NOT YET PROVED OF OIL AND GAS IN THE NORTH SEA—Continued

Date of discovery	Company	Name of find	Block number	Plans for production
2. Finds not yet proved commercial:				
September 1970	Phillips Group	Josephine	30/12	
June 1971	Hamilton	(Not named)	30/2	Gas condensate.
May 1972	Gas Council/Amoco	Lomond	23/21	Appraisal well now drilling.
September 1972	Shell/Esso	Cormorant	211/26	Structure complex.
February 1973	Phillips	Maureen	16/29	Appraisal well now drilling.
July 1973	Total	(Not named)	3/19	Gas find.
Do	do	do	3/15	
September 1973	Conoco/Gulf/NCB	Hutton	211/28	
October 1973	Total	Alwyn	3/14	Announced Oct. 10, 1973.
November 1973	Unocal	(Not named)	2/5	Appraisal well now drilling.

A major focus of drilling interest has been directed to the U.K. region. By the end of 1973, 342 exploration or appraisal wells and 198 production wells had been drilled in the U.K. sector of the North Sea. While already eleven oil fields and seven natural gas fields had been declared commercial in 1973, the discovery of new commercial finds has not yet come to an end. Early in 1974, BP and Burmah Oil discovered another large oil field (Ninian) in the northern North Sea, and in July, 1974, BP confirmed another possible major field (Magnus) fifteen miles north of the Thistle field, about 70 miles northeast of the Shetland Islands.[1] There may be as many as 125 geologic structures with potential oil and gas in the British sector of the North Sea and less than 15 percent have so far been drilled. The North Sea is therefore expected to remain an area of major exploratory activity. In 1973, 25 mobile drilling rigs were used, and an estimated 40 rigs may be deployed in 1974. Between 40 and 100 production platforms, four to five pipelines, and an undetermined number of onshore terminals, tank farms and refineries will be required.

Of all known oil developments, the area east of Shetland has emerged as the one with the highest resource potential. Hence, exploratory activity has rapidly increased in this area since 1973. Several blocks west of the Shetland and Orkney Islands and to the west of England and Wales have been leased, but shortages of men and equipment have stalled exploratory activities in these areas. Geologic structures in these areas are favorable for oil and gas, but the size of the basins and the thickness of the sediments indicate smaller quantities of recoverable oil and gas than in the North Sea.

B. RESERVES

Recent studies estimate natural gas reserves in the U.K. section of the North Sea continental shelf at 65 trillion cubic feet (tcf) and ultimate potential discoverable resources at between 80 and 116 tcf. Another 36 tcf may be recovered from the Celtic Sea and the Northwest Atlantic. Proved oil reserves are estimated at 12 billion barrels and ultimate potential resources around 40.5 billion barrels, of which 28.5 billion barrels are from the North Sea.[2]

[1] "North Sea Gets Northernmost Oil Strike," *Oil and Gas Journal*, July 22, 1974, p. 14.
[2] *Oil and Gas Journal*, June 3 ,1974. See also Appendix B.

11. High wages in the oil industry may divert labor from traditional employment sectors such as fish processing, farming, and other industries. In addition, the development of oil resources is also changing many traditional patterns of the Scottish way of life.

12. Concern exists over the environmental impact of North Sea oil and gas development. Fishing interests are particularly concerned about the impact of offshore operations on fishing activities. Citizens are concerned about the general impact of oil developments on coastal land use patterns.

13. Environmental considerations play a significant role in the planning process. In several instances, local authorities will require companies to undertake restoration of facility sites at the end of their useful lives, to the extent practicable.

14. The United Kingdom has developed a centralized system for dealing with oil spill prevention and cleanup. However, the question of liability for oil spills and destruction of fishing equipment is still an unresolved issue.

15. Decisions about onshore facilities have been made under procedures set forth in existing planning legislation, the Town and Country Planning Act (Scotland), as amended.

16. Onshore facility approval is the primary responsibility of local governments, although oversight is provided by the Secretary of State for Scotland. Local governments have the authority to issue permits except when the proposed use is incompatible with previously approved development plans. In those cases, the final decision rests with the Secretary.

17. The Shetland Islands will be a major focus of future activity connected with North Sea oil and gas development. The Shetlands appear to have been successful in planning for this development through:

(*a*) Early adoption and articulation of a policy of control of onshore development;

(*b*) acquisition, on a timely basis, of a comprehensive independent study of likely shoreside oil industry requirements and impacts;

(*c*) an effective public information and involvement program;

(*d*) the acquisition of necessary planning and management powers through new legislation; and

(*e*) the effective implementation of planning by local government, with the aid and assistance of national legislation.

Implications

These findings contain the following implications for the United States:

1. There should be encouragement and support by the Federal government for the early development of effective coastal zone management programs in States likely to be affected by Federal OCS activities through the Coastal Zone Management Act of 1972.

2. The Federal government should accept responsibility for adequately informing and preparing State and local governments as to coastal facilities and services likely to be needed in connection with OCS activities.

U.K. offshore reserves are comparable to those on the United States Outer Continental Shelf (OCS). The most recent United States Geological Survey (USGS) figures on offshore oil and gas reserves put total U.S. offshore "measured reserves" of oil at 7.6 billion barrels and natural gas at 47.8 trillion cubic feet. Total OCS "indicated and inferred reserves" of crude oil are estimated to range between 3 and 5 billion barrels, and such reserves of natural gas between 23 and 45 trillion cubic feet. Offshore ultimate potential crude oil resources are estimated between 65 and 130 billion barrels, and natural gas between 395 and 790 trillion cubic feet.[3]

C. PHYSICAL ENVIRONMENT

Oil companies are facing a number of technical problems in coping with the North Sea physical environment. Most of the discovered oil is in the northern part of the North Sea where water depth averages between 350 and 420 feet. One well has been drilled in 520 feet of water in a block some 75 miles northwest of the Orkney Islands, and other blocks have been leased in 1,500 feet of water.

While winter waves average between 7 and 15 feet 65 percent of the time, waves of more than 60 feet have been recorded in the Forties field area, and structures must withstand winds of up to 130 miles per hour. Mean winter temperatures are also severe, averaging 37 degrees Fahrenheit. These temperatures when combined with the wind, bring the effective temperatures down well below freezing.

Currents are generally weak, but sand waves and strong tides require construction of strong drilling platforms. In addition, there is considerable turbidity on the sea floor which restricts underwater activities.

Hence, environmental conditions in the North Sea are considerably more hostile than in the Gulf of Mexico or offshore California where most U.S. offshore oil and gas is currently being produced. North Sea conditions may be closer to those of the northwest Atlantic, but less severe than above the Arctic Circle. Hence, the drilling conditions in the North Sea present a unique "testing ground" against which the development of "frontier" fields on the U.S. OCS can be compared. As a recent Council on Environmental Quality report noted, many of these frontier areas are in areas of similar hostile environment.

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[3] U.S. Department of the Interior, Geological Survey, news release, Mar. 26, 1974.
"Measured reserves" are identified resources from which an energy commodity can be economically extracted with existing technology, and whose location, quality, and quantity are known from geologic evidence supported by engineering evidence.
"Indicated reserves" are reserves based partly upon specific measurement, samples, or production data, and partly from projection for a reasonable distance on geologic evidence.
"Inferred reserves" are those reserves based upon broad geologic knowledge for which quantitative measurements are not available. Such reserves are those estimated to be recoverable in the future as a result of extensions, revisions of estimates, and deeper drilling in known fields.
"Ultimate potential" or "undiscovered recoverable resources" are those quantities that may be reasonably expected to exist in favorable geologic setting, but which have not yet been identified by drilling. Exploration will permit the reclassification of such resources to the reserves category.
There is significant disagreement among experts about the accuracy of the USGS figures. Recent estimates by Mobil Oil Corp., for example, put undiscovered recoverable resources of offshore oil in the United States at only 54 billion barrels and natural gas at 274 trillion cubic feet. For a full discussion of this debate, see *Science*, July 12, 1974, pp. 127–130.

93d Congress
2d Session

COMMITTEE PRINT

NORTH SEA OIL AND GAS: IMPACT OF DEVELOPMENT ON THE COASTAL ZONE

PREPARED AT THE REQUEST OF

HON. WARREN G. MAGNUSON, *Chairman*

FOR THE USE OF THE

COMMITTEE ON COMMERCE

PURSUANT TO

S. Res. 222

NATIONAL OCEAN POLICY STUDY

OCTOBER 1974

Printed for the use of the Committee on Commerce,
United States Senate

U.S. GOVERNMENT PRINTING OFFICE

40-047 O WASHINGTON : 1974

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price $1.90
Stock Number 5270-02622

IV. ECONOMIC IMPACT AND LEASING SYSTEM

A. ECONOMIC IMPACT

The impact of the North Sea oil and gas resources on the British economy is significant. The U.K. has suffered from a chronic deficit in the balance of payments, and prior to last winter's oil embargo oil imports were costing $2.5 billion annually. The recent increases in the price of imported crude and refined oils should quadruple this figure in 1974.

Current U.K. expectations are, through rapid development of North Sea reserves, to be self-sufficient in oil by 1980. The U.K. also hopes to be a net exporter during the nineteen eighties, when a peak production of 2.5 billion barrels per annum is projected (about one-third of current Saudi Arabian production). If hopes for the recently discovered Ninian and Burmah fields are well founded, this could bring peak production to 3.5 billion barrels annually by the 1980's. At approximately $9.30 per barrel, the average price international oil companies are paying for crude oil today,[4] oil produced for the British sector of the North Sea would be worth between $23.3 billion and $32.5 billion annually during peak production in the nineteen eighties. After that, income would gradually level off as production rates drop.

B. LEASING SYSTEM

In order to maximize exploration for oil and gas, Britain instituted a leasing system quite different from that used in the United States where offshore oil reserves were not so crucial to national energy requirements. The British offer licenses to corporations or groups of companies, covering a stated concession area for a certain period of time. Under the financial terms, the licensee pays 12½ percent in royalties (based on wellhead price), an annual payment, and taxes on profits. The initial payment for an average-sized block of 64,000 acres was £6,250 ($15,000) to cover the first 6 years. After the sixth year, licensees have to surrender at least 50 per cent of the concession area and can keep the remainder on lease for a further 40 years. The annual payment for the average-sized block in the seventh year rises to £10,000 ($24,000) and thereafter increases annually by £6,250 ($15,000) to a maximum of £72,000 ($172,000).

The annual payments to the Crown treasury are considerably less than the income that could be obtained from lease-bidding. For example, in 1971, when the British Government tried out the auctioning system with 15 blocks it received a total of £37 million ($88.8 million). In contrast, income from 230 discretionary licenses involving 848 blocks between 1964 and 1972 totalled £6 million (14.4 million).[5] Taxes paid to the government have been very small because of double taxation relief.

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[4] *The London Times*, July 18, 1974.
[5] Irvin L. White, et al. *North Sea Oil and Gas Implications for Future U.S. Development*, University of Oklahoma Press, 1973, ch. II.

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3. Because of the intimate tie between offshore oil and gas extraction and necessary coastal support facilities, the Federal government should examine methods of incorporating the views and interests of affected coastal States into the planning process on offshore development.

4. State and local governments should be permitted authority to play a significant role in the decisionmaking process on which areas adjacent to their coasts will be opened for oil and gas development and to express their own terms in the leasing agreements.

5. In order to understand the overall impacts of such development, efforts should be made to obtain more detailed information on:

(a) The scale and nature of proposed offshore and onshore development in specific geographic regions prior to its inception,

(b) Projection of employment needs in coastal communities to be impacted,

(c) A forecast of community transition trends and resulting needs, including an assessment of available and needed housing and

(d) A projection of types and numbers of municipal facilities which will be required to service the population and industry new to coastal communities, as well as indigenous industries, to be impacted by OCS development.

6. Decisions concerning the areas to be opened for offshore development should be made on the basis of careful assessment, taking into consideration broad national interests as well as the interests of State and local communities. Such interests include environmental protection, provision for coastal recreation, and others.

7. Adequate lead times between the planning and implementation stages are essential to the appropriate mechanisms to deal with onshore impacts.

8. All development of the OCS should be paced to minimize the risks of environmental damage and the disruption of the infrastructure of impacted coastal areas.

In Britain, government revenue was initially (prior to oil discoveries) considered of secondary importance. Under the existing system the government expected to receive about 50 per cent of the value of oil and gas returns from the North Sea. Oil exploration demands a great deal of venture capital which governments are usually not willing or able to invest. International petroleum companies were willing to commit sizable investments because the financial arrangements were favorable and political conditions considered most attractive. Hence, by 1972 (after 8 years) 55 percent of the available acreage in the British sector of the North Sea had been leased. In the United States by comparison, only 15 percent of the Federal acreage in the Gulf of Mexico had been leased over a period 19 years.

However, the honeymoon between the oil companies and the British Government may soon be over. The unexpected quadrupling of the price of imported crude, the very size of the North Sea oil discoveries, and the election of a new government has resulted in changes. The Labour government published a White Paper in July 1974 which proposes sweeping new powers of control over all phases of exploration and development. The government intends to close base loopholes, impose additional taxes on corporate profits, require government majority participation for all new licenses, and invite companies holding licenses where commercial fields have been found to discuss government majority participation. Furthermore, it intends to control the level of production for current and future licenses; to control the development of undersea pipelines; to introduce tighter controls of exploration and development; and finally, to establish a national oil corporation which will play an active part in future offshore oil developments as well as refining and distribution of oil. The oil companies contend that under the new proposals the reward for risk-taking will vanish and if adopted by Parliament, the new measures are not likely to create additional incentive to explore for oil in British waters.

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V. EFFECT ON EMPLOYMENT

The effect of North Sea oil and gas development on employment has been significant in northeast Scotland and the Shetland Islands. However, it has so far had little impact on employment in the heavily populated areas of central and western Scotland where unemployment has recently been a significant problem. Thus, many people from cities in central and western Scotland, such as Glasgow, continue to migrate to London and the Commonwealth countries.

The oil industry is basically capital intensive and demand for labor is not high. However, the effect of oil development on employment in the less populated northeastern part of Scotland is important, and will result in lasting changes in the region.

Most of the industrial development related to oil exploration and production will be near Inverness, Aberdeen and a few smaller towns such as Peterhead. The Inverness region had a population of 90,000 in 1971. The region is expected to grow to 110,000 in just four years; to 120,000 by 1981, and to 140,000 by 1991. Peterhead has a population of 14,000, which is expected to reach 20,000 in the next five years. The ultimate figure for all of northeast Scotland, taking into account the need to maintain the high quality of the environment, is planned at between 270,000 and 300,000. This unprecedented rate of growth will cause a number of problems, including the provision of infrastructure, housing, schooling, and recreation facilities. The most immediate problems, however, are those connected with employment.

In northeast Scotland, employment in projects connected with North Sea oil exploration grew by 2,665 to 11,275 in the short period from December, 1973, to March, 1974. Local and regional authorities, in cooperation with oil related industries, have attempted to plan for this development, but they have not always succeeded. For example, Brown & Root, an American construction firm building production platforms, initially anticipated hiring 900 employees. Actual employment, however, soon grew to 3,000. The company brought in instructors and established a welding school, but housing and other facilities could not be provided fast enough. Shortages of housing, skilled labor, berths in the harbors, and equipment have had an adverse impact on some of the older established industries.

High wages in petroleum-related industries have resulted in loss of skilled craftsmen in vital ancillary industries such as shipbuilding and ship repairing. Although oil-related labor wages are generally higher than wages of other sectors, there have been complaints that some North Sea oil companies are not paying wages comparable to other parts of the world; as one critic noted, the oil companies are "treating their Scots workers as 'tartan coolies'." This problem has fueled the centuries-old problem of Scottish nationalism. Scottish Nationalist Member of Parliament, Mr. Gordon Wilson, claimed that "some international oil companies regard the Norwegians as the 'blue-eyed Arabs of the North' and an equal number treat the Scots as

tartan coolies whose remote Government in London is more interested in getting the oil out as fast as possible than in protecting the rights of the Scottish workers." [6]

Several employment sectors do not appear to have been affected by North Sea development. The fishing industry, for example, does not appear to have suffered any significant labor problems, probably because the industry is economically very sound.

Authorities fear, however, that without proper planning the structural changes in employment resulting from oil and gas development could have disastrous effects on the economy once exploration activities and the platform building boom come to an end. Hence, British officials believe careful planning for the future is of utmost importance.

The manner in which the British go about this planning could be significant to the implementation of the coastal zone management programs by U.S. coastal states. The coastal states, like Britain, must address the labor and employment aspects of oil and gas development to determine adequacy of supply, rate of influx and degree of employment changeover in coastal communities. Where necessary the coastal zone management program of a particular state will have to forecast the employment market and possibly even project training and retraining needs.

Concerning long-range employment, planning in Scotland will focus on efforts to attract petrochemical and plastic industries which use oil as a raw material. Initially, most new development will be in the heavy steel industry, production of platforms, pipe coating and laying, and in oil processing and treatment facilities. It has been estimated that between 1973 and 1985, at least 70 platforms will have to be built for the North Sea fields. If constructed in Scotland, this would require about 12 fabrication yards, each employing between 500 and 1,000 workers. Consequently, Aberdeen has become the offshore capital of Europe, but considerable effort is needed to acquire capital and advanced technology industries in order to sustain employment after the oil boom has passed. The British government has established special development organizations for Scotland and Wales to channel some of the oil revenues back into the region where oil is produced. Such a practice does not presently exist in the United States, although amendments to that effect were included in the Energy Supply Act of 1974 (S. 3221), as passed by the Senate, and the Coastal Zone Management Act.

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[6] *Daily Express*, June 28, 1974, p. 2.

LETTER OF TRANSMITTAL

U.S. SENATE,
COMMITTEE ON COMMERCE,
Washington, D.C.

DEAR COLLEAGUE: One important responsibility of the National Ocean Policy Study is to evaluate present and future United States policies affecting the oceans. Toward this end, the NOPS selected as one of its first areas of investigation the development of oil and gas resources on the outer continental shelf (OCS). This selection was made because the United States OCS leasing policy is expected to be altered greatly over the next few years.

The OCS contains significant reserves of oil and gas, and it is expected to contribute greatly to future domestic energy production. At present, the OCS contributes 18 percent of domestic petroleum and 15 percent of domestic natural gas production. Over the next decade, however, its contribution to national energy needs is expected to increase significantly and play a major role in the United States drive toward energy self-sufficiency.

In preparation for its hearings on OCS leasing policy, the NOPS staff received preliminary information about the problems involved in oil and gas development in the North Sea. Because this effort bore a direct and highly relevant relationship to the proposed rapid development of existing and frontier U.S. OCS areas, a more detailed and first-hand examination of the North Sea experience was felt necessary. It was felt a close examination of North Sea oil and gas development could provide a better basis for understanding future policy issues which the United States will have to face over the coming decade, especially in problems on coastal zone management pursuant to the Coastal Zone Management Act of 1972.

Accordingly, an itinerary for on-site investigation of North Sea activity was formulated with the assistance of the Department of State and the Embassy of the United Kingdom. A staff delegation, composed of staff from the Executive and Legislative branches, was selected for the purpose of identifying problems and problem-solving mechanisms applied by the United Kingdom to the rapid expansion of North Sea oil and gas resources. The staff survey was undertaken during the period July 1 thorugh 5, 1974.

The following report documents the observations and findings of the staff delegation and is presented to the National Ocean Policy Study for its careful consideration.

While the staff delegation does not make any recommendations for legislation, its survey of the U.K. North Sea efforts did lead to several general conclusions. First, it obtained a greater appreciation for the complexities involved in the rapid development of resources in a harsh physical environment. Second, the development of the North

VI. SOCIOECONOMIC PROBLEMS

A. INTRODUCTION

North Sea oil development is the most important event for the economy of Scotland in a hundred years. As the Aberdeen *Press and Journal* of August 25, 1972, noted: "Centuries of deprivation, exploitation and emigration have suddenly given way to the exciting prospect of prosperity for all." There is no doubt that this development will result in a significant boost to the local economy.

In the past, Scotland has gone through periods of prolonged unemployment, and considerable emigration to England and the Commonwealth countries has taken place. While the economic boom associated with the offshore exploratory activities and the construction of production platforms could reverse this trend, without proper planning the old conditions could again prevail. Hence, the Scottish authorities are attempting to insure that oil revenues will be used to diversify and stimulate general economic activities which will last beyond the initial boom. The magnitude of oil activities will significantly affect the general economy. The investment in oil drilling equipment and related services provides an example. Oil company investments in offshore and onshore facilities are worth billions of dollars. A recent estimate of North Sea oil development projects showed investments of £2,400 million (about $5.5 billion; see Appendix C). Taking into account inflation and development of other discoveries in the period 1975–79, investments could amount to £1,300 million ($3.1 billion), while the investment in new discoveries could total between £4,000 million and £7,000 million ($9 billion to $16.8 billion). This would mean a total investment of over £10,000 million ($25 billion). The question remains how much of the business will go to British firms and foreign companies investing in Scotland? The British face keen competition from American, Dutch, and French corporations, which have more experience in manufacturing drilling rigs, platforms and oil drilling equipment. Several foreign firms, particularly American construction companies, have already made or are planning to make significant investments in technologically-advanced oil-related industries, but the nationalization plans of the Labour Government may slow down foreign investment plans.

B. FACILITIES, EQUIPMENT, AND SERVICES

Scotland could play a major role in supplying the world with drilling rigs, production platforms, and drilling and service equipment, long after the North Sea oil boom has passed. Already, about 18 per cent of the world's oil comes from offshore areas. By the end of the century it is estimated that this proportion will have risen to 40 per cent of a much larger total demand. In order to meet the present demands of the oil industry, Scotland intends to make large investments in improvement of its infrastructure. The new type of concrete production and storage platforms, for example, require deepwater

II. INTRODUCTION

On February 19, 1974, the Senate passed S. Res. 222 to authorize an extensive examination of the Nation's ocean policy and programs. The National Ocean Policy Study (NOPS) was established to investigate the wide range of factors influencing national ocean policy, including:

(1) Current and prospective national capabilities in the oceans;

(2) the adequacy of current Federal programs relating to oceans;

(3) establishing policies to achieve the goal of full utilization and conservation of ocean resources;

(4) assessing the need for new policies to guide future fuels and minerals development;

(5) encouraging implementation of coastal zone management programs; and

(6) assessing current national and international jurisdictional problems over the oceans.

Senator Ernest F. Hollings was appointed Chairman of the NOPS shortly after enactment of S. Res. 222.

The NOPS selected as its first area for investigation the problems surrounding the development of oil and gas resources on the U.S. outer continental shelf (OCS). While OCS resources have been developed for over 20 years, recent events have placed them in a new perspective. The OCS contains significant oil and gas reserves and will play a major role in achieving energy self-sufficiency. At the same time, however, increased concern has developed over the potential environmental impact on ocean resources and the coastal zone impact of OCS development. These problems were given new impetus with the announcement in January, 1974 that the Administration would attempt to increase OCS leasing ten-fold over the next few years.

The NOPS held five days of hearings on the problems surrounding OCS development on April 23–25, and May 2 and 21, 1974. The hearings received testimony on a wide range of problems, including the socioeconomic and environmental impact of development, and the problems of coastal states in establishing the legal, planning and management mechanisms to deal with increased OCS leasing through the Coastal Zone Management Act.

In preparation for these hearings, the NOPS staff received preliminary information about oil and gas development in the North Sea. Because the European effort bears a direct and highly relevant relationship to the proposed rapid development of new and existing U.S. OCS areas, a more detailed and first-hand examination of the North Sea experience was felt advisable. It was hoped that a close examination of North Sea oil and gas development could provide a better basis for understanding future policy issues the U.S. will face over the next decade.

These preliminary efforts were followed by planning of a more detailed itinerary for on-site investigations of North Sea activity with the assistance of the Department of State and the Embassy of the

construction sites of up to 100 fathoms. While a number of potential sites exist in Scotland, few are presently available, and improvements in existing sites may be necessary. Supply ships which service drilling rigs and production platforms will also need additional docking and storage facilities. Initially, only Aberdeen could supply such services, but when it could no longer cope with all the traffic, new docking space was made available in other ports such as Peterhead and Dundee. In addition to expansion of existing docking facilities, northeast Scotland is also improving its railroads, highways and airports to meet growing demands on available transportation. In 1972–73 alone, passenger air traffic increased by 40 per cent in Aberdeen and 60 per cent in the Shetlands.

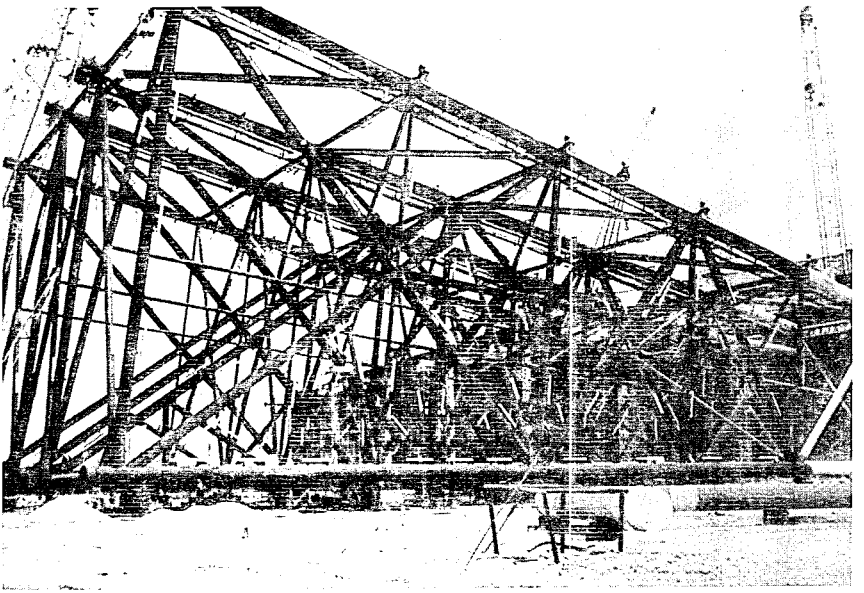

FIGURE 2. platform jacket under construction at Ardersier, near Inverness. When completed, the structure is towed to the drilling site and fixed on the ocean floor. *Photo by George A. Doumani.*

C. URBAN IMPACT

Rapid population growth caused by the influx of labor is likely in the Inverness area and Aberdeen. Aberdeen alone will need some 30,000 additional houses in the next 10 years. Although about 2,000 new houses were completed in the past year and 5,000 are planned or under construction, the pressure is still enormous on the building industry.

Construction of additional municipal facilities will also be required. In Aberdeen, for example, there is no sewage treatment plant. At present, raw sewage is dumped into the harbor, and the anticipated increase in housing and population should make these conditions worse.

A more serious problem resulting from this boom in Aberdeen is the price of land. Service land with water, sewers and other utilities, rose

in price from £3,000 ($7,200) an acre to as much as £40,000 ($96,000) an acre in the last four years.

It is difficult to project accurately total housing needs in every town and what effects labor and material shortages will create by inflating the price. In addition, rapid population increases will also cause additional demands on commercial and social services, hospitals, schools, and recreation facilities. Crime rates and other adverse consequences may affect considerably the traditionally staid Scottish way of life. Some experts fear that due to the time lag, standards for housing and other construction and municipal requirements will be adopted that are lower than what presently is acceptable. A case in point is the Brown & Root production platform construction, mentioned earlier. Not only did the labor force jump from the planned 900 to 3,000 but the time involved was merely six months, too fast for the local community to accommodate such an influx of personnel.

D. IMPACT ON FISHERIES

Fishing is one of the oldest industries of Scotland. Total catch in 1973 was valued at $375 million, and in the Aberdeen area alone, it provided employment for 10,000 people, landing about $100 million worth of fish. The industry is concerned about North Sea oil developments, and fishermen are apprehensive of the actual and potential damage to their trade. Discussions with authorities in Aberdeen and Peterhead revealed that competition for port facilities, and labor union disputes over fish handling at the docks, have caused much of the inshore fishing fleet to move to lower-cost ports such as Peterhead.

At Peterhead (Figure 3), the port authority indicated that landings increased in volume from an annual value of £600,000 ($1,440,000) in 1970 to more than £1 million ($2.4 million) *per month* in 1973. Harbor authorities have attempted to eliminate the conflict between oil-service supply boats and fishing boats, but, even though fishing boats in general have priority in Peterhead, the improvements of port facilities are bound to lead to higher costs, affecting supply boats and fishing vessels equally.

Aberdeen felt the initial impact of North Sea development since it is the largest urban area. The demand for rigs increased from about 14 in in 1973 to about 20 this year, and in 1975 about 25 rigs are expected to be operating in Scottish waters. With distances between 100 and 150 miles offshore, these rigs each require two to three supply boats operating continuously, supplying the 25,000 tons of equipment needed by each rig every year.

United Kingdom. A Congressional staff delegation was selected for the purpose of identifying problems and problem-solving mechanisms applied by the United Kingdom to rapid expansion of oil and gas resources in the U.K. sector of the North Sea.* The delegation also hoped to gain knowledge about what experience, if any, could be applicable to conditions presently existing in the United States, particularly as to the future development of Atlantic and Alaskan OCS resources.

The following report documents the observations and findings of the Congressional staff delegation and is presented to the National Ocean Policy Study for its consideration.

The staff delegation wishes to acknowledge the assistance of Mr. David T. Kay of the Scottish Information Office for his arrangement and execution of the itinerary. The courtesy, candor and cooperation of officials from the Highlands and Islands Development Board, the Scottish Economic Planning Department, the North East Scotland Development Authority, the port authorities of Aberdeen and Peterhead, the Scottish Trawlers Association, and the Zetland County Council are also appreciated. Acknowledgment is also due the British Petroleum Company, J. Ray McDermott Ltd., Arunta (Scotland) Ltd., Norscot Services (Fred Olsen Ltd.), and the Comex Diving Company for their courtesy and permission to inspect their installations and construction sites.

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*The Congressional staff delegation consisted of: John F. Hussey, Staff Director, National Ocean Policy Study; George A. Doumani, Specialist in Earth Sciences and Oceanography, Congressional Research Service, Library of Congress; Robert Niblock, Ocean Project Leader, Congressional Office of Technology Assessment; Robert Knecht, Director, Office of Coastal Zone Management, National Oceanic and Atmospheric Administration; and Richard Keating, Special Assistant to the Director, Office of Coastal Zone Management, National Oceanic and Atmospheric Administration.

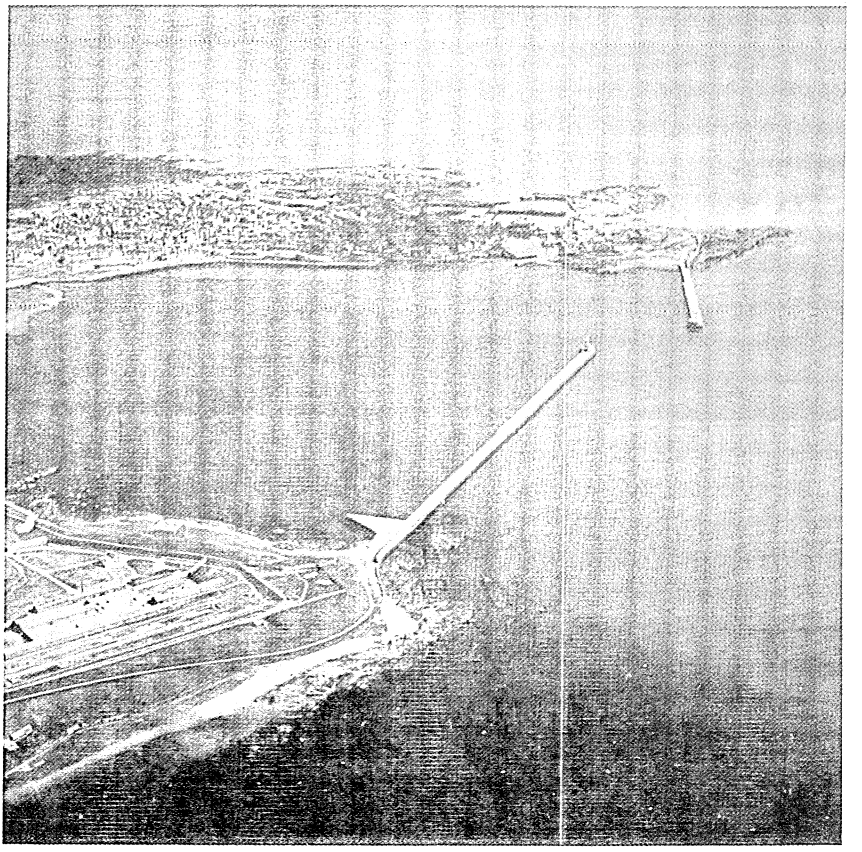

FIGURE 3. Peterhead Harbor of Refuge, currently undergoing development as an oil rig supply and servicing base. It is also home port for the in-shore fishing fleet that left Aberdeen Harbor. *Photo courtesy of North East Scotland Development Authority.*

The Aberdeen harbor authority responded with a massive program of developing the harbor, undertaken two years ago, which is reflected in significant changes in the physical composition of the docks (Figure 4). The program in progress calls for reconstruction and strengthening of the quay space to support intensive oil-related industry. It will cost approximately £2 million ($4.5 million). In addition, the Harbor Board has applied for and is awaiting government authorization for widening and deepening the entrance to Victoria Dock. This effort will cost close to £1 million ($2.4 million). Despite all this, Aberdeen has not been able to cope with the traffic, and companies like British Petroleum and Conoco had to set up their own facilities in Dundee. Thus, when the in-shore fishing fleet chose to go the Peterhead, the pressure on the port in Aberdeen eased, although the fishing industry as a whole still faces some apprehensions and acute problems.

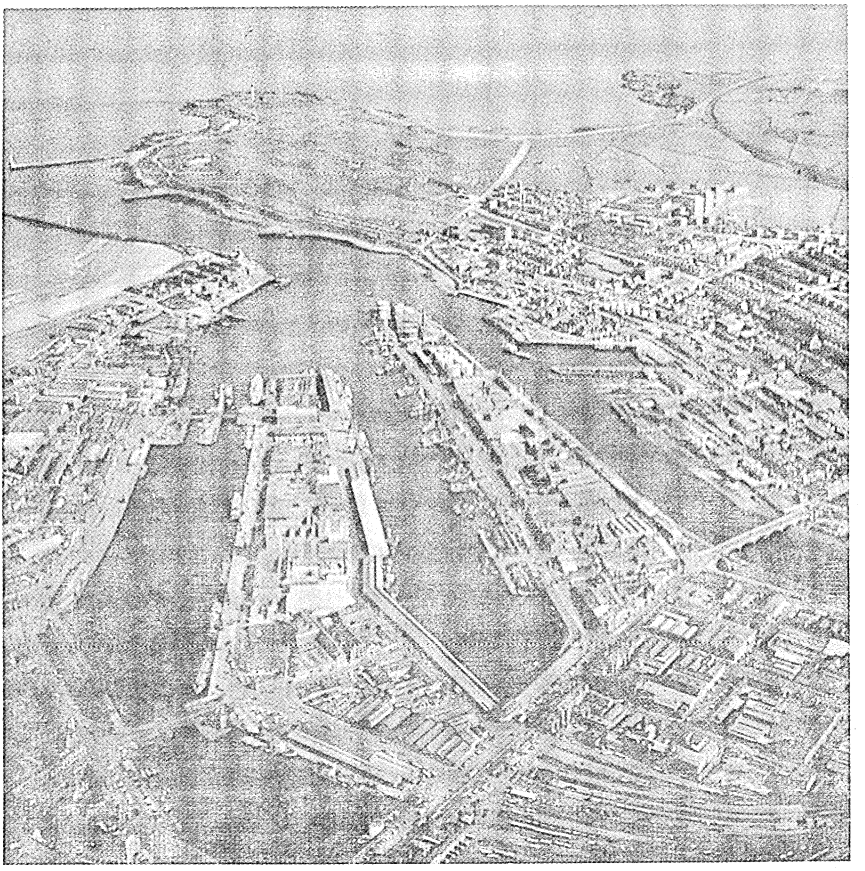

FIGURE 4. Seaward view across Aberdeen Harbor, the main North Sea oil rig supply base. *Photo courtesy of North East Scotland Development authority.*

The long-term impact of offshore oil and gas development on fisheries will stem from the structures placed on the ocean floor, pipelines to convey the hydrocarbons to shore facilities, and the areas around each of these structures that will be restricted to fishing access. Fishermen feel that several hundred yards of fishing waters around each installation would add up to a sizable area of inaccessible catch. Furthermore, although the individual areas of inaccessibility may be small relative to the total area fished, the fishing process itself may be hampered by the haphazard scattering of these structures. While some fish are attracted to the rigs, the debris on the bottom jettisoned from the rigs becomes a hazard to fishing. Consequently, the possibility of a reduced catch poses what fishing interests believe to be a serious threat.

North Sea fisheries could also be affected by potential oil spills and near-shore developments. Significant development of coastal estuaries

(the most productive marine area) does interfere with the life-cycle of a great many living organisms in the oceans and onshore.

In the United Kingdom, the authority to cope with oil spills rests with the Marine Division of the Department of Trade and Industry. It has identified specific areas which are either ecologically sensitive or support valuable commercial fisheries. Priority areas have been identified on maps by the Ministry of Agriculture, Fisheries and Food, the Nature Conservancy and the Marine Biological Association, with specific instructions concerning response techniques for each area.

While oil development in the North Sea will in fact interfere at least to some extent with fishing, British fishermen appear to be more worried about the activities of Soviet and other foreign trawlers off their coast than about the possible harmful effects of oil pollution on the species.

More serious to the fishermen than the reduction in total fishing area or oil spills is the direct damage their gear could sustain around drilling rigs and the question of who would be liable for this damage.

The oil companies have assumed responsibility for damages sustained by a fishing boat if fishing gear is jettisoned to avoid damaging bottom oil installations. However, the sea floor around the rigs and along supply-boat routes is becoming littered with debris and junk resulting from offshore construction and other operations. The Scottish fishermen claim that there is no way of policing the industry and prohibiting the dumping of debris in the offshore area. Consequently, if a trawler is forced to jettison the fishing gear, not knowing whether or not it is caught by an oil installation, and the obstruction turns out to be just debris, the oil company does not consider itself liable. The British Government has *not* undertaken initiatives to resolve this problem.

The Scottish Trawlers Association indicated that other problems may also affect the future of the fishing industry in the North Sea. For example, many of the present fishing boats have reached the age of replacement and only five new vessels are expected to join the Aberdeen fleet in 1973. However, the threat of the competition with the oil-related services, the rising cost of fuel, and the escalating costs of repairs combine to paint a picture of uncertain future. The Association is considering bringing these grievances to the attention of the central government and making a strong case for financial assistance to keep he fleet viable.

VII. PROTECTION OF THE MARINE ENVIRONMENT

The American offshore drilling experience over a period of almost thirty years has shown that the probability of a major blow-out is very small. Of the more than 18,000 offshore wells drilled on the U.S. continental shelf, only four caused major oil spills. At least one of the four spills, the Santa Barbara disaster of 1969, could have been prevented, if current USGS regulations had been in effect in 1969. Moreover, in the last few years blow-out prevention technology has improved to the degree that no major accidents have occurred since 1970.

Given this experience, the possibility of large oil spills from drilling equipment in the North Sea would appear small. If, however, a major spill would originate from one of the oil fields in the central part of the North Sea, prevailing winds are most likely to move the oil towards the Danish Peninsula and the southern and central parts of Norway. Near-shore oil spills caused by a break in the pipelines or spillage from tankers could have a significant effect on the British coastline.

While no environmental impact statement is required in the U.K., and British environmental groups are not as strong as their American counterparts, the British Government is still concerned about the potential environmental impact of North Sea development. British governments have worked hard for years to reduce air and water pollution in their country. The famous London killer smog has been effectively controlled during the last decade, and the River Thames, historically one of the dirtiest and most polluted rivers of England, has been turned into one of the cleanest rivers of Europe. Birds and fish which had not been observed in the Thames for many many decades, have returned in large numbers. Both accomplishments have been possible through concerted efforts by the British government with the fullest support of the people.

Attitudes towards offshore oil developments are very realistic. Suffering from severe unemployment in Scotland and chronic balance of payment deficits, and faced with further dependence on Middle Eastern crude, the British appear to realize that the question is not "if" but "how" North Sea oil should be developed. In other words, starting with acceptance of the need for the oil, they stress what "should" be done, rather than what "should not" be done. Scientists, public officials and civic groups have not advocated halting development until conclusive documentation is in hand that no adverse biological effects will occur. The Scots believe that such studies would take many years, and even then, their knowledge of fisheries and the ocean environment may still not be adequate to prove long-lasting negative (or neutral) impact of oil spills on marine life. However, when environmental considerations were found conclusive, some projects have been abandoned.

Offshore operations have received relatively less attention from British planning authorities than onshore developments. While there are general and specific regulations on offshore structures and stand-

ards, in practice much of the offshore exploration procedures are based on agreements between government and business. The United Kingdom and other North Sea governments assume that industry will take primary responsibility for oil spilled from offshore platforms.

General regulations concerning production accident prevention, field development and production regulation, and storage and transportation regulations are comparable with U.S. procedures. However, regulations appear not to be as specific as current U.S. Geological Survey outer continental shelf regulations, which were issued after the Santa Barbara oil spill of 1969. One OCS regulation, for example, requires that certain information concerning fixed and mobile platforms be submitted to the USGS for review. The regulation includes detailed requirements on platform safety and anti-pollution equipment. It seems that none of the North Sea governments has issued comparable specifications. This may be due in part to the fact that public pressures for safety regulations have not yet been as significant in the North Sea countries as in the United States.

Scottish authorities have also devoted little attention to offshore pollution and safety. In a report of the Committee on the Environment to the Oil Development Council of Scotland, the Committee's only comments on offshore standards are the following:

> "We understand that regulations require offshore operators to carry out regular safety drills and simulation exercises, that there are frequent and regular tests of safety equipment, and that there are elaborate procedures to prevent the occurrence of blow-outs.* * * We understand that the companies operating offshore maintain supplies of materials and equipment for dealing with accidental oil spills, and that the U.K. Off shore Operators Association Ltd. are examining proposals for a blow-out control and firefighting barge to be stationed in the North Sea.* * *" [7]

The Committee did not make any other recommendation concerning offshore pollution control, but did stress the need for government control over pipelines beyond the territorial sea.

One advantage of the British system over the American is the centralization of authority in case of the occurrence of an oil spill. Whereas in the United States responsibility is divided between the Coast Guard (mechanical treatment) and the Environmental Protection Agency (chemical and biological), in the United Kingdom responsibility rests solely with the Marine Division of the Department of Trade and Industry. This division is in charge of all cleaning-up activities and also ensures that there is no unrealistic conflict between oil development and other marine uses. Local authorities deal only with oil pollution onshore and within inland waters. As far as the possible effect of oil spills on fisheries is concerned, the Ministry of Agriculture, Fisheries and Food has an extensive hydrocarbon monitoring program. It will assess the toxicity of crude oil in the food chain and measure tainting of commercial fish.

In contrast to the United States, where mechanical containment systems are frequently used to combat oil spills, the United Kingdom and other North Sea countries rely heavily on chemical dispersants

[7] Committee on the Environment, Report to the Oil Development Council for Scotland. *North Sea Oil and the Environment,* Edinburgh, 1974, p. 16, Appendix 4.

as their primary response to oil spills. In recent years the British have developed what they maintain are low toxicity dispersants, which are expected to be less damaging to marine life than the older ones which were known to do more harm to the marine environment than crude oil.

VIII. ONSHORE PLANNING

"The simple option of total refusal to participate in oil related industry, to reject everything in favour of the status quo, is not open to us. The national interest calls for our participation and—the more we look at the problem—our own interest too. For the best prospects for the Highlands lie in keeping in step with the future."

SIR ANDREW GILCHRIST,
Chairman, Highlands & Islands Development Board.

A. INTRODUCTION

Sir Andrew Gilchrists's remarks represent the attitude of most government officials toward offshore oil development. The British have adopted an elaborate land use planning system to determine the best use of the land from the point of view of the community as a whole. Development must take place with the least possible damage to the physical environment and in such a way as to strengthen rather than weaken the social fabric of areas affected. This means that a difficult middle course must be followed between the extreme attitude which would have nothing stand in the way of industrial development, and the contrasting view which opposes virtually any change in the existing environment.

This planning system attempts not only to provide effective coastal zone land use planning, but also environmental protection. Sometimes, planning authorities insist on beautification of sites and restoration of the area after construction of facilities. When British Petroleum Company, for example, applied for a site to build a tank farm on a flat sandbank, local authorities allocated instead a former oil shale development site, with huge tailings of spent shale which needed to be flattened first. The company was required to landscape the site upon completion of construction (Figure 5). From the highway, only landscaped slopes, seeded and vegetated, are visible. Within these high banks there were several full-sized oil storage tanks at different stages of construction, each concealed from passersby. Understandably, the company had initially objected to incurring the extra expenses, but the final result serves as an excellent example of reclaiming a formerly scarred area. It also illustrates the power of local authorities to insist on development in an environmentally acceptable manner.

The picturesque village of Drumbuie, located on the northwest coast of Scotland, which had been under consideration as a site for the manufacture of concrete offshore production platforms, is an example of an oil development project rejected on the basis of unacceptable environmental and socio-economic problems. Following intense public opposition, the Secretary of State for Scotland, on August 12, 1974, turned down the proposal altogether on the basis of "conclusive environmental considerations." [8]

[8] Terry Robards. "Scottish Village Closed to Oilmen," *New York Times*, Aug. 13, 1974, p. 5.

In several other instances development plans have had to be changed and alternative sites for onshore facilities needed to be found. These and other examples indicate that British planning authorities are out to ensure that environmental damage is kept to a minimum, and that when it does occur, the social and economic gains are substantial to justify such development.

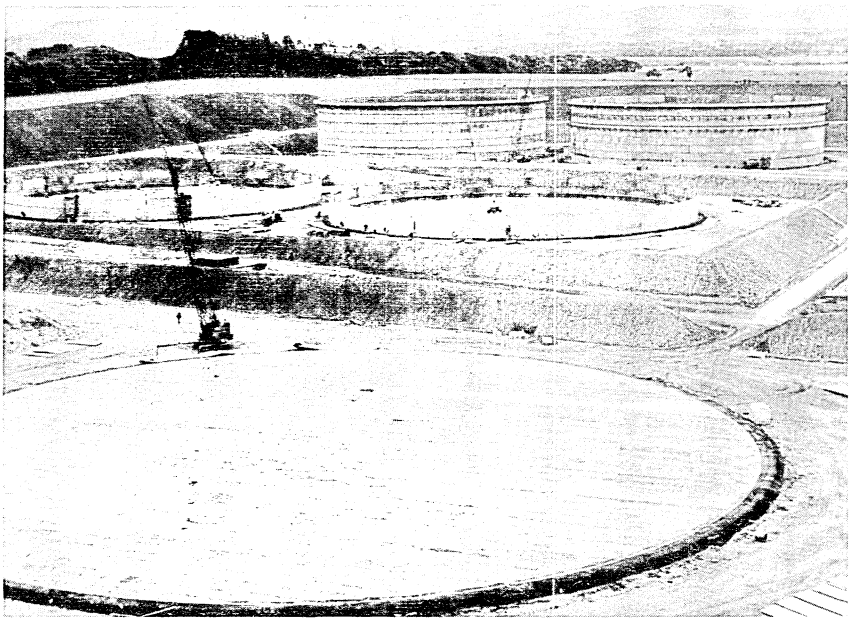

FIGURE 5. View of the B.P. tank farm at Dalmeny. The tanks are under different stages of construction, and the newly landscaped banks behind them conceal the tank farm from the Scottish countryside. *Photo by George A. Doumani.*

Because of the British government's view that maximum early development of North Sea oil and gas is in the nation's best economic interest, both the Conservative and the Labour parties have advanced proposals for nationalization of sites for platform construction. The Conservative proposal, announced just before that party's defeat in the February 1974 general election, would have bypassed normal planning procedures in the nationalization process in order to expedite the siting process. In August 1974, the Labour government announced its own nationalization scheme, which would permit the normal planning process to proceed prior to nationalization. At this writing, the necessary Parliamentary action has not taken place and no sites have been nationalized.

B. PLANNING PROCEDURES

The British planning system is designed to coordinate policies and actions of various levels of government, providing adequate access to all interested parties. It minimizes the possibility of any interest group being caught by surprise. Sufficient information is provided to all parties early in the planning process, enabling each interest group to

evaluate and respond to proposed actions. When a coastal siting need arises in connection with offshore petroleum development, the company or agency desiring the use of the site applies to the appropriate county clerk. The clerk enters the application in a register which is freely available for public inspection. If the application proposes an action in accordance with the existing development plan and zoning regulations, the company can go ahead and build.

Zoning in Scotland is regulated by the Town and Country Planning Act, which has established the machinery for the development of land use plans and for control of development through the planning process. County development plans are drawn up by local authorities after a process of extensive consultation with interest groups and after due public participation. The plans are then submitted to the Secretary of State for Scotland for approval, and before approving the plan—with or without modification—there is an opportunity for objections to be made and for a public local inquiry if necessary.

The Town and Country Planning Act has been amended continuously (last time in 1972) to keep procedures up-to-date. Amendments are subject to a similar process of consideration, and objections and inquiry if necessary, before their approval by the Secretary of State for Scotland.

In general, the Development Plan for an area zones land for the major known and foreseeable use, including housing, industry, commerce, recreation and others. Local authorities have a statutory duty to prepare such development plans, and are provided with national guidelines and data by the Secretary of State.

When a developer chooses a site for industry which is not zoned for industrial development, the Secretary of State for Scotland may decide to approve or reject the application. In that event the procedure calls for a public inquiry at the discretion of the Secretary of State before he issues a decision on the application. Some developments raise questions of national importance which go well beyond the jurisdictional boundaries of local planning authorities. In such cases the Secretary of State may "call in" any proposal for his own consideration. He may call a public inquiry, and after that approve or reject the proposal depending on the inquiry findings. He may make his approval conditional on certain points, such as a limitation on the size of the work force at the proposed site.

The planning situation in the United States is rather different. No national or state legislation requires counties or municipalities to develop plans or adopt zoning. The Coastal Zone Management Act of 1972, however, is designed to encourage and support state and local efforts in this direction, but it is not mandatory. Furthermore, the public inquiry process provided by law in Scotland seems to do a better job of involving the appropriate interests in controversial proposals than any corresponding mechanism presently used at the local level in the United States.

C. HIGHLANDS AND ISLANDS DEVELOPMENT BOARD

Companies interested in locating in northern Scotland are assisted by a special development agency, the Highlands and Islands Development Board. The Board was established in 1965 to improve the economic and social conditions of the people, and to assist the area to

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play a more effective part in the economic and social development of the nation. In carrying out this role, it is required to "have regard for the desirability of preserving the beauty of the scenery." The Board works closely with local authorities and has discretionary powers and finance to assist developments of all kinds. It advises interested industries on development opportunities, industrial sites, labor availability and financial assistance. The Board also pays attention to long-term infrastructure needs of the region.[9]

When the North Sea oil was discovered, it became the task of the Highlands and Islands Development Board to ensure that major changes resulting from oil development would take place as smoothly as possible and in such a way that they bring the greatest economic benefit to the local, regional and national economy, without impairing existing residents and industry.

D. COASTAL FACILITY COMPLEXES

Coastal installations associated with oil development vary depending on the marketing and treatment plans of oil companies. They will vary from small booster stations or pumphouses serving pipelines, to tank farms and tank terminals (for storage and transportation) with associated treatment plants (Appendix E).

Instead of allowing each oil company to select sites for pipelines and landfalls, gas treatment plants, terminals, separation and storage tanks, Scottish authorities are trying—where possible—to combine as much of the oil company activities as possible in a few areas in order to minimize environmental impact. Concentrating facilities is coordinated with regional planning efforts, which now also requires local authorities to notify central authorities of all applications for the development of land for production platforms, booster platforms for pipelines, fabrication for pipelines, installation of storage tanks associated with landing and transportation of offshore oil and gas, refineries, gas liquefaction plants, and the like.

E. REGIONAL PLANNING

Regional socioeconomic and environmental impact of industries associated with oil development is receiving as much attention as local impact. Regional interests were strengthened with the enactment of the 1972 Town and Country Planning Act which introduced structured plans setting out the regional planning authority's policy and national development objectives. However, the provisions of the 1972 Act are not yet in force in Scotland. It is declared policy to implement them gradually over the country as a whole after local government reorganization takes place in 1975.

An Interim Coastal Planning Framework, developed as a discussion paper by the Scottish Development Department in October 1973, suggests greater government guidance on land use. Based on demand

[9] The Scottish Economic Planning Board has principal responsibility for planning and coordinating the provision of infrastructure and services required for economic development. All main government departments are represented on the Board, and the chairman is the head of the Regional Development Division in the Scottish Office. It set up the North Sea Development Committee in 1972 to ensure that the planning provision of infrastructure for North Sea oil was given maximum priority. The Committee keeps in close contact with local authorities and advises them on all planning aspects related to oil developments.

for sites and their physical requirements on the one hand, and the quality of the coast and its capacity to sustain development on the other, it made recommendations for 14 Preferred Major Development Zones for the east and southwest coast in which development might, in principle, be acceptable and within which developers should be encouraged to look for sites. It also calls for 23 Preferred Conservation Zones in which developers might be expected to encounter difficulties in obtaining permission to develop sites, and for a West Coast Zone of high environmental quality where the development of individual small-scale sites may be justified, but where conservation should be predominant policy. Whenever possible, the Interim report advises, oil related developments should be sited in the more populated central belt of Scotland.

F. LONG-RANGE PLANNING

Some of the problems being examined by the responsible Scottish planning authorities will stem from factors that may affect the volume and duration of prosperity associated with oil and gas development. Apprehension has already been expressed concerning such factors as intense environmental opposition, bureaucratic controls, failure to secure the necessary facilities, and even the prospects of the United States opening up its Atlantic continental shelf acreage for oil and gas development. These factors, combined with the eventual decline of production in the North Sea itself, will cause the companies to start looking elsewhere for more promising prospects.

In order to prepare for the future slow-down, authorities are looking beyond the oil boom by encouraging petrochemical, plastic, as well as non-oil related industries to settle in the northeast. Technical skills required during the short-term production activities, combined with expected oil revenues, could provide the basis for a diversified technology-intensive, high-wage industry which will continue to prosper long after oil resources have been depleted.

In addition to the value of the market created for Scottish goods and services, the central government is committed to share a considerable part of the oil revenues with Scotland, to pay for the improvement of the infrastructure, and enable the Scots to diversify their economy in order to outlive the oil resources. The challenge ahead will be to balance oil related development with other industries, and to see to it that existing industries will not collapse as a result of the possibly short-term oil boom. All this needs to be done without causing irreparable damage to the physical environment, and with proper care to ensure the general welfare of the population of Scotland.

The Shetland Islands present a unique case study for the problems which will be encountered in the future. These problems are the subject of the next section.

IX. THE SHETLAND ISLANDS—A CASE STUDY

"It is not practical to try to preserve the countryside as it is at present. Change will occur and it must be planned for."

ZETLAND COUNTY COUNCIL, 1973.

The above quote succinctly captures the attitude of the Shetland officials toward the challenge of participating in the development of offshore oil and gas in the northern North Sea. The Islands are not in any desperate need to embrace development, but a combination of economic incentives and genuine understanding of national needs has resulted in a positive attitude toward planned development.

The Shetland Islands present a unique place to view the onshore impact of offshore oil and gas development. The Islands are isolated and not heavily industrialized. Thus, the onshore impacts associated with oil and gas activities will be highly visible and easily assessed.

A. FACILITY REQUIREMENTS

Some of the largest oil fields discovered in the North Sea are located east of the Shetland Islands. The Brent, Hutton, Cormorant, Dunlin, and Thistle fields, all discovered before 1974, are expected to produce about 1.35 million barrels of oil per day a few years from now. Two new fields found in 1974 will increase production from the northern North Sea to an estimated 2 million barrels per day. A large oil field, Ninian, was found a few months ago, and only recently, British Petroleum Co. announced discovery of yet another field, Magnus, about 15 miles southwest of Thistle.

Eventually more than half of the North Sea oil will be produced from the northern North Sea (British sector), and because of proximity to the Shetland Islands, most of the petroleum is expected to be pumped to the Islands. Within the next few years the Shetland Islands may become one of the major oil bases in the world. Oil companies generally find pumping oil through undersea pipelines to terminals onshore more economical than building large storage tanks offshore, from which tankers would haul oil to the mainland. In addition to a pipeline terminal, the Shetland Islands will need storage facilities which can hold production of several days, and transshipment facilities. It is also possible that oil companies may want to use the deep-water port facilities to transship Middle Eastern crude from Very Large Crude Carriers (VLCC) to smaller tankers which can dock in most European ports. Some observers believe that a gas liquefaction plant and a refinery may also have to be constructed on the Shetlands. It is certain that these developments will have a major impact on the socioeconomic and environmental conditions on the Islands.

B. SOCIOECONOMIC IMPACT

Prior to the North Sea oil developments, the net population was expected to grow from 17,327 in 1971 to 17,700 in 1981 and 17,900 by 1991. Oil development is likely to double these estimates. It could very well be that the Islands will reach over 30,000 inhabitants in the early nineteen nineties, which is about equal to the peak population

of 31,700 in 1861. The actual population growth will depend to a large extent on the construction of necessary and optional development projects.

Depending on development decisions by the oil companies and Zetland County Council, between 600 and 1,500 jobs may be added in the next few years. A figure of 1,000 employees being wanted as a direct result of oil related developments is considered most realistic at this time. However, one may assume that several hundred additional jobs will be created by servicing, construction and other indirect developments.

Demand on housing, health, schooling, recreational and other social and commercial needs will depend on the actual increase of population, but it is certain to cause stress on the infrastructure and the local economy. While the Zetland County Council will attempt not to upset the present satisfactory economic and social conditions, a recent study (Appendix F) indicated that the Shetlands had a maximum absorption capacity of 100 families per year without upsetting the social and economic balance. Moreover, the local government is planning to spread the new population over four existing towns in an effort to integrate the new and old populations.

The very size of the population increase, mainly migrants from the mainland, and the differences in outlook between traditional islanders (mainly fishermen and farmers) and the newcomers, will make integration a very difficult goal to achieve. Development of the Shetlands into a major oil base is very likely to lead to significant changes in the entire way of life of its citizens. Higher wages in the oil-related industries will have a major impact on employment in agriculture, fisheries, tourism and the knitwear industry. Many of those presently employed in the traditional industries, particularly the young, will be attracted to the oil industry by higher wages. Eventually, the Islands could end up with one major employer—the oil industry. The danger of such development would become evident some thirty to forty years from now when the "oil boom" dies. The County Council may decide to build permanent infrastructure and social facilities for the production phase only, and expect the oil companies to provide temporary accommodation and facilities during the short-term exploration and construction phases.

It is for these reasons that the Zetland County Council decided to apply for special parliamentary powers to reinforce normal planning and controls. Through legislation, they have won Port Authority powers for the whole Island group, blanket powers of compulsory acquisition of land within designated areas, and powers to take equity participation in oil-related coastal undertakings, which would be financed from oil revenues.

C. ENVIRONMENTAL IMPACT

Shetlanders are aware of the fact that environmental pollution is likely to increase with petroleum development. In order to minimize damage to the environment, industrial facilities will be concentrated in one area, Sullom Voe (Figure 6). Although, Sullom Voe is relatively small, a concentration of industrial facilities in the area should cause little interference with traditional industries. It has a natural deep-water harbor capable of handling tankers up to 720,000 dead weight tons (dwt). This could also turn into a port for transshipment of

Middle Eastern oil to Western European harbors which lack such facilities for large supertankers.

The Zetland County Council expects companies to share onshore facilities in order to ensure orderly development of oil related industries, and to contain development to one area. Consequently, the Council is also conducting a study (paid in part with oil company funds) to investigate the possibility of underground storage facilities for crude oil. As there are virtually no trees on the Island to hide onshore facilities, underground storage, if technologically possible, would limit the visual effects of petroleum related development on the Islands. But the main purpose of underground storage is not environmental. The County Council is mindful of increased development in the future. Their reasoning, therefore, is that if present facilities are built on the surface, future expansion would demand more land areas. If, however, facilities are initially built underground, extra facilities can be built in the future directly above the underground facilities, thus eliminating, or reducing, the use of more acreage.

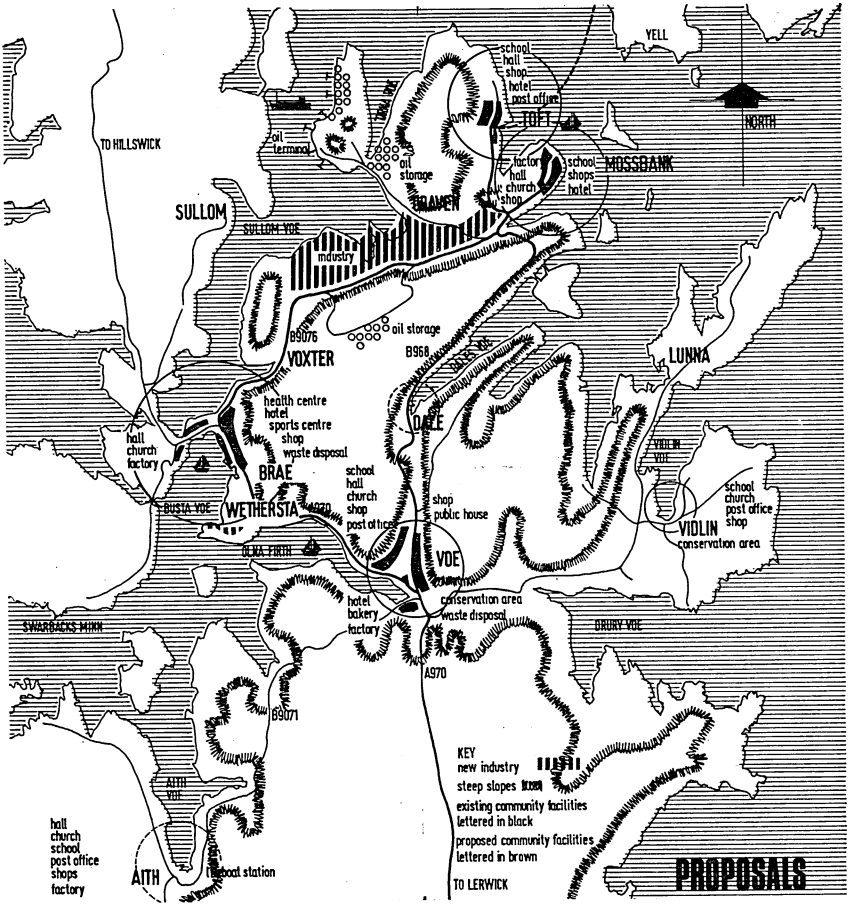

FIGURE 6. Zetland County Council map of the Sullom Voe area, showing proposed tank farms, tanker terminals, industrial zones, and community developments.

D. MEETING THE CHALLENGE: CHRONOLOGY OF EVENTS

The development of oil and gas facilities on the Islands presents an ironic contrast. Most Shetlanders do not feel they need the oil industry since traditional industries (fishing and knitwear) have thrived, and unemployment is low. Yet, the Shetland County Council recognized that certain of these developments were almost inevitable given the substantial national interest in the development of North Sea oil resources and the strategic location of the Islands. The underlying attitude on the part of the Island leadership from the beginning was, "We don't need it; but if in the national good it must come, we want to be fully in control of all of the important decisions that involve the use of our land and water, the disruption of our communities, and the long-term well-being of our people." Thus, every attempt has been made from the beginning to control all of the important decisions that involve the use of land and water resources, the disruption of communities, and the long-term well-being of the people.

The beginning came, interesting enough, in March, 1972, with an experiment the British conducted during the fourth round of North Sea licensing. Experimenting for the first time with U.S. style bonus bidding, widespread attention was attracted to the (then) enormous sum of about £20 million ($50 million) paid by Shell/Esso for a block due east of the Shetlands. This optimism was confirmed in August, 1972 by discovery of the large Brent field in a tract adjacent to that block. Since then, additional discoveries in the East Shetland Basin have brought the total recoverable oil reserve estimates up to over 10,000 million barrels. Production could well reach two million barrels per day by 1980.

The Shetland County Council took careful note of the Shell/Esso bid and adopted a policy position in April, 1972 that said, in effect, if the oil industry proposes to use the Islands then the County Council would control those uses by controlling the use of land and water.

The most apparent industry need was for a deepwater port and associated oil storage and loading facilities from which supertankers could take the oil to refineries located closer to product markets. It was clear that pipelines would probably be used to connect the larger oil fields to an oil terminal in the Shetlands.

Aware of its lack of information, the County Council immediately commissioned a study by Transport Research Limited of Glasgow of potential oil terminal sites in the Islands. In this report, completed in July 1972, the consultants reviewed five sites and found one of them to be fully acceptable—Sullom Voe. They looked at navigational acceptability (suitable for vessels up to 200,000 dwt without any significant dredging), operational acceptability (weather, tides, etc.) and oil storage potential.

It was clear that the County Council had to have much more detailed information if it wished to be totally involved and fully in control of the landside impacts of the coming oil related development. It therefore initiated two actions which have come to form the foundation of the Shetland program. First, the Council carefully drafted a statement of the additional powers that were required to put the County in a position to control land use and to participate as partner with the oil companies in the landside oil operations. Their request for these additional powers, some quite extraordinary, was forwarded to

the Secretary of State for Scotland in November, 1972 and, in April, 1974 the Parliament awarded these powers.

The second action was to commission a major multidisciplinary study of likely onshore requirements of the oil industry and how best to meet them. This study cost £72,000 ($175,000), half of which was provided by the Highlands and Islands Development Board.

The Study was started in January 1973 and was completed in July 1973.

The study concentrated on the following: prediction of the nature of oil industry onshore requirements; examination of the Sullom Voe area, from marine and land use planning aspects; assessment of how the required developments could be accommodated with least harm to the environment; and determination of what provisions must be made in the way of new housing, schools, and other facilities for the enlarged communities.

While the study was under way, the county developed and disseminated an Interim County Development Plan (March, 1972) under the terms of the Town and Country Planning Act. The document expanded the County Council's earlier oil related policy and put it into a more comprehensive perspective. It spoke to both the exploration and the exploitation phases of oil industry requirements. It contains the following statements with regard to the location of oil service bases (coastal facilities needed to service the oil supply boats that provide supplies and equipment to drill rigs, pipeline laying barges, and the like).

> "The County Council, whilst wishing to accommodate the oil service bases in a number of locations in Shetland, do not wish to see an excessive proliferation of service bases with the consequent duplication of infrastructure and services in places only a few miles apart and so permission will be granted for specific areas only, the following areas being suitable for this type of activity. (1) Lerwick Harbour. (2) Sullom Voe, Swarbacks Minn and Baltasound subject to the County Council's Planning Consultant's reports on actual sites.* * *"

Similarly, the following is an excerpt concerning the County Council policy on the exploitation phase:

> "The exploitation stage of the oil industry may require the creation on shore of terminal facilities. The siting of these facilities will be determined by a number of criteria, some of which can be quantified at the present moment; some of which will depend upon decisions made by the oil companies and upon the technical problems involved.
>
> The two factors which can be determined are the need for deep water with safe all-weather anchorage, together with a certain acreage of flat land adjacent to the site or within a reasonable distance from the deep water anchorage.
>
> The Planning Authority, by careful survey, have identified the Sullom Voe area as being most suitable for major developments arising out of the industries activities in the North Sea. (In this context "major" includes the development of tank farms, oil storage depots, terminal facilities, gas liquefaction plant, gas storage complex, oil refinery and other ancillary operations.)

> To ensure the proper development of these sites the planning authority is taking the following steps: (i) The zoning of this area for major oil developments. (ii) The promotion of private legislation to give port and harbour authority powers to the County Council in the area. (iii) The purchase of land by compulsory purchase if required, to ensure a controlled development. (iv) A multi-disciplined study of the Sullom Voe area and surrounding areas has been commissioned which will result in a Master Plan and Report being produced in the Autumn of 1973. No major development will be allowed until the Master Plan has been adopted.* * *"

Beginning in September of 1973, with the results of the consultants' study available, the County Council undertook a substantial public information program. Brochures describing the Sullom Voe Plan and the likely changes it would bring to the affected communities were prepared and widely distributed. A series of newspaper articles was commissioned by the County Council and placed in the *Shetland Times*, and exhibits depicting the consultants' recommendations were displayed in the affected communities.

As a result of this public scrutiny and additional County Council work, some modifications were made in the consultant's plan and an official Sullom Voe District Plan was prepared. This plan is now undergoing public hearing prior to its adoption as an "official" document by the County Council.

As mentioned earlier, in April, 1974, the U.K. Parliament passed the "Zetland County Council Act of 1974." This extraordinary piece of legislation allows the County Council to do the following: to act as a harbor and port authority, to license marine activities out to three miles, to obtain certain lands using condemnation if necessary and to create a Reserve Fund with oil related revenues.

The Reserve Fund will provide, both during and after the oil era, the means for the County Council to take any steps which they consider to be in the long term interest of Shetland, the Shetland economy, or the Shetland community. This would include, for example, promoting the establishment of other industries which would diversify the economy and survive the oil boom, or safeguarding the position of Shetland's indigenous industries.

Observers in the Shetlands feel that two factors were responsible for passage of this legislation—the Arab oil embargo and the discovery of still additional oil in the East Shetland Basin.

In addition to completing the official plan for the Sullom Voe development, the County Council officials are also in the process of forming a nonprofit association to be registered as a limited company, to design, construct, and operate all of the facilities at Sullom Voe. This enterprise is to be called the Sullom Voe Association. The Shetland County Council will hold 50 percent of the shares and the oil companies operating pipelines from off-shore fields to the terminal will together hold the other 50 percent. It is likely that a levy on terminal throughput will be used by the County Council to create the Reserve Fund mentioned above. Advance payments to help defray initial public costs are now being negotiated. British Petroleum Co., Continental Oil Co., and Shell Oil Co. have accepted initial financial responsibility for the Association.

The County Council is now in the process of discussing the detailed development of Sullom Voe with the oil companies. A study funded by the companies for £100,000 ($240,000) is now under way by the County Council to determine the feasibility of underground cavern storage at the site (as a possible alternative to the traditional above-ground tanks). If underground storage is found to be technically feasible, the County Council believes it will be in a position through its 50 per cent interest in the Association to require this. The County Council will, of course, own the land involved in the Sullom Voe development and will lease it back to the Association for construction and operation.

E. CONCLUSIONS

The Shetland Islands appear to have made significant headway toward resolving the onshore problems associated with North Sea oil and gas development. While caution should be used in attempting to apply the Shetland's experience to areas like the U.S. east coast, the Shetland experience does provide a case study which U.S. decision-makers should closely examine.

Yet, there are parts of New England, especially downeast Maine that are as insular in character and tradition as the Shetland Islands; there are also similarities in environmental and socioeconomic conditions comparable to Alaska's. And one can think of a good many communities along the Atlantic Coast where the construction of oil-related facilities would be viewed with considerable alarm. The concern of what happens to an impacted area, after all of the oil is produced and the facilities are no longer needed, is, of course, a universal one.

The Shetlanders have faced many problems over a very short period of time, and have done a remarkable job in planning the incorporation of oil activities into their Islands. They have developed a program that carefully guides and controls the location and environmental impact of needed new facilities that minimizes adverse social and economic effects, and, at the same time, builds financial resources for strengthening traditional industries, especially for the post-oil era.

The following factors appear to have aided the success of the Shetland approach:

1. Early adoption and articulation of a policy of control of onshore development.
2. Acquisition, on a timely basis, of a comprehensive independent study of likely shoreside oil industry requirements and impacts.
3. An effective public information and involvement program.
4. The acquisition of necessary planning and management powers through new legislation.
5. The effective implementation of planning by local government, with the aid and assistance of national legislation.

This last point is especially important since it is directly applicable to the problems now being faced in the United States with the implementation of the Coastal Zone Management Act. As Mr. Ian Clark, County Clerk and General Manager of Shetland County, stated, the Shetland success has been due to the fact that the program was developed at the local level and was strongly tailored to the local situa-

tion. He felt that the role of the national government is to give local government the confidence and support it needs to act in a timely and effective manner.

However, in the end, the most essential tool for effective development of offshore resources is the close cooperation between industry and government. Mr. George Blance, Convener of the Shetland County Council, found this to be an integral ingredient in the Shetland experience:

> "It is gratifying to find that international organizations are not insensitive to the peculiar demands of a small and isolated community faced with enormous developments.
>
> "The industry has found Shetland to be responsible, if uncompromising in its demand for ultimate control of its own destiny, and has accepted not only that the county council must be regarded as a partner, but as a senior partner in the developments which are inevitable.[10] "

The challenge facing the Shetlands is, of course, to maintain this cooperation so that the objectives of the companies and the Shetland people are achieved simultaneously.

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[10] *Petroleum Times*, March 8, 1974.

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APPENDIX A

SCOTTISH INFORMATION OFFICE PROGRAMME OF ARRANGEMENTS MADE BY THE SCOTTISH INFORMATION OFFICE ON BEHALF OF THE FOREIGN AND COMMONWEALTH OFFICE AND THE CENTRAL OFFICE OF INFORMATION FOR U.S. CONGRESSIONAL DELEGATION; JULY 1–5, 1974

Monday July 1: Scottish Office British Petroleum (Scotland) Ltd., Edinburgh—Inverness

10.15: Party collected at the Carlton Hotel, North Bridge, Edinburgh.
10.30: Arrive Scottish Office North Sea Oil Support Group, 14 Waterloo Place, Edinburgh; received by Mr J B Fleming, Assistant Secretary, Scottish Economic Planning Department. Discussions on government policy in relation to North Sea oil with Mr Fleming and Mr Amcotts and Mr Philip of Scottish Development Department.
12.00: Leave Edinburgh.
12.45: Joined for lunch at the Hawes Inn, South Queensferry by Mr T M Junor, Public Relations Officer, BP (Scotland) Ltd and Mr G Porter, BP Site Engineer, Dalmeny Tank Farm Project.
14.15: Visit the British Petroleum Tank Farm Project.
15.00: Leave Dalmeny for Inverness.
Later: Arrive Inverness where accommodation has been arranged for two nights at the Kingsmills Hotel, Damfield Road, Inverness.

Tuesday July 2: Highlands & Island Development Board, Oil Platform Construction Site

9.45: Leave Hotel in mini coach.
10.00: Arrive Highlands and Islands Development Board, Bridge House, Bank Street, Inverness, received by Mr. D. R. Fashman, C Eng, MICE, Head of the Oil and Minerals Section and Mr. R. Storey, Social Research and Development Officer; briefing on the effects of oil developments in the Highlands.
12.00: Lunch to be taken as convenient.
13.30: Leave Inverness for Ardesier.
14.00: Arrive at the oil platform building site of J. Ray McDermott Ltd., Ardersier. Received by Mr. A. Topsfield for discussion and a tour of the site.
Later: Return to Inverness.

Wednesday July 3: Inverness—Peterhead, Peterhead Services Bases, Peterhead—Aberdeen

08.00: Leave Hotel (with luggage).
11.00: Arrive Peterhead Bay Management Co. Ltd, 1A Chapel Street, Peterhead, received by Mr. S. K. Young, Harbour Manager. Short background talk on the reclamation of land in Peterhead Bay for oil service bases followed by a visit to the Aberdeen Service Company's base at South Inch.
12.30: Joined for lunch in the Palace Hotel, Princes Street, Peterhead by Mr. Young.
15.00: Visit the service facility of Arunta (Scotland) Ltd., Keith Inch, Peterhead. Received by Mr. John Sheriff, Operations Manager.
Later: Arrive Skean Dhu Hotel, Dyce where overnight accommodation has been arranged.

Thursday July 4: Fish Market, North East Scotland Development Authority, Aberdeen-Shetland, Zetland County Council, Dinner Engagement

07.00: Leave Skean Dhu Hotel in mini coach.
07.30: Visit Aberdeen Fish Market. Met by Mr. K. Harper, Inspector of Sea Fisheries, Department of Agriculture and Mr. R. Allan, Secretary and Chief Executive, Scottish Trawler's Association.

08.15: Joined for breakfast in the Station Hotel, Guild Street by Mr. Harper and Mr. Allan.
09.15: Leave Station Hotel.
09.30: Arrive Skean Dhu Hotel. Met by Mr. James A. Dinnes, MA, MRTPI, Deputy Development Officer, North East Scotland Development Authority. Briefing and discussion on the impact of North Sea oil developments in the North East of Scotland.
11.15: Leave Skean Dhu Hotel (with luggage).
11.20: Arrive Aberdeen Airport (Dyce).
11.40: Depart Aberdeen on British Airways flight BE8434 for Zetland.
12.35: Arrive Sumburgh Airport, Zetland. Met by Mr. J. H. Manson, County Clerk's Office. Lunch at Sumburgh Hotel.
14.00: Leave Sumburgh for visit to Sullom Voe, scene of proposed oil developments associated with deep water facilities.
17.30: Arrive Lerwick Hotel, Lerwick, where overnight accommodation has been arranged.
19.00: Leave Lerwick Hotel in mini coach.
19.30: Informal dinner with senior officials of Zetland County Council in the Grand Hotel, Lerwick. Attending will be Mr. I. R. Clark, County Clerk and General Manager; Mr. J. P. Moar, County Surveyor; Mr. J. M. Fenwick, County Planning Officer; Mr. J. H. Manson, County Clerk's Department.
Later: Return to Lerwick Hotel.

Friday July 5: Zetland County Council, Oil Service Base, Zetland—Aberdeen, Comex Diving, Aberdeen—London

09.00: Leave Lerwick Hotel (with luggage).
09.15: Arrive Zetland County Council, County Buildings, Lerwick. Meeting with senior officials of the County Council to discuss impact on the Islands of North Sea oil developments.
10.15: Leave County Buildings.
10.30: Visit Norscot Services a division of Fred Olsen Ltd.
11.30: Return to Lerwick for lunch.
13.45: Leave Lerwick by mini coach.
14.35: Arrive Sumburgh Airport.
14.55: Depart Zetland on British Airways flight BE8431 for Aberdeen.
15.50: Arrive Aberdeen Airport and transferred by car to Comex Diving Co Ltd, Farburn Industrial Estate, Dyce. Received by Mr. A. Redford, General Manager, for discussions on the company's involvement in North Sea oil operations.
17.15: Leave Comex.
17.30: Arrive Aberdeen Airport (Dyce).
18.00: Depart Aberdeen on British Airways flight BE8437 for London.

APPENDIX B

DEPARTMENT OF ENERGY

Production and reserves of oil and gas in the United Kingdom

A report to Parliament by the Secretary of State for Energy
May 1974

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A report to Parliament by the Secretary of State for Energy

Introduction

The Department of Energy has now completed its annual review of forecasts of oil and gas production from the United Kingdom Continental Shelf. This report gives Parliament the outcome of the review and also contains a detailed assessment for each field, of developments in 1973 and prospects for the future. It is the second of the annual series begun by last year's report.

2 Progress in developing our Continental Shelf continues to be extraordinarily rapid. In 1973, 61 exploration or appraisal and 21 production wells were drilled. The total number of wells drilled by the end of 1973 was 342 exploration or appraisal and 198 production. This high level of activity has led to a very large number of finds. At the time of last year's report, 6 gas fields and 5 oil fields had been established as commercial. The past year, with a level of exploration higher than ever before, has produced the most successful results so far. Another 5 oil fields have been declared commercial, making 10 in all. Other significant finds made during the past year will certainly be confirmed as commercial by further appraisal.

3 Gas production is now well established, and a story of remarkable success. It is only eight and a half years since gas was first discovered in our sector of the North Sea. Since then, total consumption of gas has increased threefold and 90% of this gas comes from the North Sea. Production from the North Sea in 1973 averaged nearly 3000 million cubic feet a day (mcfd) – equivalent to 27 million tons of oil a year. It will grow substantially. Reserves of United Kingdom gas should support production of 5000 mcfd in the later years of this decade. Supplies from the Norwegian part of the giant Frigg field, for which British Gas have signed a contract subject to the approval of the Norwegian Parliament, could increase this figure to about 6000 mcfd. There will be more discoveries, which will provide further production; reserves in the United Kingdom part of the North Sea alone could be significantly greater in 10 years' time than at present and successful exploration of other parts of the Continental Shelf could increase reserves still further. Although prospects

are good, our reserves are finite and care should therefore be taken to make the most efficient use of this high quality premium fuel.

4 Forecasts of future oil production must be subject to considerable uncertainty, since so much exploration remains to be done and since production has not even started. But the successes of 1973 now allow a more optimistic view of the size of our reserves. Production in 1980, allowing for discoveries not yet made, could be in the range of 100 – 140 million tons. There is therefore now a very good chance that in 1980 we can produce oil equivalent to our demand. The likelihood of further discoveries, both in areas already licensed and in new areas to be licensed later, opens up the prospect of reserves capable of sustaining production at a rate of 100 – 150 million tons a year, or even more, in the 1980s. These prospects again raise the question of how our supplies can best be used over time. Although the advantages from production at any level within this range would confer enormous benefits and last for a considerable time, they will not last for ever, and it is therefore especially important to make the best possible use of them.

I Progress and Prospects

Offshore Operations

5 The report published in May 1973 gave details of developments on the United Kingdom Continental Shelf in 1972 and of prospects for 1973. This section of the report does the same for 1973 and 1974. To provide an historical perspective of events since exploration on the Shelf first started in 1964, the charts at Appendices 1 – 7 show drilling activity for each year since 1964 and details of the significant oil and gas discoveries so far made.

General

6 As expected, exploration and appraisal drilling activity continued to increase during 1973. The first of the new mobile semi-submersible drilling rigs specially designed to remain on station throughout the year in the severe weather of the northern North Sea had been delivered late in 1972, and 11 more came into service during 1973. The total number of rigs used rose from 19 in 1972 to 25 in 1973 and the maximum number of rigs in use at any one time from 14 to 18. This resulted in an increase in the equivalent total time spent in the area by all rigs (rig years activity) from 8.6 in 1972 to 13.3 in 1973. The total number of exploration and appraisal wells begun and/or drilled therefore rose from 43 to 61. Details of all drilling activity during the year are as follows:

	Number of wells begun and/or drilled		
Area	*Exploration, with number of significant new oil or gas shows in brackets*	*Appraisal*	*Development*
East of Shetland	16 (6)	7	–
East of Scotland	18 (2)	6	–
Southern North Sea	7 (0)	6	21
Other Designated Areas	1 (0)	–	–
Total	42 (8)	19	21

The total number of exploration and appraisal wells drilled might have been even higher, but some of the special new semi-submersible rigs were late in being delivered and the weather was particularly bad for long periods at the end of the year. Exploration and appraisal activity should

continue at a high level in 1974. Most of the semi-submersibles, drill-ships and jack-ups used in 1973 should either remain on the United Kingdom Shelf or return to it and a further 15 or more of the special new semi-submersibles should arrive during the year. The number of rigs to be employed during the year could therefore be as high as 40 (compared with 25 in 1973) and the number of rig years of activity may approach 25 (compared with 13.3). The maximum number of rigs employed at any one time could well reach 30 - 35 (compared with 18).

The area East of Shetland

7 During 1973 this area emerged as one of highly exciting prospects. The discovery of the Beryl, Cormorant and Thistle oilfields in September 1972 promoted a surge of exploration activity throughout 1973 which has continued into this year. During 1973 there were six significant new finds of oil and one of gas; these, together with the two oil strikes made on the Ninian structure early this year, have increased the total number of significant finds in the area so far to 13 of oil and 2 of gas. However, in March 1973, the first well in the Shell/Esso block 211/21 failed to find oil, and later on preliminary reports of an oil discovery by the Hamilton group in block 9/28 were disproved by testing. The new semi-submersible rigs were widely used and should continue to be in great demand for the rest of this year as operators appraise recent discoveries and drill new exploration wells on neighbouring structures and other licensed blocks.

8 A detailed assessment of the developments in and prospects for each of the discoveries in the area is as follows:

i *Brent* (Shell/Esso, block 211/29, found July 1971)
A southward extension into block 3/4 was confirmed by Texaco in October 1973. There will be appraisal drilling in both blocks during 1974. Production is planned to start in 1976; orders have already been placed for one steel platform and one concrete platform for installation in 1975 and for a second concrete platform for installation in 1976. At first oil will come ashore through a floating storage/tanker loading facility ("Spar") moored on the field near the platforms and delivering into tankers, but plans to build a pipeline to Sullom Voe in the Shetlands are well advanced and negotiations are in progress with the Zetland County Council on the development of a terminal there. Shell/Esso are negotiating with British Gas for the sale of gas associated with oil production from the field. On present estimates these gas reserves could exceed those from the United Kingdom part of Frigg (see page 6).

ii *Thistle* (Signal group, block 211/18, found September 1972)
An appraisal well was drilled in 1973, the results of which led to the

declaration that the field was commercial in August of that year. It is now known that the field extends into block 211/19 held by the Conoco/Gulf/ National Coal Board (NCB) group. Firm development plans should be announced shortly. Production should start in 1976/77, oil at first being brought ashore by tanker. There is a longer-term possibility that a pipeline will be laid to the Shetlands to serve both this and the Dunlin field.

iii *Dunlin* (Shell/Esso, block 211/23, found July 1973)
The first exploration well indicated an oil field of commercial size; it was drilled close to the boundary of block 211/24 held by the Conoco/Gulf/ NCB group who contributed to the cost of the well, and the field is now known to extend into that block. Another appraisal well was drilled in the Shell/Esso block during 1973 and further drilling is expected to take place in both blocks this year. Development plans are being drawn up and will probably be announced later in 1974. Production should begin in 1977; at first oil will come ashore by tanker, with the future prospect of a joint pipeline with the Thistle field.

iv *Beryl* (Mobil/Gas Council group, block 9/13, found September 1972)
A second well was drilled in 1973 and the field was confirmed as commercial in July. There will be further appraisal drilling in 1974. A concrete development platform has been ordered for installation in 1975 and present plans are for production to start later that year, with the oil coming ashore in tankers loaded through a single point buoy mooring system (SPBM).

v *Cormorant* (Shell/Esso, block 211/26, found September 1972)
The commercial viability of this discovery has so far not been proved. The geological structure extends into block 211/21 and a well drilled in that block in March 1973 to assess the prospects of the discovery proved to be dry. It is planned to drill a second appraisal well in block 211/21 during 1974.

vi *Hutton* (Conoco/Gulf/NCB group, block 211/28, found September 1973)
Further drilling will establish the extent of the field, but preliminary assessments indicate that the discovery is likely to be commercial.

vii *Alwyn* (Total group, block 3/14a, found November 1973)
Further wells are to be drilled to assess the potential of the discovery which, if judged by the results of the first well, could well prove to be commercial.

viii *Block* 3/15
The Total group also made an oil discovery in block 3/15 in July 1973; further work is necessary before its commercial significance can be assessed. The Alwyn discovery, although clearly separate, does improve

the prospects that this discovery will be commercial, since facilities to land the oil from both fields could possibly be shared.

ix *Ninian* (BP/Ranger group, block 3/8, found January 1974; Burmah group, block 3/3, found February 1974)
This discovery is on a single large geological structure which extends northwards from block 3/8 into block 3/3. The indications are that the BP/Ranger and Burmah finds are linked, and there are hopes that the structure contains one of the largest oil fields yet discovered in the North Sea. The Burmah group announced that it intended to develop its share of the field in April of this year. Further drilling and testing will be carried out to determine the size of the field.

x *Block* 2/5
In November 1973 the Union Oil of California group (Unocal) announced that they had found oil indications in block 2/5. They are drilling wells to evaluate the commercial potential of the field.

xi *The Frigg Gas Field*
This was discovered in Norwegian waters in 1971 by the Petronord group which includes Total. The field's extension into block 10/1 (Total group) in United Kingdom waters was discovered and confirmed as commercial in 1972. A production platform is due for installation on the United Kingdom extension in 1974 and development drilling should start during the year. A pipeline for the gas from block 10/1 with a booster platform is scheduled to deliver gas to a terminal at St Fergus, near Peterhead in 1976. The gas will then be piped southwards into the British Gas network. British Gas has reached agreement on the terms for the purchase of the gas from both the United Kingdom and Norwegian sectors; approval of the Norwegian Parliament to the sale of Norwegian sector gas to the United Kingdom is awaited.

xii *Gas find by the Total group*
In July 1973 the Total group announced that a well drilled in block 3/19 had found indications of gas. Further work is to be carried out to find out whether the discovery is commercial.

The area East of Scotland
9 The high potential of this area had been shown before 1973 by the Forties, Auk, Argyll, Montrose and Josephine oil discoveries, and the gas condensate finds in blocks 23/21 (Lomond) and 30/2*. There was further confirmation of this potential when two more significant oil finds, on the Piper and Maureen structures, were made early in 1973 and these discoveries helped to maintain drilling activity at a high level throughout the year. With the increase in the number of rigs able to withstand the

severe winter weather conditions, mobile rig activity, particularly on exploration drilling, should continue to increase during 1974. A detailed assessment of each of the discoveries in the area is as follows:

i *Forties* (BP, block 21/10, found November 1970)
The Forties field was declared commercial in December 1971 – the first such declaration in the United Kingdom sector. A small easterly extension into the Shell/Esso block 22/6a has since been confirmed. Production should begin in 1975 and build up in two stages. The first stage will involve the installation, planned for mid/late summer 1974, of two steel production platforms. The installation of ancillary equipment and drilling rigs is scheduled for later in the year and early in 1975, and development drilling from one of the platforms should start towards the end of this year. Installation of these first two platforms was originally planned for 1973 but construction difficulties caused delay. The second stage will involve the addition of two further steel production platforms; these have already been ordered for installation in 1975. The oil will come ashore through a 111–mile undersea pipeline to Cruden Bay, near Aberdeen, whence it will be transferred by landline partially for refining at Grangemouth and partially for onward transmission from a terminal being built at Dalmeny on the Firth of Forth. The submarine pipeline and the necessary terminal facilities should be ready during 1974 so that production of the oil through the system can begin in 1975. A small quantity of gas (20 – 30mcfd) in solution in the oil will also be delivered at Grangemouth and BP are negotiating with British Gas for the sale of this gas.

ii *Auk* (Shell/Esso, block 30/16, found February 1971)
Auk was confirmed as commercially viable in February 1972. Production should begin early in 1975 and Shell/Esso plan to bring the oil ashore by tanker through a SPBM system to Shell's refinery at Teesport. The scheduled programme for 1974 involves the installation of a steel jacket production platform (originally planned for 1973 but delayed by construction difficulties), the drilling of development wells and the installation of production equipment.

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*Condensate consists of light liquid petroleum fractions similar in composition to petrol which, when produced in association with gas, condenses to form a liquid. It is then separated from the gas and after refining and blending can be used to produce petrol and other products. The two discoveries mentioned above contain disproportionately large quantities of condensate in relation to gas. The gas fields in the southern basin of the North Sea produce a relatively small proportion of condensate, but because of their size the actual amount of condensate is appreciable. Production of condensate from this area was about 284,000 tons in 1973 and made a small but useful contribution to United Kingdom needs.

iii *Argyll* (Hamilton group, block 30/24, found August 1971)
The commercial viability of this field was announced in December 1972. Production should begin in autumn 1974, thus making this the first field in the United Kingdom Continental Shelf to come on stream. The geological structure of the field is complex and, pending further appraisal, an experimental production scheme will be employed using a semi-submersible drilling rig suitably converted as a temporary production platform. When extracted the oil will be transferred to tankers using a SPBM loading system.

iv *Montrose* (Gas Council/Amoco group, block 22/18, found December 1969)
After the drilling of a final appraisal well in 1973, the group announced plans in November to develop this field which is now known to extend into block 22/17 also held by the Gas Council/Amoco group. A steel production platform has been ordered for installation in 1975, and production is due to start in 1976. The oil will be brought ashore by tankers loaded through a SPBM system.

v *Piper* (Occidental group, block 15/17, found January 1973)
Piper was established as commercial in March 1973 – only two months after its discovery. A vigorous appraisal drilling programme was continued and the extent of the field was established by the end of the year. The target date for the start of production is spring 1975, and a steel production platform has been ordered for installation this summer. The oil is to be brought ashore through a 125–mile submarine pipeline to a terminal already under construction on the island of Flotta in the Orkneys and transported from there by tanker.

vi *Josephine* (Phillips group, block 30/13, found September 1970)
Both exploration wells so far drilled have shown oil but not enough to establish the find as commercial. Further drilling will be necessary to determine whether production would be worthwhile.

vii *Maureen* (Phillips group, block 16/29, found February 1973)
At 5 April 1974, the first appraisal well was still being drilled.

viii *The Lomond Gas Condensate Discovery** (Gas Council/Amoco group, block 23/21, found May 1972)
At 5 April 1974 appraisal drilling was being undertaken to determine whether the discovery was commercial. If production does go ahead, sophisticated production techniques using reinjection of gas may have to

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*See footnote on p. 7.

be used to get maximum recovery of both the valuable liquid condensate and the gas.

ix *Burmah/Hamilton group Gas Condensate Discovery*
The consortium made this discovery in block 30/2 in June, 1971. Further appraisal will be necessary to establish whether the find is commercial. Should production go ahead, special techniques would probably be necessary as for the Lomond field.

Southern North Sea area
10 With so much exploration activity concentrated in the northern waters of the North Sea, 1973 was a year in which work in the main gas-producing area in the southern basin concentrated on development and production. The same is likely to be true of 1974.

11 During 1973, development drilling took place on all five main gas producing fields (Leman Bank, West Sole, Indefatigable, Hewett and Viking). Wells on one platform at Hewett were converted to produce gas from a higher level reservoir and this gas was brought ashore through a second pipeline from the field built in 1972. A 30–inch pipeline from the Leman Bank field to Bacton was laid jointly by the Gas Council/Amoco and the Shell/Esso groups. No significant new gas discoveries were made in the area during the year, but an appraisal well drilled by the Arpet group in block 49/28 near the Leman Bank field confirmed the extent of a gas discovery made in that area in 1969.

12 On the Leman Bank field development drilling has continued into this year on two existing platforms and two platforms are to be erected later in the year on which compressors will be installed in 1975 to boost pressure on the trunk pipeline system; this is to counteract a fall in field pressure caused by the production of gas from the reservoir.

13 On the Indefatigable field development drilling is continuing on one of the existing platforms, and a further production platform may be installed later in the year.

14 Drilling will continue around the Viking field throughout 1974, and it is planned to erect four satellite platforms to serve both existing production platforms on the main field during the year. No drilling is expected on the West Sole or Hewett fields during 1974.

15 On the Broken Bank area, the Conoco/NCB group are preparing to carry out surveys with a view to siting development platforms during 1975.

16 Development of the Rough gas field is expected to begin in 1974, with drilling scheduled to start in the Autumn. This field was discovered by

Gulf in block 47/8 in May 1968, but the licence has now been assigned to the Gas Council/Amoco group, which also holds the licence for block 47/3a into which the field extends. A pipeline from the field to a terminal next to BP's at Easington will be built during the year to allow production of gas to start in 1975.

Other licensed areas

17 Although some 130 blocks have been licensed for the areas west of the Shetlands and Orkneys and west of England and Wales, the high level of activity in the northern North Sea, which has fully employed the mobile drilling rigs available, has meant that licensees have not yet been able to turn their attention to these regions to any significant extent.

18 The only well drilled in other licensed areas during 1973 was by Shell in block 102/28 in the Celtic Sea. It proved to be unsuccessful. Activity will increase during 1974. Exploration wells originally scheduled for 1973 but delayed by adverse weather conditions were being drilled at 5 April by the Arpet group in block 106/24 in Cardigan Bay and by Shell in block 205/21 west of the Shetlands. There are also plans for one rig to drill at least two wells for British Gas in the Irish Sea, for about 6 wells to be drilled west of the Shetlands, and for two further rigs to be employed to drill up to six wells in the Celtic Sea. At 5 April the first of these was being drilled for BP in block 93/2.

19 This present relatively low level of activity should not be taken to mean, however, that these areas are unattractive. Licensees are using the rigs which are available to explore fully those areas to the east of the United Kingdom, which have already yielded such successful results, before moving on to the relatively unexplored areas.

20 Although no discoveries have yet been made, experience in such areas has been encouraging. There are indications that basins containing rock types similar to those already found in the North Sea are likely to occur generally in prospective areas elsewhere. The basins in such areas are generally much smaller in area and sedimentary thickness than those in the North Sea, but seismic surveys have shown that they contain structures in which hydrocarbon deposits could occur. Whether they contain as much oil and gas as the structures in the North Sea will only be known after further drilling.

Land Operations

21 Exploration for oil and gas on land has been going on in the United Kingdom for at least 60 years. Recently it has been overshadowed by offshore exploration, but there are now signs that over the next few years there will be greater activity onshore.

22 Appendix 8 shows that after a lull towards the end of the 1960s, exploration activity on land has been increasing steadily as licensees have started to fulfil their obligations under new production licences issued from mid–1967. The East Yorkshire, Lincolnshire and East Midlands areas are the areas of traditional interest. But more recently, interest has extended also to the Hampshire/Dorset basin, which appears to be particularly attractive with reservoir rocks possibly extending into the English Channel; to the Cheshire basin which continues into the Irish Sea; and to the Worcester basin.

23 Developments during 1973 were particularly promising. Two discoveries of oil were announced, by Candecca at Axholme, near Scunthorpe in Lincolnshire, and by British Gas, on behalf of itself and BP at Wytch Farm in Dorset. BP also drilled four production wells on the Beckingham oil field in the East Midlands, the first important development there since 1964.

24 The two new discoveries, coupled with the increases in crude oil prices in 1973 should give a further stimulus to onshore activity in 1974. BP and British Gas are planning further development drilling in the East Midlands and at Wytch Farm respectively, and there should also be more exploration drilling.

25 Although there are some geological connections between onshore and offshore structures, it is misleading to make deductions about onshore prospects from offshore experiences. Onshore structures in the United Kingdom are generally far smaller than offshore structures and therefore likely to contain much less oil or gas; but the relatively small scale of production onshore is nevertheless worthwhile because it is much cheaper to extract oil from the land than from the sea. In 1973 landward production of oil was about 87,000 tons and made a useful, if small, contribution to the nation's needs. The 1973 discoveries together with the possibility of further successes in the next few years are therefore important in their own right.

II Estimates of Production and Reserves

Oil: *Production*

26 Since the first finds of oil in the Norwegian and United Kingdom sectors of the Continental Shelf in 1969 and 1970, there has been a complete transformation in the prospects for oil production from the United Kingdom Continental Shelf. Ten discoveries have now been declared commercial, and many of the other promising finds already made are also likely to be commercial.

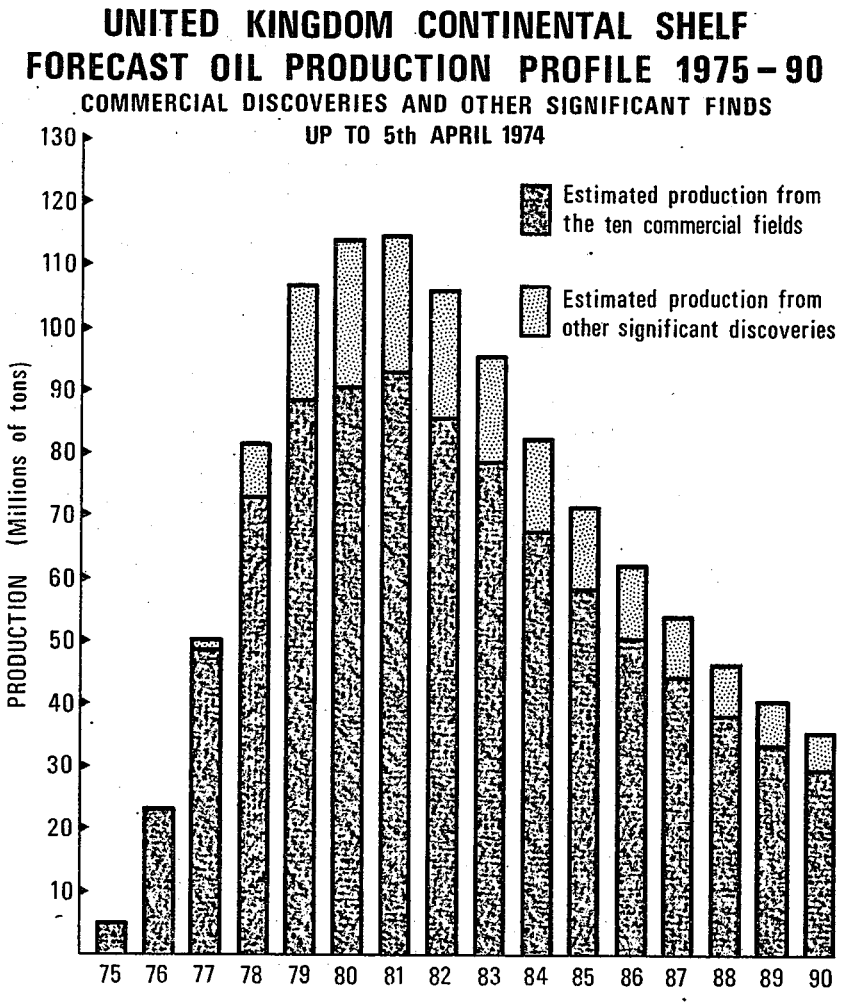
27 Forecasting the level and time pattern of production remains, however, very difficult, since it must take into account:

a) how much oil exists in the reservoirs already discovered;
b) what proportion of this oil it will be technically possible to recover (the recovery factor);
c) how many further *commercial* discoveries will be made and what is likely to be the extent of the recoverable reserves they contain;
d) how quickly the oil can be brought ashore, given the formidable technical and financial problems.

28 No final estimates therefore can yet be given. The total reserves and recovery factors of the discoveries already made cannot be finally known until each discovery has been fully depleted, although reasonably realistic estimates should be possible for most fields when they have been producing for about two years. But meanwhile it should be remembered that the first oil from the United Kingdom sector is not due to come ashore until later this year. Estimates of the number and nature of future discoveries are subject to a wide margin of error. As Section I shows, some promising geological structures have been identified in the areas still to be explored, but only drilling will tell whether they do in fact contain commercial oil deposits; and the timing of any such finds will depend very much on the scale of future exploration. The Government and industry are giving high priority to all matters affecting the timing of production. There are, however, many problems yet to be overcome; it takes time for instance to provide the necessary infrastructure, particularly in the remoter areas. Delays in building the production platforms for the first fields shortly to come on stream will probably delay the landing of oil in appreciable

quantities until 1976. Certainly production in 1975 will not be as high as the level of 25 million tons forecast in the report published in May last year. Although this slippage in the target for 1975 is disappointing, it is unlikely to reduce the production levels expected towards the end of the decade.

29 Any forecasts of future production made now must therefore be very uncertain and the following diagram should be studied with this uncertainty in mind. It has been prepared from information provided by the oil companies for individual fields and shows the best estimates that the Department can make now of possible total production for each year between 1975 and 1990 from discoveries so far made. The lower portions



of each column in the diagram show the production expected from the ten fields proved to be commercial at 5 April 1974 (Forties, Auk, Brent, Argyll, Piper, Beryl, Dunlin, Thistle, Montrose and Ninian). (More detailed information for each of these fields is given in Appendix 4.) The upper portions of each column show the possible production from the other significant discoveries which have been made. Since further appraisal drilling is necessary to establish the size of these discoveries, these estimates must be regarded as much less certain than those for the ten commercial fields.

30 The diagram shows that on the evidence now available the significant discoveries so far made should contain enough reserves to support a minimum annual production of about 100 million tons over the period 1979 – 82. It is very difficult to forecast production exactly because of the time needed to construct all the facilities necessary to bring fields up to their peak production. The diagram also shows that production from existing discoveries is expected to fall below this level after 1982 and decline gradually thereafter as the peak production period of each field is passed, and the reserves begin to decline.*

31 These estimates do not however allow for the possible increase in reserves by uprating of existing discoveries, as they are further appraised, or by new discoveries. It is reasonable to assume that there will be some increase in reserves on these grounds, but obviously very difficult to say exactly how big it will be. New discoveries are unlikely to make a large contribution until the end of the decade or later, since it takes 3 – 5 years to bring fields into production and a further 2 – 4 years for them to reach their peak. But production, allowing for uprating and new discoveries, could reach 140 million tons in 1980 and could be sustained within a range of 100 – 150 million tons, or even more, during the 1980s.

32 There is now the clear possibility that the United Kingdom will produce as much oil as it uses by about 1980. Forecasts of United Kingdom oil demand beyond that become increasingly uncertain and so it is not possible to say with any reasonable certainty how long this possibility of self-sufficiency might last.

Oil: *Reserves*

33 The new discoveries in the United Kingdom sector of the North Sea during 1973, and the further appraisal of earlier discoveries have significantly increased the nation's known offshore oil reserves; but as

*In most cases, the peak production level is maintained for 2 or 3 years, after which annual production levels decline gradually until it is economically undesirable or technically impossible to extract more oil from the field.

many of the discoveries have not yet been fully appraised and because none of them is yet producing, the reserve estimates given in the following table are still very tentative. The table sets out the estimated reserves at 5 April 1974 of the ten fields declared commercial at that time and the other significant discoveries so far made, in the following three categories:

i *Proven* – those which on the available evidence are virtually certain to be technically and economically producible

ii *Probable* – those which are estimated to have a better than 50% chance of being technically and economically producible

iii *Possible* – those which are estimated to have less than a 50% chance of being producible.

34 The figures include the small amounts of liquid condensate at present being produced with gas in the southern North Sea basin and those which might be produced from the two gas condensate discoveries in the East of Scotland area (see Section I).

Estimated United Kingdom North Sea Oil Reserves

	Totals (in millions of tons)				
	Proven	*Probable*	*Probable Total*	*Possible*	*Possible Total*
1 Ten fields declared commercial	895	165	1060	100	1160
2 Other significant discoveries not yet appraised	–	230	230	160	390
3 TOTAL from existing finds	895	395	1290	260	1550
4 Future finds from further work under existing licences	–	700	700	700	1400
5 TOTAL from all finds under existing licences	895	1095	1990	960	2950

The estimates made in the 1973 report for production in 1980 on information then available are shown overleaf:

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	millions of tons	
	Production in 1980	*Reserves to be proved by* 1975 *to sustain forecast production level*
(i) the five fields then declared commercial (Forties, Auk, Argyll, Brent and Piper)	40 – 50	about 500
(ii) including other significant finds then made (Montrose, Josephine, Beryl, Cormorant, Thistle and Maureen)	50 – 70	500 – 800
(iii) speculative estimate, allowing for discoveries in 1973–75 at same rate as in the recent past	70 – 120	800 – 1300

35 The forecast range of 700 – 1400 million tons for further reserves in areas already licensed is based on the success ratio so far attained and on the geology of the blocks which have not yet been tested. If the same success ratio continued to apply to these blocks, further recoverable reserves of 1400 million tons could be found. But since most of the more promising areas have been explored first and no discoveries have yet been made outside the North Sea, it is more reasonable to express the estimate as a range of 700 – 1400 million tons.

Gas

36 Forecasts for gas are subject to broadly the same qualifications and assumptions as those for oil described in the first part of this section. Because gas has been produced in the southern basin of the North Sea for several years, reasonably realistic estimates of the reserves remaining in that area can now be given; but there is still great uncertainty about the total reserves on the Continental Shelf as a whole. So much depends on the extent to which further commercial discoveries may be made, from both existing and future licences, and on the extent of reserves of gas associated with oil discoveries.

37 The following table gives the best estimates that can be made now of reserves remaining at 31 December 1973 in discoveries so far made. No estimates are given for reserves from future discoveries. As for oil, the figures given have been placed in three categories, proven, probable, and possible. Figures for discoveries in the southern basin are given separately from those for the northern basin. The northern basin contains significant gas and gas/condensate discoveries, which, with the gas associated with oil discoveries, means that this area will make a big contribution to the nation's gas reserves. The table also shows details of

those reserves in the southern basin which have so far been regarded as too small to justify commercial exploitation, but which may well prove to be economic in due course.

Estimated United Kingdom North Sea Gas Reserves

(Remaining in known discoveries at 31 December 1973)

	Totals in trillion (10^{12}) *cubic feet*			
Southern Basin	*Proven*	*Probable*	*Possible*	*Total*
Fields presently being produced	18.9*	1.0*	1.5	21.4
Other discoveries believed to be commercial but not yet covered by British Gas contract	3.0	0.2	0.2	3.4
Other discoveries which may become commercial in due course	—	1.2	1.4	2.6
Total Southern Basin	21.9	2.4	3.1	27.4
Northern Basin				
Significant gas discoveries (including gas contained in gas condensate finds) (a)	2.9	3.3	3.5	9.7
Gas associated with oil discoveries	3.0	1.4	—	4.4
Total Northern Basin	5.9	4.7	3.5	14.1
Total UK North Sea	27.8	7.1	6.6	41.5

*Indicates reserves covered by British Gas contract

(a) includes provisional allowance for Frigg gas field pending agreement on apportionment of field between United Kingdom and Norwegian Continental Shelves.

38 These reserves are sufficient to support production of about 5,000 million cubic feet a day (mcfd) in the later years of the decade. The figures do not, however, include the Norwegian part of the Frigg gas field, for which British Gas have agreed a contract with the operators, subject to approval by the Norwegian Parliament. With supplies from this source, total supplies of gas to Britain could be increased to about 6,000 mcfd by the late 1970s. Supplies of natural gas during 1973 averaged nearly 3000 mcfd.

39 These alternative production levels of 5000 mcfd from present discoveries or 6000 mcfd with Norwegian Frigg added could be

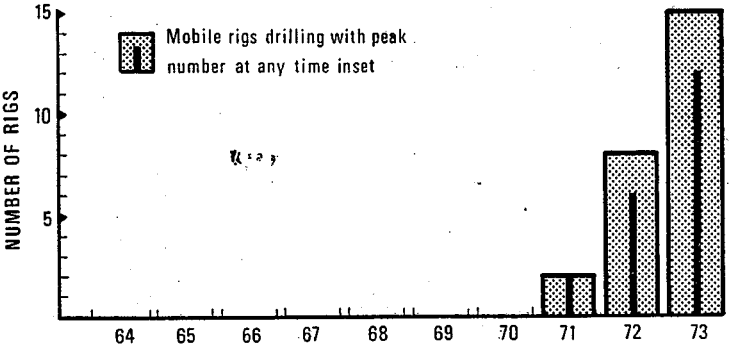
sustained until the 1980s. With further commercial discoveries these production levels could be sustained even longer, but otherwise a slow decline in output must be expected. Big finds are unlikely in the southern basin, which has now been extensively explored; the main hopes for future discoveries therefore rest on the other areas of the Continental Shelf. There is not yet enough information for a reliable assessment of the prospects in these areas, but it is reasonable to assume that further discoveries will be made over the next few years, and our hopes for more finds in the northern basin are particularly high.

Appendix 1

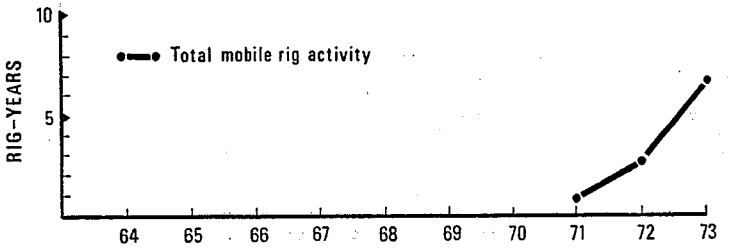
DRILLING ACTIVITY

EAST OF SHETLANDS AREA 1964–73

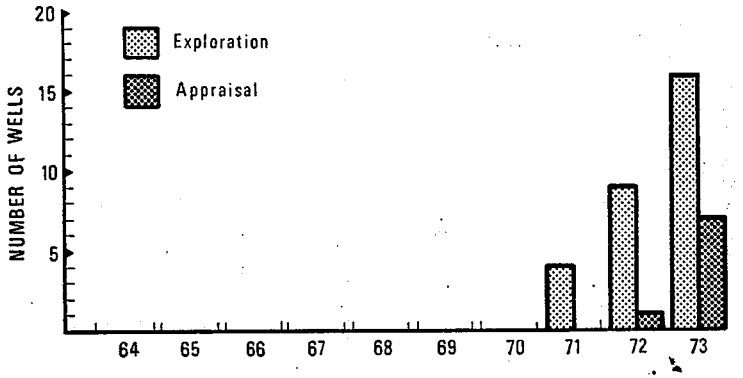
Mobile rig activity



Total rig-time spent in each year



Number of wells commenced and/or drilled

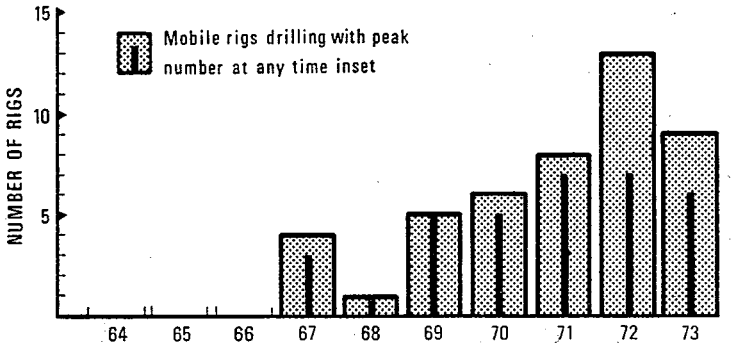


Appendix 2

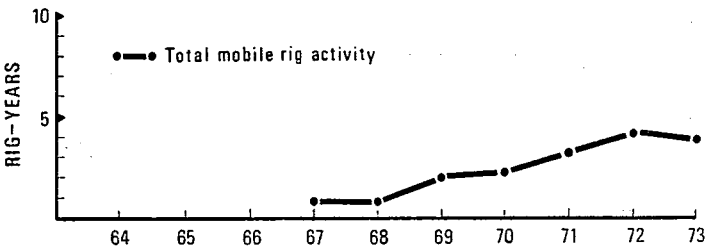
DRILLING ACTIVITY

EAST OF SCOTLAND AREA 1964–73

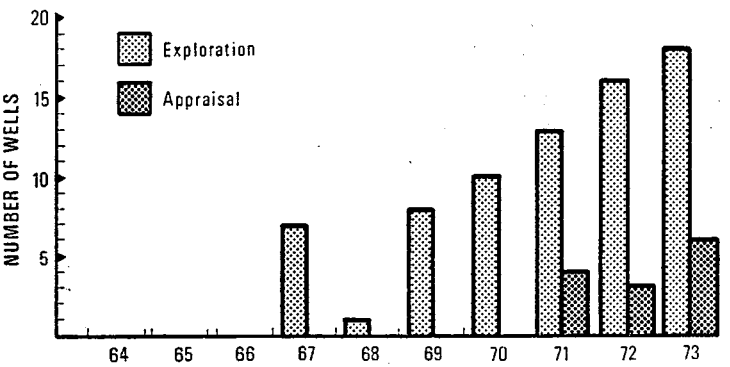
Mobile rig activity



Total rig-time spent in each year



Number of wells commenced and/or drilled

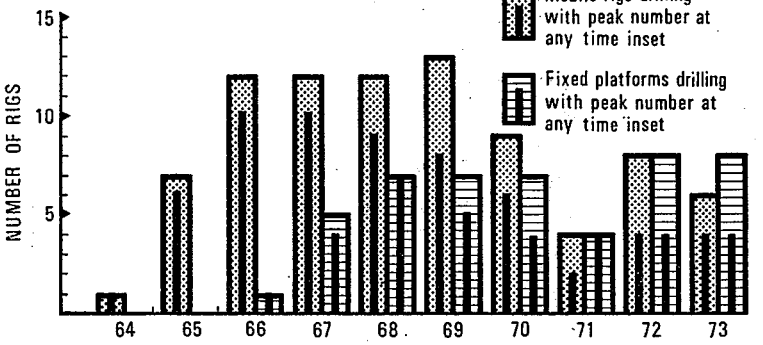


Appendix 3

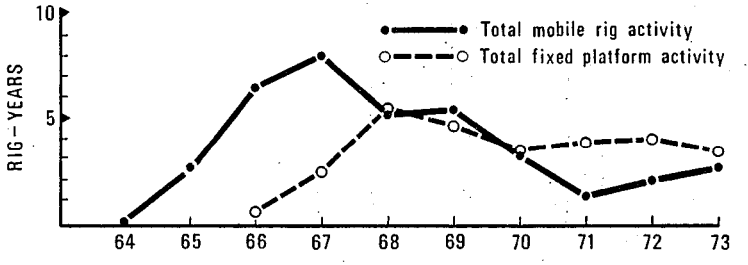
DRILLING ACTIVITY

SOUTHERN BASIN OF THE NORTH SEA 1964-73

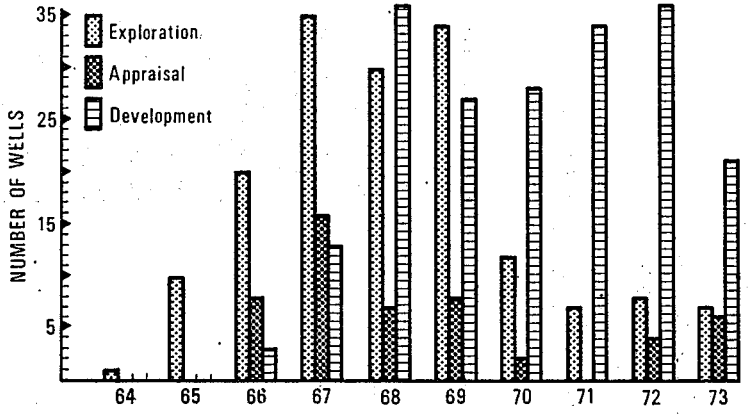
Mobile rig and fixed platform activity



Total rig-time spent in each year



Number of wells commenced and/or drilled



Appendix 4

Oil Discoveries

Proved Oil Fields

Field name	*Block number*	*Licensees*	*Company interest in block (%)*	*Extension into other UK Blocks*			*Date declared Commercial*	*Operator's estimated date of production start-up*	*Operator's estimate of first year of peak production*	*Operator's estimated peak production (million tons/per year)*
				Block number	*Licensees*	*Company interest in block (%)*				
Forties	21/10	BP Oil Development Ltd	100	22/6a	Shell UK Ltd (Shell) Esso Petroleum Co Ltd (Esso)	50 50	December 1971	1975	1977	20
Auk	30/16	Shell Esso	50 50	—	—	—	February 1972	1975	1976	2
Brent	211/29	Shell Esso	50 50	3/4	Texaco North Sea UK Ltd	100	August 1972	1976	1980/1	22
Argyll	30/24	Hamilton Brothers Oil Co (Great Britain) Ltd Hamilton Brothers Petroleum Corporation The Rio Tinto Zinc Corporation Ltd Blackfriars Oil Co Ltd The Trans-European Co Ltd	48 12 25 12.5 2.5	—	—	—	December 1972	1974	—	Initial rate of 1.6
Piper	15/17	Occidental Petroleum (UK) Ltd Getty Oil International (England) Ltd Allied Chemical (Great Britain) Ltd Thomson Scottish Petroleum Ltd	36.5 23.5 20 20	—	—	—	March 1973	1975	1976	10.6
Beryl	9/13	Mobil Producing North Sea Ltd Amerada Exploration Ltd (Amerada) Texas Eastern (UK) Ltd (Texas Eastern) British Gas Corporation (BGC)	50 20 20 10	—	—	—	July 1973	1975	1978	6

Dunlin	211/23	Shell	50	211/24	Conoco Ltd (Conoco)	33⅓	July 1973	1977	1980/1	6
		Esso	50		Gulf Oil (Great Britain) Ltd (Gulf)	33⅓				
					National Coal Board (Exploration) Ltd (NCB)	33⅓				
Thistle	211/18	Signal Oil and Gas Co Ltd	24	211/19	Conoco	33⅓	August 1973	1976/7	1978/9	10
		Champlin Petroleum Co Ltd	22.5		Gulf	33⅓				
		United Canso Oil and Gas (UK) Ltd	20		NCB	33⅓				
		Sante Fe (UK) Ltd	22.5							
		Tricentrol North Sea Ltd	10							
		Charterhouse Securities Ltd	1							
Montrose	22/18	BGC	30.77	22/17	BGC	30.77	November 1973	1976	1979	2.3
		Amoco UK Petroleum Ltd (Amoco)	30.77		Amoco	30.77				
		Amerada	23.08		Amerada	23.08				
		Texas Eastern	15.38		Texas Eastern	15.38				
Ninian	3/3	Burmah Oil (North Sea) Ltd	30	3/8	BP Petroleum Development Ltd	50	April 1974	1977/8	1981	20
		Imperial Chemical Industries Ltd	26		Ranger Oil (UK) Ltd	20				
		Murphy Petroleum Ltd	10		Scottish Canadian Oil and Transportation Co Ltd	7				
		Ocean Exploration Co Ltd	10		London and Scottish Marine Oil Co Ltd	15½				
		Chevron Petroleum Ltd	24		Cawoods Holdings Ltd	3¾				
					National Carbonising Co Ltd	3¾				

Appendix 5

Gas Discoveries

Proved gas fields

Field name	*Block number*	*Licensees*	*Company interest in block(%)*	*Extension into other UK Blocks*				
				Block number	*Licensees*	*Company interest in block (%)*	*Date discovered*	*Date of production start-up*
West Sole	48/6	BP Petroleum Development Ltd	100	—	—	—	October 1965	March 1967
Leman Bank	49/26	Shell UK Ltd (Shell)	50	49/27	British Gas Corporation (BGC)	30.77	April 1966	August 1969
		Esso Petroleum Co Ltd (Esso	50		Amoco UK Petroleum Ltd (Amoco)	30.77		
					Amerada Exploration Ltd (Amerada)	23.08		
					Texas Eastern (UK) Ltd (Texas Eastern)	15.38		
				49/28	Arpet Petroleum Ltd (Arpet)	33⅓		
					British Sun Oil Ltd	23⅓		
					North Sea Exploitation and Research Co Ltd	10		
					Superior Oil (UK) Ltd	20		
					Canadian Superior Oil (UK) Ltd	3⅓		
					Sinclair (UK) Oil Co Ltd	10		
				53/2	Mobil Producing North Sea Ltd	100		
Indefatigable	49/18	BGC	30.77	49/23	BGC	30.77	June 1966	October 1971
		Amoco	30.77		Amoco	30.77		
		Amerada	23.08		Amerada	23.08		
		Texas Eastern	15.38		Texas Eastern	15.38		
				49/19	Shell	50		
					Esso	50		
				49/24	Shell	50		
					Esso	50		
Hewett	48/29	Arpet	33⅓	48/30	Phillips Petroleum Exploration UK Ltd	35	October 1966	July 1969
		British Sun Oil Ltd	23⅓		Fina Exploration Ltd	30		
		North Sea Exploitation and Research Co Ltd	10		AGIP (UK) Ltd	15		
		Superior Oil (UK) Ltd	20		Century Power and Light Ltd	7.22		
		Canadian Superior Oil (UK) Ltd	3⅓		Plascom (1909) Ltd	4.26		
		Sinclair (UK) Oil Co Ltd	10		Halkyn District United Mines Ltd	4.26		
					Oil Exploration Ltd	4.26		
				52/5a	Phillips group as above			

Viking	49/17	Conoco Ltd (Conoco) National Coal Board (Exploration) Ltd (NCB)	50 50	49/12a	Conoco NCB	50 50	May 1968	July 1972
Rough	47/8*	BGC Amoco Amerada Texas Eastern	69.23 13.68 10.25 6.84	47/3a	BGC Amoco Amerada Texas Eastern	30.77 30.77 23.08 15.38	May 1968	1975 (planned)
Frigg (UK)	10/1	Total Oil Marine Ltd Aquitaine Oil (UK) Ltd Elf Oil Exploration and Production (UK) Ltd	33⅓ 22⅔ 44⅔	—	—	—	May 1972	early 1976 (planned)

*Discovered by Gulf Oil (Great Britain) Ltd but licence now assigned to Gas Council/Amoco group

Appendix 6

Oil discoveries

Other significant finds

Field Name	*Block Number*	*Discovered by*	*Date discovered*
Josephine	30/13	Phillips group	September 1970
Cormorant	211/26	Shell/Esso group	September 1972
Maureen	16/29	Phillips group	February 1973
—	3/15	Total group	July 1973
Hutton	211/28	Conoco/Gulf/NCB group	September 1973
Alwyn	3/14a	Total group	November 1973
—	2/5	Unocal group	November 1973

Appendix 7

Other significant gas and gas condensate discoveries

Field Name	*Block Number*	*Discovered by*	*Date discovered*
Ann	49/6a	Phillips group	May 1966
Dotty*	48/30	Phillips group	May 1967
—	53/4a	Signal group	July 1967
—	48/21a	Placid Oil (GB) Ltd	August 1967
Deborah*	48/30	Phillips group	August 1968
—	49/28	Arpet group	March 1969
Sean	49/25a	Allied Chemical group	April 1969
—	49/28	Arpet group	May 1969
—	41/24A	Total group	June 1969
—	43/20a	Hamilton group	June 1969
—	43/8a	Whitehall/Hamilton group	January 1970
—	47/13a	Tricentrol/Conoco/NCB group	April 1970
Broken Bank Area	49/21	Signal/Conoco group	July 1970
Broken Bank Area	49/16	Conoco/NCB	January 1971
—	30/2 (gas condensate)	Burmah/Hamilton group	June 1971
—	48/18b	Ranger/Sea Search group	April 1972
Lomond	23/21 (gas condensate)	Gas Council/Amoco group	May 1972
—	49/22	Mobil/Conoco/NCB group	May 1972
Amethyst	47/14a	Burmah group	October 1972
—	3/19	Total group	July 1973

*Gas supplies from these discoveries are included in the contract for the sale of gas from the Hewett field.

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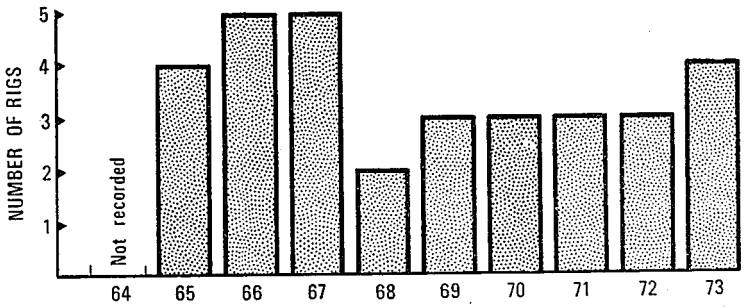
Dd 505031 K38 5/74.

Appendix 8

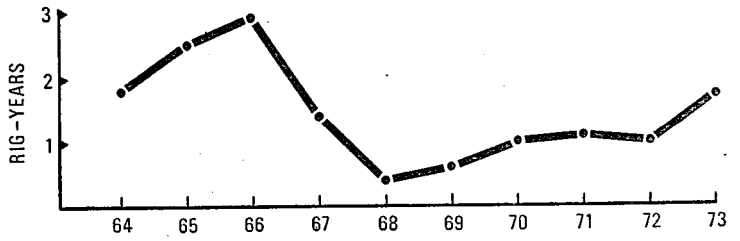
DRILLING ACTIVITY

UNITED KINGDOM LANDWARD AREAS 1964 – 73

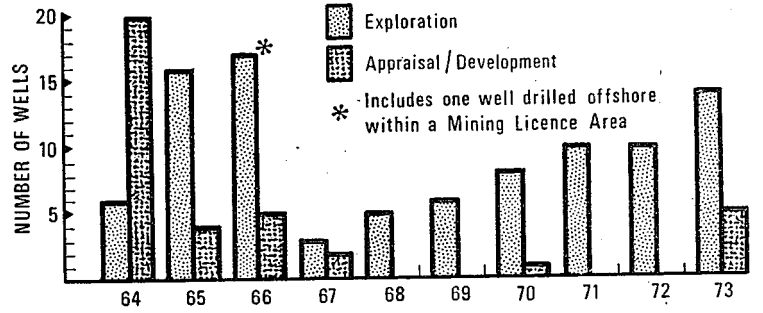
Peak number of rigs at any time



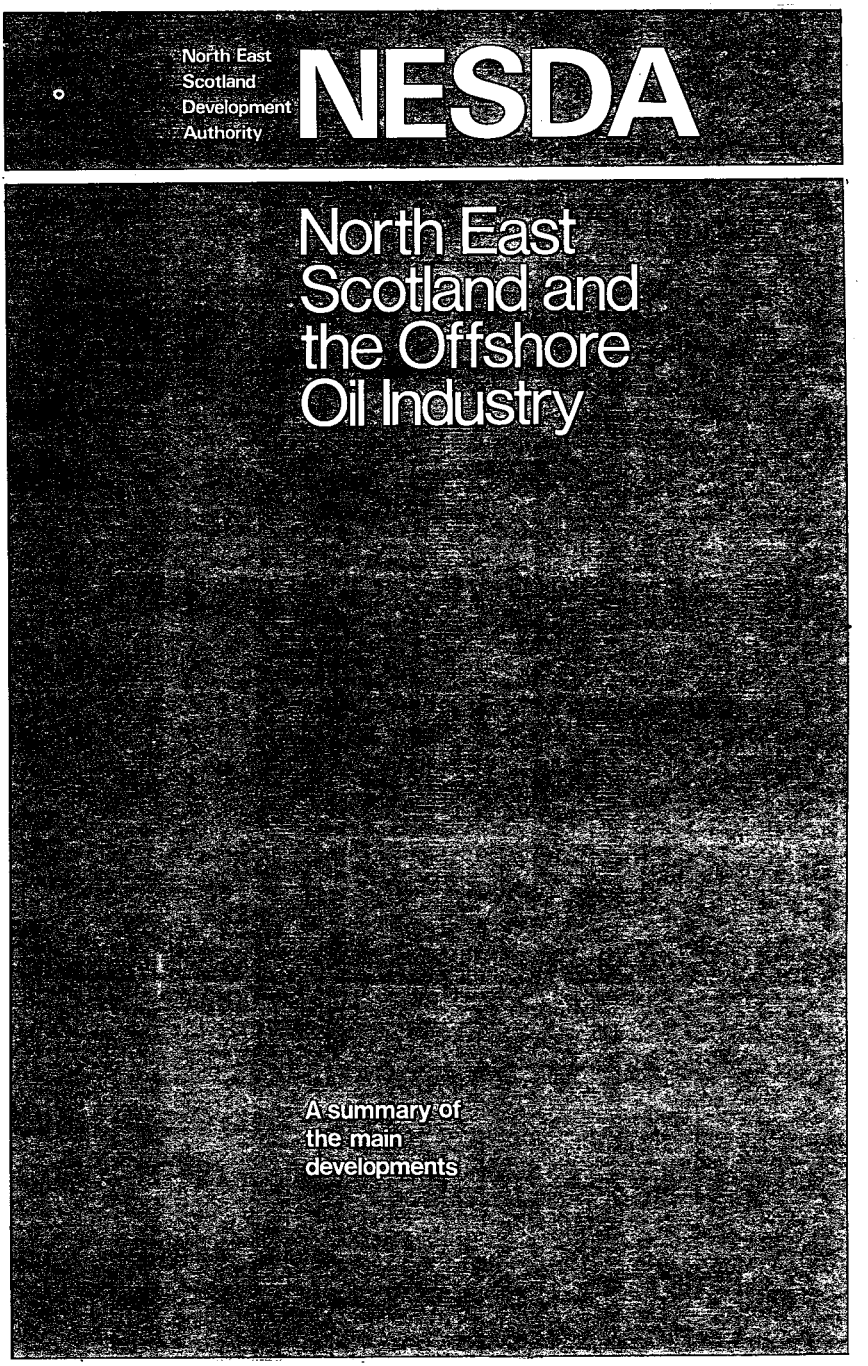
Total rig-time spent in each year

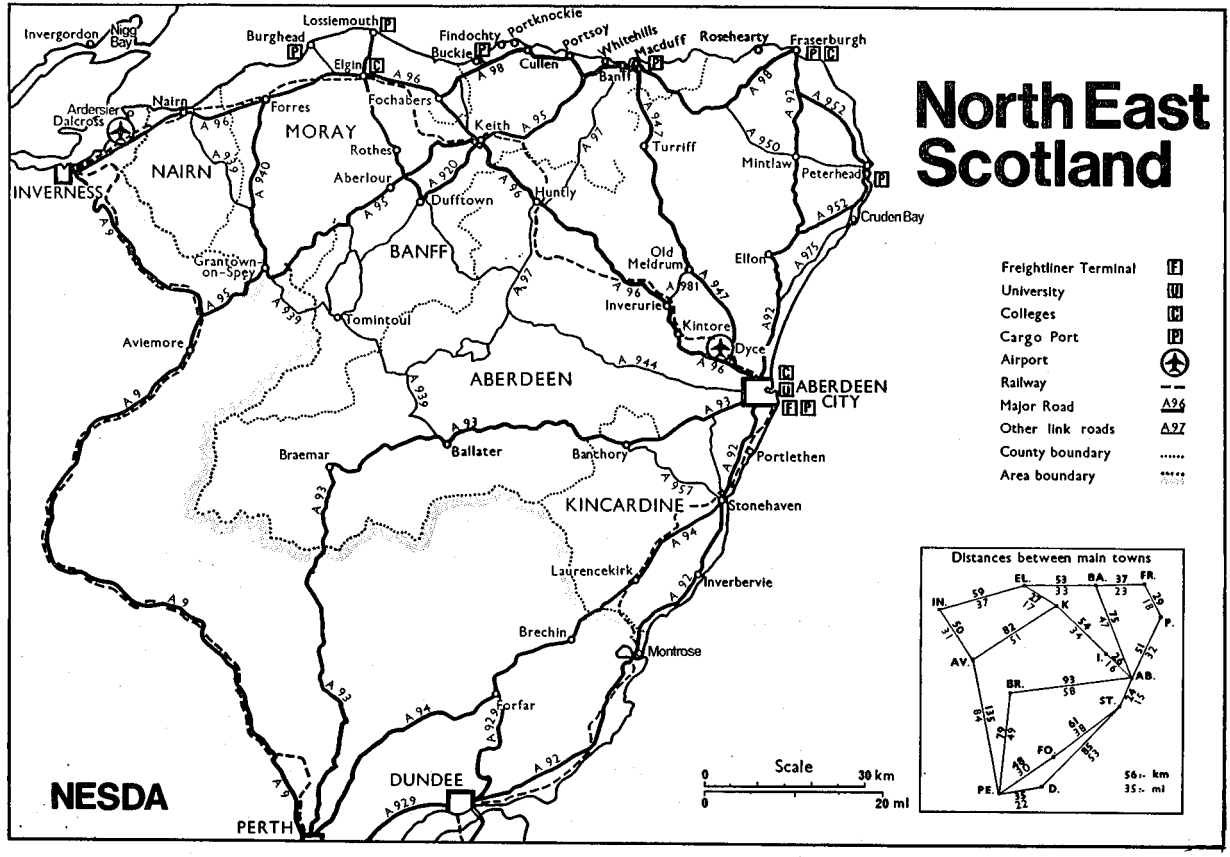


Number of wells commenced and / or drilled



APPENDIX C


North East
Scotland
Development
Authority
NESDA
North East Scotland and the Offshore Oil Industry
A summary of the main developments


North East Scotland
NESDA
Scale
0 30 km
0 20 mi
Freightliner Terminal
University
Colleges
Cargo Port
Airport
Railway
Major Road
Other link roads
County boundary
Area boundary
Distances between main towns
56:- km
35:- mi
INVERNESS
NAIRN
MORAY
BANFF
ABERDEEN
ABERDEEN CITY
KINCARDINE
DUNDEE
PERTH
Invergordon
Nigg Bay
Lossiemouth
Burghead
Findochty
Portknockie
Buckie
Portsoy
Whitehills
Macduff
Rosehearty
Fraserburgh
Elgin
Cullen
Banff
Ardersier
Dalcross
Nairn
Forres
Fochabers
Keith
Rothes
Aberlour
Dufftown
Huntly
Turriff
Mintlaw
Peterhead
Cruden Bay
Grantown-on-Spey
Tomintoul
Old Meldrum
Ellon
Inverurie
Kintore
Dyce
Aviemore
Braemar
Ballater
Banchory
Portlethen
Stonehaven
Laurencekirk
Inverbervie
Brechin
Montrose
Forfar

NESDA

THE INDUSTRIAL INFORMATION CENTRE FOR NORTH EAST SCOTLAND

NESDA is the local government organisation set up to advise companies in the Region and assist in their development. For information on the development potential in North East Scotland and Free advice on Sites, Buildings, Grants, Loans and Business Opportunities contact:—
NESDA (North East of Scotland Development Authority)
at 15 Union Terrace, ABERDEEN AB1 1NJ Tel.: 55971/2
or 23A High Street, Elgin, MORAY, Tel.: 3461

ABERDEEN CITY AND THE COUNTIES OF ABERDEEN, BANFF, KINCARDINE, MORAY AND NAIRN.

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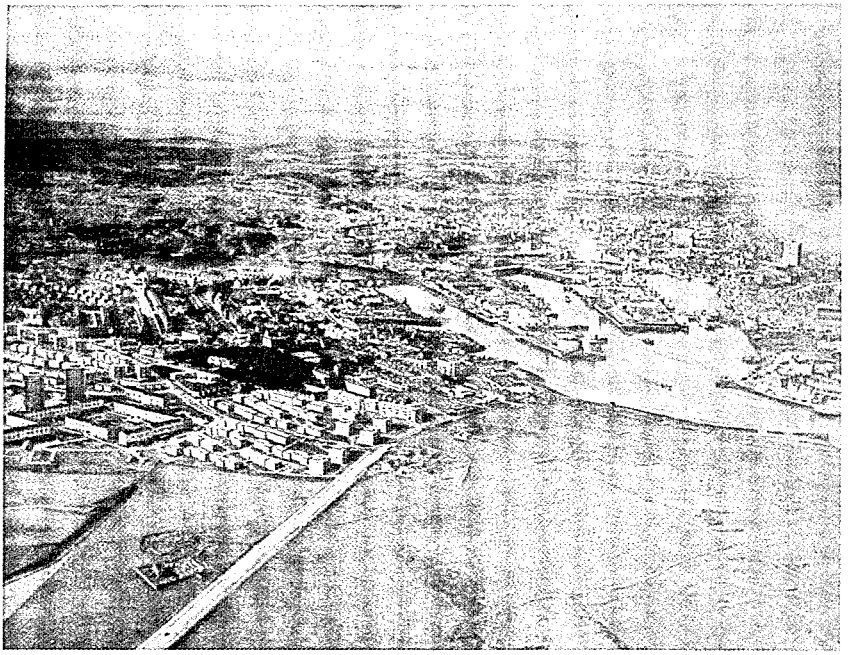
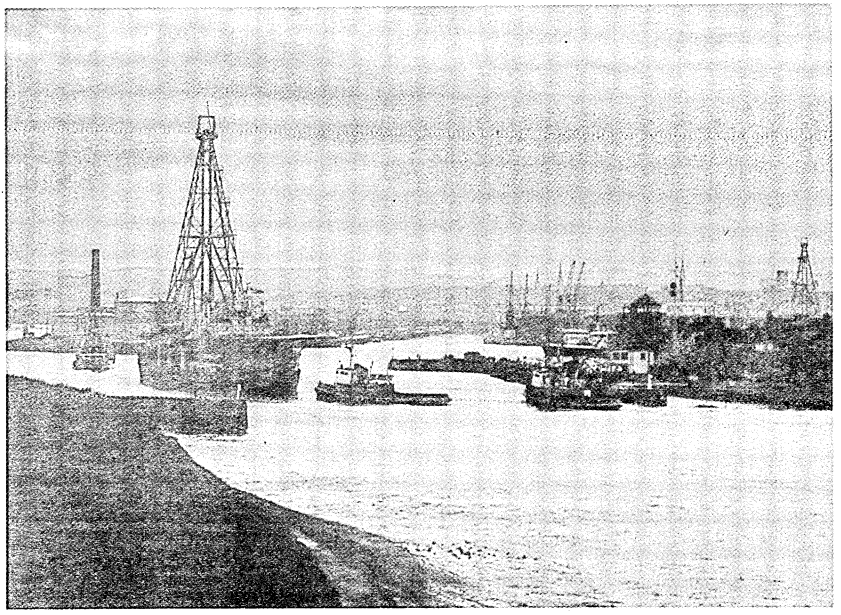


City of Aberdeen & Harbour

North East
Scotland
Development
Authority **NESDA**

North East Scotland and the Offshore Oil Industry



Drilling ship Glomar V entering Aberdeen Harbour

1974 No. 1

NESDA
15 Union Terrace
Aberdeen AB1 1NJ
Scotland

Telephone Aberdeen 55971

The North East Scotland region comprises the City of Aberdeen and the Counties of Aberdeen, Banff, Kincardine, Moray and Nairn.

Contents

Introduction

NESDA – the North East Scotland Development Authority was set up in May 1970 by the local planning authorities of the City of Aberdeen and the Counties of Aberdeen, Banff, Kincardine, Moray and Nairn, to promote economic development throughout this Region, which covers an area of 3,600 square miles and contains a population of 450,000.

The Region's major industries are rooted in its high quality resources. North East Scotland is one of Britain's leading fishing Regions and of major importance to agriculture, being the home of Aberdeen-Angus beef. Food processing is therefore a major growth industry.

But the Region is also the cradle of the whisky industry. Speyside's Golden Rectangle contains the world's greatest concentration of distilleries and produces many of the finest single malt whiskies.

The Region is also strong in marine and general engineering and has an important part in the British paper and textile industries.

Aberdeen City is the Regional capital, a major university city, the main administrative and service centre for the North of Scotland and the hub of road, rail, sea and air communications.

With its magnificent scenery and fine towns, North East Scotland is also an important centre for tourism. There are many buildings in the Region dating back to the Fifteenth Century and beyond and the numerous inhabited castles, including Balmoral, the Royal family's summer home, are a major attraction.

With beautiful coastal, rural and mountain scenery, North East Scotland offers a wide range of first class sporting and recreational facilities.

The North Sea oil industry has now provided the Region with new growth impetus and NESDA has been closely involved in its development, by providing up to date information, organising or participating in exhibitions and conferences to promote the Region's growing economy, producing up-to-date lists of the companies involved in the industry in North East Scotland and a directory of the Region's manufacturers, advising incoming firms on the availability of sites, housing and the whole range of Government grants and financial incentives. NESDA is also active in helping local and incoming companies to make contact and expand their business to mutual benefit.

NESDA's service is free and confidential.

A
The Industry's growth

1. Exploration

The past two years have witnessed the rapid build up of the offshore oil industry in Britain, with Aberdeen emerging as the major supply, service and administration centre for North Sea oil exploration.

The total number of significant oil strikes in Scottish waters has now reached fourteen. Ten of these have an estimated peak production capability of 100,000 barrels per day.

A major gas find - the Frigg Field - has also been made. This is believed to be the largest offshore gas field in the North Sea and is expected to produce about 40% of the UK's total natural gas.

Details of the discoveries are as follows:-

Field	Company	Discovery	Location	Est. Prod Potential b.p.d.*
Montrose	Amoco/Gas Council	Dec 1969	22/18	100,000
Josephine	Phillips	Sept 1970	30/13	50,000
Forties	BP	Nov 1970	(21/10 (22/6	400,000
Auk	Shell/Esso	Feb 1971	30/16	50,000
Brent	Shell/Esso	July 1971	211/29	450,000
Argyll	Hamilton	Aug 1971	30/24	50,000
Beryl	Mobil	Sept 1972	9/13	150,000
Cormorant	Shell/Esso	Sept 1972	211/26	150,000
Thistle	Signal	Sept 1972	211/18	200,000
Piper	Occidental	Jan 1973	15/17	250,000
Maureen	Phillips	Feb 1973	16/29	100,000
Dunlin	Shell/Esso	July 1973	211/23	250,000
Alwyn	Total	Aug 1973	3/5	a
Hutton	Conoco	Sept 1973	211/27	200,000
Ninian	BP/Ranger	Jan 1974	3/8	b
Un-named	Burmah	Jan 1974	3/3	b

* barrels per day

a. probably commercial

b. Expectations of a major find. Speculation that these two finds are related and may have combined production potential as high as 1,000,000 barrels per day.

The total estimated peak production of these fields excluding the two most recent finds is around 2,500,000 barrels per day. This is in excess of present UK consumption - and at current prices represents a figure at peak output of £4,000 - £4,500m per annum to the UK economy.

If hopes for the last two finds prove well-founded this would bring the total potential output to 3,500,000 barrels per day (175 million tons per annum). This would be worth a gross landed total at present prices of around £6,000 million per annum.

2. Growth of onshore supply services

Most of the rigs that operate in Scottish waters are being serviced and supplied from Aberdeen which is becoming internationally recognised as Europe's Offshore Capital.

In Aberdeen and District, there are now over 200 companies directly involved in the offshore oil industry in the following categories:

Oil exploration companies	17
Oil rig operators (excl. Shell & BP)	9
Shipping/Marine companies	13
Diving/diving services	11
Specialist service and supply companies	102
General service and supply companies	50
	202

These companies employ directly about 4,000 people in North East Scotland - at present mostly in the Aberdeen area, although recruitment in the Peterhead area is beginning to increase.

As a further indication of the breadth of the oil industry's requirements, there are now well over 300 companies based in North East Scotland supplying the industry (over and above the 200 plus directly involved). They fall into almost every industrial and commercial category and, in themselves, they bear witness to the wide range of opportunities the oil industry provides to small and medium-sized as well as larger companies.

It is very difficult to measure the number of jobs that has been created as a spin-off from the growing offshore oil industry. It is certainly considerable and accounts very largely for the low unemployment rate in the extensive area covered by Aberdeen Employment Exchange.

In addition, developments to date have already led to an inward movement of population to the Aberdeen area, taking in a commuting radius of over 30 miles. NESDA has had contact with many people moving into the area seeking accommodation and general information on living in North East Scotland.

During the past two years Aberdeen Airport has had a considerable increase in activity with passenger traffic increasing at an annual rate of over 35 per cent. Well over a quarter of a million passangers have used the airport during 1973. Additional flights and new services are being introduced and there are 18 operators using the airport with more planning to move in.

A new arrivals lounge is currently under construction and the British Airports Authority has stated its intention of taking the airport over. Among other developments they propose a major new terminal building to handle the continued expansion anticipated.

Aberdeen Airport is also the base for helicopters ferrying personnel to and from the oil rigs. The two operators, Bristows and British Airways together have 20 helicopters, making Aberdeen the biggest helicopter base in Britain. Both companies have investment plans totalling almost £20 million to expand their services in Scotland.

Industrial land and buildings

The offshore oil companies have moved into a variety of premises and a considerable amount of investment is being carried out in new offices, warehouses and factories. The total

amount runs into many millions of pounds. In addition, new hotels are being built in and around Aberdeen to cater for the increasing number of business visitors being attracted to the area.

Local authorities have allocated over 150 acres in the past 18 months and industrial land has been rapidly taken up.

A 33 acre extension to Aberdeen Corporation's East Tullos Estate attracted applications from 35 companies requiring a total of 175 acres.

In response to this demand, the City of Aberdeen is planning for major industrial developments on a 180 acre estate at Altens on the south side of the city.

Aberdeen County Council's 28 acre Farburn Industrial Estate was taken up at one meeting of the Planning Committee. The 88 acre Bridge of Don Estate is almost completely allocated and has been extended.

Another 28 acre estate at Dyce, by the helicopter base is being developed.

The County Council now have firm proposals for major industrial developments on a total of 400 acres in the immediate vicinity of Aberdeen Airport at Dyce.

Land is available further out of Aberdeen at Inverurie and a substantial amount of land is being made available at Peterhead.

In Kincardineshire, south of Aberdeen, land is available at Stonehaven and Portlethen.

Private interests are also developing industrial land in the Aberdeen and Peterhead areas and elsewhere in North East Scotland.

Aberdeen Harbour

Developments proposed or in progress at Aberdeen Harbour represent a capital investment well in excess of £10 million.

Major redevelopment is being carried out, both by the Harbour Board and by private interests. The main scheme is the conversion of Victoria Dock and Upper Dock to tidal working due for completion in May 1974.

Four integrated oilfield supply bases are completed or under construction by Shell, Amoco, Texaco and the Aberdeen - based Wood Group. Agreement has been reached for similar bases to be built by Total and by Seaforth Maritime.

Plans have been approved for the reconstruction of the fish market and associated wharves at a cost of £1.7 million. This is due for completion in 1976.

In the same year, a new roll on/roll off ferry terminal is scheduled to start operation. This will be used by the Orkney and Shetland boats but will also be available for other users e.g. to Scandinavian or North European ports.

Aberdeen ship builders Hall Russell are constructing a new graving dock for the repair and maintenance of supply boats. This is due for completion in May and will accommodate vessels of up to 370 feet in length and 60 feet beam.

A new plant for the manufacture of drilling and associated chemicals is to be constructed on Blaikie's Quay by Oil Base Limited.

Aberdeen Harbour Board are continually reviewing the needs of the oil industry and other port users and are able to consider further projects for the development of port facilities by oil-related and other interests.

Peterhead

At Peterhead, 32 miles north of Aberdeen, major developments are in hand for the Harbour of Refuge, a square mile of relatively sheltered deep water enclosed by two massive granite and concrete breakwaters.

North Side

Arunta (Scotland) have established an oil rig supply base on the southern side of Keith Inch on the north side of the Harbour of Refuge. The development includes warehousing, workshops, offices, helicopter pad, a new pier and berthing facilities. Eventually the company hope to be able to supply five rigs and plans include the construction of a graving dock for supply boats.

The first phase is complete and is the base for the Forties Field pipelaying operations.

A specially designed workshop for manufacturing wellhead completion systems is nearing completion.

South Side

On the south side of the Harbour of Refuge a comprehensive service base is under construction for the Government (through the Department of Agriculture and Fisheries for Scotland) at an estimated cost of £2,500,000. The base facilities will be operated by Aberdeen Service Company (North Sea) Ltd.

The development will include a finger jetty lying parallel to the south breakwater and able to take tankers of up to 40,000 tons (which will be needed to supply the 1320 megawatt oil/gas field power station being built by the North of Scotland Hydro Electric Board at Boddam to the south).

There will be quay space for service vessels with warehousing back-up and a fabrication yard.

The two developments combined will enable Peterhead to supply about 12 rigs and take semi-submersible rigs alongside for commissioning or repair.

Extensive areas of land near these projects are being scheduled for industrial and commercial development.

3. Equipment manufacturing

A particularly significant development is the decision by two major manufacturers of oilfield equipment to set up factories near Aberdeen.

The first to announce this were Vetco Offshore. Production has already started at their factory on a nine acre site at

Aberdeen County Council's Bridge of Don industrial estate. Eventually, the company expect to employ 200 most of whom will be skilled men.

The Baker Division of Baker Oil Tools have built an oilfield equipment factory in Aberdeen. It has been erected for them by the Lyon Group (Scotland) on a five acre site on the Bridge of Don Estate and is likely also to employ about 200.

It is also significant that the new oil equipment factories will be supplying a wider market than the North Sea. Baker Oil Tools have specifically stated that they will supply the Common Market, Eastern Europe and the Middle East as well as the North Sea from their Bridge of Don factory.

Other oil tool manufacturers are interested in building factories in North East Scotland and several already established as service depots expect to start manufacturing in the fairly near future.

4. Oilfield Development

Of all the oil companies, British Petroleum are the most advanced with their programme for bringing oil ashore. Their Forties Field, which is one of the largest oilfields so far proved in the North Sea, should be producing oil by 1975.

So far, the Company have ordered four production platforms two of which are being built by Brown and Root Wimpey, Highland Fabricators at Nigg Bay, Easter Ross. The other two are being built on Teesside by the Franco-British Consortium Laing Construction/ETPM. The biggest of the four, being built at Nigg Bay, will be the largest offshore platform ever built, costing £40 million and weighing 57,000 tons when fully fitted out. It will be pile-driven into the sea bed in almost 400 feet of water. The full height of the structure when complete is about 700 feet.

The oil will then be brought ashore by a submarine pipeline 115 miles long to a terminal on a 27 acre site at Cruden Bay, Aberdeenshire. From there it will go underground 140 miles to BP's refinery at Grangemouth, which it is planned to increase in capacity. The surplus will be exported by a new terminal in the Firth of Forth.

The total investment will be over £400 million. Exploration and development of the company's North Sea blocks will be controlled from the new administrative headquarters on Aberdeen County Council's Farburn Industrial Estate, Dyce.

The Shell/Esso consortium have several major strikes in the North Sea and are still working on their detailed plans for bringing the oil ashore. However, platforms have been ordered for the Auk and Brent fields from Redpath Dorman Long, Methil, Fife.

The operations are headquartered in a new £900,000 office block at Tullos, Aberdeen.

Occidental Petroleum head the consortium which discovered the major Piper field. Their plans include platforms and a pipeline to the island of Flotta in the Orkney Islands. They are proposing to operate from Peterhead.

The Hamilton group are currently working on plans for developing the Argyll field and a platform is being built by J Ray McDermott at Ardersier, Inverness-shire.

Total Oil Marine and the Gas Council are currently considering ways of bringing gas ashore from the Frigg Field. Outline planning permission has already been given for a major terminal at St Fergus, north of Peterhead, and it seems certain that a pipeline will bring gas here from the Frigg Field and thence underground to Armadale, West Lothian to connect with the national grid.

Natural gas conversion in the North of Scotland will be brought forward and the northern North Sea could provide over 40 per cent of the UK's total natural gas requirements. Total have applied for planning permission for their head-quarters to be built at Altens, Aberdeen.

Several other operators, particularly Amoco and Mobil, are known to be assessing production plans for their finds. Amoco will be building their North Sea operations head-quarters at Tullos, Aberdeen.

5. Oil and North East Scotland

It is clear that Aberdeen has emerged as the principal administrative, service and supply centre of the North Sea oil industry and Peterhead is now developing to provide major complementary facilities.

The Cromarty and Inner Moray Firths are developing as the major centres for fabrication and other heavy industrial projects associated with the offshore oil industry.

The Industry has already had a broad impact both geographically and in terms of business development.

The North East of Scotland has seen an influx of sales and technical representatives from a variety of companies watching the growth potential of North East Scotland.

Similarly there are a growing number of investment proposals from firms who see North East Scotland as an area on the brink of major growth and therefore offering an expanding market for a wide range of goods and services. In total, these run into tens of millions of pounds.

Although the most spectacular growth has been in Aberdeen, Peterhead and the Cromarty/Moray Firths, a wide range of firms throughout North East Scotland have already secured business as a direct result of oil related developments. NESDA has had contact with firms operating from towns throughout the Region from Forres to Stonehaven who have already won business from the oil industry and its ancillaries.

As the Industry grows it is certain that opportunities for firms throughout the Region will increase. It is also likely that new firms will be attracted to various parts of the Region to supply new markets. Already companies are looking seriously at towns on the main rail and road connections between Aberdeen and Inverness, as well as the communities close to Aberdeen and Peterhead.

Small advance factories are being built at Forres, Morayshire; Elgin, Morayshire; Aberlour, Banffshire. Others are proposed for Banff and Ellon and Huntly, Aberdeenshire, and Banchory, Kincardineshire. Industrial land is also being made available at these and other towns.

An important footnote must be added that North East Scotland's indigenous resource-based industries are currently expanding in their own right with considerable investment in distilleries, food and fish processing plants and cold storage. There have also been important developments in the engineering industries and in other diverse fields.

NESDA has been continuously promoting the development of the oil business. Towards the end of 1972, NESDA was sponsor and joint organiser of the first British trade mission specifically aimed at the offshore industry. The 10 day mission was based in Houston, Texas, and was the largest trade mission ever to leave the UK with 72 members representing over 50 organisations. The members came from all over the UK but there was particularly strong representation from North East Scotland. Business gained is already several million pounds and contacts made could lead to considerably more.

NESDA also sponsored the Offshore Scotland Exhibition in Aberdeen in March 1973 and participated in the British stand of the Offshore Technology Conference in Houston in April/ May 1973. NESDA also exhibited at the Interocean Exhibition at Dusseldorf in November, 1973 and is co-promoter with Offshore Services Magazine of Offshore Europe Exposition to be held in Aberdeen in 1975.

Throughout 1973 NESDA has continued to work hard to help increase British participation in the North Sea oil industry and many companies and organisations continue to follow NESDA's lead.

6. Education and Training

South East Drilling Services (SEDCO) have set up a school in Aberdeen to train workers for the fleet of new rigs due over the next two years. Several other oil industry training centres are proposed.

Aberdeen University has established an M.Sc. course in Petroleum Geology and is setting up a third chair of geology with specific responsibility for petroleum geology.

Robert Gordon's Instute of Technology is running four courses ranging from a one year full-time course in Offshore Engineering to a one week course for Safety and Survival.

Offshore companies operating out of Aberdeen have formed the Scottish Offshore Training Association to serve the specific training needs of all companies engaged in exploration, drilling and service operations in the Region.

Other Aspects

A Petroleum Club for oil executives has been set up and has premises at Kippie Lodge, North Deeside Road, Miltimber, Aberdeen, Telephone 73 2677.

Chairman —	Mr. R.W.McCleskey, 2 Balnagask Road, Aberdeen.
Vice Chairman —	Mr. Frank James, SEDCO, Craigshaw Road, West Tullos, Aberdeen.

A very active and well supported Petroleum Wives' Club has also been formed.

B
The Future Prospects

1. Estimates of oil reserves

Dr Jack Birks, a director of B P Trading, speaking at a Financial Times conference in September, 1972, suggested that oil reserves in the British sector of the North Sea could, if present success rates were maintained, reach more than 20,000 million barrels by the early 1980's allowing for production at over three million barrels a day.

Other forecasts suggest that an even higher figure may eventually be achieved. For example it is agreed that the Ekofisk group of oilfields in Norwegian waters with outlying fields in UK waters, may be one of several in the North Sea with a production capability of over one million barrels a day.

It has also been pointed out that the finds so far made are from different geological periods and there may therefore be more fields at greater depths.

A production capability of two and a half million barrels of oil a day from UK waters seems certain. A higher figure of between three of four million barrels a day looks likely. Ultimately, an even higher figure may be achieved, particularly as exploration spreads northwards and westwards.

(Note. A production of one million barrels a day is the equivalent of an annual output of 50 million tons, which is half the UK's current annual consumption. Consumption will rise considerably over the next 10 - 15 years, but it is still probably true that the UK will be producing from the North Sea the equivalent of its annual consumption. It is very likely that the UK may be net exporters of oil.

This is not to say the UK will be self sufficient. North Sea oil is very high quality and it is likely to be mixed with lower grade crudes for refining. Consequently Britain's demand for North Sea oil *per se* is likely to be far less than the total production and much will therefore be re-exported and low grade crudes will be imported. The net effect will be very beneficial on the UK Balance of Payments.)

2. Production requirements

Exploration, and the development and production of oil fields is likely to be spread over many years and be paralleled by changing technology. In the more immediate future, platforms of varying design and materials will be required. Although the first platforms ordered for the North Sea were of steel, concrete platforms are gaining in popularity amongst the industry. In the more distant future more sophisticated underwater production systems may be developed.

Firm estimates point to twenty platforms being required for the Ekofisk group of oilfields including Josephine and Hamilton Brothers' un-named find in Block 30/24.

On the basis of estimates discussed above, it seems likely that at least forty platforms will be required for the British sector of the North Sea, and an eventual figure of over 100 is likely to be reached. This would probably indicate the need for four or five submarine pipelines and onshore terminals, tank farms and possibly gas liquefaction plants, and eventually increased refining capacity.

3. Industrial growth and Marketing Opportunities

It has been estimated that the oil industry will invest £1,500 million in the North Sea over the next ten years, and spend a further £1,000 million on operating costs.

A more recent estimate, again by Dr. Jack Birks, points to a much higher figure. Development of BP's Forties Field is now expected to cost over £500 million compared with the estimate of £460 million less than a year ago. On this basis Dr. Birks estimates that North Sea oil development projects already announced might cost a total of £2,400 million. He further estimates that allowing for inflation, development of other discoveries in the period 1975-79 could amount to £1,300 million, while the investment in producing from expected new discoveries could total between £4,000 million and £7,000 million between 1976-79.

This is a total investment of over £10,000 million.

These staggering figures are borne out by another estimate of the world wide needs of the energy industry which suggests that it will require more investment during the next decade than all other industries combined.

Recent events have further highlighted the importance of energy and, even if growth in demand is moderated, the need to invest heavily in energy industries world wide is now fully recognised.

No industrial company can afford to ignore the market implications of this situation and in a more limited context the importance of the North Sea indicates great scope for British industry. Specialist or large companies may be able to compete successfully by themselves, but others will need to form consortia or joint ventures with other British companies or with American, Japanese or Continental companies with a complementary input.

It is already clear that the development of the North Sea oilfields is going to require vast quantities of equipment and supplies and, because of the conditions, a demand for new and improved technology.

At present, about 18 per cent of the world's oil comes from offshore sources. By the end of the century it is estimated that this proportion will have risen to 40 per cent of a much larger total demand. It is certain too, that this oil will be sought under increasingly difficult conditions, requiring major developments in technique and technology. The North Sea is a major step for the offshore oil industry and pioneer companies in the North Sea could become world leaders in the offshore field.

The onshore investment and development is certain to affect the whole of the North Sea Basin and beyond, but it already seems certain that the greatest concentration of the industry will be in the North of Scotland, with heavy industry concentrated in the Cromarty/Moray Firths and the administration, supply and service and light/medium manufacturing operations centre in the Aberdeen area with major support bases in Peterhead, Montrose, Dundee, Orkney and Shetland.

The first two oil equipment manufacturing plants are already

established near Aberdeen. North East Scotland could become the major workshop of the European offshore industry supplying equipment to North Sea operators and also the Common Market countries, Eastern Europe, the Middle East and other world markets. As over 70% of the earth's surface is under the ocean, the importance of offshore technology in exploring and producing resources in the future is clearly likely to increase.

Over and above this direct impact, North East Scotland is certain to experience general economic growth which can benefit the whole region.

4. Employment Prospects

It is extremely difficult to forecast with any degree of accuracy the likely build up of employment in the offshore industry.

Two years ago, NESDA estimated that the oil industry would be directly employing 5,000 people by the end of 1975. It was stated at the time that these were conservative estimates, but a recent survey of 157 companies carried out by the Department of Employment shows that the industry already employs 4,000 people in the North East of Scotland – mostly in the Aberdeen area, although not all are resident in the area.

The companies estimate that this figure will have risen to about 7,500 people by the end of 1974. This may be optimistic, as a number of firms are looking for the same contracts. However, allowing for a slightly longer time scale, and the influx and expansion of other specialist firms, this figure could well be reached during 1975/76.

Any estimate of the affect of this can only be a guess. It seems likely, however, that for every 10 jobs created in oil drilling activity and direct support work (i.e. those employed by companies on NESDA's A list), there will be between 5 and 10 new jobs created in all kinds of indirectly related work. These include, construction, hotel and catering trades, transport, financial, legal and professional services, retailing, local government and administrative services etc.

This means, as the numbers employed in all activities directly related to the oil industry rise to 7,500, then employment in indirectly related areas will increase to between 3,750 and 7,500.

Forecasting beyond this period to, say 1985, is much more difficult as so many variables have to be considered. Some of the factors to be taken into account are listed below.

(1) The number, size and extent of oilfields discovered in the North Sea.

(2) The methods used for bringing the oil ashore.

(3) The time scale for exploration and development of offshore oilfields.

(4) The world wide industry's view of the North Sea in relation to other prospective areas.

(5) The attitudes of British industry towards the new industrial opportunities and the extent to which they are prepared to invest.

(6) The continued ability of North East Scotland to attract oil equipment manufacturers to the area.

(7) The extent to which local and central authorities in North East Scotland are able to provide the land, housing, water, power and general infrastructure to support growing industry.

(8) The extent to which the growth of oil-related activity in North East Scotland stimulates economic growth.

In general, exploration activity is expected to intensify in the next few years, particularly if present success rates continue. As the level of exploration reaches its peak, development and production of the fields will take over the growth impetus. Exploration is expected to continue for much longer than the ten years many people suggest, as companies seek extensions to existing fields and improved geophysical techniques and drilling experience add to the knowledge of the geology of the North Sea basin. Also, more areas will be opened for exploration in the North Sea and northwards and westwards.

Development of and production from the oilfields is likely to be spread over at least thirty years, and the industry may well be a major part of the North of Scotland economy for the next half century or more.

On the basis of this information, and estimates within the industry, there will probably be about 100 rigs and platforms operating in the North Sea in 12-15 years' time. The equivalent of about 65 per cent of these may well be serviced from North East Scotland. The logistics will be more complex as some of the northernmost rigs will be obtaining some supplies from the islands and some from the mainland.

It is estimated that each rig or platform needs a direct support labour force onshore and offshore of 300. Rig servicing, maintenance and repair and the manufacture of offshore equipment in North East Scotland could produce an even higher employee ratio. Conversely, of course, a greater degree of automation and supply of equipment from other bases could reduce this.

Assuming 65 rigs and platforms creating jobs directly for 300 people each, (and current figures and forward estimates support this), the numbers employed by the oil industry in North East Scotland could have reached about 20,000 by 1985.

The improved facilities at Aberdeen Harbour and the major developments taking place at Peterhead could cope with the support for much of this. Further investment will probably be needed as the build up approaches this figure.

A rapid build up such as this, coupled with the major developments to the west of the Region in the Cromarty and Moray Firths, is likely to stimulate a considerable spin off in other areas such as construction, distribution, services etc. This could bring the total number of new jobs created directly and indirectly by the impetus of the offshore oil industry to between 30,000 and 40,000.

It will always be possible to debate these figures. If the number of platforms and rigs operating by 1985 is lower and the multiplier is not significantly different from the past then a lower figure would result, but still probably not much less than 10,000.

Similarly, if the number of platforms served from North East Scotland is higher, as some estimates suggest, and if the onshore build up is bigger than anticipated and the multiplier greater (as occurs in some other world oil centres), then the figure would be much higher (perhaps around 60,000) assuming, of course, that the Region was able to absorb an industrial build up on such a scale.

An estimate of 30,000 to 40,000 jobs in 12-15 years' time seems realistic within the present knowledge and assumptions outlined, and North East Scotland is capable of providing the services to support this growth.

5. The Future for North East Scotland

The developments outlined above will inevitably make North East Scotland one of Britain's most dynamic growth areas.

As far as Aberdeen is concerned the kind of growth envisaged in making the City Europe's Offshore Capital is very much in keeping with the City's past development. Oil and offshore specialist companies have been attracted to Aberdeen because it is already established as the major administrative, medical, communications, service and educational centre for the North of Scotland.

The Greater Aberdeen Area has a population of almost a quarter of a million with a diverse industrial and commercial structure. Consequently many of the services needed by the oil industry are already provided. An added bonus for the new offshore industries is the City's and Region's importance as a European fishing centre which has resulted in the availability of many marine services and considerable expertise throughout the Region.

Building on this nucleus, the oil industry will certainly boost Aberdeen as a centre for administration, service and light industry. This growth will, in turn, stimulate an expansion and enhancement of services already provided. Already several new hotels are to be built and the City's central area is expanding as a major shopping centre. This process will continue and is likely to lead to the provision of more commercial facilities, an even wider selection of cultural and recreational facilities than at present provided with a consequent overall improvement in the already high quality of life in the Aberdeen area.

Developments in Peterhead will make the town a growing community with its prosperity founded on the diversity provided by its growing importance as Scotland's second largest fishing port (by value of landings), the site for a large power station, the reception area for oil and gas pipelines and as a major oil rig supply and servicing centre.

Of particular advantage to the whole of North East Scotland will be the accelerated improvement in communications which the industrial development will bring. Already major improvements are being carried out to roads and harbour and air services. It is certain that these are only the beginning of major developments which will follow at a much faster rate than could be achieved without the spin off of rapid industrial development.

Other parts of the Region should clearly benefit directly from the oil industry. Towns on the main road and rail route to Inverness, such as Inverurie, Huntly, Keith, Elgin and Forres, are already attracting the interest of companies, existing and new, wanting to serve the growth markets of Aberdeen/Peterhead and Nairn/Inverness/Invergordon from a base which offers relatively low land and operating costs and pools of adaptable labour.

The overall economic growth in the North of Scotland provides opportunities for firms throughout the Region to expand their business, and, as expansion increases, the direct and indirect impact of industry will spread even more widely.

Already, financial institutions, insurance and building societies are moving in to the City at an increasing rate. In addition, many of the city centre shops are planning major investments and modernisations in the next few years.

APPENDIX D

NORTH SEA OIL AND THE ENVIRONMENT

Edinburgh: Her Majesty's Stationery Office 1974

A report to the Oil Development Council for Scotland

Foreword

The following Report by the Committee established by the Oil Development Council for Scotland in August 1973 to consider the possible effects of oil development on the environment, and related matters, was presented to the Council at its meeting in December 1973. Members of the Council generally endorsed its recommendations and its assessment of the need for action, and proposed that it should be published as a contribution both to the debate on the environment implications of oil developments and to the development of Government policy.

The Report's recommendations are now being considered by the Government.

Preface

Oil developments in Scotland raise questions of great complexity, scale and urgency. We have within our remit identified measures which can both improve the consideration of environmental matters and safeguard the physical environment where oil developments take place ; and we commend them to the Council as a contribution to the solution both of present problems and, what is more important, *of problems and pressures which will increasingly arise in the future*. But during our work we found it impossible to avoid making observations which did not fall strictly within our remit. Recent events in the Middle East have increased the pressure for development and re-emphasised the urgent need to find solutions to the many problems of policy and of provision. The exploitation of oil resources from the UK Continental Shelf promises to bring massive returns to the producing companies and to Government. Yet our impression is that the resources as yet committed by central and local government are inadequate to meet the immense demands which are being and which will be made. *We regard it as absolutely essential that Government should make the decision to deploy more manpower to the solution of the problems and more resources to the provision of the attendant infrastructure and other services required.*

Committee on the Environment Report to the Oil Development Council for Scotland

Members
The Marquess of Bute *Chairman*
Mrs J.Balfour
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Assessors
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G.F.Hendry Esq. *Scottish Development Department*
J.W.Anderson Esq. *Department of Trade and Industry*

Secretariat
H.Morison Esq. *North Sea Oil Support Group*
S.C.Brown Esq. *North Sea Oil Support Group*

1 Introduction

1.1 We were appointed by the Oil Development Council for Scotland in August 1973 with the following remit

Having regard to the need to ensure a proper balance between industrial development and preservation of the environment, to consider the possible effects of oil development on the environment; the adequacy and effectiveness of the existing planning machinery in dealing with proposals for such development; the feasibility of publishing a national strategy for coastal development; and to make recommendations to the Oil Development Council for Scotland.'

We have taken the word 'environment' in its broadest sense to include what may be termed the social and socio-economic environment. While oil developments can have a major impact on the landscape, their social and economic effects may be of equal, and in some circumstances, greater impact.

1.2 We have met 4 times and have considered evidence and memoranda submitted to us by the Scottish Development Department, the Scottish Economic Planning Department and the Department of Trade and Industry, as well as papers by Jean Balfour ('Some Environmental Aspects of Oil Developments'[1]) and Sir Andrew Gilchrist ('Oil and Scotland: Exploitation, Infrastructure, Planning'[2]). Our members have had the opportunity of examining oil developments on the ground at first hand. We have made one interim report to the Council.

1.3 It is the wish of our Committee to place on record our gratitude to Mr H. Morison and Mr S.C.Brown of the North Sea Oil Support Group for having so ably carried out their secreterial duties, particularly in the drafting of the report; to express our appreciation to our assessors Mr W.D.C.Lyddon (SDD), Mr G.F.Hendry (SDD) and Mr J.W.Anderson (DTI) of their patience and advice; and to thank the officers and staff of the Scottish Development Department, the Scottish Economic Planning Department, and the Department of Trade and Industry for supplying us with a great deal of detailed information to assist us in our deliberations.

[1]From a Paper delivered to the Standing Conference on North Sea Oil, April 1973.

[2]Paper presented to the Oil Development Council for Scotland, September 1973.

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2
General Conclusions

2.1 Oil developments, as we note in our preface, raise questions of great complexity, scale and urgency. Recent events in the Middle East have emphasised this. We have examined the likely impact of oil developments and the present machinery for control; and we have made a number of detailed suggestions which are designed not merely to improve matters at present, but also lead to a more careful, sensitive and effective anticipatory consideration of environmental impacts during and after future licensing rounds. *As the problems are urgent, so is the need for action; and in commending our recommendations to the Council we emphasise this need.*

2.2 A major factor leading to our appointment was, we believe, a widespread concern that a proper balance was not being achieved between industrial developments and environmental and social considerations. In our view certain broad considerations on a proper balance would command general assent, and must be applied in examining specific proposals. These would recognise that due weight should be given to environmental as well as to industrial considerations; that the environment should not heedlessly be sacrificed to economic growth, and that priority should not always be given to industrial development. It must too be borne in mind that land is a limited resource of increasing value to the community as a whole.

2.3 The environmental implications of decisions on the scale and content of rounds of production licences have only become fully apparent after the Fourth Round in 1971; and the most fundamental of our recommendations is that the Government should, in considering the extent and content of future rounds of licences, plan in advance for the additional demands which the resulting programme of exploration and exploitation will make on the environment, and to control the onshore impact of offshore developments.

2.4 Turning to planning on the ground, we endorse the policy of zoning oil developments proposed in the Interim Planning Framework[1], and would oppose any piecemeal proliferation of sites. We propose that the Town and Country Planning (Scotland) Act 1972 should be amended to ensure the proper rehabilitation of sites. We suggest that public ownership of sites might be desirable in certain instances, both to ensure due observance of planning conditions during operations and proper rehabilitation thereafter and to provide a continuity of use and local employment. *We stress that due attention must be given to the scale of proposed developments in the context of the human and physical resources of the area in which they are to be located.*

2.5 We emphasise the need for the most stringent pollution and safety standards, and are glad to learn that the DTI have made and are proposing further regulations on this subject.

2.6 *Improved forward planning for oil related developments is, in our view, the most pressing immediate need which we have identified.* While it is not in our opinion feasible to develop a detailed nationwide plan for such development at this stage, an overall indicative strategy requires to be formulated. Close liaison between local planning authorities and central government, and between Government and the industry, is of prime importance; and there should in our view be continuous informed discussion between them.

2.7 We have identified four areas in particular where we think that further study is required:

(a) First, while we recognise the benefits of properly planned oil processing and refinery developments in this country, we are concerned at the prospect of piecemeal developments; and we emphasise the need for the Government to initiate urgently a study of oil processing needs and sites and to publish its conclusions.

(b) Secondly, further study is required to determine the best directions for social policy in the face of large scale oil developments in a scattered rural community; and we recommend that the Secretary of State for Scotland should commission such research.

(c) Thirdly, we consider that the Government should study means towards streamlining public inquiry procedures.

(d) Fourthly, bearing in mind the lack of suitable sites from an environmental viewpoint for fabrication of the designs of concrete platforms at present in favour, we suggest that the Government through the Ship and Marine Technology Requirements Board, should give a high priority to research into the next generation of extraction systems, including platforms of advanced design and sub-sea systems.

2.8 In conclusion, we reiterate the urgency of the present situation and the need for positive steps to be taken to meet it. *The rewards to be won from the exploitation of North Sea oil are great; and we owe it to future generations to ensure that we minimise any detrimental effects upon the environment (in the wider interpretation explained in our introduction) in winning them.*

[1] 'North Sea Oil and Gas: Interim Coastal Planning Framework: A Discussion Paper' (Scottish Development Department, October 1973).

3
Summary of Recommendations

Licensing Policy

1 In considering the extent and content of future rounds of licences in areas of the UK Continental Shelf adjacent to Scotland, the Government should take account of the additional demands which the resulting programme of exploration and exploitation will make on the environment, on planning services and on infrastructural requirements; and they should include conditions in future licences enabling them to monitor the production, landing and overall distribution plans of producing companies, and to steer onshore developments to particular sites if the need arises (5.4).

Planning Strategy

2 Discussion Papers on Oil Developments should be continued and updated at regular intervals (6.7).

3 The Discussion Paper 'An Interim Coastal Planning Framework' is commended to local planning authorities as a feasible and useful approach to the problem of setting geographical priorities for oil developments, having regard to the need to balance the quality of the coast and its capacity to sustain development with the technological requirements of oil developments (8.3).

4 Projects which are more locationally flexible should be encouraged into areas where the capacity of the environment to sustain them is greater (4.2).

5 The Scottish Development Department should undertake further analysis of the West Coast Zone as rapidly as possible in the light of the comments we have made in paragraphs 8.4 and 8.5 (8.6).

6 An examination should be made of the availability of medium depth (25 fathoms) sites on the Clyde for the construction of gravity platforms. (We understand that the Department of Energy have a preliminary study in hand.) (5.8).

Rehabilitation of Land

7 Section 50 of the Town and Country Planning (Scotland) Act 1972 should be amended to empower local planning authorities to require developers to enter into financial agreements ensuring proper rehabilitation of land as a condition of the granting of planning approval (7.8).

8 The Government should examine the possibility of public ownership of sites for major oil developments in environmentally sensitive areas (7.11).

Planning Procedures

9 Local planning authorities should, where they have not done so, update their Development Plans or produce structure plans to take account of oil developments (6.7).

10 The central government departments concerned should provide for each authority working on a new development plan specific advice on matters which it would be in the national interest to take into account (6.7).

11 The Secretary of State for Scotland should develop a model form, for use throughout Scotland, specifying the information which developers must provide when submitting applications for permission to carry out oil related developments (6.8).

12 The Secretary of State for Scotland should require local planning authorities to inform him of all applications for major oil-related projects immediately they have been received. (We understand that steps are already being taken to implement this conclusion) (6.9).

Public Inquiries

13 The Government should examine the possibility of streamlining public inquiries; and in particular should investigate the feasibility of introducing a system of preliminary examinations to determine matters of fact prior to public inquiries (6.5).

14 The Secretary of State for Scotland should examine the possibility of issuing general guidance on the documentation which he would expect to be provided for a public inquiry convened to consider an application for a major oil-related development (6.12).

15 Where impact analysis studies are commissioned their terms of reference should give emphasis to the social and socio-economic impact of the proposal and to its long-term effects on the community where it is sited. Consultants should confer widely with local bodies and interests, and in particular with the appropriate local authorities, on the effects of the proposed development and the demands it will make on local services (6.13).

Planning Conditions

16 The Secretary of State for Scotland should issue guidance to local planning authorities on model planning conditions which might be imposed in the case of oil-related developments (7.1).

17 The application of planning conditions in the case of offshore completions of platforms in close to shore or esturial conditions should be clarified, and the local planning authority or Secretary of State, as appropriate, should have powers of enforcement (7.2).

18 The Scottish Development Department should continue to encourage local planning authorities in whose areas major oil-related developments are to take place to employ, either individually or jointly, suitably qualified enforcement officers to ensure that developers comply with planning conditions (7.3).

19 The Scottish Development Department should ensure that steps are taken to monitor the effects of developments on the environment and ecology of the area in which they are situated (7.10).

Safety

20 The Department of Energy's statutory powers to control standards of undersea pipelines should be extended beyond the three mile limit (7.14).

Manpower

21 The Government should make an examination of the supply and demand of qualified planners and take appropriate steps to increase supply (6.16).

22 The training of planners should include reference to the impact of oil developments, and have increased emphasis on planning for rural areas (6.16).

23 Local planning authorities affected by oil developments should be encouraged to recruit additional planning staff so far as possible, and to employ consultants where they lack the resources to carry out the necessary forward planning themselves (6.17).

24 The Scottish Development Department should continue to make grants to local planning authorities to cover half of the cost of consultants retained to assist in the preparation of development plans related to oil; similar assistance should be granted where local planning authorities employ consultants to assist in the drawing up of planning conditions for oil-related developments (6.18).

25 Where a local planning authority receives an unforeseen application for a major oil development after it has approved estimates for a particular financial year and it is, as a result, required to employ during that financial year additional planning or enforcement staff for which it had not budgeted, the Scottish Development Department should grant special financial assistance to the authority to cover half the salary cost (including employer's superannuation and national insurance contributions) of this additional staff to the end of that financial year (6.19).

Further Work

26 The Government should examine in the light of total requirements the demand for processing facilities, including refineries; and they should publish their findings (6.7).

27 The Secretary of State for Scotland should commission research to determine directions for social policy in connection with large scale industrial developments in scattered rural communities (6.13).

28 The Government, through the Ship and Marine Technology Requirements Board, should give a high priority to research into the next generation of extraction systems (5.8).

4
Impact of Oil Developments

4.1 Industrial developments related to North Sea oil are neither homogeneous nor of uniform environmental impact; and they raise environmental problems with different degrees of scale and urgency. The principal types of development having important planning implications are service bases, landing points for pipelines, fabrication sites and refineries. To the industry, service bases are of first priority, because they are needed for the exploration phase. For the most part the necessary work required for exploring and servicing the areas at present licensed has been approved. Landing points for pipelines, together with the associated tank farms, separation equipment and possibly terminals, are important as an essential link in the production process and can raise intricate local environmental problems. Fabrication ranges from module and equipment production to platform building. Sites for the production of modules and other equipment have generally been found in the Central Belt and on the East coast. Steel platform sites have been approved in a number of places on the East Coast, though they have had considerable environmental and socio-economic impact. The location of sites for the production of gravity production platforms (concrete or steel and concrete platforms) is controlled to a great extent by technological requirements; and for the designs at present favoured by the oil companies, which require some 40 fathoms inshore with 100 fathoms in sheltered conditions close by, suitable sites are found only in a few places on the West coast where they are likely to have a serious effect on the environment. Finally, the extent to which a demand for new refineries will develop as a result of North Sea oil is unclear. A map showing the location of oil-related developments in Scotland is given in Appendix I.

4.2 These different types of development have differing environmental implications and differing site requirements depending on the activity involved and its technological needs. They differ, too, in the extent to which they are steerable to locations which, in terms of pre-existing infrastructural support, labour availability, and probable impact on the physical environment, are *prima facie* more suitable for development. There are, for example, no essential locational requirements for the construction of valves, pumps and compressors. Pipe-coating requires large areas of land well serviced with roads or railways and adjacent to a strong quay; but such developments can normally be accommodated in localities, and there are many in Scotland, where there are established industrial resources and skills. On the other hand, the site requirements for constructing production platforms are rigorous, and for some designs are found only in a few parts of the country (although they could conceivably be constructed abroad). And the location of pipeline landing points, tank farms and the associated equipment is dictated almost entirely by the geography of the oil fields and the adjacent land. Having regard to these different degrees of locational flexibility we consider that those projects which are more locationally flexible should *ceteris paribus* be

encouraged into areas where the capacity of the environment to sustain them is greater.

4.3 The environmental impact of oil developments on the physical landscape is not limited to the developments themselves. *The introduction into rural areas of labour intensive industry, often operating under pressure in difficult working conditions, requires a massive investment in infrastructure. We are concerned that the speed at which this at present requires to be provided might prevent proper planning and cause the adoption of standards of housing, roads and other services lower than that which has now become nationally acceptable.* We recognise that the provision of the necessary infrastructure is a priority need; but we would emphasise the need to maintain proper environmental and planning standards in its provision.

4.4 The oil-related developments which we have described will have an impact not only on the landscape, but also on the social and economic fabric of the areas where they are located. Indeed we regard the effect on the community of some oil developments as of greater importance than their intrusion on the landscape. The fabrication of production platforms, for example, may be a relatively short term project, perhaps lasting 10–15 years at most on a particular site; and with the requirements for rehabilitation which we recommend in Section VII the site is unlikely to prove an eyesore or a twentieth century example of industrial dereliction. But platform fabrication is labour intensive and there is little guarantee of continuity of employment. *We view with great seriousness the prospect of the collapse of indigenous industry in remote rural areas in the face of competition from relatively short-term and non-continuous oil projects.* We consider this point further in our examination of Impact Analyses in Section 6.

4.5 In short, we note that oil developments will have an impact not only on the physical landscape, but also on the ecology of the area, and on its social and economic life. Examples of how great an impact this can be are to be found in the Moray Firth. All of these aspects require to be taken into account when proposals for oil developments are to be considered. But they require to be balanced by considerations of the national interest and of the economic benefits which the development of North Sea oil resources will bring; and this aspect we consider in the following section.

5
Economic Benefits of Oil Developments and the National Interest

5.1 Our remit charged us 'to have regard to the need to ensure a proper balance between industrial development and preservation of the environment'. We concluded therefore that it would be necessary for us to consider the economic benefits to be derived from the development of our North Sea oil resources and the desirability of such development in the national interest so that we might form a view on what a proper balance might be. Environmental quality is not, however, quantifiable in the same terms as economic benefits and thus a precise equation is unattainable.

5.2 The economic benefits to be derived from oil developments are twofold. First there is the value of the product itself. Secondly there is the value of the market created for the goods and services needed to exploit the product. These benefits are separable. It would, for example, be theoretically possible to exploit North Sea oil using foreign goods, services and expertise (always provided they were available): this would require offshore installations, pipeline landfalls and tanker terminals in this country but no sites for fabrication of platforms, modules and the like. We make this point not because we consider that fabrication in the UK is undesirable (and we note that reliance on foreign goods and services would be contrary to the Government's expressed policy of seeking increased involvement by UK industry), but in order to emphasise that the economic and national interest considerations to be taken into account are different where a decision not to proceed would prevent oil coming ashore, and where it would prevent the UK gaining business which would create employment and added value. Thus the considerations in relation to a pipeline landfall differ from those in relation to a platform fabrication site.

5.3 On the Government's present estimate of a production of 70 to 100 million tons a year (1.4 to 2 million bbl per day) by 1980, production of North Sea oil will have very considerable benefits for Exchequer revenues and for the balance of payments. In addition, it will contribute markedly to security of supply: by 1980 the North Sea will provide, on present estimates, some two-thirds of the UK's then demand for oil.

5.4 We have noted that many of the criticisms of the planning system, both from those eager to promote industrial developments and those who seek preservation of the environment, have arisen from doubts as to its capacity to deal with, and the environment's capacity to absorb developments as rapid as those springing from the Fourth Round of licences in the North Sea. We have, therefore, considered the possibility that the exploration and exploitation of the oil resources of the UK Continental Shelf should be retarded. Apart from the present oil supply situation we understand that it would not be possible to alter the conditions in present licences which govern the speed of exploration. The increased pressure for speedy exploitation to supplement Britain's energy supplies makes the need for proper forward planning and

advanced consideration of environmental impacts the more imperative. We recommend, therefore, that in considering the extent and content of future rounds of licences in areas of the UK Continental Shelf adjacent to Scotland, the Government should take account of the demands which the resulting programme of exploration and exploitation will make on the environment, on planning services and on infrastructural requirements, and that they should include conditions in future licences enabling them to monitor the production, landing and overall distribution plans of producing companies, and to steer onshore developments to particular sites if the need arises.

5.5 The International Management and Engineering Group[1] have estimated that the value of the market for offshore goods and services for the UK sector of the North Sea during the next 10 years will be some £300m a year. A major part of this expenditure will, we understand, be on production platforms and associated equipment. The market can provide substantial employment and investment opportunities in itself; but the technological knowledge developed during its exploitation can, in addition, provide a springboard to the worldwide offshore market, estimated by the International Management and Engineering Group at £1,300m a year. We recognise that the industrial activity generated in Scotland as a result of this offshore market can make a considerable contribution to economic regeneration and to the restructuring of the Scottish economy. In regional terms the opportunities of increased investment and employment in the Highlands and Islands Development Board area in particular are to be welcomed, especially if they are paralleled by the establishment of longer term developments than those which are exclusively oil-related.

5.6 Difficulties have arisen in the approval of sites for steel production platforms, but far greater environmental difficulties are presented by gravity structures (whose fabrication on designs now favoured by the oil companies requires deep water of at least 40 fathoms close inshore with 100 fathoms adjacent). Suitable sites for the present designs are restricted to a few areas on the west coast of Scotland of high landscape value; and the capacity of the local community to absorb such developments without short term distortion and long-term adverse effects on its social and economic life seems limited.

5.7 On the other hand we understand that gravity production platforms are more suitable for the deep water conditions of the northern North Sea where, given appropriate seabed conditions, they present both cost and technical advantages. Their production in this country would provide a net gain to the economy to the extent that it would employ resources that would otherwise either be used less productively or not at all. Their fabrication here might, moreover, produce a psychological boost to the UK companies involved in producing the equipment mounted on the platform, which can produce work of up to the value of the platform itself; and it might place them in a better position to win orders than if deep water gravity structures were built elsewhere, although they could, of course, win orders for equipment to be used on platforms constructed elsewhere on the continent of Europe.

5.8 The economic benefits we have described apply equally to any concrete gravity structure, while the disbenefits may apply only to the designs at present favoured. It is a matter of judgement whether UK contractors could effectively break into the market if they had no opportunity to produce structures of these designs.[2] Because, moreover, the provision of deep water sites is at present the subject of a public local inquiry we do not consider that it would be appropriate for us to make recommendations on this question. We would note in passing however that against the economic benefits to be derived from such labour intensive operations as platform construction in remote rural areas must be set the costs falling on the community of the provision of infrastructure services to support such developments. We emphasise, moreover, that the west coast of Scotland is of high scenic and environmental quality, representing a major natural asset of international significance; and we consider that labour intensive industrial operations should be permitted here only if they are of overriding national importance. It is our general view that it is desirable for as much oil related work as possible to be steered towards the Central Belt. We recommend therefore that the Government, through the Ship and Marine Technology Requirements Board, should give a high priority to research into the next generation of extraction systems including platforms of advanced design and subsea systems. We understand that the industry are at present devoting a considerable research effort to the design of concrete gravity platforms for deep water which can be competitively constructed and towed in medium depth (ie, 25 fathoms or less) conditions and we suggest that an examination should be made of the availability of sites on the Clyde for the construction of such platforms.[3]

[1] 'Study of Potential Benefits to British Industry from Offshore Oil and Gas Developments', International Management and Engineering Group of Britain Ltd. HMSO 1973.

[2] An order has subsequently been placed for a design of gravity platform which is to be constructed on the Clyde.

[3] We understand that a site survey is now in hand.

6
Planning Procedures

Criticisms of procedures

6.1 The planning machinery has been under fire from both flanks. On the one side are those who argue that it is too cumbersome and too time consuming to deal speedily with applications related to an industry where speed is of the essence, on the other are those who suggest that it is of insufficient power to guide the forces of development and that it is, of its nature, incapable of taking account of the effect of developments on the social and economic life of the community. We have therefore, devoted a considerable amount of our time to an examination of the adequacy and effectiveness of the existing planning machinery in dealing with proposals for oil-related industrial development.

6.2 In examining planning procedures we have distinguished between the statutory machinery laid down under the Town and Country Planning (Scotland) Act 1972 and the operation of the machinery by the local planning authorities and the Scottish Development Department. The machinery itself, which is described in Appendix II, has been devised over the years in order to provide a balance between conflicting interests and to ensure that everyone who would be affected by a proposed development has an opportunity to have his views on it taken into account. We recognise the many advantages of this machinery and we concur with Sir Andrew Gilchrist's assessment of it:

'It allows full consultation with all affected interests, it protects the rights of individuals to be heard on applications which concern them, it leaves the great majority of decisions in the hands of locally elected people, and it ensures a forum of those increasing numbers of people who are worried about the effects of certain developments on the environment and wildlife. Even the relatively slow procedure can be seen as an advantage since time is allowed for careful consideration and for objections to be formulated.'[1]

6.3 On the other hand, Sir Andrew notes that the planning system is under stress, and that it is currently being criticised for a number of reasons. Our own examination has in particular identified the following criticisms which have been made, although we have not been able to establish that they are all justified; indeed some, as is inevitable with a system designed to balance different interests, are mutually contradictory.

(i) Development plans are out of date.

(ii) Planning applications for major oil related developments or for associated housing involve therefore lengthy, cumbersome and costly procedures of amendment and public inquiry.

(iii) Some planning applications are being decided by the Secretary of State too rapidly, in an *ad hoc* fashion, and without sufficient public debate.

(iv) Local planning authorities have insufficient staff to revise development plans quickly enough or to make an adequate appraisal of major applications.

(v) Public local inquiries into the objections to individual applications are an inadequate forum for the consideration of applications which can have a widespread regional impact, for which an alternative site may be more appropriate, and which may be of strategic importance nationally.

(vi) Many oil related developments will impinge on the social or economic life of the community rather than on the physical environment. It is said that the planning machinery cannot cope with this.

(vii) The planning machinery does not provide adequate control over the siting of major developments or over speculation in land.

(viii) The machinery does not afford sufficient opportunity for the public to be informed of the content of current planning applications.

The Statutory Machinery

6.4 We have not examined fully whether modification of the statutory machinery would lead to significant improvements which were in the interest of the community as a whole. The planning system has, however, recently been the subject of rigorous reappraisal followed by new legislation. We cannot rule out the possibility that shortcomings in operation may disguise shortcomings in the statutory procedure itself, but the statutory planning machinery as such appears in general to be adequate to meet the normal demands created by oil related developments. In one area, however, that of the public inquiry, considerable advantage would in our view accrue from a relatively minor modification of the statutory machinery.

6.5 Public inquiries appear to us to be unnecessarily lengthy, formal and expensive. A considerable amount of time at public inquiries is moreover devoted to eliciting matters of fact. This not only makes the Reporter's task more difficult and delays proceedings with prolonged quasi judicial question and answer: it adds considerably to the costs to be borne by the parties involved in the inquiry. It seems to us that there is much to be said for the introduction of a preliminary examination solely to establish the relevant facts. While this might delay the start of the inquiry proper, it would in our view, if properly timetabled, significantly shorten the total time to the announcement of the Secretary of State's decision. It would moreover enable the Secretary of State to identify major issues which the Reporter should investigate at the inquiry. We recommend that the Secretary of State should examine the possibility of streamlining public inquiries and in particular look at the feasibility of a preliminary examination procedure such as we have suggested.

[1] 'Oil and Scotland': Report to the Oil Development Council for Scotland: paragraph 40.

The Operation of the Machinery

6.6. Our examination of the operation of planning procedures has led us to the conclusion that many of the criticisms we have identified in paragraph 6.3 could be answered by improvements or modification in the way in which the procedures are operated. These improvements involve better forward planning, better and more sensitive appraisal of applications and better staffing of local planning authorities. We consider them in detail in the following paragraphs.

Forward Planning

6.7 Improvement in the speed and sensitivity with which applications can be handled could be obtained with more thorough forward planning at central and local government levels. We note that local planning authorites are already doing a good deal of work to update their development plans ; and we consider in Section VIII below the steps which are being taken by the Scottish Development Department to devise a Coastal Planning Framework to assist local planning authorities in developing Structure Plans or revised Development Plans. Difficulties in forward planning can however arise where it is unclear what developments are to be planned for : and such difficulties can be particularly acute in the case of those oil-related developments where site is dictated by technology, and where technology is rapidly developing. Close liaison and the provision of technical advice is, therefore, of great importance. We consider that there is a need for central government to issue to local planning authorities and others as much information as possible on likely oil developments, in terms both of geography and of technological needs ; and we recommend that the Discussion Papers on Oil should be continued and updated at regular intervals[1]. Local planning authorities are likely to experience difficulties in particular in relation to applications for planning permission to develop oil processing plants and refineries, and we are concerned at the possibility of piecemeal refinery development. We recommend, therefore, that the Government should initiate a study of the requirements for processing facilities, including refineries, and of suitab'e sites, having regard to the development of North Sea oil resources in the context of the United Kingdom's total needs in the foreseeable future and of the export potential for refined products ; and that they should publish their findings. We recognise that planners will experience difficulties because of the swift development of oil technologies and needs ; we recommend, nevertheless, that local planning authorities, where they have not done so, should update their development plans or produce structure plans to take account of oil developments, though we recognise that this will take considerable time and effort. We recommend, further, that the central government departments concerned (primarily the Scottish Development Department, the Department of Energy and the Scottish Economic Planning Department) should provide for each authority working on a new development plan specific advice on matters which it would be in the national interest to take into account.

[1]To date, 2 have been published : 'Production Platform Towers : Construction Sites' (Scottish Development Department, April 1973) and 'An Interim Coastal Planning Framework' (Scottish Development Department, October 1973).

Appraisal of Applications

6.8 While development control involving the analysis of planning applications is a normal function of local planning authorities, they are faced with particular problems when dealing with major oil-related developments. The operation proposed may be unfamiliar, may be set out in little detail, and yet may have a widespread effect on the surrounding land and community. The action we have recommended in the previous paragraph should serve to provide local planning authorities with necessary information on the nature and technological requirement of proposals. We note that the Scottish Development Department is encouraging local planning authorities to mount a rigorous appraisal of applications for major oil developments and to elicit from the developer an account of the alternative sites considered and we commend this practice to local planning authorities. We understand that some local planning authorities require developers to submit with their planning application details of their proposals in a standard form ; and we recommend that the Secretary of State should develop a model form, for use throughout Scotland, specifying the information which developers must provide when submitting applications for permission to carry out oil related developments. We believe that such would be of benefit to local planning authorities and developers alike (for the latter may not have extensive knowledge of planning procedures) in saving time and in obviating misunderstandings.

6.9 We have debated whether there would be an advantage in the 'calling in' by the Secretary of State of all major oil-related planning applications immediately they are received by the local planning authority. While such a procedure would in some cases lead to increases in the speed with which the application is handled, we do not recommend it as invariable practice. Local planning authorities have an important part to play in the consideration of proposals for major projects, particularly in regard to their impact on the local community, and we fear that, if the decision were taken out of their hands at the outset, they would not address themselves to the issues involved in the detail and with the thoroughness which we consider necessary. We have concluded, however, that there would be advantage if the Secretary of State were informed of all major applications (ie, fabrication sites for major offshore installations, installations and storage tanks associated with the landing and transportation of oil and

gas, and processing installations such as refineries and liquefaction plants) immediately they have been received. This will enable the Department to assess at the outset what assistance the local planning authority may need in analysing the proposal and to ensure that, at an appropriate stage, attention is directed to particularly important aspects (the adoption of the standard form of application proposed in the previous paragraph would facilitate this assessment). It should, moreover, lead to an improvement in the speed with which applications for major projects are handled. We understand that the Scottish Development Department is already taking steps to implement this conclusion.

Public Inquiries

6.10 In paragraph 6.5 we make a recommendation for modification of the procedure to be followed in cases where it may be decided to hold a public inquiry. We have in addition, identified three areas where we consider that improvements could be made in the handling of applications at public inquiries, whether or not the procedure is modified as we suggest.

6.11 The first of these areas concerns the availability of reporters. It is, in our view, most undesirable that public inquiries should be delayed because a reporter is unavailable; and we are glad to learn that the Department are taking steps to increase the number of full-time reporters.

6.12 We note that the Scottish Development Department are considering methods of improving the quality of evidence given at public inquiries, and that prior to the Drumbuie Inquiry the Secretary of State wrote to the developers and objectors to indicate a number of questions which he expected the inquiry to consider. We are of the opinion that it would be useful for this practice to be more frequently employed; and we recommend that the Secretary of State should examine the possibility of issuing general guidance on the documentation (eg, Impact Analyses, Economic Assessments) which he would expect to be provided for a public inquiry convened to consider an application for a major oil-related development. Such guidance would, of course, require adaptation if our proposal for a preliminary hearing were adopted.

6.13 We have considered ways in which the effect of proposed developments on the community may be examined, and we have concluded that Impact Analyses such as the one commissioned from SPHERE for the Drumbuie inquiry[1] might in some cases usefully be prepared for inquiries into proposals for major oil-related developments. The precise form of these would, again, require modification if preliminary hearings were adopted; and it is likely that something considerably less elaborate would suffice. We recommend the desirability of consultants conferring widely with local bodies and interests, and in particular with the appropriate local authorities, on the effects of the proposed development and the demands it will make on local services. We suggest that Impact Analyses should examine not merely the likely short-term impact of proposed developments on the community during the period when operations are taking place, but also their effect, whether beneficial or detrimental, on its continuing life and the extent to which a development might impose irreversible and possibly undesirable changes. We recognise that an examination of such implications will necessarily be less structured and less quantified than an examination, for example, of the infrastructural needs created by a proposed development. The long-term effect of developments on the community in which they are situated is, however, of public concern; and we recommend that the terms of reference of Impact Analyses commissioned or prepared in relation to proposals for major oil-related developments should give emphasis to the social and socio-economic impact of the proposal and to its long-term effects on the community where it is sited. We suggest, moreover, that research is required to determine the best directions for social policy in connection with large scale industrial developments in scattered rural communities.

Planning Inquiry Commission

6.14 It has been suggested that a Planning Inquiry Commission established under Section 44 and 45 of the Town and Country Planning (Scotland) Act 1972 might be an appropriate way of handling major proposals —particularly where alternative sites throughout Scotland may be involved—and that a Commission should be appointed to develop a planning strategy for oil developments. There has been no experience of a Planning Inquiry Commission in Scotland; but we can envisage circumstances where a Commission would be useful and desirable. The Commission machinery however could have disadvantages in terms of delay and cost; and in many cases most of the benefits of the Planning Inquiry Commission might be obtained without the mounting of a separate operation. A full scale Impact Analysis carried out by independent consultants, and modified as we suggest in paragraph 6.13, matches the work which a Commission's own research team would undertake. A planning strategy for oil developments may, as we suggest in Section 8, be developed without resort to a Commission; and guidance by the Secretary of State on matters which should be examined at an inquiry will ensure that sight is not lost of broader issues. The dialogue we propose between central and local government, and between Government and the developers, can ventilate many of the issues with which a Commission would be concerned. And the Oil Development Council itself can play a major part in the development of strategies for oil development.

[1]Impact Analysis Oil Platform Construction at Loch Carron. SPHERE Environmental Consultants Ltd. Scottish Development Department, August 1973.

Manpower

6.15 The effectiveness of the measures which the Department is already taking, and which we have proposed, to speed-up and improve the operation of planning procedures is limited by shortage of planners in the areas concerned.

6.16 We understand that local planning authorities are experiencing difficulty in recruiting suitably experienced planners to deal with the increasing volume of work associated with oil developments. This difficulty may be aggravated by uncertainties because of local government reform[1]; but there is also we understand an absolute shortage of planners. We suggest therefore that the Government should make an examination of the supply and demand of qualified planners and take appropriate remedial action, for example by increasing the number of post-graduate awards for planning courses and the number of places in planning schools. Moreover, the planner who has to deal with proposals for oil developments in rural areas requires, in our view, different skills and a different body knowledge than the planner concerned with the urban environment. We suggest, therefore that it would be desirable to incorporate into the training of planners reference to the impact of oil developments and increased emphasis on planning for rural areas.

6.17 We have considered whether problems arising from the shortage of planners could be overcome in the short-term by the establishment of a roving planning unit attached to the Scottish Development Department which might be seconded to assist local planning authorities. We do not however consider that the establishment of such a unit would present any significant advantages over the employment of consultants by local planning authorities or the recruitment of additional staff where these are available. It would be equally difficult to recruit staff for the unit; it would be subject to a fluctuating workload; it would be difficult to anticipate what skills would be necessary in the unit; and, like consultants, it would lack detailed local knowledge and require careful briefing. We consider, therefore, that local planning authorities in the areas affected by oil developments should be encouraged to recruit additional planning staff so far as this is possible in the present shortage; and that they should be encouraged to employ consultants where they lack the resources to carry out necessary forward planning themselves and find it impossible to recruit additional staff.

6.18 Financial considerations may inhibit the adoption of either of the solutions proposed in the previous paragraph, particularly where needs have arisen unexpectedly. We note that the Department has made grants to some local authorities to cover half of the cost of consultants retained to assist in the preparation of development plans related to oil; and that this assistance has enabled Zetland and Caithness to appoint internationally known firms of planning consultants to undertake such work. We hope that the Department will continue to make such assistance available; and that they will grant similar assistance where local planning authorities employ consultants to assist in the drawing up of planning conditions for oil related developments.

6.19 We recognise that a precedent would be established by the granting of special financial assistance to enable local planning authorities to employ additional planning staff to deal with oil developments. We understand, moreover, that the Department would prefer to assist planning authorities in financing consultancy appointments, since this provides a means of distinguishing between genuine need arising from North Sea oil and more routine planning work that may have fallen behind hand. Nevertheless, local planning authorities can face acute problems when an unexpected development is proposed, and we consider that oil developments may be distinguished from most other industrial developments both in their scale and in the speed with which they require to be dealt. We recommend therefore, that where a local planning authority receives an unforeseen application for a major oil development after it has approved estimates for a particular financial year and it is, as a result, required to employ during that financial year additional planning staff for which it had not budgeted, the Scottish Development Department should grant special financial assistance to the authority to cover half the salary cost (including employer's superannuation and national insurance contributions) of this additional staff to the end of that financial year.

[1]We note, in addition, that the Local Government Staff Commission has written to all local authorities placing considerable limitations on the employment of more staff.

7
Planning Conditions, Rehabilitation of Land, Pollution and Safety

Planning Conditions

7.1 Oil developments create unique environmental problems and many are taking place in areas where there is little relevant experience of large scale industrial developments. We consider, therefore, that there would be significant advantage if the Secretary of State were to issue guidance to local planning authorities on model planning conditions which might be imposed by them in the case of oil related developments. We do not make recommendations on what might be included in such conditions, although noise, hours of operation, and pollution (insofar as it is not covered in legislation) are obvious candidates. We recommend that the Secretary of State should consider the possibility of issuing such guidance and we suggest that, in doing so, he should stress the *need for precision in the drafting of planning conditions.*

The application of planning law below low water mark

7.2 The possibility that concrete production platforms might be completed partly or wholly in deep water near to the shore has raised the question whether planning law can apply to such activities. It is, we understand, not entirely clear that planning law will apply. Platform construction at sea could be controlled to a certain extent both by conditions attached to the use of the shore site from which supplies are made, and by the conditions in the mooring lease which the contractor requires to negotiate with the Crown Estates. But we consider that it is essential both that planning conditions can be applied to the offshore fabrication site, and that an appropriate body, whether the local planning authority or the Secretary of State, should be empowered to enforce them. We understand that the Department are examining the legal position further; and we recommend that, if necessary, steps should be taken to ensure that planning conditions may be applied to offshore sites for the fabrication of production platforms and the like and that the local planning authority or, if appropriate, the Secretary of State should have powers of enforcement.

Enforcement

7.3 We urge the Department positively to encourage local planning authorities in whose areas major oil developments are taking place to employ, either individually or jointly, enforcement officers to ensure that developers comply with planning conditions. We have been informed that at least two Highland authorities, Ross and Cromarty and Inverness, have appointed their own enforcement officers. We would emphasise that enforcement officers should have appropriate qualifications for the work they are to undertake. Where local planning authorities are faced with an unexpected and rapid development they may experience financial difficulties in relation to the appointment of enforcement officers similar to those that arise in the case of planning staff. We recommend that the Department should grant special financial assistance to them on the lines proposed in paragraph 6.19.

Rehabilitation of Land

7.4 There is widespread concern that oil-related industrial developments which may be of a relatively short life, such as platform fabrication sites, might be abandoned in a derelict state. We have, therefore, devoted a considerable amount of time to examining how dereliction can be avoided and how a proper rehabilitation of redundant sites can be achieved. We would emphasise at the outset that by proper rehabilitation we do not necessarily mean rehabilitation to the site's former state: there may be opportunities for facilities provided on the site to be put to an alternative use; and we would welcome this where it led to continuity of employment.

7.5 It is clear that planning law at present gives local planning authorities adequate powers to require contractors to rehabilitate sites to the authority's satisfaction. Rehabilitation can, however, be very expensive; and what is not clear is how rehabilitation can be financed where a contractor for any reason is unable to meet his obligation. We have considered a number of methods whereby finance can be made available in such circumstances. In particular we have examined the possibility of a fund to be financed from contributions by the developers and government, with the latter contribution perhaps coming from oil royalties, and the possibility of requiring developers to make suitable insurance arrangements to ensure that rehabilitation will be financed if they fail.

7.6 We can see advantages in the establishment of a fund. If it were partly financed from royalties it would ensure that some, at least, of the benefits of oil developments were to be applied to overcoming the drawbacks. It would enable rehabilitation of a more positive nature to take place than if the developer himself were required to finance rehabilitation: while, for example, it would not perhaps be equitable for the developer to be required to convert a dock into a marina, such a project could be financed from an Environmental Restoration Fund. On the other hand, a fund would present very real disadvantages. It would mean a departure from the principle that developers should be responsible for the consequences of their activities. Individual developers might be tempted to evade their responsibilities in the knowledge that the fund would meet the cost. A Government contribution financed from oil royalties would raise problems associated with the hypothecation of taxes; and there would be a major difficulty in assessing the contribution which individual firms would make. The administration of a fund would be complex. While there is a precedent for a fund in the Ironstone Restoration Fund, in the case of ironstone the process of extraction and restoration is a continuous one; the operations are geographically concentrated and similar in method and scale; and the cost of

restoration depends to a large extent on the volume of mineral extracted, so that financing a levy on production is quite appropriate. None of these considerations apply in the case of major oil developments.

7.7 We have concluded because of the difficulties outlined in the previous paragraph that the development of an Environmental Restoration Fund would not be immediately feasible. We consider, therefore, that local planning authorities should be empowered to require individual developers to make arrangements under a system of bonds or guarantees to ensure that planning conditions requiring rehabilitation will be complied with. Individual arrangements of this kind could, in fact, be more satisfactory than a fund in the short term before a fund had time to build up ; and a system of bonds or guarantees (unlike the assessment of contributions to a fund) could probably be left to the insurance market, which would make a commercial assessment of the viability of individual projects and of the reliability of their parent companies and set the premiums accordingly.

7.8 We have been advised that the powers we have proposed could be conferred on local planning authorities by modification to Section 50 of the Town and Country Planning (Scotland) Act 1972. This section empowers local planning authorities to enter into agreements with landowners to regulate or restrict the use of their land and to make incidental financial agreements. Two modifications appear necessary. First, the scope of the agreements would require to be widened to allow purely financial agreements to be entered into, and it might be necessary to specify the nature of these agreements including, perhaps, guarantees or performance bonds. Secondly, it appears to us necessary to provide that in specified circumstances the local planning authority could make the entry into such agreements for the purpose of site restoration a condition of planning permission. This would involve a major departure from the principle that no financial consideration should be required for the granting of a planning permission ; and we suggest, therefore that such conditions should, at least initially, be subject to the approval of the Secretary of State. We recommend that Section 50 of the Town and Country Planning (Scotland) Act 1972 be amended accordingly.

7.9 The operations which we suggest should be covered by the arrangements proposed in the previous paragraph are major oil-related developments of a limited life, such as sites for the fabrication of platforms and other major offshore structures and installations and storage tanks associated with the landing and transporting of oil and gas. We note, however, that our recommendations may have wider implications ; and we do not therefore make recommendations on how eligible projects should be defined beyond suggesting that consideration might have to be given to identifying in a more general way the projects which we suggest should be covered.

Monitoring of oil developments

7.10 Rehabilitation of sites used for oil developments and the assessment of future proposals may be facilitated by the monitoring of the environmental and ecological impact of developments. This involves a study both before operations begin, and during the operational life of the development. We understand that such monitoring has taken place in relation to oil developments at Milford Haven ; and we recommend that the Secretary of State should take steps to ensure that it takes place in the case of major oil developments in Scotland.

Public ownership of sites

7.11 The specification of appropriate planning conditions, employment of suitably qualified enforcement officers and the arrangements we have proposed to ensure proper rehabilitation of sites should, we think, serve to meet many of the fears which have been expressed on the adequacy with which oil developments, once they have been approved, can be controlled. But they may still be inadequate in connection with major developments in areas of great environmental sensitivity ; and even if they are adequate there may still be public concern. We recommend, therefore, that the Government should examine the possibility of public ownership of sites for major oil developments, and in particular sites for gravity platform construction in environmentally sensitive areas such as the West coast, which could be leased to contractors who obtain orders. Such an arrangement would serve not only to allay public fears that planning conditions would not be properly enforced or the land would not be adequately restored ; it would also help to provide continuity of employment and use at the site in question.

Pollution and Safety

7.12 We have received reports on pollution and safety. An accident to an oil installation or a blowout at sea could produce major environmental and ecological damage in the short term and we wish to comment briefly on this aspect. We understand that regulations require offshore operators to carry out regular safety drills and simulation exercises, that there are frequent and regular tests of safety equipment, and that there are elaborate procedures to prevent the occurrence of blowouts. The northern basin of the North Sea presents rigorous working conditions and geographical difficulties ; and a major accident would require co-ordinated efforts and international collaboration. We would emphasise therefore the importance of the measures already being taken. We understand that the companies operating offshore maintain supplies of materials and equipment for dealing with accidental oil spills, and that the UK Offshore Operators Association Ltd. are examining proposals for a blowout control and firefighting barge to be stationed in the North Sea. We commend this proposal.

7.13 The human element cannot be divorced from safety procedures; and we are glad to learn that the Government are proposing to include in regulations made under the Mineral Workings (Offshore Installations) Act 1971 provisions as to hours and standards of work for offshore operatives.

7.14 While the owners and operators of undersea pipelines have a major interest in their engineering standards and safety, we are perturbed to learn that the Government have no powers to control the standards of such pipelines beyond the 3 mile limit. We hope that consideration will be given to the inclusion of such statutory powers in any legislation which might be proposed on pipelines.

8
The Coastal Planning Framework

8.1 Our remit asked us to consider 'the feasibility of publishing a national strategy for coastal development'. While we were sitting, however, the Scottish Development Department published, as a Discussion Paper, an Interim Coastal Planning Framework which, in our view, goes a long way towards meeting demands for the development of a national strategy for coastal development, and (apart from its consideration of the West Coast) perhaps as far as is possible given the rapid development of the technology for the production of offshore oil. In this section of our report, therefore, we confine ourselves to commenting on particular aspects of the Coastal Planning Framework. A summary of the Framework and a map illustrating its proposals is given in Appendix 3.

8.2 The Interim Coastal Planning Framework gives effect to a suggestion in the White Paper on Land Resource Use in Scotland[1] that there should be greater central government guidance on land use. It brings together knowledge of the demand for sites and their physical requirements on the one hand and the quality of the coast and its capacity to sustain development on the other. It makes recommendations for 14 Preferred Major Development Zones, in which development might in principle be acceptable and within which developers should be encouraged to look for sites in the first instance, for 23 Preferred Conservation Zones, in which developers might be expected to encounter difficulties in obtaining permission to develop sites, and for a West Coast Zone of high environmental quality between Thurso and Machrihanish where the development of individual sites may be justified, but where conservation, which does not of course preclude smaller scale developments, should be the predominant policy.

8.3 We consider that the Discussion Paper offers a feasible and useful approach to the problem of setting geographical priorities for oil developments and we commend it to local planning authorities. We concur with its general conclusions that, as far as possible, oil developments should be sited in the Central Belt and that there are likely to be significant benefits in grouping oil developments, as far as is practicable, in order to minimise the environmental impact of schemes on the coast and to facilitate economic provision of infrastructure and supporting services. We consider that there would be advantage in identifying 'priority development zones' which are seen as more suitable than other preferred development zones for oil developments in terms of their capacity to absorb developments, their supply of labour and their pre-existing infrastructural support, and we understand that the Scottish Development Department are already holding discussions with local planning authorities in order to identify such zones. We suggest that local planning authorities should draw up development and

[1] 'Land Resource Use in Scotland' Cmnd 5428, September 1973.

conservation plans in the light of the Report's recommendations for development and conservation zones.

8.4 It is with the West Coast Zone that we have found most difficulty. The designation of the whole West Coast as a Preferred Conservation Zone would not perhaps be realistic in that the Zone contains some sections of lower scenic quality. On the other hand, we are of the view that the West Coast constitutes a special case because of the high quality of the natural environment; because of its value in European terms as an unspoilt area and therefore as a scenic, recreational, tourism, and wildlife resource; because of the delicate socio-economic balance of the small communities and their way of life, which could be irretrievably changed by the impact, local and regional, of large scale labour intensive developments; and because of the general sparcity of supporting infrastructure. Our observations are underlined by the findings of the SPHERE Impact Analysis. We have, therefore, strong reservations about the placing of large scale labour intensive developments on the West Coast. We consider that such developments should be permitted here only where they are clearly in the national interest and where, for geographical or technological reasons, they are unable to be located elsewhere. We would not have the same reservations about some other forms of oil-related development being located in the area; and indeed we consider that developments such as service bases would integrate well into the present economic pattern and could be of lasting benefit. It is our hope that communities in the West Coast Zone will in fact as a result of oil-related developments benefit by an enhanced standard of living and a more diversified economic base: our concern is that this should be achieved without undue damage to the environment nor too radical nor abrupt description of the best features of the local way of life.

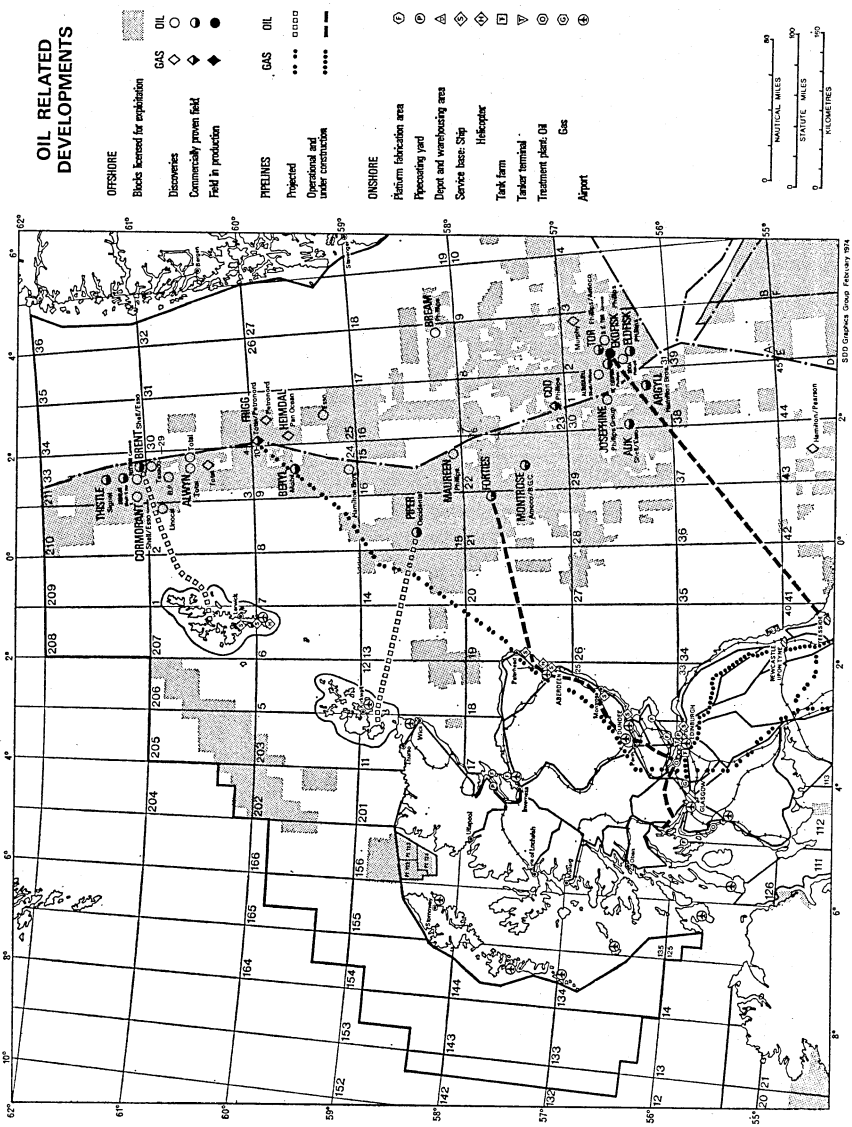
8.5 We consider in principle that growth points are to be preferred to scattered developments, but further work requires to be done on the implications of a West Coast growth point or points before we could reach a conclusion on whether this would be the right approach. If, however, a growth point solution is to be adopted, and if a site is approved for platform fabrication in the West Coast Zone, then we suggest that the possibility of centring the growth point on the fabrication site should be examined, since this could mitigate the adverse effects on the local community of the end of platform fabrication operations.

8.6 We note that the Scottish Development Department are undertaking further analysis of the West Coast Zone; and we recommend that they should proceed as rapidly as possible with this analysis in the light of the comments we have made in paragraphs 8.4 and 8.5.

Chairman's Note

The complexity of the Committee's brief needs no emphasis to those who have read so far. This Report was presented to the Council in December 1973 not so much on the assumption that it constitutes a final answer but rather in the hope that it may make a useful contribution towards the evolution of a balanced national policy and be of some assistance to those involved in taking decisions that will affect Scotland for long to come.

Appendix 1 (section 4)



Appendix 2 (section 6)

Outline of Scottish planning procedures

1 The Town and Country Planning (Scotland) Acts since 1947 have established machinery for the making of plans for the land use and for the control of development through planning permissions granted by local planning authorities. Development Plans are prepared by the local planning authorities after a process of extensive consultation with interested bodies and after due public participation. Development Plans are submitted to the Secretary of State for Scotland for approval, and before approving the Plan, with or without modifications, there is an opportunity for objections to be made and for a public local inquiry to be held if necessary. The process of amending Development Plans to keep them up to date is a continuing one, and amendments are subject to a similar process of consideration, and objection and inquiry if necessary, before their approval by the Secretary of State.

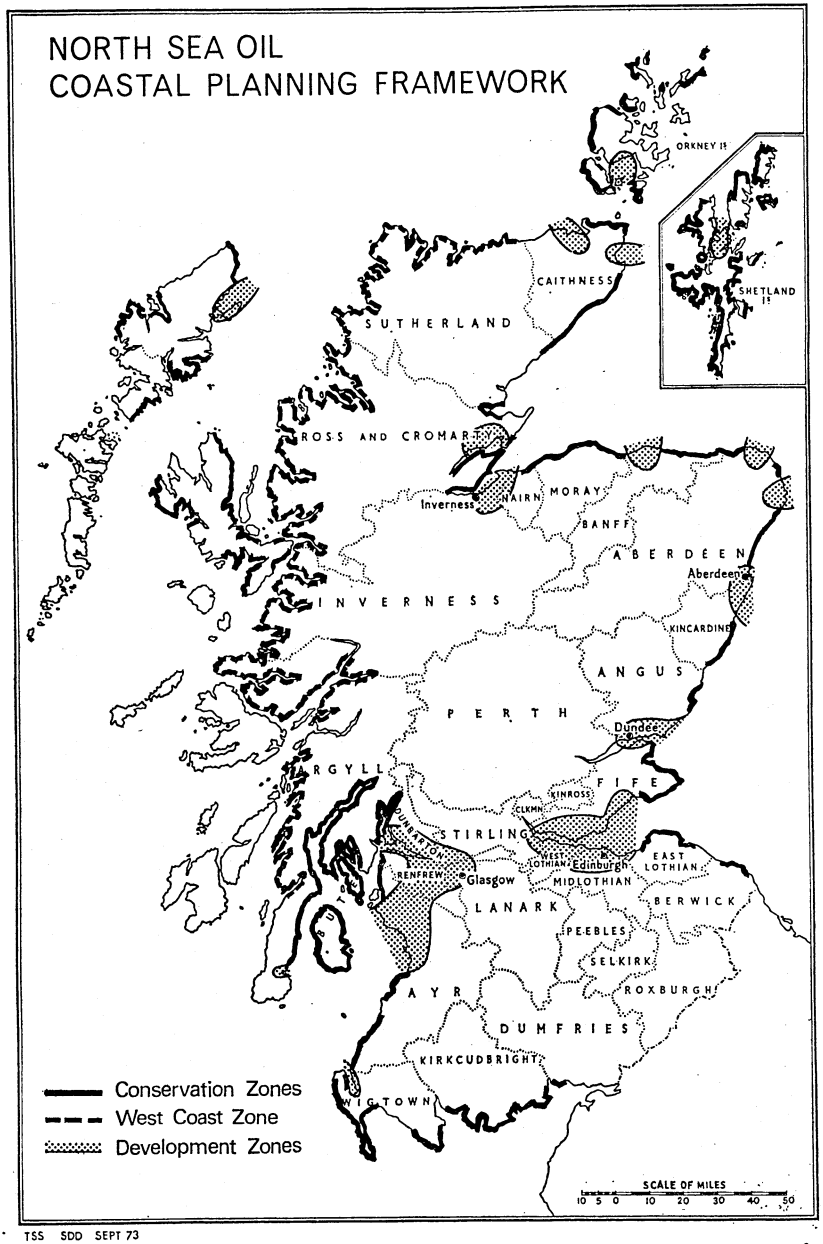
2 In general the Development Plan for an area zones land for the major known and foreseeable uses, housing, industry, commerce, recreation, etc. If the site chosen by a developer is already appropriately zoned a decision on his application can be taken by the local planning authority without further ado. Most planning decisions in Scotland are taken in this way. If planning permission is refused or granted subject to conditions which the applicant finds unacceptable, or if the local planning authority does not reach a decision within a prescribed period, normally two months (which is held to constitute a deemed refusal unless the applicant consents to a postponement), the applicant may appeal to the Secretary of State and in that event the normal procedure is for a public local inquiry to be held before the Secretary of State issues a decision on the appeal.

3 Where the site chosen by a developer is not appropriately zoned, and the local planning authority wish to approve the development, the normal procedure is for the authority either to prepare a development plan amendment or to apply to the Secretary of State for a Direction under Article 8 of the Town and Country Planning (General Development) (Scotland) Order 1950 enabling the authority to grant planning permission notwithstanding that the proposed development is not in accordance with the provisions of their development plan. In either case there would be the opportunity for objections and a public local inquiry would be held if necessary before the Secretary of State reached his decision.

4 Certain developments raise issues which go well beyond the boundaries of an individual local planning authority and in these cases there is power in the Planning Acts for the Secretary of State to 'call in' the application for decision by himself. Once again the normal procedure is for a public local inquiry to be held before the Secretary of State reaches his decision.

5 The Town and Country Planning (Scotland) Act 1969 established the framework for a new Development Plan system. The essential difference is the introduction of 'structure plans' setting out the local planning authority's policy and general proposals for the use and development of land in its area, and the relationship of that use and development to similar plans for neighbouring areas. In preparing their structure plans, local planning authorities are required to have regard in particular to current policies with respect to the economic planning and development of the region as a whole, and to the resources likely to be available for carrying out the proposals for the structure plan. These provisions of the 1969 Act (which has now been consolidated with earlier planning legislation in the Town and Country Planning (Scotland) Act 1972) are not yet in force in Scotland. It is declared policy to implement them gradually, and to complete this process over the country as a whole only after local government reorganisation. This does not, of course, imply that the content of development plans under the present system cannot be updated until the new statutory procedures are adopted : there is nothing in the present system to prevent local planning authorities from taking into account the matters mentioned above, and many of them have done so in preparing amendments to their Development Plans.

Appendix 3 (section 8)



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The Interim Coastal Planning Framework

Against the background of the national economic importance of North Sea Oil developments, and the land use planning problems which they have created, the report summarises the results so far of current work being undertaken in the Scottish Office on land-based operations associated with the discovery of oil and gas in the Scottish waters of the North Sea. The work is incomplete in some respects, particularly in relation to the west coast and islands ; but it provides for discussion a broad framework within which forward planning and project location may take place. The main points are as follows :

1 The coast of Scotland has for much of its length scenic and environmental qualities of national significance. These significant stretches include areas which may, in the national economic interest, be required for development.

2 Oil developments occupy a relatively small proportion of the land and coastline, but the implications of the developments go much wider than the land that is actually occupied.

3 There are likely to be significant benefits in grouping oil developments, as far as is practicable, in order to minimise the environmental impact of schemes on the coast, and to facilitate economic provision of supporting infrastructure and services.

Central Belt

4 As far as possible, oil developments should be sited in the central belt.

East and South-west Coasts

5 Fourteen coastal zones are suggested in which development might in principle be acceptable and within which developers are encouraged to look for sites in the first instance. They are referred to as Preferred Development Zones and are as follows :

Forth Estuary ; Lower Tay Estuary ; Aberdeen ; Peterhead ; Fraserburgh ; Buckie ; Moray and Cromarty Firths ; Wick/Thurso ; part of Shetland ; part of Orkney ; Stornoway ; Clyde ; Campbeltown ; Stranraer.

6 Twenty-three sections of the mainland coast are suggested in which conservation considerations are particularly strong. These are referred to as Preferred Conservation Zones and are :

St Abb's–Cockburnspath ; Dunbar–Longniddry ; Lundin Links–Tentsmuir ; North of Arbroath–South of Montrose ; North Esk–Dunnottar ; North of River Don–Boddam ; St Fergus–St Combs ; Rosehearty–Cullen ; Port Gordon–Fort George ; Black Isle ; North Sutor Cliffs ; Tain–Dornoch ; Helmsdale–South Head ; Brough Head–Dunnet Head ; North of Campbeltown–Ardyne Pt ; Loch Goil and Loch Long ; Cloch Pt–North of Largs ; South of Ayr–Dipple ; Woodlands Bay–Finnart Bay ; North of Stranraer–Kirkcolm ; Craiglaggan–Glenluce ; Fort William–Eggerness Pt ; Carsluith–Blackshaw.

In these areas, developers may expect to encounter difficulties in obtaining permission to develop sites.

7 Agreement in principle to zones of this nature does *not* of course imply either that no development should take place at any location in a zone where conservation is given priority, or that stretches of coast cannot be protected from development in areas where development is generally acceptable.

8 For the Preferred Development Zones which are agreed by the local planning authorities concerned, it is suggested that as a matter of urgency forward looking development policies and plans for the specific areas in which development might be acceptable should be drawn up, if this has not already been done.

9 Equally, for the Preferred Conservation Zones which are agreed, it is suggested that local planning authorities, in conjunction with the Countryside Commission and the Nature Conservancy, should draw up appropriate development plan conservation policies.

West Coast Zone

10 A West Coast Zone is identified where there are areas of considerable scenic quality, and where conservation considerations are of particular importance. It possesses no potential development area clearly able to support a concentration of major new developments. On the other hand, this zone is very extensive, and contains some sections of lower scenic quality. There is a possible need for fabrication sites requiring the deep water facilities found on this coast, and the development of individual sites within this zone may be justified. Further analysis is being carried out, pending which the discussion paper adopts a different approach for this area than for the East Coast and elsewhere.

11 The evolution of a coastal planning framework for the accommodation of oil-related developments will be a continuing task as information changes and technology develops. Further work can be distinguished as being immediately necessary on the following fronts, amongst others :

(a) Investigation into demand for an availability of appropriate sites for the changing requirements of platform fabrication.

(b) Continuing analysis of the location of landing points for oil and gas in association with storage areas and tanker terminals.

(c) Analysis of the infrastructure requirements of supply and service bases together with the relationship between mainland and island bases and the effect of the movement of exploration to westerly areas.

(d) Environmental and ecological analysis of the coast in general, particularly on the west, and of the sites of individual proposals as they arise.

It is emphasised that the Report is a discussion paper out of which policy guidelines may emerge. Its contents are

without prejudice to the duties and responsibilities either of the local planning authorities or of the Secretary of State. In particular, it is for the local planning authorities to translate general policy guidance, if found acceptable, into specific land zoning, while individual planning applications for particular sites will each have to be considered on their merits in the normal way.

The Scottish Development Department are holding discussions on the paper with coastal planning authorities and other interested bodies.

APPENDIX E

N O R T H S E A O I L A N D G A S

PIPELINE LANDFALLS

A DISCUSSION PAPER

Scottish Development Department
May 1974

PREFACE

This paper has been prepared to provide information about and facilitate discussion of some of the issues involved in the development of North Sea Oil resources.

None of the views expressed should be taken to imply that a policy has been decided, or as prejudging any particular planning application which may be made for a specific site, and which will, of course, fall to be considered on its merits.

RE 29831 TBCL(3)

NORTH SEA OIL AND GAS

Pipeline Landfalls Discussion Paper

NORTH SEA OIL: PIPELINE LANDFALLS DISCUSSION PAPER

INTRODUCTION

It is a licence condition that petroleum (oil and natural gas) found in the UK sector of the Continental Shelf must be brought ashore to the UK. In most cases producers operating in the northern basin of the North Sea are likely to bring their petroleum to land by pipe where it can be loaded into tankers in the relative safety of the shore, or whence it can be piped to some suitable market or refinery. Because of the immense cost of laying an undersea pipeline (currently about £½m per mile) the company will be anxious to keep it as short as possible - that is to bring the pipeline ashore at the point nearest to the wellhead. Generally, bringing the pipeline ashore does not cause much damage to the environment nor are suitable sites very difficult to find. However there are certain activities and installations which may necessarily be associated with the pipeline landfalls, and it is in finding suitable sites to accommodate these that the main problems lie.

2. These installations may include plant for gas treatment, and gas and oil separation, crude oil storage tanks and terminals capable of taking 250,000 ton tankers. Naturally the general public fear that if each producing company is allowed to develop on its chosen site there will be a proliferation of such installations around the coast. On the other hand if there were a limited number of suitable sites for these developments some companies may fear being pushed out of the market for them by monopoly land holding.

3. The purpose of this paper is accordingly to identify the areas in which sites suitable for both landing pipelines and for the associated development are likely to be required, and to promote discussion of the steps which might be taken to encourage companies to concentrate pipeline landfalls and associated development within these areas.

4. The paper is arranged in 3 sections. The first identifies the areas where companies are most likely to wish to bring oil or gas ashore (based on known fields and discoveries), the second outlines the nature and scale of the development associated with landfalls sites, and the third describes the criteria likely to be important in selecting landfall sites.

LIKELY AREAS OF DEMAND FOR PIPELINE LANDFALLS

5. Where oil is delivered onshore by pipeline, whether from the UK sector or elsewhere, the preferred landfall for the line is likely to be the nearest possible suitable site to the field. Natural gas from the UK sector which is to be supplied through pipes in Great Britain must first be offered to the British Gas Corporation at a reasonable price and, if the BGC accept the gas, they are likely to require the producer to deliver it to the mainland. Before a producer can use or supply gas through pipes to any other than the BGC, he must obtain the consent of the Secretary of State for Energy.

6. Presently known discoveries of oil and gas which are likely to be brought to Scotland lie in 3 main groups. Tables 1, 2 and 3 are schedules giving the location of finds, planned and possible landfalls and production plans, where these are known.

7. The most northerly group is the cluster around Brent, some 90 miles east of the northernmost islands of Shetland. This includes Shell/Esso's Brent field their Cormorant and Dunlin discoveries, Mobile's Beryl field, Signal's Thisle field, Total's Alwyn field, the Hutton field of Conoco/National Coal

Board/Gulf, BP/Ranger's Ninian field and other recent discoveries. The nearest approachable land in the UK to this concentration lies in the Shetlands. The nearest mainland landfall is the Duncansby Head area of Caithness, but this is about 150 miles further away. Within this concentration of fields lies also the Frigg gas field (Total Oil Marine Group) but the pipeline from this is to be taken, not to Shetland, but to St Fergus (Aberdeenshire) which, being on the mainland, enables a link to be made with the existing gas grid system, currently terminating at Glenmavis (Coatbridge).

8. The second group of field is rather more widely scattered and extends from about 125 miles east of Wick to about 135 miles east of Aberdeen. It includes Occidental's Piper field, BP's Forties field, BGC/Amoco's Montrose field and Phillip's discovery Maureen. There are 3 areas almost equally near this group; the Orkneys, the north-east coast of Caithness and the Rattray Head area of Aberdeenshire. Of these the north-east coast of Caithness is likely to be the least attractive landfall area as it is a relatively remote part of the mainland and it does not provide sheltered deep water suitable for tanker terminal sites. The Orkneys have already been selected by Occidental, who propose to lay a 135 mile pipeline from the Piper Field to a tank farm and a tanker terminal at Flotta, and the Rattray Head area has been selected by BP who are building a 110 mile pipeline from the Forties Field to Cruden Bay, whence the crude oil will be piped under land to their refinery at Grangemouth. Apart from Orkney and Rattray Head companies may be interested in bringing oil to the Inner Moray Firth area. It is certainly farther from known fields (65 miles farther from Piper than is Flotta), and would involve laying additional costly submarine pipeline, but it could provide both several soft pipeline landfall sites and either an easy pipeline route south and west or tank farm and tanker terminal sites.

9. The third group of fields is that around Ekofisk, some 250 miles east of the Firth of Forth. This group includes the Norwegian Ekofisk complex of Ekofisk, West Ekofisk, Eldfisk and Tor, Hamilton's Argyll and Shell/Esso's Auk fields, and Philips' Josephine discovery. The group lies equally near Teesside and Emdon (Germany) and it is planned to take oil from the Ekofisk complex to existing refineries at Teesside and gas to Emden. Oil from Argyll and Auk will be taken by tanker to various destinations in the UK. No plans are known for Josephine which has not been commercially proven.

10. Thus, on the assumption that the demand will be for pipelines along the shortest route from the well to land, the area where there is most likely to be a demand for oil pipelines landfall sites is Shetland. There may be some demand for landing oil in Orkney, in addition to Occidental's proposal, and there may be some additional demand for oil or gas landfalls in the Rattray Head area. Taking other important factors into account, the Inner Moray Firth may also attract a demand for landfall sites.

INSTALLATIONS ASSOCIATED WITH OIL AND GAS

11. The installations associated with landing gas are quite different from those associated with landing oil.

12. Gas producers who sell their product to the BGC treat the gas to bring it to BGC specification at their terminal and then pipe it to the adjacent BGC terminal. Because of the greater risk inherent in piping untreated gas, and because of the greater expense involved, the BGC prefer producing companies to locate their treatment plant as near the landfall as possible. In order to prevent proliferation of terminal sites along the coast the BGC prefer to select a landfall point and terminal area which can be used by, say, 3 producers as well as themselves. This concentrated plant may well take an area of about 100-150 hectares, giving approximately 20 hectares for each producer and 60 hectares for the BGC. Much of this land will be used for security spacing of equipment and

will not be built over. The equipment in the concentration will include a radio mast, a flare stack, fire fighting equipment, office accommodation and perimeter security fencing. It may also include sulphur removal plant. Depending upon the pressure at which the gas reaches the treatment plant it may be necessary to add compressors.

13. Oil producing companies, on the other hand, sell and refine their products independently. The installations required by them will depend on their marketing and oil treatment plans, and will vary from a small booster station or pump house (as is planned at Cruden Bay, Aberdeen), serving the pipeline as it passes inland from the landfall, to a maximum of a tank farm and tanker terminal in and from which oil can be stored and transported by tankers of up to 250,000 tons (as are being built at Dalmeny and Hound Point, West Lothian) with associated treatment works, where necessary for gas separation and ballast water cleaning. A tank farm and tanker terminal will certainly be required where oil is landed at island or at remote mainland locations from which it is not feasible to pipe oil inland. The amount of land needed for the tank farm will depend on the volume of oil to be stored which in turn will depend both on the volume of oil being received from the field and on the number of days supply it may be necessary to hold in case of difficulty in feeding into tankers for onward transmission. Probably the maximum area needed for one company's field would be about 60 hectares, which could accommodate 6 tanks, each holding about half a million barrels, (representing about 10 days' supply from a field yielding quarter million barrels per day or about 12 million tons per year). The tank farm site will include tanks of up to 100 metres diameter and 20 metres height, normally arranged in pairs with surrounding safety bunds, fire fighting equipment, a site office and perimeter security fence. Normally tanks are above sea level so that oil can be fed into waiting tankers by gravity. There may be considerable visual advantage (and possibly extra safety) in concealing the tanks underground. This can be done by complete or partial burial of the metal tank, but it may also be possible to create underground caverns which can be used unlined for oil storage. The Institute of Geological Science has surveyed the coast and considers that some areas may have suitable rock formation for the creation of unlined cavern storage. There may however be problems in loading tankers from a below-sea-level situation which makes the exercise impracticable but, assuming there are no risks of polluting underground water supply, this method of storage might make the development more acceptable locally and clearly needs to be investigated further.

14. The tanker terminal will require sheltered water of at least 20 metres depth and will comprise a pier or single-point mooring for perhaps 2 or 3 tankers, with fire fighting equipment, loading gantries and site office on land.

15. Normally companies will look for a tank farm site adjacent to the tanker terminal, as this makes it easier to load the tanker and obviates the need for duplicate site offices and safety equipment. A tank farm which is based higher than sea level will allow the waiting tanker to be loaded by gravity. It has been possible to agree to the tank farm being 3 miles away from the terminal (Dalmeny and Hound Point) but this is believed to be about the maximum separation acceptable. It may also be relevant that it may be more easy to carry the concrete and large steel plates required for the tank farm by sea to a site near the terminal than to take them even short distances by road from the terminal inland.

16. It is unlikely that companies will choose to refine oil at the landfall. Normally the choice of refinery site depends more on the location of markets than on the availability of nearby sources of crude oil which is very much cheaper to transport than products. This is likely to hold good even where very large quantities of crude oil are brought ashore in one place.

CRITERIA FOR SELECTING LANDFALL SITES WITHIN A GENERAL AREA

17. Once the general location for landing a pipeline has been selected the choice of landfall site will depend partly on the physical characteristics of the shore and partly on the companies' production plans.

18. For landing gas if a mainland location is required the main physical criteria will be:-

Onshore

a. A flat approach or reasonably gentle transition from marine to land environment. Cliffs of up to 30 metres can be accommodated if the rock is soft.

b. Sufficient land for the treatment works - ie about 100 to 150 hectares of flat land.

c. A non-urban area.

Off-shore

a. A gently sloping approach from the sea with sufficient depth of sand or shingle to give not less than 3 metres of cover over the pipeline down to low water mark, and 2 metres cover out to a 15 metre depth of water.

b. A sea bed not subject to shifting of scour.

c. A sea not subject to currents or to strong tidal flows.

d. Areas not used for anchorage or mooring.

e. An approach free from obstacles.

19. For an oil producing company wishing to transport oil from the landfall by tanker the main physical criterion will be the selection of a suitable tanker terminal site plus sufficient land nearby for a tank farm. The company will also be looking for an easy landfall for the pipe, and their requirements in this respect are very similar to those for a gas pipeline landfall. If the company is landing on a mainland site and sending the oil landward by pipeline, then the shortest distance between the field and the ultimate destination may assume greater importance in the selection of landfall site.

CONCLUSIONS

20. It may be necessary to carry out a detailed analysis of the effect of such developments on the local environment and it is proposed to issue a separate technical memorandum shortly giving guidance about the nature and timing of such investigations.

21. Four general areas are likely to be selected for landfall sites by oil and gas producing companies. These are Shetland, Orkney, the Inner Moray Firth area and the Rattray Head area. If adequate suitable sites can be found there, there would be advantage in the landfalls and associated developments being confined to them.

22. It is unlikely that substantial amounts of gas will be brought to Shetland. It cannot be used there in commercial quantities and would therefore need to be liquefied for transport by tanker; so where gas is available in commercial quantities it is more likely to be separated at the production platform and piped direct to the mainland. But it is very likely that a considerable amount of oil will be landed on the islands and it will be necessary for this subsequently to

be moved by tanker, unless as seems unlikely, it is refined first and transported as products. It is not possible to estimate at present how many pipelines (or more relevant, how many pipe trenches) would land here. This will depend on the yield from the fields, the amount of duplication of pipes required by companies and the amount of trench sharing which is possible. It seems possible that there are several suitable sites but the Interim Development Plan of Zetland County Council identifies Sullom Voe as the most suitable for major developments arising out of the industrial activities of the North Sea and their consultants' report confirms this assessment. According to a survey by the Institute of Geological Sciences the rock formation of the Sullom Voe area may well be suitable for underground cavern storage.

23. In Orkney again, any oil landed must subsequently be moved by tanker. Scapa Flow provides ample sheltered deep water suitable for tanker terminals and this may attract companies wishing to transport by tanker in preference to the nearest mainland sites at Duncansby Head and Rattray Head which have no sheltered deep water. The overall scheme proposed by Occidental on Flotta for a tank farm covers an area of land that could well be much greater than is needed to take the expected yield from Piper. There are in addition sites on the mainland of Orkney both around Scapa Flow and on the northern side of the mainland which are potentially suitable for tank farms and adjacent to possible tanker terminal sites. According to the Institute of Geological Sciences the rock formation of the Orkneys may be suitable for underground cavern storage, although there may be local geological difficulties.

24. The Caithness area from Duncansby Head to Wick is relatively near some fields but as no tanker terminal sites are available the area could only be used by a company wishing to land its pipe on the mainland and to continue it south under land. This does not seem likely unless petroleum is discovered nearer to this coast, and the area has already been bypassed by the BGC in favour of the St Fergus area.

25. More than one firm has already expressed interest in the Inner Moray Firth area, which could provide both soft pipeline landfalls and an easy land route south and west or a tank farm and tanker terminal site. It would seem that landfall development could take place here in accordance with the approved development plans for the area. However further interest in this area by gas and oil producing companies is likely only to result from new oil or gas discoveries.

26. The Rattray Head area has already attracted one gas and one oil pipeline and it is assumed that the BGC will wish to attract other gas pipelines to St Fergus. No sheltered deep water anchorage is available round the Head and any oil must be distributed by underland pipeline. The route southwards for the gas pipeline will run for most of its length in fairly close proximity to the BP oil line currently under construction. There may well be a limit to the capacity of this route to take further pipelines. Before further landings in this area are allowed this will need to be taken into account.

TABLE 1 COMMERCIALLY PROVEN FINDS WITH KNOWN OR PROPOSED PRODUCTION PLANS

Name of Operator and FIELD	Approx. Location (in statute miles)	Operator's UK Refineries	Method of production and distribution ϕ
BP FORTIES*	110 miles ENE Peterhead	Isle of Grain, Kent Llandarcy, Glam Grangemouth Belfast	Production expected to commence in 1975 from first two (of four planned) platforms. Oil to be transported by under-sea pipeline from field to Cruden Bay (110 miles) thence by land to Grangemouth.
Shell AUK	190 miles E of Dundee	Stanlow, Cheshire Shell Haven, Essex Teesport, Yorks Heysham, Lancs Ardrossan	Production using tankers through Single Point Buoy Mooring system (SPBM).
Shell BRENT*	110 miles ENE of Sullom Voe	As for Auk	Initially production using floating storage/tanker loading facility ("Spar") is proposed. Pipeline to Sullom Voe under active consideration.
Hamilton ARGYLL	220 miles E of Edinburgh	-	Production by semi-submersible drilling rig fitted with production equipment; transportation by tankers using SPBM system.
Occidental PIPER*	135 miles ESE of Flotta	Canvey Island (projected)	Proposed to produce by platform and transport by pipeline to Flotta.
Mobil BERYL	125 miles SE of Lerwick	Coryton, Essex	Proposals to produce using concrete platform and tankers through a SPBM system.
Amoco MONTROSE	125 miles E of Peterhead	Milford Haven	Proposals to produce using platform and tankers through a SPBM system.
Total FRIGG (Gas)*	220 NNE Peterhead	-	Production planned by under-sea pipeline to terminal at St Fergus near Peterhead.
Phillips EKOFISK (Oil/Norwegian)*	215 NE Teesside	Billingham, Teesside	Production at present using tankers. Pipeline to Teesside currently under construction

* indicates where offshore pipeline is either under construction or projected or could well be laid.

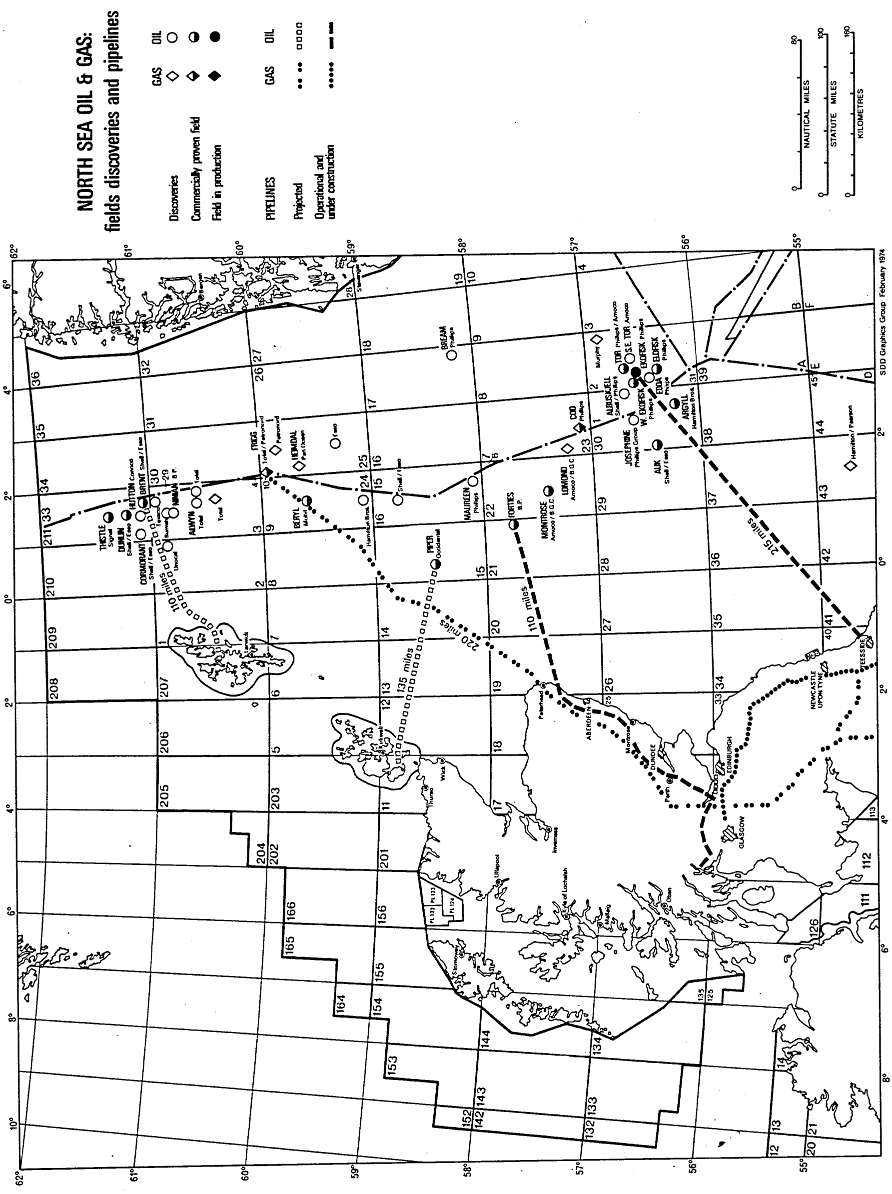
ϕ It should not be assumed that output from any given field will automatically be processed by the operator. For example Amoco, as operator for the Montrose field holds only a 30.77% interest in the licence. The other licenses and their respective share are as follows: British Gas Corporation 30.77%, Amerada 23.08% and Texas Eastern 15.38%.

TABLE 2 COMMERCIALLY PROVEN FINDS WHERE PRODUCTION AND DISTRIBUTION PLANS ARE NOT KNOWN

Name of Operator and FIELD	Approx. Location	Operator's UK Refineries
Shell DUNLIN	125 miles NE of Lerwick	see AUK table 1
Signal THISTLE	145 miles NE of Lerwick	-

TABLE 3 OTHER SIGNIFICANT DISCOVERIES

Name of Operator and FIELD	Approx. Location	Operator's UK Refineries
Phillips JOSEPHINE	210 miles E of Dundee	see EKOFISK in Table 1
Shell CORMORANT	110 miles NE of Lerwick	see AUK in Table 1
Phillips MAUREEN	140 miles ENE of Peterhead	see EKOFISK in Table 1
Total 3/15 (un-named)	125 miles ENE of Lerwick	-
Conco HUTTON	120 miles NE of Lerwick	South Killingholme, Lincolnshire
Total ALWYN	120 miles ENE of Lerwick	-
Unocal 2/5 (un-named)	100 miles NE of Lerwick	-
BP/Burmah NINIAN	110 miles NE of Lerwick	see FORTIES Table 1 Burmah has refinery at Ellesmere Port, Cheshire.


NORTH SEA OIL & GAS:
fields discoveries and pipelines
GAS
OIL
Discoveries
Commercially proven field
Field in production
PIPELINES
Projected
Operational and under construction
NAUTICAL MILES
STATUTE MILES
KILOMETRES
THISTLE
DUNLIN
CORMORANT
HUTTON
BRENT
NINIAN
ALWYN
FRIGG
HEIMDAL
BERYL
BREAM
MAUREEN
PIPER
FORTIES
MONTROSE
LOMOND
COD
ALBUSKJELL
TOR
S.E. TOR
W. EKOFISK
EKOFISK
ELDFISK
EDDA
JOSEPHINE
ARGYLL
AUK
110 miles
220 miles
135 miles
215 miles
ABERDEEN
DUNDEE
EDINBURGH
GLASGOW
NEWCASTLE UPON TYNE
TEESSIDE
SDD Graphics Group February 1974

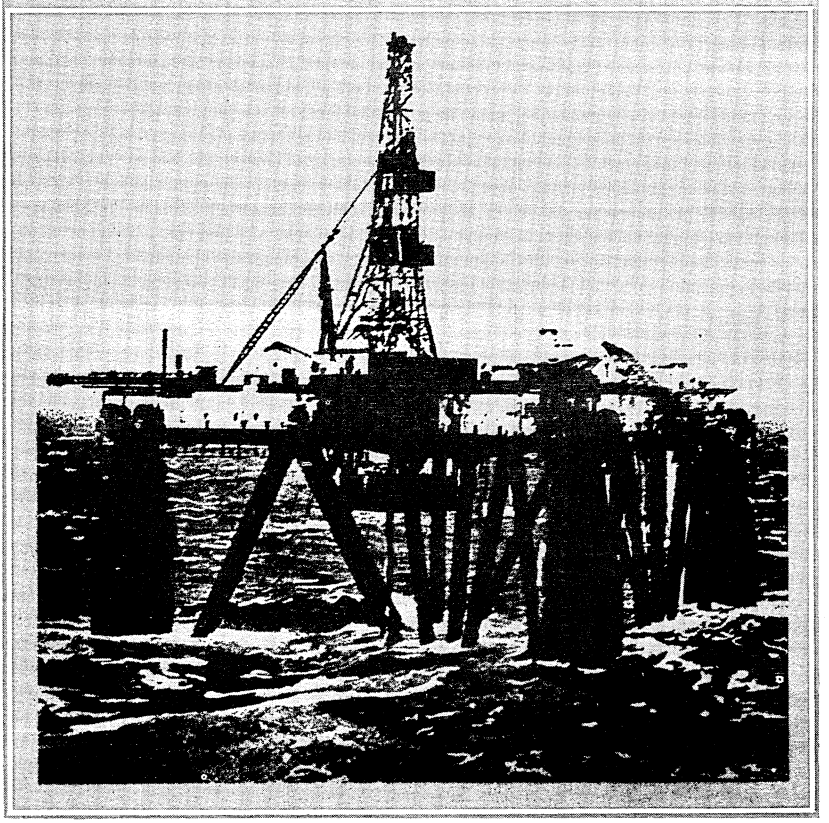
APPENDIX F

HMSO/31½p net

THE SCOTTISH OFFICE

Scottish Economic Bulletin

Special Number:
NORTH SEA OIL



FOREWORD BY THE RT. HON. GORDON CAMPBELL
Secretary of State for Scotland

This issue of the Economic Bulletin is devoted to the new offshore oil industry and it outlines the main effects on Scotland and on the work of the Scottish Office Departments.

The discovery of oil fields off the shores of Scotland following earlier discoveries of gas off the English coast, is probably the most important event for the Scottish economy during this century. It has all happened within the last two years. Indeed if speedy and expensive drilling exploration northwards had not been encouraged, we should even now be unaware, in 1973, of the existence of this oil.

So much has been written and said about the new discoveries in a short space of time that misconceptions abound. There seem even to be some who think the oil is a few feet below Aberdeen harbour and is already flowing! The facts are that it is about 2 miles below the sea bed and as much as 100 miles or more out to sea. Deep water and stormy weather demand new and modern technology to find and extract the oil, and it is likely to be about a year before the first oil is landed.

This hidden hoard of precious energy has lain in the Continental Shelf for centuries. The advanced technology needed to extract it is such that man has set foot on the moon before being in a position to win this oil. There is no reason why Scottish industry should not become a focus for the new expertise required, taking part in under-sea operations elsewhere in the world as well.

The launching of this new industry now is a boon for Scotland as it has brought development and welcome new jobs of the kinds at which Scots excel. In the past two years, when unemployment has been regrettably high, the Government have helped the winning of new jobs for Scotland as this Bulletin describes.

In the Scottish Office we have taken very swift action ourselves when this could help. In particular, as an Appendix on the Peterhead developments records, I was able to take an important initiative in an unusual situation where historical events had placed responsibilities upon the Secretary of State. The successful results will enable oil rigs to be serviced from Peterhead this year with benefits in employment and other ways for that area.

At the same time, as Planning Minister for Scotland, I have been keeping a balance between desirable development and the protection of our environment, with flexible and vigilant application of the planning procedures laid down by Parliament. For example, within these procedures I enabled planning permission to be given very quickly for a platform fabrication complex to be established in the Cromarty Firth. Within 4 months the largest graving dock in Europe had been scooped out; and within 8 months work had started on building what will be the largest production platform in the world. The complex emits no pollution and should not, when its tasks are completed, leave scars or dereliction. Such projects produce hundreds of valuable jobs. Serious delays could have caused them to have been abandoned or started outside Scotland.

Because of the many new developments in the North, there is already a movement of labour northwards within Scotland. This movement presents a challenge for all engaged in planning and in building the essential services in the areas affected. Special measures are being taken, as this Bulletin reports, to meet this challenge.

At the same time the Government are incurring expenditure for Scotland, in anticipation of the benefits which the oil will bring to the economy when it starts to flow. Thus large sums have been authorised to be spent now on accelerating the construction and improvement of roads, harbours, housing and other services in Scotland. This is of immediate benefit to Scotland, by improving and creating valuable assets for the community as a whole, besides being of timely help to the new industry and its related developments.

The new industry is posing problems and requiring difficult decisions, some of which need to be taken quickly. But its potential and promise for Scotland are great, if we accept the challenges and the leading part which is open to us.

SCOTTISH ECONOMIC BULLETIN

SPECIAL NUMBER: NORTH SEA OIL

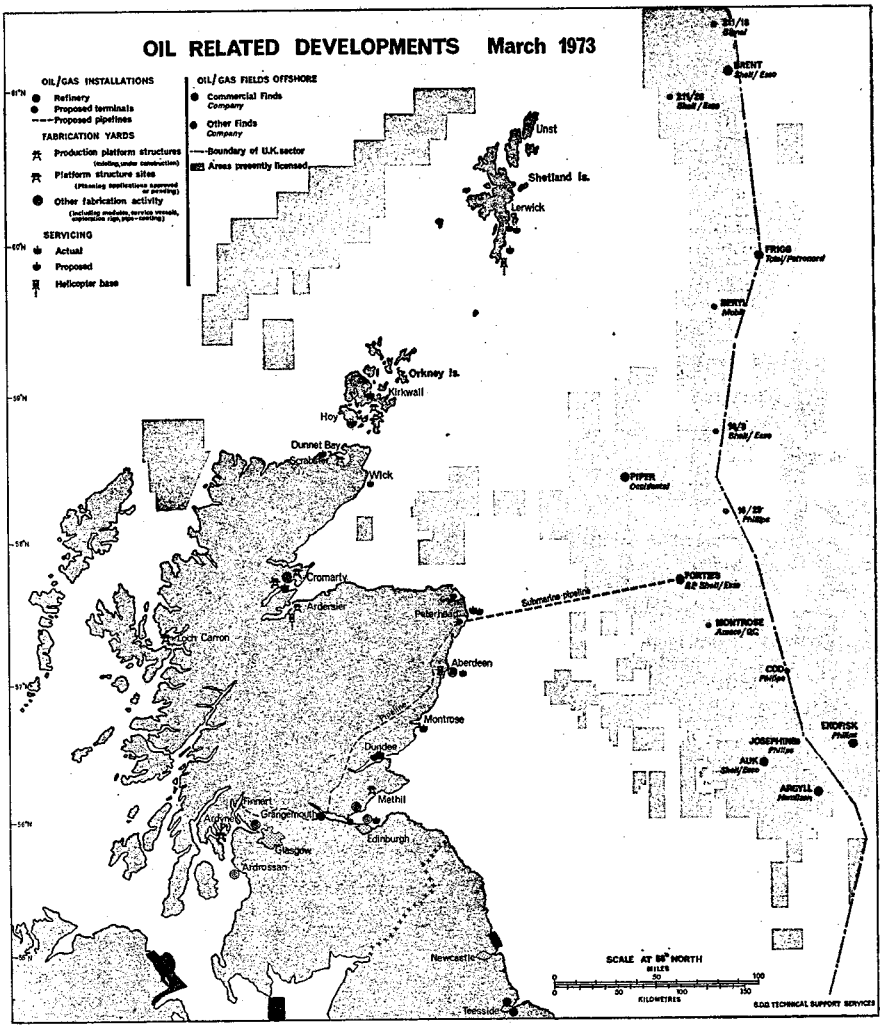
INTRODUCTION

This special issue of the Scottish Economic Bulletin is devoted to information on the discoveries of under-sea oil and gas and the developments rapidly ensuing from these discoveries, especially insofar as they affect the Scottish economy. It does not consider broad issues of licensing or fuel policy. These were discussed in *North Sea Oil and Gas: A Report to Parliament* (Department of Trade and Industry) published in January. This Bulletin concentrates on providing a picture mainly of the onshore activities, an area in which the Departments of the Scottish Office are in various ways involved, including:

- activity in the Scottish economy, including industrial, port, and infrastructure developments;
- planning procedures under which developments take place and are controlled; and
- Government organisations and initiatives designed to co-ordinate industrial and local developments.

The situation is continually changing, with new discoveries and projects being announced almost weekly. This Bulletin outlines the stage reached at the end of March 1973.

CONTENTS



Note: Finnart-Grangemouth Pipeline is in existence

1. EXPLORATION AND PRODUCTION

With oil imports costing £1,000 million a year and with a growing demand for energy in a world in which energy supplies are far from secure, major domestic oil and gas resources are clearly of the greatest value. For Scotland the discoveries in the northern part of the North Sea are of immense importance.

THE LOCATION OF THE OILFIELDS

As a result of exploratory work so far, about eleven finds of oil have been announced in the British sector. Most of these have to be further assessed, but five have been established as propositions for early commercial use; oil is unlikely to begin coming ashore until next year.

The following annual peak production figures are expected:

- The BP 'Forties' field off Aberdeen, the largest find—about 20 million tons a year;
- The Shell/Esso 'Brent' field, to the east of Shetland—15 million tons;
- The Shell/Esso 'Auk' field, to the east of Dundee—2 million tons;
- The Hamilton 'Argyll' field, also east of Dundee—3 million tons.
- The fifth commercially viable find is Occidental's 'Piper' field, east of Wick. Recently announced development plans include facilities for landing up to 10-12 million tons a year.

In addition mention should be made of two relevant finds in the Norwegian sector—oil in the Ekofisk area; and gas in the Frigg field, which also extends into the British sector. These developments are shown in the map on page 4.

THE EXTENT OF THE OIL RESERVES

One great difficulty in assessing the significance of under-sea oil is to estimate the potential scale of discoveries in the next 30 to 40 years. Exploration and development are still at an early stage and many areas round the coast remain to be tested and assessed. Until this is done it is impossible even to begin to estimate with any claim to accuracy the full extent of the commercially productive reserves. The Government have not tried to estimate more than seven years ahead and present estimates are that by 1980 production of oil from the British Continental Shelf could possibly supply about half of the United Kingdom's requirements of oil at that time. These Government estimates, which are periodically reviewed and updated, have to allow for production from finds which have shown positive results, but whose extent and viability have not yet been assessed, and for new discoveries. It is even more difficult to forecast output after 1980, as exploration continues and extends to waters beyond the North Sea.

Other estimates of production and reserves have also been made. The report of the International Management and Engineering Group (IMEG), published earlier this year, gave an estimate of production of 103 million tons—higher than the earlier Government figure, because of different assumptions about the speed of production build-up—with production rising to 135 million tons in 1985. Other unofficial estimates go above this, but no firm assessment can be made of the total amount of oil likely to exist in the British offshore waters. Even where promising geological structures exist, there is no certainty of oil or gas. Only extensive exploration and appraisal drilling can reveal what actually lies beneath the sea bed. Indeed, some of the geologically interesting structures west of the British Isles are prospective only in the longer term, since the depth of waters puts them beyond the limits of existing production technology.

The technical aspects of sea-bed exploration and production are very complex. The various stages which occur, namely survey work, exploration, development and production are outlined briefly below.

THE SURVEY METHODS USED

There are three principal methods of surveying the sea-bed to determine the existence of structures that might be petroleum-bearing—magnetic, gravimetric and seismic. The last of these gives the most detailed information and operates through the different responses of rock

strata to shock waves. In general, this work is carried out by specialist contractors on behalf of licensees, but a Governmental agency is also active in this field. This is the Institute of Geological Sciences, formerly the Geological Survey, operating under the aegis of the Natural Environment Research Council. It is partly based in Edinburgh, where its activities include the Scottish headquarters for conventional geological survey work, the Seismology Unit, and one of the Continental Shelf Units. This Continental Shelf Unit is one of two in the UK and, with the other Unit at Leeds, helps to provide full assessments of the geological and geophysical information available about the Shelf, including the data which the licensees are required to provide to the Government under their work programmes. These confidential assessments are available to the Government's professional oil advisers.

A preliminary detailed map of the geology of the southern part of the North Sea has been produced, identifying the potential hydro-carbon-bearing areas of the Shelf. More maps of other areas, including Scottish waters, are now in hand. As a result of this work by the Institute the UK is likely to become one of the world leaders in the provision of comprehensive offshore geological surveys.

THE EXPLORATION AND APPRAISAL STAGES

If the geological and geophysical evidence is favourable, the licensee will conduct exploration drilling to determine whether oil or gas exists in the rock structure. Where the water is more than about 200 feet deep—as it is in a large part of Scottish offshore waters—drilling is usually carried out from semi-submersible drilling rigs or from drilling ships. The weather conditions in the North Sea are among the worst of any offshore exploration area in the world. This has required the design of large new rigs, costing up to £10 million, more of which will be operating in the next few years.

Once a discovery has been made it must be appraised by the drilling of further wells. This helps to determine the extent of the structure and whether the find is commercially viable. Chart 1 on page 23 shows the number of wells drilled in the UK Sector since 1964/65. The number of exploration and production wells has been increasing since 1970/71 as the search for oil builds up. Chart 2 shows the estimated pattern of rig activity up to 1977, which suggests a continuing rapid rate of exploration.

DEVELOPMENT AND PRODUCTION

Once a find has been proved to be commercial, the company has to make plans to develop the field. The development stage generally involves the drilling of directional production wells from fixed platforms firmly secured to the seabed and projecting well above the surface of the sea.

The climatic conditions and the depth of water in the North Sea cause difficulties for all phases of the production process. For example, the development of the 'Forties' field calls for four production platforms, each of which will drill about 27 directional wells to tap the field. These platforms will be sited in 400 feet of water and must be able safely to withstand 94 foot waves with a simultaneous wind velocity of 130 mph. In total, each structure will be 700 feet tall, higher than London's Post Office Tower, and will use about 50,000 tons of steel, about the same as was used on construction of the Forth railway bridge. Chart 4 on page 24 shows the number of platforms likely to be in operation over the next few years. The largest in the world is at present being built in the North of Scotland, at Nigg Bay in the Cromarty Firth.

TRANSPORTATION

The transport of oil from field to shore depends on such factors as the rate of production, distance from shore and water depths. In the case of the large Forties field it is planned to pipe the oil ashore through a 32 inch diameter line with a $2\frac{1}{2}$ inch reinforced concrete coating. In the case of the relatively small Auk field, the flow rate is not large enough to justify the high capital cost of a pipeline, and Shell propose to load the oil direct into tankers from a single-point buoy mooring. This method will also be used initially at least for Shell's Brent field.

Neither of these transportation methods is trouble-free. The laying of such a large diameter line from the Forties field in about 400 feet of water has never before been attempted and is something of a record in itself. Pipe-laying in deeper waters will be even more difficult—so difficult that a new generation of dynamically positioned semi-submersible pipelaying barges is being designed for the purpose. Once successfully laid, however, pipeline transport is very reliable.

Loading tankers at sea by single-point buoy mooring requires reasonable weather conditions and this method is liable to be interrupted by bad weather, often for several days at a time. Consequently, to ensure that oil production continues, consideration has been given to storing the oil in floating or underwater tanks until tanker loading can resume. This arrangement is being introduced in connection with production from the Ekofisk field, involving the construction of a 1 million barrel concrete tank.

The stages of development following the exploration and discovery of oil are accordingly technically demanding and expensive. Chart 3 on page 24 gives an example of how the timing and phasing of expenditure on an oil discovery might proceed.

2. ONSHORE INDUSTRIAL AND ECONOMIC ACTIVITY

During the past eighteen months, the pace of developments associated with the exploration and production of oil has been remarkable, especially on the east coast. Just as exploration itself has proceeded rapidly, so have the various industrial and service projects stimulated by the oil industry. It is estimated that North Sea oil activities have already given rise to some 3,600 jobs in Scotland and that projects so far announced can potentially give rise to a further 8,600 over the next few years. A sizeable drop in unemployment in the Cromarty Firth area has already been brought about and unemployment in Aberdeen is now well below both the Scottish and United Kingdom average. Besides these industrial and service activities, the discovery of oil has also influenced port developments, transport, and infrastructure plans.

THE INDUSTRIAL OPPORTUNITIES

The present pattern of development indicates two main centres for the manufacture of heavy equipment for the oil industry.

In the *Moray and Cromarty Firths:*

- Brown and Root are building production platforms for the BP Forties field and for the Indefatigable gas field;
- J. Ray McDermott are preparing to undertake similar work at Ardersier;
- M. K. Shand have established a pipe-coating plant for BP's underwater pipeline.

In the *Firth of Forth* area:

- Redpath Dorman Long (North Sea) Ltd are building platforms for the Auk and Brent fields at Methil;
- Robb Caledon and Motherwell Bridge are undertaking steel fabrication at Burntisland;
- Bredero Price are establishing a pipe-coating plant at Leith, where the land pipeline from Cruden Bay to Grangemouth will be coated.

Numerous other developments ranging from the inquiry stage to firm projects are in process and the map on page 4 shows existing yards, and those for which planning applications are approved or pending. On the West Coast McAlpines are to build concrete platforms using the deep water at Ardyne Point.

PLATFORM CONSTRUCTION SITES

Site requirements for this kind of activity vary according to the character of the structure to be built. The platforms at present under construction at Nigg Bay, Ardersier and Methil are steel structures which will be fixed to the seabed by piles. Steel platforms require coastal sites with access to water up to about 60 feet in depth. Such sites can be found in a number of areas where existing communications and infrastructure services already exist to a greater or lesser extent.

In future some platforms seem likely to be manufactured wholly or in part in reinforced concrete, relying on their weight to keep them in position. The construction of these structures, substantial parts of which may be built while the structure is afloat, will in most cases require sites with access to much deeper sheltered water. These deep water sites can be found only in a few places on the West coast. Such sites are liable to be remote from existing communities and infrastructure, to have difficult communications and to be in areas of high landscape value.

In view of these factors, the Government has been assessing the demand for facilities for platform assembly likely to arise and the possibility of meeting it. While it is impossible at this stage to make precise forecasts, the oil discoveries so far made suggest that for at least the next 10 years the demand will be very substantial.

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The fabrication sites for which planning permission has been given in Scotland are capable of accommodating some 12 structures at a time, of which 8 would be steel structures. Given the fact that it takes 18 months to 2 years to build each structure there would appear to be a need for at least double this capacity. The Secretary of State has made clear that in dealing with this demand he will ensure that coastline of exceptional value is not damaged. His planning controls will be exercised in such a way that the number of sites is limited and that full advantage is taken of sites which have the particular characteristics required.

OTHER INDUSTRIAL DEVELOPMENTS

Many companies throughout Scotland are sharing in the task of supplying the oil industry, and others are equipping themselves to do so. Orders connected with North Sea oil equipment have been won by some well established Scottish firms; for example, cranes are being manufactured by Carruthers in East Kilbride, compressors by Howdens in Glasgow, pumps in Glasgow by G. & J. Weir, generators by Parsons Peebles in Edinburgh, and deck modules by Foster Wheeler John Brown in Dumbarton. Companies based in the United Kingdom are supplying some 50 per cent of the oil industry's requirements. It is hoped to increase this substantially and in Scotland it is especially important that industries in the west of Scotland, many of which have appropriate skills and experience not currently being fully employed, should benefit by winning orders. The steps the Government are taking to encourage the fullest participation by industry in Scotland and in the UK generally are described in the next section.

The supply and servicing operation for oil exploration rigs and production platforms is generally undertaken by purpose-built supply boats at the rate of two or three for each rig. The vessels operating in UK waters have been developed from those used in calmer sea conditions in other parts of the world. Originally concerned mainly with the supply task, their nature and function have been extended to provide anchor handling and towing capability. The dimensions of vessels currently available range in length up to 200 ft, in beam up to 42 ft and in draught to 15½ ft, and maximum power on forward thrust units is about 7,000 bhp. Some of the latest boats have more than one bank of power units to provide extra thrust for towing. (Chart 4 on page 24 estimates the scale of supply vessel operations needed up to 1977.)

Supply boats are of a size and type which would make them suitable for building in some of the smaller Scottish shipbuilding yards, where they would be a welcome source of employment. Hall Russell of Aberdeen, who originally built a vessel of this type on spec, are the only Scottish company so far which has been able to break into this market for which they seem well suited. But there are other Scottish companies who should be able to play an important part and it is greatly to be hoped that they will benefit from the opportunity.

3. GOVERNMENT ORGANISATION AND INITIATIVES

Rapid arrival and growth of the under-sea oil industry, following the earlier discoveries of under-sea gas, have led to a number of important changes in Government organisation which are designed to stimulate development and provide co-ordination and control.

THE SCOTTISH ECONOMIC PLANNING BOARD AND NORTH SEA OIL DEVELOPMENT COMMITTEE

The Scottish Economic Planning Board is the body principally responsible for planning and co-ordinating the provision of infrastructure and services required for economic development. All the main Government Departments in Scotland are represented on the Board and its chairman is the head of the Regional Development Division in the Scottish Office. From the start the Board has been closely concerned with the infrastructure required for the North Sea oil developments; but during 1972, in response to the increasing pace of development, the Board set up a special North Sea Oil Development Committee to ensure that the planning provision of infrastructure for North Sea oil was given maximum priority. The Departments most closely concerned in the oil operation are represented on the Committee which works under Scottish Office chairmanship. Other Departments and public bodies may be consulted and called in as required.

The Committee's remit requires it to maintain close contact with local organisations, and to provide advice and assistance to local authorities on the planning aspects of oil related developments. Because the Cromarty Firth and Inner Moray Firth areas have been suddenly and acutely affected by new industrial activity on an unprecedented scale, there are special co-ordinating arrangements with the local authorities in that area.

One of the Committee's immediate tasks is to estimate the growth of employment and related population in the areas most likely to be affected over the next few years. This involves contact with the companies concerned and the collection and processing of information from a wide variety of sources. The results of this work are being made available as quickly as possible to Departments, local authorities and other bodies responsible for planning and the provision of services.

STANDING CONFERENCE ON NORTH SEA OIL

Because of the quickening pace of the oil developments and the wide range of interests involved who needed to be kept well informed, the Parliamentary Under-Secretary for Development, Mr George Younger, presided on 14 February 1972 at a meeting between representatives of the oil companies, Government Departments, local authorities and other parties concerned with the oil developments. The meeting established itself as a Standing Conference on North Sea Oil and will meet twice yearly under the chairmanship of a Scottish Office Minister. The second meeting of the Conference was held at Inverness on 3 October and the third in Dundee on 27 April.

The Conference provides a forum for discussion of matters of common concern relating to the development of the industry. Among the subjects which it has discussed are land requirements and environmental problems, the impact of oil developments on the Highlands, and business opportunities for Scottish industry. Periodic information sheets on the progress of the North Sea developments are issued to members of the Conference between meetings and are also made available to a wider public. The Regional Development Division of the Scottish Office acts as a central point of reference for information and enquiries.

RESEARCH STUDY ON THE IMPACT ON SCOTLAND OF OIL RELATED DEVELOPMENT

The Scottish Office has commissioned a research study into the impact on Scotland of the discovery of North Sea oil. The study will be carried out by the Department of Political Economy at Aberdeen University under the joint direction of Professor Maxwell Gaskin and Professor Donald MacKay. It is expected to cost £37,500 and will take about three years to complete. Interim results will be available as the work proceeds.

The aim of the study is to examine the present and future impact of petroleum exploration, extraction and processing, together with their related services and activities on the areas of Scotland most affected. The main subjects examined will be:

- The impact of new and prospective developments on local labour markets.
- The effects on existing industries and services.
- An assessment of the overall infrastructure requirements for the future.

The areas to which particular attention will initially be paid include Aberdeen, Dundee, Orkney and Shetland, the Cromarty Firth area, and the Firth of Forth.

The research staff will work closely with Government Departments and the study will be controlled by a Steering Group chaired by the Senior Economic Adviser in the Scottish Office. The results of this work will be available as it proceeds to the North Sea Oil Development Committee and will be communicated where appropriate to local planning authorities.

OFFSHORE SUPPLIES OFFICE AND SCOTTISH PETROLEUM OFFICE

In order that the role of British companies in supplying the needs of the oil industry should be properly assessed, the Government commissioned a study from the International Management and Engineering Group in the spring of 1972. Their terms of reference required them to look especially at the contribution which could be made from firms in Development Areas including Scotland. Their Report has been published, and gives a detailed account of the forms of activity in which British companies may be expected to participate.

In response to the consultants' recommendations the Government have set up within the Department of Trade and Industry an Offshore Supplies Office in London and a new Scottish Petroleum Office in Glasgow. These will be responsible for promoting the maximum participation from British and Scottish industry. The Scottish Petroleum Office will work with the Scottish Industrial Development Office (SIDO), established a year ago in Glasgow, to promote the development of Scottish industry. The new office will, through SIDO, be in a position to keep in touch with all parts of Scottish industry. It will be able to make use of the powers to provide selective financial assistance which were delegated to SIDO under the Industry Act and will draw on the skills and expertise of SIDO staff as well as on their contacts with Scottish industry.

The new Office will have alongside it a branch of the Petroleum Division of the DTI, staffed largely by expert petroleum production engineers. This new organisation will therefore form a strong Scottish centre for all industrial matters arising from oil and related activities.

4. THE PROVISION OF INFRASTRUCTURE AND SERVICES

The steadily increasing activity in the wake of the discovery of oil has meant demands for additional investment in the areas affected. Many Scottish ports and harbours in the north and north-east are preparing for the present and future servicing of rigs and platforms, and additional infrastructure investment and services are necessary to meet the requirements of the new oil industry and of the expanding population in particular areas. In this way the construction of ports, harbours, roads, housing and other facilities and services are being accelerated some time before the first oil from the North Sea is landed.

PORTS AND HARBOURS

Ports or harbours must meet a number of requirements for them to be suitable for the establishment of service bases. They must be capable of round-the-clock operation at all states of the tide and, within the limits of acceptable cost, water depths alongside berths should be as great as possible as this enables them to be put to several kinds of use. This is particularly important if incoming cargo is to be brought in by general cargo vessels. The length of berthage required varies from 100 ft to 250 ft and the quay will normally have to accommodate heavy and lengthy loads; most servicing companies need warehousing and open storage facilities, either adjoining the quay or within a relatively short distance.

During exploration drillings, a single rig might need 1,000 tons of supplies per month, mostly fuel, chemicals and tubular steel. Later development drilling calls for a larger volume of supplies and a single production platform might then use 25,000 tons of supplies in a year. Of this 50 per cent would be liquid (water and fuel), 25 per cent powder (cement etc.) and 15 per cent tubular steel.

The National Ports Council have recently undertaken a study of the demand for, and supply of, berth facilities at bases in Scotland for oil rig servicing in the UK sector of the North Sea. The findings and conclusions of this study will be made available for guidance in the formulation and appraisal of proposals for the development of oil service bases. Meanwhile, many port and harbour developments presently exist or are under way, as is shown in the following paragraphs and on the map on page 4. The main centres of activity for the industry are at present Aberdeen and Dundee.

ABERDEEN: Work is in progress on a £1·3 million scheme to convert the Victoria and Upper Docks to tidal working and will result in about 2,250 ft of quayside being available for service vessels at all states of the tide.

In addition to existing facilities at Pocra Quay:

- Amoco are building a 350 ft quay and supply base for their operations;
- Shell are operating out of Torry and are awaiting approval for expanding their base. (Other operators are using adjacent facilities);
- Texaco with six acres of land leased are to construct their own base on the south bank of the River Dee;
- SEDCO are also based in Aberdeen, as are other major drilling contractors.

DUNDEE: The Harbour Trust have reached agreement with Dundee Petrosea Ltd for the exclusive use of the new facilities at the Eastern Wharf, currently under reconstruction at a cost of £450,000. This development, which will provide an additional 540 ft of quay space, is primarily for service vessels (3 berths) and also incorporates facilities for roll-on/roll-off ferries.

- BP's supply operations are based on Queen Elizabeth quay with comprehensive facilities available.
- Conoco, who have signed a contract with Dundee Petrosea Ltd, are now operating from this base.
- Ocean Inchcape, who own and operate supply vessels, have announced plans for a base in the vicinity of the Robb Caledon yard.

PETERHEAD: Several developments are under way or planned by Arunta and the Aberdeen Service Co. The last of these is associated with the development of the south side of the Bay undertaken directly by the Secretary of State following parliamentary authorisation. This swift Government initiative and action are outlined in the Appendix on page 21.

MONTROSE: A major development is being undertaken jointly by P & O and the Montrose Harbour Trust at an estimated cost of £2·5 million. The project will involve extensive reclamation to provide land for storage facilities. The berthage is designed to accommodate up to 12 supply vessels. The base will be operated by a subsidiary of the P & O group—Sea Oil Services Ltd of Aberdeen. The first stage of the development, on the north side of the harbour, is expected to be operational by the Spring of 1973.

LEITH: Continental Shelf Supply Services Limited have taken options on 70,000 sq ft of warehousing on the quayside at Victoria Dock with a view to providing a 24 hour supply service. Other quay facilities are available for further oil-related activity. The new entrance lock provides a constant depth of 37 ft of water in the Western Harbour.

HOUND POINT; near Dalmeny: The Forth Ports Authority and BP are negotiating about the proposed development of an island terminal in the Forth, which would be able to take 250,000 ton tankers. Planning permission for the terminal has already been granted.

WICK: There are three separate proposals by potential developers for oil service bases in the existing harbour. One of these developers also has plans for a development at *Scrabster* Harbour.

SHETLAND ISLANDS: At Lerwick, the Harbour Trustees have plans for an extension of the North Harbour to accommodate the Aberdeen/Lerwick ferry roll-on/roll-off terminal and facilities for Shell/BP. Sea Oil Services Ltd and Fred Olsen Ltd also plan to establish oil service bases north of the existing harbour area at Lerwick. Hudsons Service Co are developing a service base on a 25 acre site at Sandwick. The County Council recently applied for a Scottish Provisional Order giving them powers to control port and other developments in Shetland and to undertake certain developments at their own hand. Parliament has decided that these proposals must be promoted in the form of a Private Bill and this is now being done.

ORKNEY: Hudsons Service Co have announced plans for a £1 million base at Carness covering 160 acres with 3,000 ft of quay space. A consortium of Shell, BP and SEDCO have expressed an interest in the use of facilities at the former RN Store Depot at Lyness, Scapa Flow, for an oil service base, and negotiations between MOD and the consortium on the terms of a lease for part of the facilities are well advanced. The County Council have sought and have been granted leave to promote a draft Provisional Order on similar lines to that applied for by Zetland.

ROADS

The highest priority is being given to the improvement of the A9 between Central Scotland, Inverness and Invergordon at a cost of some £60 million. A limited amount of improvement work between Perth and Inverness has already been carried out or is in progress. In May 1972 details of 8 schemes on which preparation work was being started were announced and the preparation of a further 9 schemes was announced in September. Apart from a difficult section through the Pass of Killiecrankie where further studies are being undertaken, the entire A9 between Perth and Inverness is included in the comprehensive preparation now under way. The schemes will provide for an extensive realignment of the A9 and for by-passes of Perth and Inverness in addition to towns such as Dunkeld, Aviemore, Newtonmore and Kingussie. These schemes require the solution of major engineering problems in very difficult country, but preparatory work is being pressed forward vigorously and several schemes have now been developed to the stage of indicating the preferred route of the road.

The section of the road on which work will start first is the stretch from Inverness to Invergordon across the Black Isle. Statutory trunk road orders for this were made in September 1972. This part of the scheme involves 20 miles of new road at an estimated cost of £17 million. It is hoped to start work on the foundations of the Kessock Bridge this year, which itself is a major undertaking costing £6 million and similar in scale to the Erskine Bridge over the Clyde. It is hoped to have the whole section ready for traffic on the completion of the bridge in 1977. This will reduce the distance to Invergordon by about 12 miles.

The virtual reconstruction of the A9 and the completion of the M90 motorway from Edinburgh to Perth at an estimated cost of £20 million will provide a modern strategic route from North Scotland to the central industrial belt and the South. To this the North East will be linked by a fast feeder route achieved by general improvement of the existing roads including the provision of dual-carriageways between Perth and Dundee and between Stonehaven and Aberdeen; the improvement of both the inland and coastal routes between Dundee and Stonehaven; improvements at Peterhead; and the reconstruction of bridges and bypassing of various communities on the route. This programme envisages expenditure of some £11 million.

The motorway programme from Glasgow to Stirling and the completion of a 'motorway standard' route between Edinburgh, Glasgow and Greenock are also proceeding.

AIR SERVICES

The need for fast personal communications underlines the important part that will be played by air services in the development of the North Sea oil industry. Already traffic is growing rapidly; Aberdeen had 190,000 terminal passengers in 1972, 40 per cent above 1971, while at Sumburgh, Shetland, the increase was even more dramatic, at 60 per cent. A number of improvements have been introduced or are under discussion, including:

- jet services direct from Aberdeen to London;
- proposals for a new terminal at Aberdeen;
- new terminals are in operation at Inverness and Sumburgh and improved airport facilities are planned.

Aberdeen and Sumburgh have become the major bases for helicopter servicing oil rigs of the Scottish coast, and BEA moved their United Kingdom Administrative headquarters for helicopters to Aberdeen last year. Private companies also operate helicopter services from Aberdeen, Sumburgh and Inverness (see map).

The Civil Aviation Authority has set up a Working Group to consider the future of Highland air services (including Aberdeen) and the longer-term implications of the growth in traffic due to North Sea oil developments. Part of this Group's work will be to quantify the demand for air travel by the oil industry and associated developments in order to assess what further improvements of ground facilities will be required.

RAILWAYS

British Rail have also responded to the activity generated by oil developments. Improved passenger services to Aberdeen have been introduced and much of the steel, cement and pipes for North Sea oil has been carried by rail. The first of a new design of small freightliner terminals is to be constructed at Dundee, with a capacity of 60 containers per day and provision for future expansion. British Rail are paying close attention to the need for rail links required for oil-related developments. This has resulted in the construction (in one week) of a quarter-mile spur from the Inverness to Wick/Thurso line to serve the pipe coating yard of M. K. Shand Ltd at Invergordon, and the reopening of the passenger station at Alness (closed since 1960) to cater for the greatly increased population in the district.

HOUSING

Housing in the areas affected by North Sea oil developments may be provided by the local authorities, by the Scottish Special Housing Association, or by private developers.

- Local authorities in the areas directly affected by North Sea oil activity face a variety of problems and uncertainties in providing new houses. In particular there has been uncertainty about the precise extent and timing of the new demands; and because of overload on the building industry, there is an acute shortage of labour which adversely affects the competitive pricing of contracts. These problems are being tackled in a number of ways, including in the Moray Firth area joint discussions between the Government and the authorities concerned, directed towards co-ordinating demands and organising better methods of meeting them.

- A direct Government contribution is being made through the Scottish Special Housing Association with a total programme of 2,300 houses for completion in the period 1973-77. The Association are already building 200 houses in Inverness the first of which will be completed towards the end of 1973 and the remainder in 1974. They will also be building 200 in Nairn, 200 in Dingwall and 250 elsewhere in Easter Ross. In the North East they are engaged on a programme of 1,350 houses and they will be building 100 in Shetland.

- Private housing developments are much more difficult to forecast depending as they do on independent assessments of population movements and on the supply of available land. From information provided by the local planning authorities in the North and North East, some 1,700 acres are zoned for development for owner occupation, of which some 800 acres have accessible services.

These housing developments and the associated population movements will of course give rise in many cases to a need for additional school provision. The Scottish Education Department are keeping under review, with the education authorities concerned, the scale and timing of the new building required.

5. PLANNING, THE ENVIRONMENT AND POLLUTION CONTROL

There is no doubt that North Sea oil developments can bring economic benefits to the Scottish economy in terms of employment and higher incomes. But fears have sometimes been expressed about the ability of the planning system to cope with them. On the one hand it is suggested that planning procedures are so time consuming that developments may be lost or only be realised on a smaller scale than would otherwise be possible. On the other hand, there are anxieties lest the environment may be damaged either because the speed of developments outpaces the controls available under the existing planning machinery or because that machinery simply proves unequal to the task. It is clear that these anxieties are to some extent contradictory and that some at least of the fears in the popular mind arise from an imperfect understanding of the planning system. But in fact the system has worked well so far despite the considerable strain which major new developments have imposed upon it. As earlier sections of this Bulletin have shown, several valuable projects have been able to get under way with a speed which few thought possible, yet any environmental damage has been kept to a minimum.

PROJECT REQUIREMENTS

The wide variety of activities associated with under-sea oil and gas have already been described. This diversity applies particularly to the operations on land and their site requirements. For example:

- Well-head platforms are of many different types and sizes and the particular design may determine depth of water required and other features of the site.
- The fabrication of certain types of concrete platforms is limited to a small range of possible sites because of the great depths of water required close inland.
- The servicing of both exploration rigs and platforms requires harbour bases with a wide range of supplies and services, as the last section has shown.
- Pipelines can only be brought ashore where the landfall is suitable, and the rocky conditions which prevail on much of the coastline of North and North-East Scotland make such sites hard to find.
- Storage and processing points on land will be needed.
- Refineries and other industrial developments may be required.

Thus, each one of these operations will have different requirements, different time-scales and a different impact on the area and its communities. Of equal importance are the housing and infrastructure requirements of communities whose population may increase rapidly with new employment. The planning authorities must therefore look forward over as long a period as possible in preparing their development plans.

THE PLANNING SYSTEM

The objective of planning control is to determine the best use of land from the point of view of the community as a whole. Developments must take place with the least possible damage to the physical environment and in such a way that they strengthen rather than weaken the social fabric of the areas affected. This means that a difficult middle course must be followed between the extreme attitude which would have nothing stand in the way of industrial development in Scotland and the contrasting view which opposes virtually any change in the existing environment.

The development planning and control machinery is laid down in the Town and Country Planning (Scotland) Act 1972. Local planning authorities have a statutory duty to prepare development plans which indicate the areas zoned for particular uses such as industry and housing. These plans are submitted to the Secretary of State for his approval.

In most cases development proposals lie within the appropriately zoned areas of existing development plans. Each proposal for development however must be the subject of a planning application to the local planning authority, which may approve it, with or without conditions, or reject it. If it is rejected the applicant may appeal to the Secretary of State.

The application may however not conform with the current development plan. A prudent local authority will attempt to anticipate new forms of development by keeping its plan up to date, amending or revising it as necessary. But such revisions take time, since they must be undertaken in great detail to show the citizens who may be affected, and ultimately the Secretary of State, that the revised plan is well founded. It is hardly surprising that the early on-shore developments associated with North Sea oil have required amendments of development plans, most of which were drawn up before oil discoveries could be forecast. Where a proposed development is significant and does not conform with the development plan, the authority may have to ask the Secretary of State for a direction authorising them either to approve the planning application or to submit a development plan amendment.

The Secretary of State may call in any proposal for his own consideration if the application is of national significance or affects more than one local planning authority. In all three cases—appeal against rejection, applications for a direction or development plan amendment, or called in planning application—the Secretary of State may order a public inquiry. The report of this inquiry is submitted to him and subsequently published. He may then approve the proposal or amendment if he is satisfied that it is well founded.

In view of the importance of reaching quick decisions on major projects, the Secretary of State asked local planning authorities in March 1972 to give priority to the consideration of projects for new industrial building of 15,000 sq ft or more. This has allowed a number of major on-shore developments, notably the fabrication yards at Nigg Bay and Ardersier to be handled swiftly and effectively.

Up to February 1973 just under 1,000 acres of land in Scotland had been allocated for major oil-related developments (with about 250 acres actually in operation) and of this about half had required development plan amendments. A further 1,800 acres are now under consideration. When these figures are compared with the 6,000 acres of land which on average are taken annually for all development purposes in Scotland, they emphasise both the importance of the new industry and the need for good advice in considering possible sites and in taking planning decisions.

Now that on-shore developments have started and the scale of exploration and future oil production are becoming clear, it is necessary for local planning authorities to get ahead with the updating of their development plans. Government departments are doing all they can to assess future demands. The situation may be expected to change constantly as new oil fields are discovered and as advances are made in a rapidly emerging technology. But a substantial amount of knowledge and expertise is now available and Government departments are making this available to local planning authorities through the North Sea Oil Development Committee.

In addition the Scottish Office bring parties together on individual projects where there may be an impact on the environment. Meetings are held where appropriate with representatives of the local planning authority and of the Nature Conservancy and Countryside Commission. Of particular interest from the environmental point of view are the Environmental Forum and the Coastal Survey.

Environmental Forum

This Forum is held regularly under the chairmanship of the Director of the Countryside Commission for Scotland, to bring together representatives of many voluntary bodies concerned with the environment. Bodies represented are:

Countryside Commission for Scotland
Nature Conservancy
Scottish Landowners' Federation
National Trust for Scotland
Scottish Civic Trust
Scottish Wildlife Trust
Royal Society for the Protection of Birds
Association for the Preservation of Rural Scotland
Scottish Council of Social Service
Council for British Archaeology (Scottish Regional Group)
Conservation Society

Not only are the voluntary bodies kept informed of the developing oil scene, but there is also a valuable exchange of views between the various bodies and the Scottish Development Department, both on general matters concerning oil and on particular projects as they are likely to affect the environment. The Forum can be a useful source of information about what is being said, thought and feared locally in areas concerned.

Coastal Survey

The on-shore developments in Scotland have built up rapidly in the last two years, and as has been explained applications for planning permission have been given urgent consideration with the minimum delay. The pressure for development is, however, expected to continue and many difficult planning decisions will have to be taken. To enable the best use to be made of the available sites the Scottish Office, a consultant landscape architect retained by the Department, the Countryside Commission for Scotland and the Nature Conservancy are now undertaking a coastal survey, in order to guide local authorities which have to deal with problems raised by applications for industrial sites.

Existing information about the Scottish coast has been assembled, and special investigations of three main kinds are now being undertaken:

(*a*) A study of the coast and the availability of sites suitable for current industrial demands.

(*b*) A study of the main industrial uses to establish the flexibility that exists in siting requirements.

(*c*) An inspection of the coast in detail to establish its current appearance and use.

POLLUTION CONTROL

Controls exist to minimise the possibility of oil leaks which might damage beaches or fishing grounds. Any offshore operations—seismic surveys, well drilling or the installation of production platforms—require the approval of the Department of Trade and Industry, and the DTI consult Scottish Office Departments as appropriate before consent is given to proceed. The consent of DTI is also required for the routing of pipelines anywhere in the designated areas of the UK Continental Shelf. A condition of such consent is that, wherever possible, pipelines must be buried to remove the risk of damage. The DTI is empowered by Pipelines Act 1962 to prescribe the technical standards of pipelines in territorial waters, which determines the standards for the whole of the line.

Deliberate discharge into the sea of oil from offshore operations is prohibited under Section 3 of the Prevention of Pollution Act 1971 under heavy penalties.

The UK has taken steps to ensure that the necessary preventive measures are taken by all licensees:

- good oilfield working practices must be observed;
- specific requirements for well-drilling methods, equipment and procedures must be followed to prevent and detect blow-outs;
- control and fail-safe equipment must be used in production arrangements.

In addition, legislation now being prepared under the Mineral Workings (Offshore Installations) Act 1971 will also have an anti-pollution effect, insisting that:

- installations and equipment are properly constructed;
- all suitable precautions are taken at sea;
- all operations are properly supervised.

Both licence provisions and safety regulations are enforced by the Petroleum Production Inspectorate of the DTI.

On the basis of experience elsewhere in the world, with these precautions and safeguards the risk of accidental pollutions from offshore oil operations is slight. But it is nonetheless necessary to establish procedures for dealing with pollution, however small the risk may be. Apart from major shipping accidents involving tankers, most oil slicks have hitherto been caused by sea-going vessels cleaning fuel tanks, though this nuisance should be reduced by recent international agreement. Local authorities have schemes for dealing with oil pollution on their shores or on inshore waters, and grants of 50 per cent are available towards the cost of clearance

and the purchase of materials and equipment. The Department of Trade and Industry are responsible for treating oil spills at sea and have the following standing emergency arrangements:

- The Fisheries' patrol vessel 'Switha' of the Department of Agriculture and Fisheries for Scotland is based on Leith. It patrols northern areas including the waters around Orkney and Shetland, and carries on behalf of DTI spraying equipment and over 5,000 gallons of dispersant. DAFS expect to take delivery later in 1973 of another patrol vessel fitted to carry and spray a similar amount of dispersant and, in 1974 of a third such vessel.
- At Invergordon, one dispersant spraying kit is available for use on the tug 'Kestrel' taking 3,000 gallons of dispersant.
- At Aberdeen there are two dispersant spraying kits for use on Aberdeen Harbour Commission tugs carrying about 6,000 gallons of dispersant.
- The oil companies' UK Offshore Operators' Emergency Action Group have agreed plans for co-operation with DTI in the event of serious leakage from a pipeline or oil rig. This group have on Scalloway, Shetland, 7,200 gallons of dispersant with spraying equipment for fitting to an oil rig supply vessel; and at Aberdeen 14,400 gallons of spraying sets for fitting to two similar vessels. It is understood that BP Ltd manufacture up to 10,000 gallons daily of a suitable dispersant at Pumpherston so that additional supplies can be available at short notice.

6. CONCLUSION

This Bulletin has shown that in the short space of two years since the discoveries of North Sea oil became a commercial reality, major industrial and service developments are taking place in Scotland. Much of this is happening in areas which were previously little affected by industry. Scotland's recent economic history gives no parallel to this situation; only by going back to the spread of industrialisation in the Central Belt a hundred years ago can one find one.

Scotland needs the employment and prosperity that these new activities can bring. Some areas which previously suffered from inexorable population decline are rapidly acquiring a new dynamism. Scotland's labour force has the skills and training to meet these new demands whether it be engineering, metal working, shipbuilding or seafaring. Opportunities such as those now appearing are rare; and it is essential that Scottish industry and labour should respond if the opportunity is not to be lost to others. In particular, the industries of the Clyde valley and of Lanarkshire have both the need and the opportunity to gain. The Government will assist and are already doing so, but the initiative should also come from firms themselves.

The spread of development to new areas creates problems as well as opportunities. Scotland has suffered much from the social and physical legacy of unplanned growth in the nineteenth century: and it is vital therefore to avoid repeating the mistakes of the past in the areas which are now becoming industrialised. It would be foolish to claim that industrial growth can take place without environmental disturbance. But it is the purpose of planning to ensure that environmental damage is kept to the minimum and that when it does occur the social and economic gains are substantial enough to justify it. Scotland is fortunate in having more space for development than most European nations; but the physical requirements of some of the heavy industry, notably platform construction, are likely to impose severe limits on the number of possible sites. Where these are of high landscape value, difficult planning decisions are inevitable.

The planning machinery has so far stood up well to the test which these developments have imposed upon it. As this Bulletin shows, the Government have taken speedy action to initiate a whole range of major infrastructure projects, and have set up machinery to assist the local authorities and to co-ordinate planning generally. There will of course be some short-term problems, since some types of infrastructure by their nature cannot be provided as quickly as industrial projects can be set up, and in some areas labour resources are already overstretched. The Government will try to identify the areas of need as far in advance as possible and give priority to the provision of necessary infrastructure. But companies too have a part to play, for orderly and successful development requires full and early consultation between the Government, local authorities and those involved in industrial and commercial development.

DEVELOPMENT OF PETERHEAD HARBOUR OF REFUGE

The Bay at Peterhead has for many years been a refuge from storms. Because the Secretary of State for Scotland was the harbour authority there, with very limited powers under a local Act of 1886, the Government were able to take swift action when the Bay's suitability as a servicing base became evident last year. As a result the Scottish Office are now directly involved in providing harbour facilities for the oil industry. The Department of Agriculture and Fisheries are building the basic quay structure for a service base on the south shore of the Harbour at an estimated cost of £2 million. On the north side Arunta (Scotland) Ltd are developing a similar but smaller base.

Peterhead Harbour of Refuge was formed by the building of two massive stone breakwaters enclosing the South Bay of Peterhead. This has enabled the Bay in the past to be used simply as a sheltered anchorage. The construction work, for which Peterhead Prison was originally established, was authorised by the Peterhead Harbour of Refuge Act of 1886. But it was not finally completed until the 1950s. The Harbour was then transferred to the Secretary of State for Scotland in view of his responsibilities for the Prison and his general interest in harbour facilities.

The Department of Agriculture and Fisheries assumed financial responsibility for the maintenance of the breakwaters and the general upkeep of the Harbour although day-to-day work was carried out on their behalf by the Peterhead Harbour Trust. The Trust are statutorily responsible for the Fishery Harbours of Peterhead which are entered through the Harbour of Refuge. In recent years Peterhead has become established as the second fishing port in Scotland in terms of the value of landings.

During 1971 the increasing pressure on harbour facilities at Aberdeen forced companies servicing the offshore developments to look elsewhere if they were to expand their activities. Two main factors attracted them to Peterhead:

1. The Bay provides the only deep, sheltered water between the Cromarty Firth and the Tay which is accessible in all weather conditions.
2. Peterhead is situated at virtually the most easterly point of the Scottish mainland. The steaming time to the main areas of exploration is accordingly less than from Aberdeen.

The impetus for developing the Bay gained momentum during 1972. The Scottish Office became closely involved in industry's efforts to take advantage of the Harbour's industrial potential. At the same time it was keeping a watchful eye on the possible effects of industrial activity on the amenity of the Bay and on the lives of the local community.

Events then moved rapidly:

Spring 1972	It became evident that development of any kind in the Bay, other than purely as a haven of refuge from storms, was prohibited under the terms of the 1886 Act.
May 1972	Because of the urgent demand for harbour facilities and despite the heavy Parliamentary programme, the Secretary of State introduced an amending Bill into Parliament enabling him to undertake developments of the Harbour or authorise others to do so.
June 1972	Babtie, Shaw & Morton, a Glasgow firm of consulting engineers were engaged to evaluate the various proposals for the south side of the Bay, and to advise on the best overall scheme for the development of the Bay.
July 1972	The final committee stage of the Bill in the Commons was completed.

August 1972 — The Harbours Development (Scotland) Act 1972 received the Royal Assent.

The consulting engineers completed their report, recommending that a 1,500 foot quay should be built and some 22½ acres of land reclaimed to provide six servicing berths.

The Secretary of State accepted the recommendations and decided to directly undertake the development of the basic quay structure for lease to one or more operators.

An explanatory memorandum based on the Report was circulated to all firms which had expressed interest in operating out of Peterhead. It was given wide circulation in the town and was published in full in the local newspaper.

September 1972 — It was made clear to prospective leasees and in Parliament that the Government would expect a full commercial return on their investment.

A public meeting was convened in the town at which officials of the Department explained the developments and answered questions on them. The meeting was well attended and the Government's proposals received a general welcome.

October 1972 — Detailed negotiations took place with companies interested in using the Harbour as a servicing base.

Aberdeen County Council started work on a temporary access road to the development site to facilitate the construction work.

November 1972 — A small committee was appointed to advise the Secretary of State on the development of the Harbour of Refuge. Its members were chosen for their wide experience of business, management shipping and local authority administration.

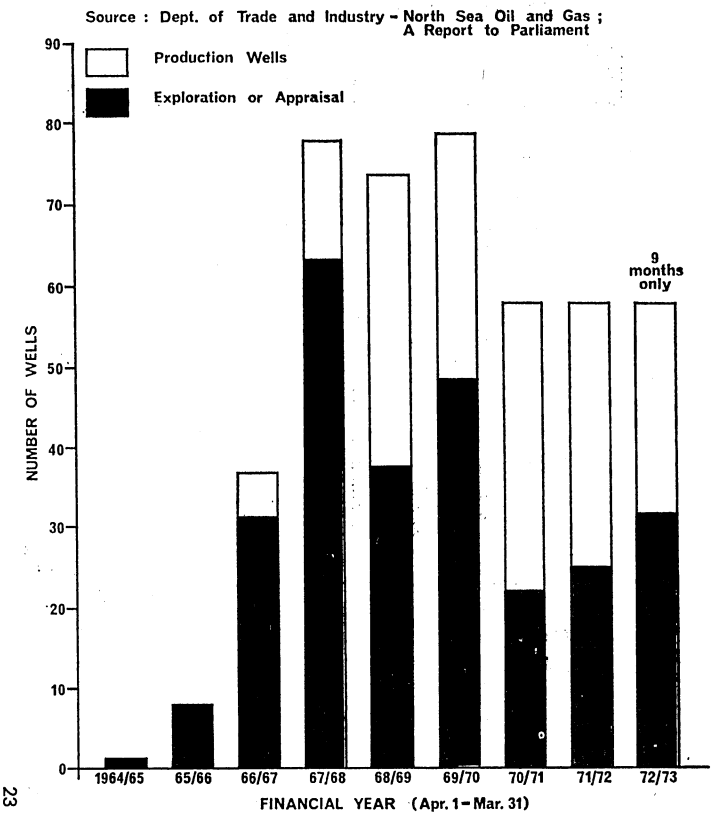
Agreement was reached between the Secretary of State and the Aberdeen Service Company (North Sea) Ltd, a subsidiary of Sidlaw Industries, the important Dundee group, for the lease of the full quay and back-up land.

January 1973 — Dredging work began bringing the sand infill for the reclamation work from Rattray Bay, 4 miles to the north.

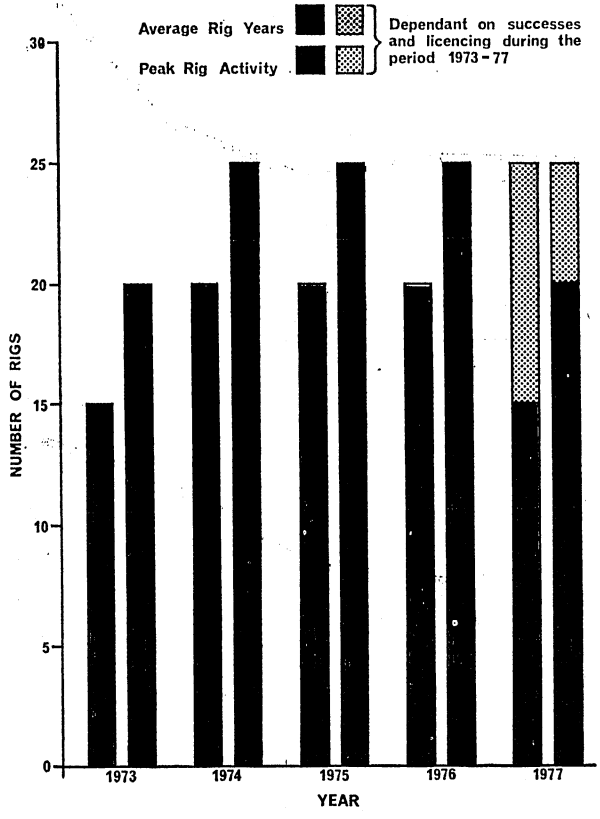
February 1973 — A full-time Harbour manager was appointed to supervise the developments.

March 1973 — The Aberdeen Service Company announced a £500,000 investment programme of warehouses, offices and storage tanks to develop a fully integrated service base at Peterhead. It is expected that the base will be largely completed by October 1973.

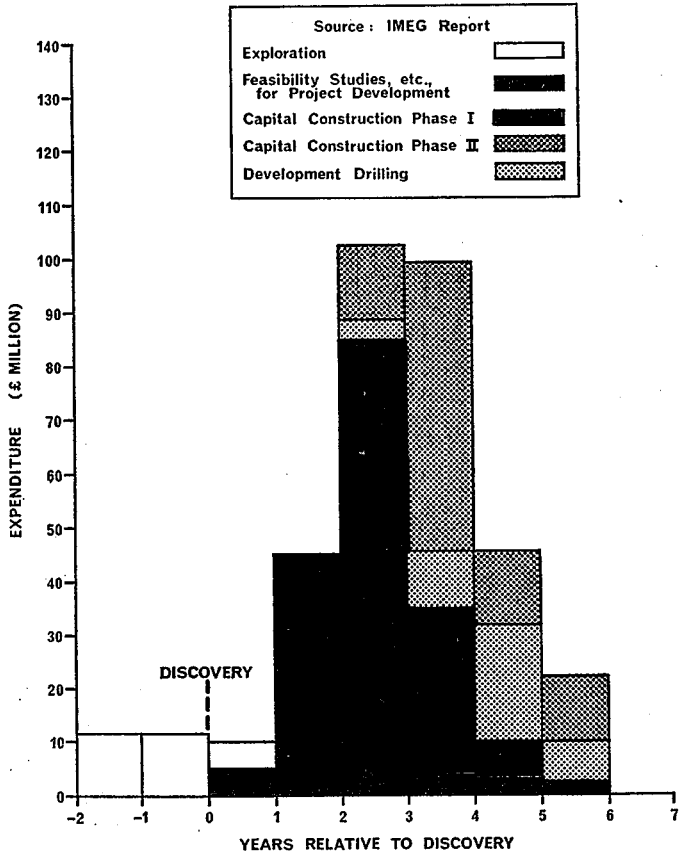
1 Number of wells drilled in the United Kingdom Continental Shelf



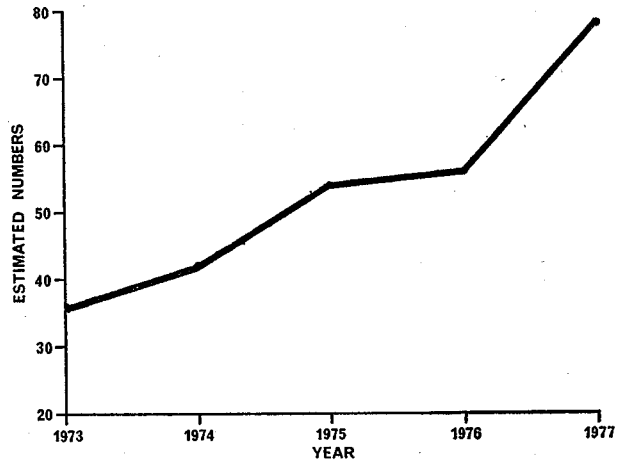
2 Average rig years (based on average number of rigs operating per week throughout the year) and peak rig activity



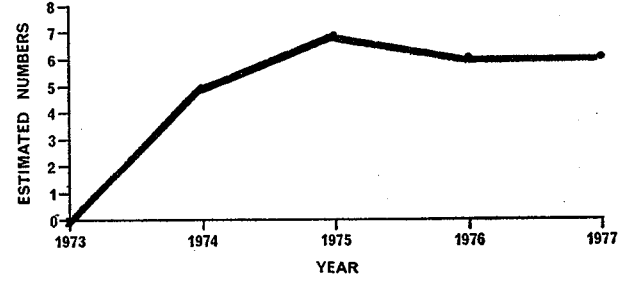
3 Expenditure on drilling by a petroleum company: an example of phasing



4 Supply boats operating from mainland and islands



Operational fixed drilling platforms



Printed in Scotland for Her Majesty's Stationery Office by Howie & Seath Ltd., Edinburgh Dd. 953957/3229 K6 9/73

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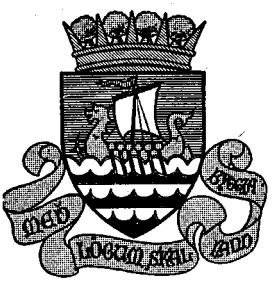
APPENDIX G

ZETLAND COUNTY COUNCIL



INTERIM COUNTY DEVELOPMENT PLAN

County Development Office,
4a Market Street,
Lerwick.

28th March, 1973.

ZETLAND COUNTY COUNCIL

INTERIM COUNTY DEVELOPMENT PLAN

PREAMBLE

Plans for the development of any community must take account of two factors (a) the aims and ideals of that community and (b) the practical steps for the implementation of these aims. The County Council accepts that continuing industrial development is likely to affect the social fabric of the islands. It realises that in any case the social pattern is subject to constant change.

However, as the elements involved in modern industry are so different from the nature hitherto of life in Shetland, the County Council feels it appropriate to set forth the characteristics of present island society and that an attempt should be made to identify the qualities of Shetland life of which many Shetlanders are only intuitively aware. The County Council believes that in so doing it will help the assimilation and happy settlement of the relatively large influx of people who will have to make their homes in Shetland.

Life in Shetland has been affected by various factors.

1. The integration - the homogeneity - imposed by the sea boundary. The high proportion of the population born and bred in Shetland. Only a small changing population.
2. The small size of the population - broken into small communities.
3. Difficulties in communications.

Characteristics emerging from these have been:

a. Communities where the individual feels he matters, has a sense of belonging.

b. Strong family ties.

c. A tolerance through not having been exposed to or confronted by strong social pressures.

d. An absence of serious crime - little parental fear for the safety of young ones.

e. Religious tolerance.

f. The realisation that the continuance of a native dialect affords an enriched means of communication.

This Interim Development Plan is by nature a planning instrument, having to do with the physical and material. It is fit and proper that Zetland County Council should highlight the human background against which it proceeds to meet what is probably the greatest challenge and opportunity in its history.

CONTENTS

COUNTY WRITTEN DEVELOPMENT PLAN

Written Statement

1. INTRODUCTION:

1.1 In the early 1950s a considerable amount of preparatory work was carried out on a County Development Plan; however this material never reached submission stage. The only part of Zetland County to be covered by a statutory plan is the Burgh of Lerwick, the Town Map being approved in 1964. The following year in accordance with S.D.D. Circular No. 2/62 the county submitted tourist development proposals and these were noted by the Scottish Development Department. More recently renewed attention has been given to the County Development Plan and in the late 1960s a considerable amount of survey information was collected, but again this work did not reach the formal submission stage.

1.2 With the recent expansion of the local economy and the emergent pressures related to North Sea Oil development, urgent action is required to meet the new situation. It is the county's firm intention to follow this Interim County Development Plan with surveys in preparation for a County Development Plan, taking cognisance of the Town and Country Planning (Scotland) Act 1969, and in particular the S.D.D. Circular No. 52/1971 and related Advice Notes.

1.3 The purpose of this Plan is to

(1) establish a planning control framework to guide proposals for development throughout the county area.

(2) identify priority areas for detailed survey work.

1.4 It should be pointed out that this Plan while not fully supported by up-to-date information, is based on a wealth of knowledge gathered over a number of years and on recently accumulated practical information collected by various officials of the County Council and on the guiding principles laid down in various Circulars and Advice Notes issued by the Scottish Development Department.

1.5 The Interim County Development Plan consists of:

i A written statement which is intended as a policy document covering the relevant topics for development planning in Shetland.

ii A County Map in the scale 1 to 100,000 (1 centimetre equals 1 kilometre). This will provide a comprehensive presentation of the county's proposals and policies.

2 PROBLEMS AND PRESSURES FOR DEVELOPMENT:

2.1 Development of the county to date has largely been confined to that of the county's natural resources, and the scale of these developments has been small by mainland comparisons. As a result pressures by conflicting interests have been small and easily resolved.

2.2 With the advent of the development of another of the county's natural resources, namely oil, planning pressures have increased. Oil-related industries tend to be highly technological, highly mobile, and where shore-based installations are concerned, highly land intensive.

2.3 The extent and scale of the changes taking place inevitably give rise to conflict. The crofter and fisherman have to get on with their work and want as little interference as possible. At the same time the oil industry must have bases from which to operate and facilities with which to get on with their jobs, and the investment of hundreds of millions of pounds in capital and operating costs results in time being of great value.

2.4 New workers will come to the islands. More houses must be built, industrial facilities must be provided, the tourist industry must be catered for, attractive scenery must be preserved. Yet the full enjoyment of the beauty of the landscape which is the essential backcloth to the islands' activities depends on the development of a healthy industrial economy which alone can create the opportunities for people to live in the islands.

It is not practical to try to preserve the countryside as it is at present. Change will occur and it must be planned for.

3 AIMS AND OBJECTIVES:

3.1 The County Council's general aims for the development of Shetland have been set out in various documents during the past ten years, consequent to a visit to Faroe by members of the County Council in 1962.

The policy can be broadly summarised in the following paragraphs:

(1) Having achieved the stabilisation of Shetland's population, to progress towards an increase in population.

(2) The diversification of the economy of the islands.

(3) Development throughout the islands in order to retain viable communities in the landward areas of the county.

(4) The co-ordination of public investment in order to achieve a pattern of focal points in the landward area where some return in terms of population development can be achieved on the public investment.

(5)/

(5) The minimising of the problems associated with the physical isolation of the county.

(6) The retention of Shetland's regional identity.

3.2 To these general aims need to be added a number of more specific planning objectives which define some of the ways by which the primary objectives would be achieved.

Development

(a) The diversification of the existing industrial base by the development of indigenous industries and the attraction of new industries from outwith Shetland.

(b) Development in the countryside which is suitably located and carefully designed.

(c) The use of landscaping techniques to enhance the visual impact of rural development.

(d) The provision of development opportunities throughout the county and of selected sites for developments.

(e) The improvement of external and internal communications.

Conservation

(a) The conservation of good agricultural land and the encouragement of the full development of its potential.

(b) The conservation of mineral resources and the ensurance of their efficient working and restoration.

(c) The efficient use of water resources commensurate with needs for industry, domestic purposes and conservation.

(d) The conservation of areas of particular value for their landscape quality, their recreational significance or their natural history interest.

(e) The conservation of village character and buildings of significant architectural or historic value.

(f) The efficient use of land.

(g) Experimental tree planting.

(h) The reinstatement of derelict land for beneficial use.

(i) An adequate and convenient distribution of recreational facilities.

3.4 Implementation

The County Council will try to achieve these objectives in four ways; by the

(a) adoption of policies especially those relating to development and conservation

(b) promotion of specific schemes

(c)/

(c) dissemination of advice and fuller public participation

(d) control it exercises over all development as planning authority.

4 EMPLOYMENT:

4.1 The aim of the County Council is to maintain a healthy economy by encouraging the development of existing local industries and by promoting new ventures based on the indigenous material resources and innate skills of the people. Employment in oil and associated developments will rely largely on imported labour but the return of native Shetlanders will be actively encouraged and this source of employment will also be used to provide jobs for retention of population which would otherwise be lost by emigration.

5 DEVELOPMENT DISTRICTS:

5.1 Development districts will be established throughout Shetland in areas where some return in terms of population retention, and indeed population growth, can be envisaged. Each development district will form a natural geographical and economic unit which has one or two townships which can be designated as focal or nodal points. To avoid ineffectual scattering of scarce resources throughout the district County Council investment will be concentrated at these points. This policy should assist the building up of vital communities within each district which should be capable of supporting the social, educational, shopping and other services necessary for their wellbeing and should have a potential for attracting the small industries needed to provide local employment.

5.2 The districts are defined as follows:-

i The Islands

Each of the island communities fall naturally into one development district. Baltasound, Mid Yell and Symbister will form the focal point for each of their respective island communities. The other smaller islands will be treated as an entity in themselves where development would not be concentrated on one particular centre but could be envisaged as taking place anywhere on the island. The exception to this island policy is Bressay, which is considered as part of the central mainland area associated with Lerwick.

ii The Mainland

Five geographical districts are defined:

(a) Northmavine

(b) The West Mainland

(c)/

(c) The South Mainland

(d) The Central Mainland

(e) Nesting, Lunnasting and Delting.

5.3 The focal points of these districts are:

(a) Northmavine

Here there is no well-defined centre. On balance Hillswick is the most suitable focal point but development at Ollaberry will also be encouraged.

(b) The West Mainland

Walls and Aith are the 2 main focal points.

(c) The South Mainland

The 2 focal points of this district are Sandwick/Cunningsburgh and Sumburgh. In the case of Sandwick and Cunningsburgh it is not desirable or realistic to separate these 2 communities because of their proximity. Current proposals for housing and industrial development indicate that Sandwick is the area likely to attract the greater share of development but Cunningsburgh will also be required to contribute to and benefit from new infrastructural provision.

(d) The Central Mainland

Lerwick and Scalloway form the key foci for development on the mainland. However both require to be planned in their wider context, thus Scalloway, Trondra and Burra (Hamnavoe) form a dispersed but interrelated unit for planning purposes. Similarly Lerwick, Bressay, Cunningsburgh, Gulberwick and Quarff, Whiteness, Weisdale and Tingwall form another area for which an overall plan is required.

(e) Nesting, Lunnasting and Delting

Brae is the main focal point for this district. Voe is a secondary centre which on account of its character should develop as a residential/tourist centre.

6 INDUSTRY:

6.1 Agriculture

At the present time it is not possible to develop a full policy for agriculture. This will be made at a later date. In the meantime, however, there are three areas in which a contribution can be made to a policy statement.

(1)/

(1) The intention is to improve and promote the development of the agricultural industry generally as part of the overall economy in Shetland. This could include moving towards a greater degree of self-sufficiency.

(2) The policy is to conserve areas of high quality agricultural land, and in particular to retain good quality farms as effective units, even when these can very often occur in close proximity to built-up areas. Close contact will be kept with the Department of Agriculture and Fisheries for Scotland on this matter.

(3) New agricultural buildings can give cause for concern from an amenity point of view though in most instances they do not come within the scope of planning control. Consideration will therefore be given to the use of an Article 4 Direction under the Town and Country Planning (General Development)(Scotland) Order, 1950 to take agricultural buildings out of permitted development to ensure that where possible new buildings of more than 5,000 square feet or more than 40 feet in height are grouped with existing buildings and their design, colour, materials and siting are carefully treated so that they fit into the landscape or enhance it.

6.2 Forestry

The policy is to encourage the use of shelter belts, initially on an experimental basis. This can help create new amenity settings for development.

6.3 Fishing and Fish Processing

(a) The County Council's policy is to give full support for the development of a modern and efficient fishing fleet. For this document it is not possible to give firm proposals by which the County Council would seek to achieve this aim, but it is essential that detailed research be undertaken into the fishing and fish processing industries.

(b) Provision of small fish processing factories in many localities within the islands has provided local job opportunities and a valuable land based extension to the fishing industry.

The success of these local units can be measured by the dramatic increase in processing capacity from 3,200 boxes per day in 1970 to 5,500 boxes in 1973.

It is important to ensure that development of the processing side of the industry keep in step with developments in other parts of the industry. Unless this occurs there are dangers of over or under provision in either fishing or processing capacity which could have serious repercussions on the economy of the islands

(c) In association with the fishing industry within Shetland the County Council shall assist wherever possible in finding a solution to this problem, which will involve:

(1)/

(1) An examination of the existing fishing methods, size and structure of the fishing fleet, recommendations for future building.

(2) An examination of the fish processing capacity, together with recommendations for the future size and organisation of this industry.

(3) An examination of marketing and buying systems.

(4) An examination of the need for diversification in the fish processing industry and ways of achieving diversification.

(5) Further reports will be prepared by the County Development Office in collaboration with the W.F.A., H.I.D.B. and the H.I.B.

6.4 Knitwear and Textile Manufacturing

The County Council's policy is to support the existing textile manufacturing industry in Shetland. The County Council will determine its policy on the following particular problems:-

(a) The present pattern and distribution of knitwear units.

(b) The need for a Shetland Trade Mark, not only associated with the knitwear industry but industry in general.

(c) The repercussions of the introduction of powered knitwear units.

(d) The recruitment and training of labour for the industry.

(e) The feasibility and desirability of establishing a Spinning Mill on the Islands.

6.5 Oil Developments

(1) The advent of North Sea Oil proposals has brought to the fore the need for a short term outline plan in order to control these developments and safeguard the creation of a full Development Plan.

(2) Policy

The stated policy of the County Council in dealing with North Sea Oil is as follows; to:-

(a) Keep abreast of developments.

(b) Influence developments for the good of Shetland.

(c) Provide themselves with safeguards so that the basic interests of the Shetland Community are protected.

(d) Provide the facilities and services which are necessary to ensure that the economy and the Community adjust to changing circumstances with the minimum distress or inconvenience.

In addition to these overall policy objectives the following paragraphs indicate some means by which the County Council hope to achieve the aims stated above:

(i) Since the County Council's resources in respect of infrastructure/

infrastructure provision are limited they must as a first priority be devoted to the support of indigenous industries.

(ii) The County Council will endeavour to ensure that all areas in Shetland benefit from any oil based service activities in the Islands.

(iii) Where possible the policy of Development Districts with designated focal points will be adhered to.

(iv) Where it appears that oil development infrastructure could secure improved facilities for the long-term development of the economy of the County, in the period subsequent to the cessation of oil developments, this factor will influence the siting of the proposed development.

(3) Areas of Oil Activity

There are two phases to the oil industry in which Shetland will be involved:

(a) Exploration

(b) Exploitation

In both phases there will be a need to develop specialised facilities together with ancillary infrastructure and it is essential that these developments be properly controlled by allocating areas for various developments.

(a) Exploration Areas

(i) The County Council, whilst wishing to accommodate the oil service bases in a number of locations in Shetland, do not wish to see an excessive proliferation of service bases with the consequent duplication of infrastructure and services in places only a few miles apart and so permission will be granted for specific areas only, the following areas being suitable for this type of activity.

(1) Lerwick Harbour.

(2) Sullom Voe, Swarbacks Minn and Baltasound subject to the County Council's Planning Consultant's reports on actual sites.

Development has already taken place at Broonies Taing and consideration will be given to any application to improve and expand these facilities.

(ii) Siting for housing both public and private - hotels, associated industry, schools, water, electricity supplies, roads, shops and general community/

community services sufficient for each stage of the development of oil service facilities will be identified.

Local Plans will be required for areas affected by these developments and will be submitted as detailed submissions.

(iii) The build up of oil service facilities in Shetland is likely to involve an influx of population. It is difficult at this stage to quantify the numbers of people involved in such an operation, but it is important that in planning new infrastructure, allowance is made for expected expansion of population.

(b) Exploitation

The exploitation stage of the oil industry may require the creation on shore of terminal facilities. The siting of these facilities will be determined by a number of criteria, some of which can be quantified at the present moment; some of which will depend upon decisions made by the oil companies and upon the technical problems involved.

The two factors which can be determined are the need for deep water with safe all weather anchorage, together with a certain acreage of flat land adjacent to the site or within a reasonable distance from the deep water anchorage.

The Planning Authority by careful survey have identified the Sullom Voe area as being most suitable for major developments arising out of the industries activities in the North Sea. (In this context "major" includes the development of tank farms, oil storage depots, terminal facilities, gas liquefaction plant, gas storage complex, oil refinery and other ancillary operations.)

To ensure the proper development of these sites the planning authority is taking the following steps:

i. The zoning of this area for major oil developments.

ii. The promotion of private legislation to give port and harbour authority powers to the County Council in the area.

iii. The purchase of land by compulsory purchase if required, to ensure a controlled development.

iv. A multi-disciplined study of the Sullom Voe area and surrounding areas has been commissioned which will result in a Master Plan and Report being produced in the Autumn of 1973. No major development will be allowed until the Master Plan has been adopted.

Development/

10

Development Control of Oil and Associated Developments

(a) The County Council are determined to prevent the proliferation of major oil installations throughout the County and will direct potential developers towards the one industrial complex at Sullom Voe.

(b) In conjunction with the developers the County Council will seek the development of shared basic service facilities on the industrial site at Sullom Voe by a number of developers and by so doing will ensure intensive use of the available sites.

(c) To prevent the wasteful sterilisation of valuable land the County Council will impose time restrictions for the submission of detailed plans and for the carrying out of work.

(d) In the development of any industrial complex within a predominantly rural area the County Council will not normally permit development unless it satisfies the following general requirements:

i. Visual Effect

Shetland has few trees by which to obscure prominent developments. Due regard must be made to the landscape setting, siting, scale, design, height and colour of all buildings. Where possible full use must be made of contours and breaks in slope. Large buildings, tanks, etc. must be contoured into the landscape and where possible their outline softened by the provision of artificial banks.

In co-operation with the developers and the Forestry Commission, the County Council will encourage the planting of shelter belts within the industrial area and in most cases the planting of experimental shelte belts will be a condition of planning permission.

ii. Effect on People Living Nearby

When considering planning applications, the planning authority will pay due regard to nuisance which is likely to arise from noise, light, smell, smoke, dust unneighbourliness or effect on public health.

iii. Availability of Public Services

The concentration of major developments at Sullom Voe is in the interests of economy in the provision of services.

iv. Residential Development

Residential development will not be permitted within the industrial zone at Sullom Voe unless it can be demonstrated that it is necessary for the safety or security of the industrial complex.

Consultation will take place between Central Government, Local Government and the private developers to ensure that adequate housing is provided timeously.

v. Pollution

It shall be a requirement of planning permission that developers undertake to provide effective control on pollution, both of the air, land and sea. The County Council intend to pursue with central government and with other agencies problems arising in this field.

6.6 Extraction Industries

Sand and Gravel. The aim is to strictly control the extraction of sand from beaches which are under threat of serious erosion. However, there is an urgent need for building purposes and for the agricultural industry to supply sand. This will entail the identification of new sites if we are to be successful in conserving the beaches of Shetland. Aberdeen University at the request of the County Council have produced a report on the beaches in the South Mainland and action will be taken on the basis of this report. In addition, the County Council have asked their Consultants to identify and report on alternative sources of sand.

Major developers will be required to satisfy the planning authority that they will obtain their supplies of sand and aggregate without affecting Shetland's environment.

Limestone. The County Council are proposing to undertake the commercial exploitation of limestone from the north end of Trondra.

As part of the County Council's policy on the preservation of its beaches it will seek to restrict the use of beach deposits of shell sand for agricultural use, and will endeavour to provide alternative source of material at a reasonable cost.

Peat and Seaweed. The County Council will seek to find ways of exploiting the resources of peat and seaweed on a commercial basis.

6.7 Industrial Promotions.

The County Council are anxious to create the best possible conditions for the diversification of the islands' economy.

The County Development Department are at present identifying small areas of land within each of the focal points which will be purchased by the County Council with the intention of supporting any new or existing industry. These areas of land will be used either to provide sites for small industrial development or to support industrial development within the area by providing housing, etc.

7 COMMUNICATIONS:

7.1 Internal Ferries

The present proposals are for an overland vehicle ferry route linking the mainland to Whalsay, Yell, Unst and Fetlar and from Lerwick to Bressay. These proposals are now being implemented/

implemented. In the longer term the future policy will be to provide a service to Skerries. Private ferry links between the Mainland and Foula, Fair Isle and Papa Stour exist and these should be continued in the future.

7.2 Roads

The more heavily trafficked principal roads should be improved to 5.5 metres wide two way roads and a road line should be reserved to connect with a bridge from north of Lerwick to Bressay.

Projected developments indicate that a higher degree of activity than normal will be required on minor road improvements in certain areas.

7.3 Harbours and Jetties

The preliminary report on piers given by the County Development Officer on 29th December, 1971, gives guide lines on the County Council Piers Policy. Broadly, piers in Shetland can be classified into three Classes:

(a) Those required for fisheries development.

(b) Those required for transport.

(c) Those for other commercial developments.

Where new piers are constructed by the County Council an attempt will be made to site and design them so that all three uses can be catered for at the same pier or harbour.

The Council will seek the development of piers in the existing focal points, since this facility is often ancillary to other activities which are best developed in the focal points.

Priority will be given to the completion of the vehicle ferry terminals and bearing in mind the changing transport pattern and the rapid changes being brought about by the oil exploration activity; an endeavour will be made to establish a programme for the period 1974-1979.

(a) Fisheries Piers

Priorities will be discussed with the Shetland Fishermen's Association.

(b) Oil Supply Piers

The joint use of facilities where feasible for oil and fish use will be encouraged so that benefits will remain with the community in the longer term.

7.4 Rural Bus Services

Many rural bus services have declined in recent years and are uneconomic.

The County Council now have powers to subsidise unprofitable services where these are considered to be essential to the community and a basic pattern of rural bus services must be maintained.

Before/

Before considering the use of its subsidising powers it would take the following criteria into consid ration:

(1) Basic Service

This to provide at least one return trip per week from each rural district into Lerwick. Service to be looked at in conjunction with school contracts.

(2) Duplication

Duplication of uneconomic services will be eliminated and the County Council would not support applications from competing services for the same areas.

(3) Operating Costs

Every effort be made to reduce operating costs.

(4) Fares

Fares will be adjusted to balance revenue provided this can be done without putting service beyond means of people it is meant to serve.

(5) Developments

Ideas for combining forms of service should be examined, i.e. Post Office, small parcels, etc.

7.5 Internal Air Service

This is at present provided by Loganair who in conjunction with the H.I.D.B. have developed an internal service with grass landing strips to serve the following locations:

Scheduled - Lerwick, Fetlar, Whalsay

Charter - Fair Isle, Foula, Papa Stour

The service operates from Sumburgh airport and also uses the 2,100 ft. long tarmacadam strip at Baltasound which is owned by the County Council.

The County Council will seek the provision of a surfaced airstrip in the Lerwick area of sufficient capacity to be used by light aircraft other than those operated by Loganair. This could be provided in Tingwall Valley, Rova Head or Bressay or some other suitable location. The existence of a surfaced airstrip in the Sullom area is likely to become of increasing importance.

Existing helicopter pads exist at Sumburgh - Baltasound, but the need exists for the provision of a new pad in the Lerwick area.

7.6 External Air Services

The present policy is to concentrate on Sumburgh and in this connection the improvement of facilities at the airport for navigational aids, aircraft parking, and passenger handling will be encouraged but other alternatives should be examined in the full Development Plan.

At/

At present Shetland's link with the mainland is through Aberdeen and the aim of external air services is to build up this direct link, but recent developments in the North of Scotland have made an examination of this policy urgent, and in this respect a full report will be prepared at an early stage both for the full Development Plan and the Civil Aviation Authority.

The County Council will encourage any proposals to link Shetland by air with other North Atlantic countries.

Whilst examining the question of Shetland's air route to the mainland, the County Council do reject the thesis of feeder air services based on smaller aircraft, and maintain that a modern short take-off aircraft capable of carrying in excess of 50 passengers into and out of Sumburgh should be sought as a replacement to the Viscount.

7.7 External Sea Links

The County Council support the proposed introduction of a modern roll-on roll-off ferry to link Shetland with Aberdeen to be provided by the North of Scotland, Orkney and Shetland Shipping Company. Whilst supporting this move by the North of Scotland, Orkney and Shetland Shipping Company, the County Council will examine the possibilities of other sea services to Shetland both from the Scottish mainland and other North Atlantic countries in the light of developments.

8 HOUSING

8.1 The County Council will meet their housing requirements within the focal points of the Development Districts, seeking to identify sites and decide the optimum settlement form for each locality. For example, nucleated small clusters, linear or dispersed pattern, density and scale of development, and also the balance between private and local authority housing will be specified.

8.2 In settlements not scheduled as focal points, residential development will be allowed provided that:

(a) It is located in existing clusters or existing scatters of housing or in an approved area.

(b) It will not be excessively expensive to provide other essential services - water, drainage, electricity, etc.

8.3 In the case of other isolated development in the country the County Council will allow the renovation or rebuilding on existing croft sites. Such developments will be allowed on the understanding that the cost of the provision of services to these sites will be borne by the developer.

8.4 The County Council will discourage the provision of chalets and caravans for permanent dwellings.

8.5/

8.5 Conversion of buildings to residential use

The conversion of buildings such as chapels, schools, etc. will only be allowed if:

(1) It is a means of preserving a building of cultural or historic interest or one of architectural interest.

(2) It will not create a building out of character with its surroundings.

9 EDUCATION AND HEALTH SERVICES

9.1 The Authority is committed to a policy of reasonable rationalisation which balances the need to provide efficient education against the social need to maintain small communities. Primary schools are maintained wherever a reasonable roll can be maintained. In some cases primary schools are maintained with a very small roll because the effect of comparative isolation is thought to be less disadvantageous than the alternatives available.

Secondary Education is provided in seven Junior High Schools established at strategic places from Baltasound in Unst to Sandwick in Dunrossness, Aith in the West to Symbister in the East. These schools offer a common course in Secondary Classes I and II and work based courses in Secondary Classes III and IV. All pupils in the Primary Schools transfer to the Junior High School for their own area. Pupils may proceed purely at their parents' request from Secondary II in the Junior High School to the County's only six year all-through Comprehensive School - the Anderson High School - in Lerwick. Exceptionally, pupils attending Junior High Schools may be presented in one or two subjects in the Scottish Certificate of Education on the 'O' grade.

The Authority provided comfortable Hostels which offer free board and lodging to pupils attending the Anderson High School in Lerwick who are unable to travel daily between home and school.

The pattern of Primary and Secondary Education may change with changing circumstances. New schools will replace old as necessary and it seems quite possible that one or two of the present Junior High Schools could attain "Senior" status.

The Authority has modest facilities for Day Further Education within the County and these will shortly be expanded. It makes use of the extensive facilities offered in the Technical Colleges in Inverness, Aberdeen and elsewhere.

9.2 Health

Hospital and Health Centre facilities exist in Lerwick, and country practices serve the rural areas.

No policy can be determined at present but should any build up of population occur at other points in the county an increase/

increase in hospital provision will be necessary, together with a fuller range of medical services throughout the county.

10 PUBLIC UTILITIES AND PUBLIC SERVICES

10.1 The County Development Department is currently engaged in a review of all public services in Shetland.

It is quite apparent that services designed to serve a small population (17,000) which is predominantly rural in character are inadequate to serve new industry on a large scale and a large increase in the population.

It is accepted by the County Council that the development of the county calls for a programme of improvement in existing services to meet the new demands and the new opportunities created by the broadening of the islands' economic base.

In some cases these needs must be met by other public bodies and every support will be given by the County Council to these bodies.

The County Council will seek financial help from central government and industry for any programme of extension of public services beyond the needs of that of the present population. A full policy statement on public services is not possible for this interim report.

10.2 Electricity

The availability of electricity for domestic use is virtually universal in Shetland. Three phase power supplies for industrial undertakings is also available and there is at present sufficient capacity within the Lerwick generating station to cope with present demand.

Any dramatic increase in the islands' population or the advent of industry which made a high use of electrical energy would necessitate a careful examination of the islands' generating capacity. In general the present distribution system is adequate to cope with most demand.

With the advent of large scale industrial undertakings it is expected that these would need new electrical generating stations which, unless developed by the North of Scotland Hydro-Electric Board, would be expected to sell surplus production to the H.E.B.

10.3 Water

With the exception of a survey done by the County Surveyor's department in 1946, no hydrological survey of Shetland water resources has been undertaken.

The County Council adopted a policy of progressive supply and improvement of water services in the rural areas of the County which policy has been continued by the North of Scotland Water Board who have virtually completed a programme of the supply of mains water to all areas of the county.

The/

The quantity of water available in particular parts of the County is limited and the recent revival of industrial activity has produced crises situations in certain areas.

The likely future demands for both domestic water supply and water for industrial use are large, and as an interim policy pending a hydrological survey, the County Council will permit the winning of water for industrial use provided:

(a) The Water Board corroborates that it cannot provide the water supply timeously and at an economic rate.

(b) The developer is prepared to install the supply at his own expense.

(c) The proposal is acceptable to the North of Scotland Water Board.

10.4 Gas

The only supply of gas at present available in Shetland is in the form of bottled supplies.

The County Council should consider carefully a policy towards the use of gas as a form of energy in Shetland if and when supplies of natural gas are available on the islands.

10.5 Drainage and Sewage

The County Council have adopted a policy of progressive provision of main drainage to most parts of the county. Where the cost of this provision has been excessively high compared to the numbers of houses served, septic tanks have been provided.

The County Council will continue with this policy for the provision of drainage facilities in step with demand.

10.6 Community Services

The present policy of the County Council is to attempt to provide people living in the rural areas access to as wide a range of community services as those living in the towns.

These services are very wide ranging, each having a slightly different pattern of provision. Some, like home nursing must come to the country, but many others involve travel to a special building to receive the service; for example the hospital, and thus can only be provided in the main centres of population.

The County Council have two aims:-

(a) To increase where economically possible the range of services provided throughout the country districts by the use of mobile units.

(b) To ensure adequate transport throughout the county to enable non car owners to travel to Lerwick to receive services.

The/

The limited funds available for new facilities and the cost of maintaining bus services set severe limitations on the improvements which can be achieved and the following factors must be taken into account in trying to augment the existing facilities:

Location. The County Council will group any new facilities within the framework of the focal points policy.

Site Grouping. Wherever possible, buildings for community services will be provided on a single site, since this gives scope for economies in construction and maintenance. For example a school may also contain facilities for a part-time library, health clinic, public meetings, adult education, etc. Wherever possible buildings will be sited and planned for use by societies, etc.

11 TOURISM AND USE OF THE COUNTRYSIDE

11.1 The County Development Officer has already prepared a paper on the feasibility of a country park provision in the Walls area and at Clickimin. In general terms the county is not in the position to prepare a detailed policy statement for tourism. It feels that the county is on the threshold of a significant change in the pattern of tourism in Shetland because of the introduction of roll-on roll-off ferry services. The influx of mobile tourists will create a need for bed and breakfast facilities, possibly new hotels, roadside facilities, camping sites, caravan sites.

Full consultation will be made between the County Council, Scottish Development Department, the Countryside Commission for Scotland, the Scottish Tourist Board, the Shetland Tourist Organisation and the H.I.D.B. to consider a joint strategy for tourist development in the county.

11.2 Countryside Leisure Facilities

The County Council is examining schemes for countryside leisure facilities and these will be the subject of further reports.

11.3 Derelict Land

The County Council will examine schemes for the reclamation of derelict land, basing their recommendations on:

(a) Financial aids available

(b) Degree of unpleasantness of derelict sites

(c) Impact of offensiveness of the sites which is of more than local significance, i.e. on tourism, town, areas of special countryside value

(d) After use potential

11.4 Advice

An attractive environment cannot be produced by controls and the County Council action alone. It is necessary to have/

have the co-operation, enthusiasm and understanding of those who own, use, live in or visit the countryside and of relevant organisations.

The County Council believes it can also help by providing guidance and advisory services or informing people where advice can be obtained.

The County Council in an effort to help potential developers receive the benefit of timely advice have published a notice asking potential developers to give as much notice as possible of their intentions to the Development Officer.

The County Council will endeavour to provide helpful guidance on some of the following fields:

landscaping
building design
building conservation
natural history
archaeology
sport and countryside recreation

The County Council will also direct enquiries to those specialist agencies where fuller advice can be found.

12 AREAS OF LANDSCAPE VALUE

12.1 In each designated area of landscape value the County Council's policy is to:

(1) protect the surroundings of the area so that views out of it and into it are not spoilt;

(2) ensure that development or redevelopment blends with the surroundings and does not impair the character of the area;

(3) take positive steps to improve the character and visual appearance of the area.

12.2 To achieve these objectives:

(1) Planning applicants will be required to show proposed development in relation to surrounding areas.

(2) A high standard of design will be expected for any development and must be sympathetic to their surroundings in materials, form and scale.

(3) There shall be no advertising except for well designed informative signs.

(4) Detailed studies of each area will be made and plans submitted dealing with improvement of each area.

(5) Industrial development will not normally be permitted unless the development is compatible with the traditional economy of the area.

12.3 Areas

Certain areas of Shetland have already been designated as nature reserves or as sites of special scientific interest by the Nature Conservancy. The Department of the Environment/

Environment through the Ancient Monument Commission has also identified certain ancient monuments and sites of archaeological interest worthy of preservation.

(a) Nature Reserves

Noss Island Island of Haaf Gruney
Hermaness, Unst

(b) Sites of Special Scientific Interest

All sites listed or to be listed by the Nature Conservancy. (An updated list will be held by all planning staff of the County Council)

(c) Ancient Monuments

All buildings listed or to be listed by the Commission for Ancient Monuments. (An updated list will be held by all planning staff of the County Council)

(d) In addition to these areas the County Council designate as areas of Great Landscape Value under SDD Circular No. 2/1962, the whole of the County of Zetland excepting:-

(1) South Mainland: the area to the south and east of a line running due east from West Point of Hestingot (384119) to the A970, thence north along the road to 398193, thence due east to the coast.

(2) Sandwick: the area to the south of a line running due north from Ness of Hoswick (413228) to the A970 thence east along that road to 427256, thence in a straight line to the coast at 437237.

(3) Central Mainland: the area to the north of a straight line running from the west coast at 406380 to the east coast at 447370 and south of a straight line running from Man Ness (394388) to 402405, thence to 414404, thence along the watershed of Hill of Steinswall to 435442, thence to the coast at 439440 Also the island of Bressay north and west of a straight line from 492407 to 503408, thence north along the watershed of Hill of Setter to the coast at 497441.

(4) Catfirth: the area to the south of a line running due north from the coast at 439539 to 440560, thence due east to 453560, thence due south-east to 460547, thence to the coast at 450530.

(5) Aith: the area to the east of a line running due south from the coast at 315523 to 315518, thence due west to 308518, thence due north to 308530, thence due north-east to 322453, thence north along the unclassified road to 314570, thence due north-east to 322576, thence in a straight line to the coast at Stead of Aithness (322593), and to the west of a line from/

from the coast at 358504 to Leaskie Knowe (372499), thence north along the watershed of Weisdale Hill and West Hill of Weisdale to the Hag Mark Stone, thence in a straight line to the coast at 378640. Also the island of Linga (3563).

(6) Whalsay: the area to the west of a line from the coast at Breiwick (557610) due north to 554627, thence due north-east to 570647, thence to the coast at 566656.

(7) Lunnasting: the area to the east of a line from the coast at 460677 to Cunnigill Hill (430675), thence south along the watershed to the B9071 at 422630, thence along that road due west to its junction with the A970, thence to the top of East Hill of Voe (408623), thence south to 410602, thence due east to the coast at Ayre of Atler (457610), and to the west of a line from the coast at 480654 to the coast at 475632.

(8) Sullom Voe: the area to the north and west of a line from the coast at 400637, north along the watershed of Souther Hill, Hill of Dale, Hill of Oxnaboel and Hill of Swinister to the coast at 457736, east of a line from the coast at 352678 to the coast at 352685, and south and east of a line from Houb of Lunnister (351719) to the A970 at 333728, thence north along that road to 363850, thence to the coast at Long Taing (377855), also the islands of Little Roe and Lamba.

(9) Yell: the area to the east of a line from the coast at 533900 to 500900, thence due north to 500000, thence due east to 520000, thence to the coast at 550963.

(10) Unst: the area to the east of a line from the coast at Nuda (623040) to the A968 to 595046, thence north along that road to 608085, thence north to 610105, thence to the coast at The Punds (645110).

(e) Villages or townships worthy of conservation will be designated under the Civic Amenities Act 1967:

(1) Lerwick Town Centre

(2) Lower Sound

(3) Voe

(4) Hamnavoe

(5) Tresta

(6) Ireland

(7) Fladdabister

13 DEVELOPMENT CONTROL

The Development Control Policies to be adopted by the County Council have been outlined in the various sections of this statement and development will not be permitted unless it satisfies the general requirements contained in the statement.

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In addition permission for development which would normally be allowed may sometimes have to be refused for reasons which over-ride the considerations set out in this statement; for example, policies adopted as interim measures may need to be adapted in the light of survey work undertaken for the full Development Plan.

APPENDIX A

1. POPULATION

1.1 The population of Shetland was at its maximum about 100 years ago; at the time of the 1861 census about 31,700 persons lived in the County. Since then the population has fallen continuously, particularly after the First World War. The county report of the 1971 census gave a resident population of 17,327 persons, almost one half of the population a century previously.

1.2 Population Change 1951-71

(a) Since 1951 there has been a fall in population of 2,025 persons; between 1951 and 1966 the rate of decline was fairly steady at about 140 persons per year, but between 1966 and 1971 this has changed to a small increase of about 15 persons per year.

(b) Within the County there has been varied pattern of population change. Over the decade 1961-71, the decline of 485 persons in the County as a whole was made up of a marginal increase in Lerwick Small Burgh, with decline of nearly 500 persons in the landward areas. The increase in Lerwick's population has taken place since 1966 and in the landward areas the rapid decline of 1961-66 has been replaced in the 1966-71 period with a slight population increase, although this masks the fact that in some districts there was considerable growth (e.g. Tingwall and Whalsay) while in others the decline is still rapid (e.g. Fetlar).

(c) The population decline in the County has been the result of both net migration losses and a low rate of natural increase. Between 1961 and 1970 the Registrar General's estimate indicates a net migration loss from the County of almost -1,200, all of the local authorities sharing in this net loss except Gulberwick and Quarff. The annual rate of net migration from the County fell from about -150 per year 1961-66 to less than -100 per year 1966-70. This reduction was largely due to the change in Lerwick Small Burgh, from experiencing a net loss 1961-66 to a small net gain 1966-70 and a net gain in Gulberwick and Quarff.

(d) The total natural increase between 1961 and 1970 in Shetland was +150, i.e. +0.9 per 1,000 population per year. The annual rate of natural increase is very low and compares with +3.2 per 1,000 population for the Highlands Planning region as a whole and +5.5 per 1,000 population in the North East planning region. These low rates of natural increase are the result of the very heavy net migration losses of the last century which have "weakened" the age structure of the County, so that a high proportion of the population is in the retired age groups.

(e) Shetland at the 1971 Census had over 3,500 persons in the retired age groups, over 20% of the County's population, and this contrasts with the proportion with Scotland as a whole of 15%. Shetland also had a lower proportion of its population in the younger age group (under 15); 23.1% compared to 26.5% in Scotland. In the working age group/

group, Shetland has lower proportion than Scotland (56.3% compared to 58.6%) and the difference is entirely in the younger working age group, i.e. 15-44 years.

1.3 Future Population

In view of the uncertainty about the effects of oil development on the county's population it has been decided to examine only the base population at this stage.

If one assumes that the net migration balance reduced to zero between 1966 and 1971 then the very low rate of natural increase +0.9 per 1,000 population per year indicate a population of 17,700 in 1981 and 17,900 in 1991.

However immigration is now taking place and one can no longer assume a net migration of zero. This trend which was established during the period 1966-71 has continued beyond that date. Estimates of the population of Shetland for 1972 have been made using the National Health Scheme registrations for the period May 1971 to September 1972.

These figures have produced a positive migration balance of 367 together with an excess of births over deaths of 46; a total population increase of 413.

This gives an estimated population of 17,740, already in excess of the 1981 projection arrived at from census figures alone.

The effect of immigration will not only affect the total population figures but because most immigrants are young married couples could significantly affect the rate of natural increase of the population. Taking 1971-72 estimate the natural rate of increase has risen to 2.2 per 1,000 but this cannot possibly be used to calculate future population, only indicate a trend during a short period.

The Council realises that these increases in population are of a rather dramatic nature and, subsequent to this, have introduced policies to provide houses for incoming workers. It is considered to be premature to estimate the effect of these factors on population trends.

<u>These figures do not include the effects of oil developments which may be very significant.</u>

APPENDIX B

EMPLOYMENT

An important feature of the Shetland economy is the small size of the total labour force. According to Department of Employment statistics the total number of employees registered in the Lerwick Employment Exchange in June 1971 was 5,433. Because this figure is derived from an estimated base on a sample check it is subject to a comparatively wide margin of error. The numbers involved are small and exclude the self-employed workers who are relatively numerous in some key industries in Shetland. Working on the alternative premise of the Census definition of economically active people one can arrive at a work force of some 6,000 males listed as economically active, compared with an employee total of 3,400 (1966 Census). Even if we only add the female employees to this figure we obtain a work force of 7,770, and it is likely that the true measure of economically active population of Shetland is in the region of 8,000.

The present unemployment situation in Shetland, again taking into account the approximate nature of the statistics available, would seem to be running at a figure of about 4.5% which is below the Scottish average and is only just over the present national average. At this level it shows a remarkable narrowing on what is usually a much wider gap. In terms of people, the wholly unemployed at the end of 1972 numbered under 200 compared with well over 400 in 1965.

In looking at the distribution of employees alone, the present structure of Shetland employment gives the appearance that over 66% of the Shetland work force live by rendering services. (In the broad sense of the term). This is misleading because of the uncertainty of the employment figures and the non-recording of the self-employed, and also because major primary and manufacturing industries in the islands contain an appreciable number of workers who are not recorded as employees. However, making allowance for this element, it remains that service activities are the largest element in the Shetland economy. The size of this service element may be surprising if services are thought on as typically sold or provided for local inhabitants, but the economy is a self-contained one, and must obtain some of its income from outside - in fact it must export. Some of the 'services' are in fact exported by being sold to non-residents - tourism and the servicing of non-native vessels are prime examples, and as oil exploration develops, another important one will be added.

Secondly, some major services in the public sector (education and health) are largely supported by income from outside the Islands, viz: from Central Government grants.

Despite the large numbers of people living by rendering services, the export sector of the economy, which is largely accounted for by primary industries (by food processing and textile manufacturing) is of crucial importance to the economy as a whole, and it is through exports that the pace of all economic life is influenced.

APPENDIX C

Future Programme

The County Council are determined that the production of a full County Structure Plan will be submitted within the next two years.

To achieve this aim the Council have agreed to appoint consultants to undertake this study which must be completed within 18 months from the date of their engagement.

In addition to the County Structure Plan the County Council have already appointed consultants to produce a master plan for the Sullom Voe/Swarbacks Minn area and have agreed to commission additional local plans for

(a) Lerwick and its environs

(b) The Island of Unst.

On their completion, these studies will be submitted as amendments to this document.

The County Council have agreed to strengthen their present planning staff to enable them to better implement Development Control Policies and produce Local Plans for other areas of the County not covered by consultants surveys.

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