



Commissioner's Report

Results of the Public Review

**On the Effects of Potential
Oil and Gas Exploration
Offshore Cape Breton**



March 29, 2002

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Mr. Herb Dhaliwal
Minister of Natural Resources
Government of Canada
580 Booth Street
Ottawa, ON
K1A 0E4

Mr. Gordon Balser
Minister Responsible for the Petroleum Directorate & the Accord Acts
5151 George Street, 4th Floor
Halifax, NS
B3J 3M5

Mr. Jim Dickey, CEO
Canada-Nova Scotia Offshore Petroleum Board
6 th Floor TD Centre, 1791 Barrington Street
Halifax N.S.
B3J 3K9

Dear Mr. Dhaliwal, Mr. Balser, Mr. Dickey:

I am pleased to submit this report of the Public Review on the effects of potential oil and gas exploration and drilling activities within exploration licences 2364, 2365 and 2368. As Commissioner for the Review, I have followed the Terms of Reference requirement to pay particular attention to the socio-economic impacts, effects on the ecosystem, and to mitigation of impacts. I have been mindful of your admonition to ensure that the general public and all interested parties had full opportunity to participate in the process. Also, in keeping with your direction, the Commission's secretariat created a library of scientific and technical studies and other reports and documents for use by the general public and interested parties as reference material for their submissions.

Participation in the Review process was strong and reflected a broad range of interests. Some participants expressed frustration with the Review's limitation to the Exploration phase. This was especially true for those who wanted to attend to socio-economic impacts. Their views were also heard, and are summarized without comment in the report.

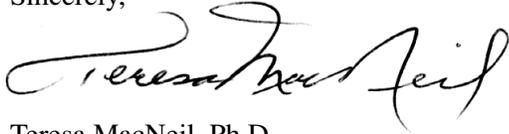
The Terms of Reference did not require me to make recommendations. Consequently, I gave principal attention in this report to summarizing the views of participants and, later, to presenting my conclusions.

It has been a privilege to serve as Commissioner for this Review. I have enjoyed hearing each of the participants' views and regret that the limits of a report do not permit me to refer to each of them. I was very impressed by the quality of attention paid to the preparation and presentation of their respective positions. A record of all written submissions and of each day's presentations will be available to the public through the Beaton Institute of the University College of Cape Breton.

I want to express particular gratitude to my small group of colleagues who so thoroughly supported the Commission's work: Joan McInnis, Executive Assistant, for her professionalism and unrelenting attention to detail; Edward Carey, P.Eng.; Technical Coordinator, for his work in identifying and gaining access to scientific and technical expertise and resource materials; and to Dr. Robert Bailey, Senior Advisor, for his quiet, systematic and wise advice, and for his incisive approach to each aspect of the process.

Finally, as a conclusion of my experience with this Review, I see the need for the Canada Nova Scotia Offshore Petroleum Board to move along with the next step of its regulatory process in relation to the proposals of Hunt Oil and Corridor Resources. My report includes suggestions for making that process more responsive to the concerns of the public. It is my view that with attention to what science and experience have shown, along with the findings of this Review, and the collaborative advice of informed interest group representatives, you will have a solid base for deciding whether the proposed activities should proceed.

Sincerely,

A handwritten signature in black ink, appearing to read "Teresa MacNeil". The signature is fluid and cursive, with a large initial "T" and "M".

Teresa MacNeil, Ph.D.
Commissioner

Table of Contents

EXECUTIVE SUMMARY	5
INTRODUCTION	9
BACKGROUND	9
THE MANDATE	9
THE REVIEW PROCESS	10
THE REPORT	11
THE CONTEXT	12
THE COMPANIES' PROPOSALS	12
<i>Seismic Surveys</i>	12
<i>Exploratory Drilling</i>	13
THE MARINE HABITAT	13
MARINE MAMMALS AND BIRDS	15
THE ECONOMIC SETTING	16
IMPACT ASSESSMENTS	17
THE CONCERNS AND ISSUES	19
OVERARCHING CONCERNS AND ISSUES	19
<i>Protecting the Marine Environment</i>	19
<i>Coexistence</i>	20
SPECIFIC CONCERNS AND ISSUES	21
Seismic Surveys	21
Fish and Invertebrates	22
Concerns about marine mammals and birds	24
Exploratory Drilling	25
Environmental Hazards	25
<i>Regional Development</i>	26
<i>Socio-economic</i>	27
<i>Mitigative Measures</i>	28
OTHER PERSPECTIVES	29
<i>First Nations</i>	29
<i>Municipal Governments</i>	29
POLICY ISSUES	30
OIL AND GAS DEVELOPMENT	31

CONCLUSIONS AND RECOMMENDATIONS 32

Confronting Uncertainty 32

Establishing Relationships 33

Marine Resource 34

Beyond the Terms of Reference 34

RECOMMENDATIONS 35

APPENDICES

TERMS OF REFERENCE APPENDIX I

PUBLIC REVIEW COMMISSION’S RESOURCE LIBRARY APPENDIX II

ISSUES/INFORMATION MEETINGS APPENDIX III

PROCEDURES FOR HEARINGS APPENDIX IV

PRESENTATIONS, WRITTEN SUBMISSIONS
& FINAL STATEMENTS & ADDITIONAL WRITTEN REPRESENTATIONS APPENDIX V

REFERENCES APPENDIX VI

DEFINITIONS OF IMPACTS APPENDIX VII

AREAS OF GENERAL AGREEMENT AND DISAGREEMENT APPENDIX VIII

EXECUTIVE SUMMARY

On February 6, 2001, the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) appointed Teresa MacNeil (see last page in report) as a one-person Commissioner to conduct a public review of the effects of potential offshore oil and gas exploration and drilling activities in Sydney Bight and southern Gulf of St. Lawrence regions where Hunt Oil Company of Canada and Corridor Resources Inc. proposed to conduct seismic surveys.

The Inquiry was to hear public views on those proposals and examine the assumptions behind those views. The Terms of Reference (see Appendix I) required the Commissioner to prepare a summary of the public concerns and to prepare findings on the probable socio-economic and ecosystem effects of these activities. But it was not part of the mandate of the Commissioner to advise on whether the exploratory programs proposed by Corridor and Hunt should proceed. Nor was it within the Commissioner's mandate to recommend whether a moratorium should be placed on exploration of the Licence areas and their surrounding environments. And she wasn't to conduct a scientific inquiry into the merits of the proposals or deal with any other matter "beyond consideration of the effects of potential oil and gas exploration and drilling activities within the licence areas."

The Inquiry was conducted in two phases: first, a series of public meetings to allow groups and individuals to identify concerns and exchange views about the process, and; 2) a series of public hearings to hear submissions from interested parties.

During 15 days of well-attended hearings between January 10, 2002, and February 1, 2002, the Inquiry received 130 formal submissions from the affected companies, the petroleum industry, commercial fishery interests, environmental groups, business organizations, aboriginal leaders, the tourism industry, the building trades, education institutions, government departments, politicians and ordinary citizens.

The process itself was useful and instructive, Commissioner MacNeil said, because of the subtle but noticeable "shift in viewpoints" that occurred during the hearings. Despite their differences, she noted "an increasing openness to hear, understand and sometimes acknowledge merit in a competing argument from other participants" during the hearings.

As a result of what she found during the public hearings, the Commissioner reached a number of conclusions, offered "advice" on several areas beyond her Terms of Reference and made two recommendations.

Conclusions:

- *There is need for expert examination of the science and experience that is at the root of the remaining uncertainty.*
- *The proponents need to update their exploration plan, with particular emphasis on addressing some of the uncertainty which underlies the issues including ways and means to resolve them.*
- *In light of issues raised during the Public Review, the CNSOPB should pay particular attention to:*
 - *The fact that commercially important fisheries, such as snow crab, or fisheries in which the stocks are nearly depleted, are based in close proximity to the proposed exploratory programs*
 - *The fact that munitions dumps are located within some of the licence areas. The CNSOPB should request a full report of their characteristics from the Department of National Defense in order to evaluate their potential impacts.*
- *The strongly motivated participants having developed a high level of understanding of the issues during the Review process constitutes an important consultative resource for the next stage of the regulatory process.*

- *The Ministers now have a responsibility to take advantage of gains made by the various interest groups as a result of the investment those groups made in the Review process.*
- *On the basis of participants' interactions during the hearings, enhanced relationships among interest groups such as the fishing and petroleum industries, the building trades, environmental groups, all levels of government, and business interests can champion a range of specific matters which require particular attention whether through investigation, coordination, co-operation or regulation.*
- *The southern Gulf and Sydney Bight areas should be treated as one for impact assessment purposes. Any assessment of potential effects of exploratory activity in either area should take into consideration potential effects, if any, in the other area.*
- *Mechanisms such as Marine Protected Areas and Integrated Management Plans should not detract from the requirement for planning to be problem-centered, and for the method of problem solving to be rooted in an analytical process and not in preconceived ideas.*

Advice:

- *The Commissioner advises government agencies, particularly the CNSOPB, to establish effective arrangements to keep fishery interests informed, particularly about impending actions associated with rights issuance.*
- *The Commissioner advises early and full consultation by the Crowns, as well as the private developers, to pursue the implications of aboriginal title with the Mi'kmaq.*

Recommendations:

- *that the necessary scientific, technical and experiential resources be convened to assess the existing base of knowledge in relation to the DFO review, the Hunt and Corridor proposals, and the Public Review Commission's Findings.*
- *that the Ministers and the CNSOPB broaden the consultative system to apply to the next stage of the decision-making process for the three Licence Areas, to include a cross-section of interests for the purpose of gaining advice about whether or not the proposed activities should proceed, and the specific measures to be taken in the event their decision is to proceed with exploration and drilling activities.*

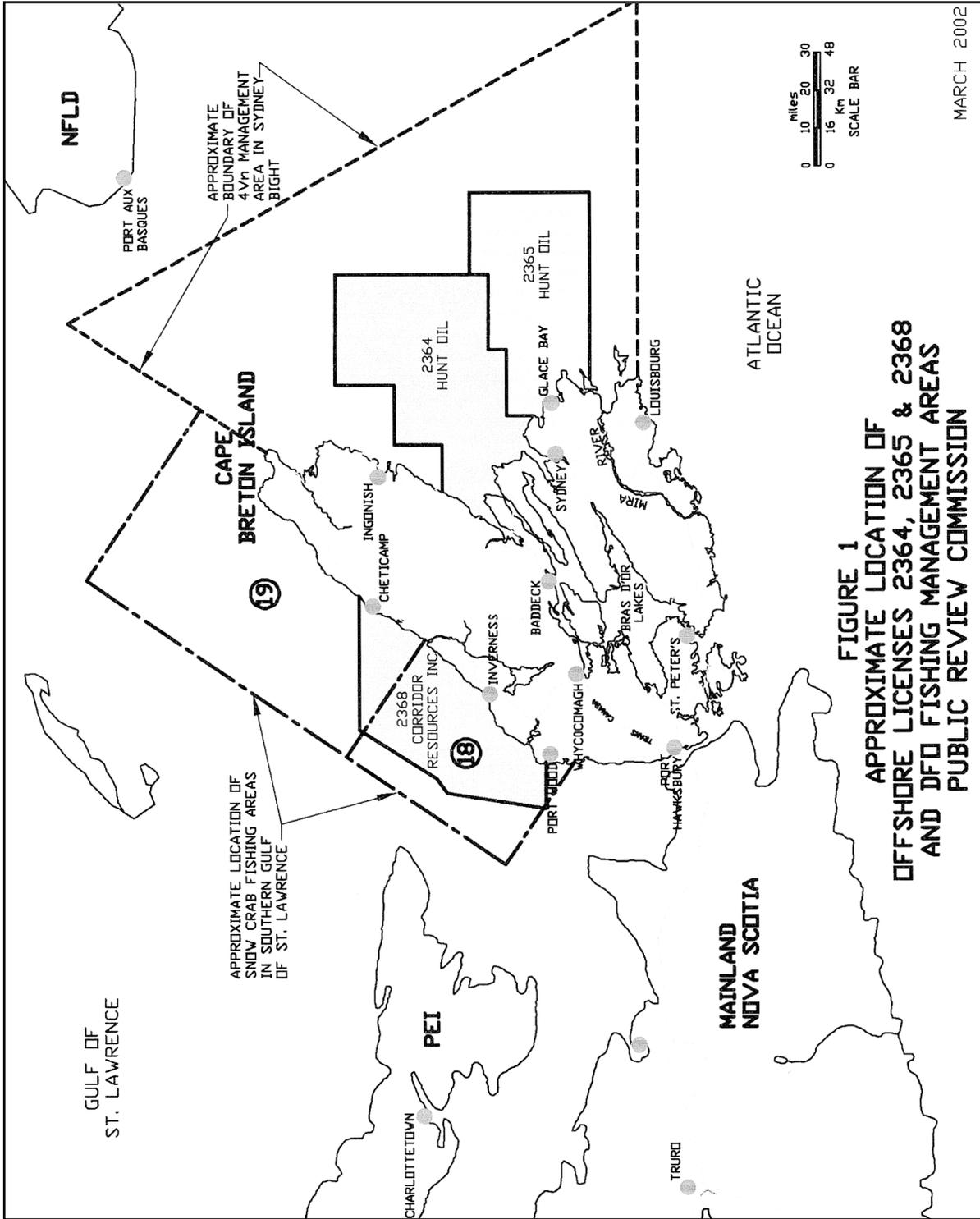


FIGURE 1
APPROXIMATE LOCATION OF
OFFSHORE LICENSES 2364, 2365 & 2368
AND DFO FISHING MANAGEMENT AREAS
PUBLIC REVIEW COMMISSION

INTRODUCTION

BACKGROUND

On July 1, 1998, the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) granted Hunt Oil Company of Canada, Inc. two licences (2364, 2365) to explore for oil and gas in a 5,800 sq km area off the northeast coast of Cape Breton, Nova Scotia. On July 1, 1999, the CNSOPB awarded Corridor Resources Inc. a similar exploration licence (2368) for 2,470 sq km off the west coast of Cape Breton. Later, both Hunt (and its partner, TotalFinaElf E & P Canada Limited) and Corridor proposed conducting two dimensional (2D) seismic surveys within their licenced territories.¹

Those proposals sparked public concern on a range of issues from how such exploration might affect the fishery to what impact it could have on the area's traditional way of life. As a result of those concerns, the federal Minister of Natural Resources Canada and the Nova Scotia Minister Responsible for the Petroleum Directorate and the Accord Implementation Act issued a joint directive, instructing the CNSOPB to conduct a public review of the proposals before approving any programs associated with them.

In October 2000, the CNSOPB issued orders to both Hunt and Corridor to stop work on their licences.

In January 2001, the CNSOPB issued Proposed Terms of Reference for the Public Review and asked interested parties for written comments on them. After reviewing three dozen submissions, the CNSOPB issued the final Terms of Reference on April 30, 2001.

THE MANDATE

On February 6, 2001, the CNSOPB appointed me as Commissioner to conduct a Public Review of the "effects of potential oil and gas exploration and drilling activities within the licence areas."²

My mandate included reviewing matters related to "socio-economic impacts," "effects on ecosystems" and "mitigation of impacts." But it did not — and this is important to point out — include questions "of energy policy or legislation, jurisdiction, the fiscal or royalty regime of governments, the division of revenues between the Government of Canada and the Government of Nova Scotia, or matters which go beyond consideration of the effects of potential oil and gas exploration and drilling activities within the licence areas." My review was not intended to be a "scientific inquiry" into the effects of exploration either. Nor was it intended to make judgments or seek consensus from the scientific community on matters of fact and existence. My mandate, in effect, was to hear public views and examine the assumptions behind those perceptions.

On April, 2001, I established an office for the Public Review Commission (PRC) in Sydney and retained the services of support staff to form a three-member Secretariat, including one full-time manager and two part-time specialists. This office has been responsible for coordinating the Review and for acquiring, and making available to the public, as per my terms of reference, scientific, technical and other reports relevant to oil and gas exploration in the affected areas (see Appendix II).

¹The licence areas in question all extend to the shoreline of Cape Breton (Figure 1). Licence areas 2364 and 2365 (Hunt) are located in the Sydney Bight region along the northeast coast of Cape Breton extending into the Cabot Strait 60 to 75 km. Licence area 2368 (Corridor) is situated in the southern Gulf of St. Lawrence and follows the west coastline of Cape Breton from Port Hood to Cheticamp in Inverness County, extending 35 km from the shoreline into the southern Gulf of St. Lawrence and reaches to about 25 km of the Prince Edward Island shoreline.

² These activities include seismic surveys, well-site seabed surveys, gravity surveys, geochemical studies, aeromagnetic surveys, swath bathymetry surveys and exploratory or delineation drilling, with associated testing and flaring programs.

THE REVIEW PROCESS

The Review Process was conducted in two phases.

During the first phase — a series of eight meetings were held in Cape Breton, Antigonish and Prince Edward Island between September 25 and October 4, 2001 (see Appendix III) — the goal was to give members of the public, as well as public interest groups, the chance to identify and exchange views about their concerns. At the same time, these meetings gave me an opportunity to talk more about my mandate and its scope, and to direct participants to the relevant background information available for review.

After these meetings, we published a “Report of Concerns” and circulated it widely as a summary of the issues as they had been identified to us.

This was followed by the publication of the Procedures for Hearings (see Appendix IV) governing participation during the public hearings, which was to be the second phase of the Review Process. These hearings were intended to “provide the general public and interested parties with an opportunity to make presentations, submit documents and express their views and opinions.”

Between January 10, 2002 and February 1, 2002, I held 15 days of hearings and received 130 submissions and related references (see Appendices V & VI).

Typically, presenters took about one third of the time they had requested to convey their submissions orally. The remaining time was for questioning. If all the questions could not be dealt with within the allotted time, I either extended the period, postponed further questioning to the end of the day and/or requested questioners to submit their queries in writing to the presenters.

With the exception of one day when the hearings were in Montague, Prince Edward Island, all the public hearings took place at the Wagmatcook Culture and Heritage Centre in Wagmatcook. Wagmatcook is a Mi’kmaq community located on the Trans Canada Highway about 16 km west of Baddeck and is reasonably easy to reach from any part of Cape Breton and northeastern Nova Scotia.

The Centre initially was chosen for its location. But it turned out to be a good choice for other reasons that I believe are worth noting here.

Although as many as 200 people attended on some days, there was a core group of 50 people who were present each day from 10 a.m. to whenever the hearings ended, sometimes as late as 6:30 p.m. They were, in the language of the terms of reference, “the interested parties.” While it is unfair to attach labels to them, they generally represented interests in the commercial fishery, industrial and business development, protection of the environment, protection of a unique culture and lifestyle and, in the case of the two proponents from the gas and oil industry, an interest in getting the go-ahead to proceed with offshore exploration.

They were all ardent, their convictions fixed and their determination to be heard and heeded substantial. Many were associated with the preparation and presentation of formal submissions and had done the difficult job of assembling data to substantiate their case. Others were simply convinced of the integrity of their position, rooted as it was in their experience and values. Taken together, they represented the broad range of differing, often conflicting, views I heard, including views about matters — such as the need for construction jobs, or the value of natural gas as a source of energy for industrial projects, or the intrusion of production platforms on fishing grounds — that were beyond my terms of reference.

What struck me as instructive about their collective role in the hearings was that a noticeable shift in viewpoints occurred over the three-week period. Because we were all away from the distractions of a larger community and because the Culture and Heritage Centre provided a popular food service as well as a venue where participants could meet to discuss issues or to simply enjoy some minutes of

relaxation away from the intensity of the hearings, people with opposing views often ended up talking to one another. I will not pretend that this resulted in new alliances. The unemployed construction worker did not abandon his determination to seize the opportunity to benefit from a resource beneath the sea in favour of protecting crab fishing grounds. And the fishermen remained convinced the known value of the fishery, which has provided their livelihood for hundreds of years, should not be sacrificed to the uncertain value of gas and oil, with a lifetime of only a couple of decades. Nor did representatives of the gas and oil companies offer to postpone their proposed exploration activity until more research could be conducted, as some were demanding.

The shift was more subtle than that, but no less significant. I noticed gradual adjustments in seating arrangements, for example. A group of construction workers, who had occupied a block of seats at the back of the room each day for several days, moved one morning to seats beside fishermen, environmentalists and oil company representatives. Through their questions and comments, they also made clear that their wish to understand was nearly as strong as their desire to be understood. That was not uncommon. I noted an increasing openness to hear, understand and sometimes acknowledge merit in a competing argument from other participants as well. Participants increasingly exchanged jovial remarks and I even noticed representatives of competing interests having lunch together.

To give you a sense of the impact of all of this, just consider some of the summary statements people made during the final day of hearings:

- “Anyone having attended these hearings can not go away from here without acknowledging how our social and economic lives are integrated, or they have not been listening.”
- “This public hearing process has provided for a gathering of a rather diverse group of people, on all sides of the issue, who I believe have come to have a more sincere understanding of the ‘other person’s’ reason for being here.”
- “With enough time, I think we could have developed consensus here if we could have been locked in a room for another month.”

Consensus was not the objective of the public hearings, of course. But those who will make the final decision about whether to proceed with exploration would do well to recognize that the various interest groups and individuals involved in this process are disposed and willing to work out their differences together. They want to be part of the process. I will deal with this in more detail in my Conclusions and Recommendations section.

THE REPORT

What follows is both a report on my findings during the public hearing process and also my own findings and recommendations.

While not reflecting every view presented, I have attempted to represent the essence of the proceedings in this report, which includes a summary of the views of the general public and interested parties.

Many of the issues discussed fell outside my mandate but seemed inextricably linked to the substance of the issues that did fall within my purview. In particular, these include issues related to the constitutional concerns of the First Nations, the legislative and administrative concerns of the fishing industry, environmental and other participants, and the socio-economic and environmental matters linked with development and production, which were a concern, one way or another, of virtually all of the participants. Because these issues are germane to the subject of the Review even if not specifically within my mandate, I believe I would misrepresent much of proceedings of the hearings if I failed to report on them.

THE CONTEXT

One of my principal responsibilities was to prepare a “summary of the views of the general public and interested parties.” This is that summary, focusing on the issues as seen by participants at the hearings in Wagmatcook and Montague.

It is no easy task to synthesize, or even encapsulate, all the views of all of the groups and individuals who participated in this Public Review process. While there were significant areas of agreement on such general issues as the need to protect the fishery, for example, there was no such common ground on the specifics of how that should best be achieved. And the devil, of course, is in those details.

I will begin with an explanation of the Hunt and Corridor proposals, as the companies outlined them to me, followed by a section on the state of the marine habitat, mammal and seabird populations of the area, as detailed by Fisheries and Oceans Canada and many others, and a third section on the current economy of the region from a number of sources.

These will provide readers with some context for the discussion to follow.

THE COMPANIES’ PROPOSALS

Seismic Surveys

Corridor and Hunt have proposed conducting 2D seismic surveys in their licence areas as the first step in identifying geological structures which may contain gas or oil.

Although the precise details cannot be confirmed until it selects a contractor, Hunt said its proposed survey in the Sydney Bight will use modern seismic methods and technology.³ It expects to conduct its survey during late autumn or early winter specifically to avoid interfering with fishing activity during the spring, summer and early fall, and also to mitigate potential negative interactions with sensitive biological attributes of the marine environment. The timing, of course, will also help the company avoid winter conditions when heavier sea states, which generate noise adversely affecting seismic data collection, decrease the amount of time available for surveys.

Corridor proposed a less extensive survey than Hunt on its lease in the southern Gulf of St. Lawrence. It plans to use the smallest airgun array practical for achieving its geophysical objectives.⁴ The survey would last approximately five days during October or November.

Both Hunt and Corridor describe the socio-economic benefits associated with seismic operations as “modest.” The surveys will be short term. The vessels and crews contracted to do the work will likely be

³ A seismic vessel will tow an array of 30 to 40 airguns approximately 6 m below the water surface, and a hydrophone streamer, the length of which is predicted to be 4,500 to 6,000 m. The vessel speed during the survey will be no less than 3.5 knots and no more than 5.5 knots. The airgun array will operate at acoustic intensity levels typical for current seismic operations in the offshore area of Nova Scotia. The airguns will discharge approximately every 12 seconds and will be arranged in such a manner that, to the extent possible, the energy is directed downwards towards the seafloor. Hunt plans to run 31 survey lines totalling 2,053 km in length. The length of each line will vary. Some may be as short as 20 km and others may exceed 100 km. All lines will be located 6 km or more beyond the shoreline. These lines will take about 20 days to complete. This estimate does not include down time associated with weather conditions or other unforeseen circumstances.

⁴ The array would consist of 15 to 20 individual airguns and operate at acoustic intensity levels approximately one-third to one-half the value used on the Scotian Shelf. The hydrophone streamer with a length of approximately 4,000 m would be shorter than the streamers commonly used on the Scotian Shelf. The survey would consist of 28 lines, totalling 685 km, towards the western edge of its licence area. All lines would be more than 15 km from the Cape Breton shoreline and 21 km from the PEI shoreline.

from outside the country, although some deck hands may be hired locally and some provisions may be acquired from regional ports. Corridor has indicated it would hire one or two fishery observers to monitor its seismic program for any effects that it may have on the fishery.

Exploratory Drilling

Both Corridor and Hunt say exploratory drilling would only be carried out if their seismic surveys identified geological structures capable of trapping oil and gas. Drilling, they noted, is the only way to confirm the presence and nature of hydrocarbons in such structures.

Both companies have also indicated they would likely use jack-up drilling rigs if they were to carry out exploratory drilling. These rigs require by regulation a 500 m exclusion zone around them to protect both the rig and marine vessels. If the surveys identify oil and gas prospects in waters deeper than 80 m, the companies indicated they might use semi-submersible rigs. Because semi-submersible rigs require the temporary installation of an array of six to ten anchors, they would require an even larger exclusion zone.

Prior to drilling, the companies would conduct surveys of the sea bottom around where the drilling rig would be located to ensure it was clear of debris, the substrate would support the rig legs and there were no shallow gas deposits near the surface of the ocean floor that might pose a hazard to drilling.

They would use water-based drilling muds. Such muds contain a variety of non-toxic components, the major ones being bentonite and barite. Although muds are normally discharged into the marine environment without treatment, Corridor said it would be prepared to bring all muds ashore for disposal if an environmental assessment of its proposed drill site provided evidence discharges of this nature would cause harm to the local environment.

The drilling rigs would be equipped with blowout preventers to control the flow of gas or fluids from the well. Corridor and Hunt acknowledged blowouts represent a distinct though, they insist, small risk. Corridor suggested the probability of an oil spill in excess of 10,000 barrels is one in every 6,700 wells, and the probability of a spill in excess of 150,000 barrels is one in every 20,000 wells. Hunt, in its submission, compared offshore oil exploration and development, which contributes approximately 1.5 percent of the total hydrocarbon input into the world's oceans, with the marine transport industry, contributing about 45 percent.

Corridor and Hunt stated that all drilling rigs contain waste management systems designed to prevent discharges of wastes or on-board spills into the marine environment. These systems control such wastes as grey and black water, ballast and bilge water, deck drainage, discharges from machinery spaces, garbage and cooling water.

Corridor estimated it would need approximately 40 days to drill a well to 3,000 m and to evaluate its oil and gas potential. Such an exploratory well would probably be drilled in the fall but a final decision would be based on discussions with the fishing community. Hunt calculated that drilling and evaluation on its lease could take anywhere from 50 to 140 days. These activities would be timed to avoid causing potential adverse effects on fish populations and to avoid interfering with the fishery. Activities would not be conducted on any of the licence areas during the winter months because of ice conditions.

Drilling rigs would be serviced by supply vessels. Hunt indicated these vessels would make an average of three trips a week to the rig. It would also maintain one stand-by vessel on a 24 hour basis. Helicopters may be used periodically to fly personnel to the rig and effect crew changes.

THE MARINE HABITAT

In an effort to assist the public and me in the Review, the Department of Fisheries and Oceans (DFO) in the Maritimes, Gulf and Laurentian Regions prepared a comprehensive document outlining its current

state of knowledge, including the identification of knowledge gaps about the marine environment in the southern Gulf of St. Lawrence and Sydney Bight. This information is contained in its Habitat Status Report.

In it, the DFO describes the marine habitats in the southern Gulf of St. Lawrence and Sydney Bight areas in which Corridor and Hunt propose to explore as "... two biologically sensitive areas," which are closely linked, biologically diverse and contain sensitive life stages of marine organisms throughout all seasons of the year.

The southern Gulf is a shallow, semi-enclosed region with seasonal ice coverage that features a counter-clockwise flow which is subject to alterations by the actions of wind and tide. The semi-enclosed basin morphology combined with tidal action facilitates the movement of deeper water, rich in nutrients, to the surface layers of the water column. The Cape Breton Trough links the southern Gulf and the Sydney Bight regions.

The southern Gulf of St. Lawrence supports spawning, nursery and feeding activities for a variety of important fish stocks. Approximately 500,000 tons of mackerel spawn in the Gulf each year. In recent years, the biomass of mature age classes of herring stocks has been estimated at more than 450,000 tons. Although many fish stocks are depressed, recent studies suggest densities of groundfish in the Gulf — such as American cod, American plaice, white hake, and winter, witch, and yellowtail flounder — are "among the highest in Atlantic Canada." Diadromous fish, the most important of which are Atlantic salmon, gaspereau, striped bass and smelt, are also found in the southern Gulf of St. Lawrence area.

DFO estimates that up to one million tonnes of mature marine fish may migrate along the west coast of Cape Breton between the spawning and feeding grounds of the Gulf of St. Lawrence to wintering grounds outside the Gulf. Stocks using this route, which was described by several participants in the hearings as a "narrow corridor," include mackerel, herring, tuna, cod, plaice, white hake and witch flounder, and several species of diadromous fish.

The water depths in the Sydney Bight region range from 50 m to 120 m. The slope to the Laurentian Channel is steep with water depths increasing to about 400 m. The sea bottom is characteristic of the shallow Scotian Shelf region, which stretches to the southwest along the Atlantic coastline. Ice is present from 60 to 100 days of the year.

The DFO states in its report that the physical environment of Sydney Bight area provides diverse habitat conditions for breeding and feeding as well as over-wintering. The deeper waters adjacent to the Laurentian Channel favour over-wintering habitat for adult herring and most groundfish stocks while the shallower waters are feeding and breeding areas for cod and other species. According to information provided by the DFO, several species of diadromous fish, as well as marine fish, use Sydney Bight as a migratory route into and out of the Bras d'Or lakes.

Invertebrates support important fisheries in the southern Gulf of St. Lawrence and Sydney Bight. The DFO economic records show that lobster and snow crab are the basis for major regional fisheries. Rock crab, sea scallop and sea urchins support smaller fisheries, and DFO has suggested that toad crab, stone crab and shrimp have "commercial potential."

Lobsters frequent inshore environments in the southern Gulf of St. Lawrence and Sydney Bight. The DFO research indicates the production of lobster larvae in the southern Gulf of St. Lawrence is among the highest per unit of surface area of any region in North America. Snow crab are found in mid-shore environments. Its studies indicate that the southern Gulf of St. Lawrence and the Sydney Bight are settling areas for snow crab larvae and are occupied by all benthic phases and size groups of snow crabs.

The DFO notes in its Habitat Status Report that a large seasonal variation in planktonic biomass, up to "five-fold" in summer, is characteristic of the southern Gulf of St. Lawrence. Moreover, it notes, the biomass of zooplankton is much higher during the period from April to September than elsewhere in

the Gulf or the St. Lawrence Estuary. Much of that biomass is made up of a wide variety of larval and immature fishes and invertebrates. Information on the communities of zooplankton in the Sydney Bight is not as complete as that for the southern Gulf of St. Lawrence.

The DFO describes the southern Gulf of St. Lawrence as one of Canada's most productive marine areas; it represents less than one percent of Canada's exclusive maritime zone but accounts for 15 percent of its total commercial catch. Information provided to me by the DFO indicates that the southern Gulf of St. Lawrence supports 12,234 fishers operating under the authority of 28,596 licences and 9,000 fish processing workers at 145 plants. This level of activity, it notes, is an important component of the economic base of local communities located adjacent to the Gulf of St. Lawrence.

The DFO identified lobster and snow crab as the principal commercial species harvested in the southern Gulf of St. Lawrence region. Data from the DFO Gulf management region in 2000 indicate that lobster and snow crab account for 52 percent and 25 percent of the total landed value respectively. Other molluscs and crustaceans account for 14 percent of the landed value while pelagic, estuarial and groundfish account for the remaining nine percent.

The DFO estimates, from data collected in the 4Vn management area (Figure 1) which encompasses the Sydney Bight, that the total landed value for all species there in 2000 was \$27,720,000. Shellfish accounted for over 90 percent of this total. Groundfish and pelagic and estuarial fisheries accounted for most of the remainder.

MARINE MAMMALS AND BIRDS

The DFO has identified at least 15 species of cetaceans that occur in, or pass through, the Cabot Strait. Six of these — the fin, minke, humpback, and pilot whales, the white-sided dolphins and the harbour porpoise — are regular visitors. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) lists the fin and humpback as being of "special concern." The DFO considers the Cape Breton Trough to be an important feeding area for whales, but it notes it does not have a good understanding of many of the behavioural and biological attributes of this group of animals such as seasonal activities, species and abundance.

In addition to the species identified by the DFO, Corridor lists the blue whale — another species designated to be of "special concern" — as a regular visitor, and the beluga and bottlenose whales and the white-beaked dolphin as occasional visitors to the area. It also indicates that the right whale, which COSEWIC has labelled "endangered," may on rare occasions be found in the southern Gulf of St. Lawrence. According to Hunt, many of the same species of cetaceans are found in Sydney Bight.

The DFO identified four species of seals commonly found in the southern Gulf of St. Lawrence; two permanent residents, the grey and harbour, and two seasonal residents, the harp and hooded seals. According to Corridor, the harp seals migrate to the southern Gulf of St. Lawrence from the arctic in December. The hooded seals also spend the winter months in the southern Gulf of St. Lawrence and are associated with the ice cover. In the Sydney Bight, Hunt has identified five species of seals: the grey, harp, hooded, harbour and ringed seals. Hunt indicated that all, except the grey seal, are occasional visitors. Grey seals are the only permanent residents in the study area where they have a breeding colony on Hay Island.

Corridor has identified three species of sea turtles that are found in Atlantic Canada. A few leatherback turtles have been reported in the Gulf of St. Lawrence during the summer season. Loggerhead turtles may be found in the Gulf but their status in this region is not known. Kemp's Ridley turtle has been found in Canadian waters but Corridor concluded its presence in the Gulf may be problematic. These three species are listed by COSEWIC as "threatened" or "endangered." Hunt cited evidence that leatherback turtles occur in the Sydney Bight from June to mid-November, after which they may move into deeper water before migrating into subtropical or tropical waters.

Environment Canada provided information showing that coastlines in the licence areas provide important habitat for many species of seabirds throughout the year. It noted that several tracts of coastal lands, including Bird Islands, Ingonish Island and the Margaree Island National Wildlife Area, located near or within the licence areas, are recognized as particularly significant for bird life. The Department identified the important breeding colonies for a number of seabirds, including the Atlantic Puffin, Razorbill, Black Guillemot and Leaches Storm Petrel. In addition, it identified a variety of non-breeding species which use this general area, depending on species, throughout the year.

According to the information provided by Corridor, the waters off western Cape Breton Island support low densities of coastal and pelagic seabirds relative to many other coastal regions of Atlantic Canada. Colonies of cormorants, large gulls and terns dominate the seabird colonies of coastal Cape Breton Island with Margaree Island and The Capes having the largest colonies. Information provided by Hunt suggests the coastal area on the east side of Cape Breton supports higher densities of coastal and pelagic seabirds than the western side. Hunt identified five important breeding and resting sites in its study area. Nesting occurs on Bird Islands, Green Island and Port Morien between March and October. Sites at Ingonish and Louisbourg are important resting areas for migrating seabirds.

THE ECONOMIC SETTING

While acknowledging the central role of the fishery to the economy and social well-being of many coastal communities in New Brunswick, Prince Edward Island and Nova Scotia, many participants in the Review from northeastern Nova Scotia expressed the opinion that exploration represented an opportunity to diversify and strengthen the economy of the region.

No comprehensive summary was available describing the current status of industry, trades and business in the province's eight eastern counties where there is high interest in the proposed gas and oil exploration activity. However, a number of presentations provided an overview of some of these attributes.

Hunt cites a study conducted by Gardner Pinfold, in March 1999, which identified weaknesses in most socio-economic indicators in Cape Breton. These included: "consistent decrease in employment opportunities;" "a relatively low and declining participation rate;" "an unofficial unemployment rate double the provincial average;" "a relatively low earned income;" and "a declining population."

Keith Brown, from the University College of Cape Breton provided information to illustrate that the Cape Breton Region had the country's highest rate of unemployment, at 17.7 percent in 2001, and that it has a per capita income below the provincial average. His evidence indicates there has been "substantial improvement in both employment and participation rates in Cape Breton in the past five years and most notably during 2001, even in the face of the closure of coal mining and steel production." However, he observed that the regional economy remains fragile and needs "a new economic engine" to put it on firmer ground. Exploration, he concluded, represents an opportunity to assess the potential of an oil and gas based industry to fulfill this need.

A prevalent theme of the presentations from business and trades interests was the importance of providing opportunity for young people to remain in or return to the region in order to stop the current population decline with its negative implications for families, communities and social and educational institutions of various kinds. Many made reference to the regrettable fact that, due to negative economic circumstances, most parents cannot look forward to having their children and grandchildren living nearby.

IMPACT ASSESSMENTS

Hunt and Corridor provided the Review with their assessments of the potential environmental and socio-economic effects of seismic activities on their licence areas. The documents focused on the effects of seismic activities on fish and invertebrates, marine mammals and birds, the fishery and the regional economy as well as the potential for cumulative effects, and on ways and means of mitigating adverse effects. Hunt also identified the location of military ocean dumpsites, which may pose a hazard to exploratory activities.

In general, both companies concluded seismic activity would have no significant effect on the marine environment and its uses, and that the socio-economic benefits to Cape Breton would be small.

Hunt's study was based on an autumn survey and focused on an area, including all of Sydney Bight bounded by Cape North in northeastern Cape Breton, Scaterie Island in the east, and the Laurentian Channel to the northeast. Hunt contended the likelihood of any environmental impacts on marine life, including commercial fish and invertebrates, eggs and larvae, marine mammals, and birds, at the population level was low and that the magnitude of any impacts which might occur would be minor (less than one percent of the population of any particular species) or negligible. Similarly, it contended the effects of seismic work on fishing activity would be minor to negligible (see Appendix VII).

Hunt identified two munition dumps, one containing unexploded bombs and the other containing 'explosives' of an unknown nature. The proposed survey will pass over the site containing unexploded bombs and approximately 18 km east-northeast of the site containing explosives.

Although the boundaries of the Corridor assessment were defined by the boundaries of its licence, it did take into account the effect of seismic noise disseminated beyond those boundaries. In general, it concluded the impacts on the behaviour of adult fish as well as fishing success rates for crab and lobsters, pelagic and demersal fish were likely to be minimum to moderate. And those impacts, it predicted, could be mitigated by conducting the surveys in the late fall or early winter when the fishery was less active, and when seismic activities were less likely to interfere with behavioural patterns important to the maintenance of commercial stocks. As a consequence, it estimated the residual impacts would be minor or negligible. While Corridor allowed that the likelihood of direct effects of seismic operations on crab and lobster in the benthic community is unknown, it concluded the magnitude would be minor to negligible. It argued that research on invertebrates has demonstrated they are invulnerable to lethal and sub-lethal effects of vibration and pressure changes although such effects could cause changes in behaviour. Effects on individual marine mammals were assessed to be likely but minor, and the effects on populations of marine mammals, seabirds and sea turtles negligible.

Corridor noted that over 80,000 km of seismic survey lines had been run and nine exploratory wells drilled in the Gulf of St. Lawrence over the past several decades with no apparent adverse effect on marine life or the fishery. Based on this experience alone, it believed its small program of 685 km of 2D seismic would not cause any significant effects.

Corridor and Hunt outlined the measures they were prepared to take, if necessary, to mitigate any potentially adverse effects from their operations. These included:

- pre-seismic studies of the affected areas;
- execution of surveys in the fall or early winter to minimize potential effects on sensitive life stages and interference with fishing;
- using "ramp-up" procedures to incrementally increase power to the air gun array over time thereby encouraging animals to leave the operating area prior to commencement of surveys;
- deployment of chase boats to encourage animals especially large mammals to leave the operating area;

- shutting seismic operations down when marine mammals are found to be within a predetermined zone around the seismic vessels;
- retaining trained biological observers on board the vessels;
- monitoring the effects of air guns on selected crab populations during and after the seismic program;
- consulting with fishermen and First Nations; and
- providing financial compensation for attributable damage.

In addition, Corridor noted it was planning to conduct a very short seismic program using relatively small, low-powered air guns compared with those used in conventional seismic surveys, which would further reduce the risk of adverse effects to the marine environment.

Both Hunt and Corridor concluded the impacts of their respective proposed programs would not contribute to any cumulative impacts. Fishing was identified as the only other significant activity affecting the marine environment during the general period when seismic operations are proposed. Each company concluded that the effects of its activities would not combine in any additive or synergistic way with the impacts of the fishery on the environment and therefore there would not be any cumulative effects.

Corridor did not provide any detailed assessment of the impact of exploratory drilling on the environment at this time. It noted that, in the event a potential oil and gas prospect was located as a result of its seismic study, the company would be required to prepare a detailed environmental assessment specific to its drilling proposal.

Hunt, for its part, did prepare a generic assessment of the potential environmental and socio-economic effects of exploratory drilling. It estimated the discharge of muds and cuttings would have a smothering effect on the benthic or sea-bottom community within an area covering a few hundred square metres under and adjacent to the drilling rig. It noted that, while there was no scientific information about the effects of muds and cuttings on snow crab, it had examined the research of the effects of these discharges on sea scallops and concluded the effects on snow crabs would be less because of their greater mobility and different method of feeding. With respect to lobsters, Hunt concluded there would be no impacts because they did not inhabit the areas in which exploration was planned. As a consequence, Hunt concluded that such discharges would have “minor, sub-local, medium-term impacts” on the benthic community.

As mentioned earlier, current regulations require a 500 m exclusion zone around a jack-up rig. Hunt predicted this zone would have a minor effect on the fishery generally but the impact could be significant for a few fishermen who rely on those particular sites for a large portion of their catch. Hunt has indicated it would seek to mitigate this effect through compensation.

Hunt stated that gray water and black water, generated on the drilling rig, is collected, treated and tested prior to discharge into the marine environment, meaning its impact would be negligible. Waste products which are discharged into the marine environment, Hunt notes, must be treated to meet regulatory requirements while other types of routinely generated wastes are usually collected and transported to shore for treatment. It concludes that the effects of the disposal of all wastes on the environment would be negligible.

Flaring, the practice of burning gas as part of the procedure for testing the hydrocarbon potential of exploratory wells, can attract birds and has been identified by Hunt as a possible hazard. However, it predicts that flaring during exploration will pose only a minimum risk not only because it happens infrequently but also because bird deaths resulting from this activity are rare.

Hunt also examined the potential impacts of lights, noise and disturbances to marine life, including birds, associated with the operation of the rigs and supply boats and found these effects to be negligible to minor.

If there were to be oil spills, Hunt anticipated the effects of crude oil would be greatest on birds that came in direct contact with the oil. Such exposure would reduce their ability to regulate their body temperature and adversely affect their buoyancy, leading to death. The effects on marine organisms such as eggs, larvae, fish, invertebrates and marine animals would be negligible or unlikely. Hunt noted that when sea turtles have been exposed to oil, it can cause temporary lesions in the skin. The company suggested there is some evidence indicating turtles have only a limited ability to detect and avoid oil.

It also examined the question of cumulative impacts of exploratory drilling on the marine environment and concluded that none were likely.

Hunt judged that, although there could be some important spinoff economic benefits, the overall benefits of a single exploratory well would likely be modest because there are few industries in Cape Breton which have the capability to conduct such work.

THE CONCERNS AND ISSUES

OVERARCHING CONCERNS AND ISSUES

For the most part, I will focus on the issues that dominated the proceedings. But participants also identified a range of other concerns that reflected their desire to be cautious either about damaging the environment and public health or foreclosing opportunities to stimulate the regional economy as a basis for enhancing the quality of life, including creating employment and social benefits.

These matters were often not controversial by themselves but suggested as factors decision-makers should consider when evaluating the Corridor and Hunt proposals. I have therefore included these matters in this section as well.

Protecting the Marine Environment

All participants, including those associated with the petroleum industry, the business community, the building trades and the municipalities agreed it was necessary to protect the vitally important marine environment in the licence areas.

However, there was little agreement about how to do this. Environmental and fishery groups and many individuals, for example, favoured a moratorium on exploratory activity in the Gulf of St. Lawrence and Sydney Bight at least until:

- research has been conducted to identify areas of high biological productivity, diversity and sensitivity,
- such areas have been protected through regulation or legislation, or
- new, more environmentally benign techniques are developed to explore for oil and gas.

The Conservation Council of New Brunswick argued for a temporary moratorium on exploratory activity while the DFO and the CNSOPB did the necessary research to better understand the potential impact of seismic activities and drilling in shallow water environments. In addition, the Council requested DFO take advantage of the proposed moratorium to assume its leadership role in identifying areas of high biological productivity or areas particularly sensitive to petroleum exploration and development.

In a similar vein others argued there should be no oil and gas exploration until the completion of a full environmental impact assessment involving all the stakeholders. Among those making that suggestion: the Chair of the Parliamentary Standing Committee on Fisheries and Oceans, Wayne Easter, and Nova Scotia New Democratic Party MLAs Howard Epstein and John Holm. The NDP noted that since the Hunt and Corridor inshore exploration licences were the first ever issued in Nova Scotia, the

federal and provincial governments had a particular obligation to undertake a full public review before allowing the companies to proceed.

Concern about the risk of damage to marine resources from exploration in shallow, near shore waters was a common theme, often closely related to suggestions of establishing marine protected areas. While the environmental community generally was not predisposed to entertaining any exploratory activity in the licence areas, representatives from some organizations did indicate they would be prepared to cooperate with other stakeholders to identify key sensitive areas where exploration should be prohibited. Those opposed to exploration also argued that most progressive western countries with offshore oil and gas prospects had either banned near shore exploration or had imposed rigorous legislative requirements for “opening up” such areas to exploration.

Those who favoured exploration rebutted those points with their own information including, for example, evidence that there has recently been near shore exploration in Canada at Bay St. George, Newfoundland. They also pointed out that, during the 1970s, numerous wells had been drilled off the shores of Cape Breton as part of an effort to evaluate coal deposits. Further, they argued that many of the locations where exploration was forbidden in other countries were areas that are not good prospects for oil and gas discovery and, in any case, were not set aside for environmental or fishery reasons.

For their part, representatives of the petroleum industry claimed they are, and have been, willing to work with the regulatory authorities and interest groups to help identify areas for protecting marine resources. Once identified and established, they said, industry would have clear direction on where it could and could not pursue exploration efforts.

Although the Corridor and Hunt licences are on different sides of Cape Breton, many participants argued the two areas are inextricably linked biologically. As noted in the DFO Habitat Status Report, fish from one area migrate annually to the other. The Maritime Fishermen’s Union emphasized this interrelationship in its presentation, which noted that this was why “our fishermen on the Acadian Peninsula in New Brunswick, or the South Gaspé for that matter, have always had common cause with inshore fishermen in places like Little River or Dingwall or Big Bras d’Or or Glace Bay.” Fishermen in Prince Edward Island echoed the same sentiment while expressing their dissatisfaction that the CNSOPB had used administrative and provincial boundaries to set the parameters of this Review rather than considering natural ecosystems.

Coexistence

Coexistence was another controversial theme throughout the hearings.

The fishing industry argued that coexistence is already in place; it has accepted offshore oil and gas exploration and development on the Scotian Shelf and has no major objections to such activities in the Laurentian Channel. In both these areas, the fishing industry has acknowledged that locations around drilling rigs and production platforms must be set aside exclusively for exploration and development.

But it argued the government and the oil and gas industry should be equally willing to accept that some areas need to be set aside exclusively to support the fishery. It insists that the biological resources in the licence areas are just too sensitive to place at risk from petroleum activities, and that fishing is too constrained either by natural or regulatory factors to permit exploration without adversely affecting it.

Furthermore, they argued that coexistence must be based on a relationship among equals. That means governments must put in place an effective legislated process involving all stakeholders to identify these areas. Some fishery groups, in fact, indicated they would not discuss the concept of coexistence until the current licences were revoked so both parties could re-start the process on an equal footing.

The petroleum industry, business community and construction industry favoured coexistence too but, generally, interpreted the concept differently. Using the same example as the fishery, they argued that current cooperation between the fishery and the petroleum industry on the Scotian Shelf

demonstrates coexistence can be successful. In general, it is their view that past experience in shallow water environments in other areas of the world, including the west coast of Newfoundland as well as the Gulf of St. Lawrence itself, demonstrated that exploratory activity does not represent any significant risk to the marine environment.

Those groups also argued the oil and gas industry has demonstrated it has developed a range of procedures and technologies that effectively mitigate potentially adverse impacts on the marine environment and its resources.

Evidence presented at the hearings suggested that past efforts at consultation between the fishing community and the public, and the petroleum sector and its regulator, CNSOPB, had not been successful. Both Corridor and Hunt maintained they had made sincere and honest efforts to consult with representatives of the fishery but felt that their efforts had failed to engage fishers. The fishery and environmental groups, for their part, felt that government agencies, particularly the CNSOPB, had let them down by not establishing effective arrangements to keep them informed, particularly about impending actions associated with issuing exploration licences.

Even the meaning of the term “precautionary principle,” a concept that formed an integral part of many arguments during the hearings, became a matter for debate. At one end of the spectrum, there were those who interpreted it to mean exploration and drilling activities should not proceed until there was absolute proof they would have no adverse effect on the marine environment. At the other end of the spectrum, were those who suggested there was no need to apply the concept because severity of the potential impacts did not meet certain administrative or legal criteria.

Many participants traced public concern about the proposed exploratory activities to the current process for issuing exploration rights, which they perceived to exclude citizens who had a legitimate interest in the potential environmental and socio-economic effects of such activities on other uses of marine resources. Although it was outside my terms of reference, the Gulf Nova Scotia Fisheries Advisory Board and 4Vn Management Board asked me to inform both levels of Government the rights issuance process must be “fixed.” In particular, they requested that the process include fishermen before industry identifies offshore parcels and before the CNSOPB issues a Call for Bids. Other participating groups, including the First Nations with their unique interest in the proposed activities, made similar requests.

SPECIFIC CONCERNS AND ISSUES

Seismic Surveys

Fishery interests from northeastern Nova Scotia were well represented and participated actively throughout the Review, and particularly during the 14 days of hearings at the Wagmatcook Culture and Heritage Centre. In addition, fishery representatives from both New Brunswick and Prince Edward Island made contributions at the hearing in Montague, PEI. Those organizations, as well as representatives from other groups and individuals opposed to seismic activity—including environmental groups, some members of the First Nations as well as individual participants—provided arguments to rebut many of the findings in the companies’ environmental and socio-economic assessments.

Perhaps most significantly, they claimed there simply is not sufficient scientific information available—either generally or, more critically, for the southern Gulf of St. Lawrence and Sydney Bight specifically—to make accurate assessments about the potential environmental and consequent socio-economic effects.

These two areas, they note, are biologically productive and diverse and contain many species of fish and invertebrates that support a variety of successful inshore fishing industries. They provide important spawning grounds, nurseries, feeding areas, migratory routes and over-wintering grounds. Neither the life cycles of these commercially important species nor the attributes of the non-commercial biomass, which represents an important part of the food chain, are sufficiently well understood to provide a basis for proceeding with seismic exploration.

In addition, they point out that sensitive life stages and/or behavioural patterns essential to the health of fish and invertebrate populations occur during almost all seasons of the year. Consequently, representatives of the fisheries and others argue that there is no 'window of opportunity' for conducting seismic exploration activities as the companies had suggested. Moreover, there are wide annual variations in the natural cycles related to these attributes which, in turn, make it difficult to predict 'safe' periods — such as the late fall or early winter — for conducting seismic activity in any given year. Consequently, it is their contention that the two regions containing the three licence areas should be considered as one "sensitive area" in which petroleum activities are prohibited.

They also suggest that the shallow, stratified waters and enclosed or semi-enclosed nature of the basins in which the licence areas are located may enhance the propagation of sound in ways which could, in turn, exacerbate the adverse effects of seismic operations. Corridor disagreed and provided evidence to demonstrate that, from an acoustical perspective, shallow waters in an enclosed basin such as the Gulf are an advantage because the propagation of sound waves breaks down in shallow water and the sound is absorbed by the sea bottom more effectively than in deeper waters. The belief that the sound reverberates from the shoreline, they argued, was erroneous.

Fish and Invertebrates

Behavioural Effects: None of the participants disputed the arguments that fish react to the discharge of air guns. Information was presented by parties on both sides of this issue to demonstrate that the nature of these reactions, or lack thereof, has been studied and that they vary widely between species and between developmental stages within species. But there was a wide gap in the interpretation of the significance of these effects for the maintenance of robust fish stocks within a healthy ecosystem. Those opposed to seismic activity relied heavily on arguments that there were simply too many unanswered questions about a variety of risks and not enough accurate scientific information to address them with any degree of certainty. Those promoting limited seismic surveys relied heavily on experience about impacts elsewhere in the world—as well as the results of scientific literature, and upon more general observations of animal behaviour such as the over-riding biological urges to feed, breed and migrate—to demonstrate those adverse effects would be minimal.

Most participants agreed seismic activity over breeding fish stocks presented an unacceptable risk. Opponents of seismic activity pointed out that vocal communications are an important component in the breeding process of many fish species and the potential for airgun sounds to disrupt such communications was seen to be high.

They also argued that seismic activity constituted an unacceptable risk to migrating fish as well. They presented arguments to support the proposition that fish migrating along the western coast of Cape Breton and the Sydney Bight were particularly susceptible to disturbance during the late autumn and early winter when the companies want to conduct their surveys. During this period, large numbers of various commercial fish species move along a narrow pathway between their spawning and feeding grounds in the Gulf of St. Lawrence and their over-wintering grounds in the Sydney Bight.

They contend that behavioural changes in fish species following seismic activities could result in reduced fish catches. The Sentinel Fishery Association, which is collecting data to monitor the recovery of cod stocks in Area 4Vn, expressed concern that such changes, temporary as they might be, could interrupt data collection. Kevin Nash of the Sentinel group said his Association has collected data on these trends for seven years and feared that the effects of seismic activities on catches could, in turn, adversely affect the interpretation of these time series data.

Those opposed to seismic further argued that discharging air guns over populations of feeding fish and invertebrates may also have adverse population effects, especially where fish are driven from their feeding sites to other, less suitable, ones.

Sub-lethal Effects: There was evidence to indicate that seismic activities cause sub-lethal effects such as hearing loss, damage to internal organs, particularly swim bladders, and perhaps even stress. Effects

from such interference may be either temporary or permanent but, in either case, could seriously impair the ability of the affected organism to perform essential biological functions such as avoiding predators, feeding, breeding and migrating.

Again, there was little disagreement on this matter. As with the behavioural effects, the principal disagreement centred on the significance of the effects at the population level. Those opposed to seismic programs pointed out the scientific community has no knowledge about its potential effects on the species of fish and invertebrates in the Gulf of St. Lawrence and Sydney Bight areas. They argued that populations of these animals are not evenly distributed throughout the areas and that seismic activity in locations where there are high concentrations of animals could result in serious damage. Further, they indicate, the limited research which has been carried out elsewhere in the world suggests such effects could be significant at the population level.

Corridor and Hunt countered with their assessment of worldwide experience, as well as their assessment based on the estimated range of sub-lethal levels of sound. They suggest that only a relatively small proportion of the population of any given species would be adversely affected. Furthermore, they contend, seismic activities carried out in the fall will substantially reduce the level of interaction with sensitive life stages of marine organisms. Consequently, it is their conclusion that the impact of sub-lethal effects at the population level would be minimal.

Lethal Effects: There was no disagreement among participants that many organisms near airguns, when they fire, will be killed. Participants opposed to seismic activity argued these lethal effects could be much larger than those predicted by Corridor and Hunt. This could occur, they suggested, if organisms or life stages of organisms such as larvae or juveniles, sensitive to lethal impacts, were concentrated at or near the depth of airguns when they fired and/or if the zone of lethal effect was larger than that predicted in the companies' assessments. Corridor and Hunt acknowledged seismic activities would have a lethal effect on some organisms located close to the air guns. However, they believed the evidence upon which their assessments were based indicated the very small percentage of any population which would be killed, combined with the fall timing of the survey, would preclude any significant impact on marine life.

The Atlantic Salmon Federation identified a range of possible adverse impacts on salmon which are at historic low levels in North America. It noted that the western half of Cape Breton and the northern coast of mainland Nova Scotia contain some of the few remaining healthy stocks of wild salmon in the province but that they are now in decline. The Federation cited evidence that the Corridor Licence area lies across an important migration route for salmon returning to the rivers of the Gulf of St. Lawrence and for juvenile fish migrating from these rivers to ocean feeding grounds.

The location of overwintering grounds for grise is unknown but it is believed they are located in near coastal waters which could place them at risk from the proposed seismic program in the southern Gulf of St. Lawrence. It also noted there is very little information of the ecology of the salmon's prey species and how these relationships might be affected by seismic activity. But the Federation indicated that if exploration proceeds, it would be willing to work with industry to help devise strategies to mitigate adverse effects on Atlantic salmon.

Many of the participants expressed another concern; they believed the limited seismic programs proposed by Hunt and Corridor would be merely the first stage of much more intensive and extensive seismic activity in the southern Gulf of St. Lawrence and Sydney Bight areas. In particular, they argued that any success Corridor and Hunt may have in locating promising geological structures will lead to 3D seismic programs, which they believe are more powerful and therefore more damaging than 2D surveys. In addition, they believe that success will spawn an expansion of seismic activity in general throughout these regions. This increased activity would, they suggest, further magnify the adverse behavioural, sub-lethal and lethal effects on commercial fish and shellfish populations in these areas.

Crab fishermen from the Area 18 Crab Fishermen's Association claimed the risk of damage from seismic activity to their fishery was particularly high because: their fishing area lies entirely within the

Corridor licence area; all ages of crabs, from spawn to adults, are found within the licence area; and crabs migrate through the licence area from Gaspé to western Cape Breton, Sydney Bight and beyond. Further, they argued that a major effect on the crab fishery would also have major implications for Inverness County where the landed value of snow crab exceeds that of lobster. Based on this knowledge and the absence of scientific evidence on the nature of seismic impacts in Gulf waters, they believed the risk of significant damage to snow crab in Area 18 is particularly high and, consequently, the risk to the livelihood of the fishery and the economy of Inverness County and Cape Breton Island is equally high.

Crab fishermen argued there are no peer-reviewed studies on the effects of seismic activities on snow crab in the Gulf of St. Lawrence. Therefore there is no basis upon which to assess the potential adverse effects on that fishery. The fishermen had no confidence that the results of studies on related species that have been conducted in other regions could be used to predict the impact of seismic on the snow crab fishery in the Gulf of St. Lawrence.

Crab fishermen noted that a study of the impact of seismic energy on the behaviour of snow crab is being proposed under the auspices of the Environmental Studies Research Fund (ESRF). However, they suggest this study will not provide the type of information that will be required as a basis for assessing the potential impact of seismic activities on the crab stocks in the southern Gulf of St. Lawrence and Sydney Bight. They argue the proposed ESRF study will be done in waters deeper than those where Corridor and Hunt are proposing to conduct their seismic programs. More importantly, they suggest, the study is limited to adult or commercial size crab to the exclusion of the younger age classes, which are of primary concern in the southern Gulf of St. Lawrence and Sydney Bight. In response to concerns expressed by fishermen about the absence of information on the impact of seismic activities on snow crab, Corridor proposed that, since its seismic program was small by average standards, it might provide the basis around which a study could be developed to determine the effects of seismic on the various stages of crab development. It was prepared to consider this approach, in consultation with the local snow crab fishermen, as a basis for monitoring the effects of its project on crab populations. Similarly, Hunt has proposed an environmental effects monitoring program to identify possible effects of seismic programs in the Sydney Bight region. The program would be designed with the assistance of a liaison committee involving fishermen, First Nations and the DFO.

Concerns about Marine Mammals and Birds

Several groups and participants from the environmental and tourism community disagreed with the companies' assessment that seismic activity would not have a significant effect on mammals, particularly cetaceans, and turtles, many of which are categorized as "threatened" or "endangered."

Some argued there is little knowledge about the numbers, distribution and movements of cetaceans and turtles and that, in the absence of such knowledge, the potential risk to these animals is unacceptable. They contend such risks are not warranted since these animals are symbols of a pristine environment and natural beauty used to attract tourists and, in the case of whales in particular, provide the basis for a growing ecotourism industry.

Others presented evidence to support their argument that the noise from air guns when discharged bathes the marine environment in sound for as much as tens of thousands of square miles. While the effects of such sound pollution are not well understood, they argue there is enough evidence to suggest it may impair critical behavioural patterns such as those associated with reproduction and protection from predators.

Those who supported the exploration proposals submitted evidence to advance their arguments that the effects of seismic on marine mammal behaviour was transient and resulted in no apparent long term effects.

As for the impact of seismic activities on birds, Environment Canada indicated that shock waves from air guns may 'knock out' or kill birds diving in the vicinity of seismic surveys. In addition, it suggested, seismic activity may have an adverse effect on seabirds if their prey is driven from their

habitual hunting areas. It recommended that Corridor and Hunt avoid running seismic programs within one kilometre of seabird concentrations.

Exploratory Drilling

The Unamaki Institute of Natural Resources presented evidence which suggested a number of potentially adverse effects from exploratory drilling. These included the clogging of the feeding apparatus in filter-feeding animals by bentonite with consequent death and/or reduction in growth rate, and damage to gills of bivalve molluscs from barite with similar effects. The Institute contended that the reduction in growth, together with a lower reproduction rate, might have an effect on benthic communities over substantial areas.

Those concerned about exploratory activity argued that the areal extent and environmental effects of discharging drilling mud and cuttings would be greater than Hunt had predicted. The Unamaki Institute noted that the DFO has developed models to predict the dispersion of water-based muds. These, it suggested, can be used to assist in predicting the potential impact of discharging this material into the marine environment. It noted that this should have been done for the licence areas. Hunt countered that, in a generic sense, it did use the data available from Scotian Shelf studies in its preliminary environmental assessment. Further, it confirmed that dispersion studies would be done for the specific location of any exploratory well site where it might consider drilling in the future.

The Sierra Club noted both leases encompassed highly significant seabird protected areas at Margaree Island in the southern Gulf of St. Lawrence and the Bird Islands in the Sydney Bight. Tourist operators use the latter as a point of interest for boat tours. The Sierra Club argued the Nova Scotia Bird Society or the local tourism businesses should have been consulted about the potential impacts of exploration on these bird colonies before the licences were granted.

Environment Canada added that birds are perhaps the most obvious victims of oil pollution and that large numbers of birds can be killed by small amounts of oil. It also advised that certain species, such as the Leach's Storm Petrels, can be attracted to the lights of drilling rigs as well as to the lights of support and seismic vessels. It recommended that Corridor and Hunt monitor the effects of lighting on birds, and devise and implement strategies to mitigate the severity of adverse impacts. In its environmental assessment of the effects of drilling, Hunt argued the effects of lighting would be negligible to minor.

Environmental Hazards

Myles and Associates presented information indicating there are military and industrial ocean dumpsites off the coast of Nova Scotia that have not been assessed for potential hazards to oil and gas exploratory activities. Based on its studies, Myles and Associates has concluded there may be military dumpsites off the coast of Cape Breton containing chemical warfare agents, particularly mustard gas.

In its environmental assessment, Hunt noted it had contacted the Department of National Defence regarding dumpsites in the vicinity of its proposed activities. Two sites were identified; one possibly containing unexploded bombs and the other explosives. Corridor stated it would consult with the Department of National Defence regarding the existence and location of dumpsites prior to executing any seismic surveys, and would not put people or the environment at risk from such hazards.

Myles and Associates also argued there are no documented studies indicating the nature of the potential effects of seismic testing and other exploratory activities on chemical warfare agents in military dumpsites. It recommended governments place a moratorium on all petroleum exploration in the nearshore and offshore areas of Atlantic Canada until such studies are done.

Hunt referenced evidence in its environmental assessment indicating there are no known examples of munitions exploding *in situ* by any type of disturbance.

Several participants noted that the presence of winter ice would also have a major impact on efforts

to contain and recover any oil or chemical products spilled during drilling operations. Corridor said it would conduct drilling outside the winter season thereby mitigating any problems that ice might pose for oil spill containment and clean-up.

Environment Canada explained that local violent winds known as 'suête' winds could affect exploratory activities in the southern Gulf. It also noted that the potential for encountering waterspouts during the fall should also be addressed when planning exploratory activities for this area. Tropical storms and hurricanes, it advised, could generate storm surges and extreme waves which could be particularly destructive to facilities located in both the southern Gulf and the Sydney Bight regions. Both companies indicated that these matters would be specifically addressed if they planned to drill exploratory wells.

Regional Development

A variety of groups and individuals from industry, the construction and building trades, the business community, boards of trade and development agencies and four of six municipalities offered strong support for proceeding with exploration. They argued that the direct value of exploration is the opportunity that it provides to assess the potential of oil and gas to create a new industrial base for Cape Breton and to contribute generally to the wealth of the province. Without exploration, there can be no development and without development there can be no petroleum industry, and without the petroleum industry there may be no new industrial base for the Cape Breton economy.

Although committed to the importance of gas and oil exploration, supporters of this activity stressed the merit of achieving a diversified economy. They maintained that the ultimate objective is to have strong, sustainable communities. Through the recently established Growth Fund, Enterprise Cape Breton Corporation informed the Commission that it oversees a development policy with five growth sectors of which oil and gas development is one. Sean Reid, a Mulgrave businessman who has experience with offshore gas and oil development, described the hydrocarbon industry as a lever to build the economy without injuring existing economic sectors.

Evidence was presented to illustrate a partial linkage between depressed economic conditions, out-migration of children and poor health indicators such as high rates of cancers and heart disease. Supporters of exploration argued that the opportunity to investigate the potential for an oil and gas industry in Cape Breton must be pursued to determine its potential for alleviating the current economic condition and the associated negative attributes. Others argued that the economy in rural Cape Breton, which is grounded in the fishery and tourism, is gaining in strength; it is only the area that is traditionally referred to as industrial Cape Breton, that is experiencing economic difficulties. They see exploration as a threat to this stable economic base.

Evidence was presented by both business and trades organizations that there is a well-qualified work force in Cape Breton ready to do the kind of work required by the gas and oil industry particularly during its development phase. The Cape Breton Island Building Trades Council, for example, has a membership of 3,600 skilled tradespeople, many of whom are currently unemployed. As well, there are long-established and developing service industries capable of providing extensive metal fabrication work and a wide range of supply base services to the oil and gas industry.

It was recognized by all who would proceed with gas and oil exploration that tourism and fishery are significant industries which must not be adversely affected by exploration activities. But, important as they are, it was alleged that these industries are not generating sufficient employment to deal with the requirement for jobs among members of the local workforce with the result that other industrial options must be found. Some suggested that science and technology resources are available, here and elsewhere, to ensure that change can be managed in a way that will protect the fishery and tourism along with the broader physical, social and cultural environment. Further, it was suggested that the risk of negative publicity and the consequent damage to corporate reputations alone would serve as a deterrent to any oil and gas company whose policies or practices posed an unnecessary risk to the marine environment.

Without exception, those who favoured proceeding with exploration recognized that measures have to be taken to ensure that co-existence is achieved in a way that allows the fishery and tourism industries to continue with confidence. They acknowledge a process has to be put in place to enable relationships of trust to build within a context where stakeholder voices have equal strength but they offered no model for such a process.

Socio-Economic

All participants accepted and were indeed adamant that the fishery must be protected from any significant adverse effects of petroleum exploration.

The parties opposed to petroleum exploration in general, and seismic in particular, believe experience with oil and gas activities in Nova Scotia demonstrated that the benefits from the exploratory program to the region did not warrant the risk to the fishery. They presented information to demonstrate the high value of the fishery relative to other areas of Canada. Unlike the petroleum exploration industry, they noted the fishery provides local, regional or provincial employment for fishermen, boat-builders, suppliers etc.

Opponents of exploration also noted that seismic vessels represent a hazard to fishing activity by either damaging fixed gear or interfering with fishing patterns. The companies argued that they would, among other strategies, time their activities to avoid such conflicts. Hunt argued that such arrangements had worked well during the inshore exploratory program conducted in Bay St. George, Newfoundland, although the fishing community provided information suggesting that not all fishers there agreed. Hunt noted that this program was similar in size and duration to the one it proposed, and the fishery was also similar to the fishery in the Sydney Bight. The principal difference was that the survey in Bay St. George was closer to shore, sometimes as close as one kilometre, while the survey proposed for Sydney Bight would not be carried out any closer than six kilometres from the shoreline.

Similarly, the fishery presented anecdotal information derived from experience on the Scotian Shelf to argue that the oil industry enforced a much larger exclusion zone around drilling rigs than required by regulation. Its view was that such enlarged zones in the sometimes small and highly productive fishing sites in the southern Gulf of St. Lawrence and Sydney Bight would have a significant impact on some of the fisheries. The Unamaki Institute of Natural Resources argued that even where petroleum companies only enforced exclusion from the regulated zone, fishermen would face increased costs because of the more complicated logistics associated with adapting fishing patterns to a smaller or obstructed fishing area, and of adjusting to the logistics of new fishing patterns.

The nature and distribution of risk was an important issue to many participants. It was generally the view of those opposed to seismic exploration that all of the risk associated with exploration would accrue to the fishing industry and that the petroleum industry would be the recipient of all of the benefits. Moreover, the fishery was being forced to accept the risk to their livelihood involuntarily. It was not an arrangement in which they were free to enter on a voluntary basis.

The stress associated with anxiety about the potential impacts of petroleum exploration on some members of the fishery was seen as a form of “cumulative” effect. Fishermen noted a variety of recent sources of anxiety including adjustments to: the groundfish collapse; the increased costs for licences and new wharf maintenance; regulatory requirements for monitoring fishing activities; the requirement to meet safety regulations; the new provincial legislation which may reduce buyer competition in the lobster market; and seeking ways and means to come to terms with the Marshall decision on Native fishing rights. They argued that they are already burdened with a variety of unresolved social and economic pressures and that they do not have the resources to deal with additional ones at this time.

Participants who expressed concern about exploratory activity argued the socio-economic effects of delaying the exploration for oil and gas would be inconsequential since the oil and gas would be there for use sometime in the future.

This view was not supported, as discussed above, by those advocating exploration. Many pointed to the need for diversification and strengthening of the regional economy to slow-down the current decline and its consequent social implications. Corridor argued a “window of opportunity” currently exists for gas in the North American market. Without exploration, it suggested, there will be no knowledge of the extent and value of oil and gas resources and, without this information, there can be no informed decision making about accessing this opportunity before it may be lost. Further, Hunt warned that Nova Scotia risks losing the opportunity to sustain a viable oil and gas industry in the absence of “timely continuous exploration.”

The nature of further consultations, to which most participants were open, was an issue. The fishery and environmental community favoured stakeholder consultations leading to an integrated management plan for the southern Gulf of St. Lawrence and the Sydney Bight regions. In its closing statement, the Gulf Nova Scotia Fisheries Advisory Board advocated a process that engaged all stakeholders, was based on sound science, focused on the identification of valued ecosystems, considered the full range of human activities, considered changing conditions and technologies, addressed cumulative effects and resulted in the streamlining of the regulatory approvals process.

Those supporting exploration favoured an approach to consultations that would focus on resolving specific issues through research and negotiation. They believe there is enough knowledge about the potential effects of exploration to move cautiously forward in these biologically productive and actively fished areas, particularly the Gulf of St. Lawrence. They see advocacy for long term, integrated planning as means to achieve, *de facto*, a moratorium on oil and gas activity.

Mitigative Measures

Corridor and Hunt proposed several methods of mitigating any potential adverse effects of exploratory activities in their environmental and socio-economic assessment, including conducting their seismic surveys in the late fall and winter (previously discussed) and providing compensation for loss of income by the fishery.

The fishing industry argued there were no known effective measures to compensate fishermen for loss of income that could occur if seismic operations reduced fish or invertebrate catches either by altering animal behaviour or by killing significant proportions of particular age classes. Furthermore, such measures would be impossible to develop because of the difficulties associated with identifying damage that might not be evident for several years after the completion of seismic programs.

They also offered anecdotal evidence from other compensation programs on the east coast of Canada to support their contention that the petroleum industry was reluctant to provide compensation, even where damage to fishing gear from seismic operations was clearly demonstrated, without long and protracted legal proceedings.

The fishing industry urged me to recommend to both levels of government that a comprehensive compensation package covering all aspects of exploration, development and abandonment be put in place before any exploration activities are initiated. Such a package should cover not only damage to gear and vessels but also loss of income arising from spills, authorized and unauthorized discharges, and loss of access.

Corridor and Hunt said they are prepared to work with the industry to develop mutually acceptable arrangements for compensating fishers for any loss of income they may incur because of exploratory activity. They noted such arrangements have been successfully established by other oil and gas companies operating on the east coast. Corridor informed the Commissioner that, because of the unique situation of the crab fishery in Areas 18 and 19, it would be prepared to compensate crab fishermen for any loss of access that they might suffer in the event that Corridor applied for, and received approval to drill an exploratory well. In providing compensation for such loss, it said it would follow the principle that fishermen will be left no worse off than if Corridor had not displaced them.

In response to concerns expressed by fishermen, the Canadian Association of Petroleum Producers outlined some of the regulatory requirements for oil and gas companies operating in Canada's offshore regions. Each company must demonstrate it is financially responsible to meet third party claims. In the first instance, it must post a financial instrument with the regulatory authority, usually a letter of credit, in the amount of \$30 million which can be accessed by claimants for immediate compensation. It also must demonstrate a further financial capability of \$350 million to meet third party claims.

OTHER PERSPECTIVES

Representatives of the First Nations identified a number of issues that were particularly unique to their interests. And Municipal governments, as representatives of the public at large in their respective communities, provided a political perspective on the issues associated with exploration.

The following outlines some of the views and issues related to this point of view.

First Nations

The Commissioner received five submissions from representatives of the First Nations. The principal issues expressed in these submissions were protection of the marine environment and the fishery (discussed above), participation in economic and social benefits, and the status of First Nation rights under the Constitution.

I was reminded of the 1999 Resolution of the Atlantic Policy Congress of First Nation Chiefs demanding stoppage of the process with reference to ("NS 98-2, Parcel 1") the Corridor licence area.

Some presenters criticized the governments' failure to take the lead in protecting the environment from potential damage. They suggested any assessments of potential environmental effects should be conducted by independent scientists, not those hired by the oil and gas industry.

Some presenters also referred to the need to protect potential archeological sites, including burial grounds, that may lie within the area encompassed by the licence areas.

Particular concern was expressed that the oil and gas exploration proposals represented a continuation of the non-native propensity to allow industry, and multi-national corporations in particular, to indiscriminately exploit natural resources for maximum profit at the expense of First Nations.

Municipal Governments

Six municipal units made presentations. Each expressed concern about the need for policies that ensure the long-term viability and sustainability of their economic, social and environmental circumstances, and for safeguards against undue harm to the marine ecosystem.

Four of the municipalities supported the proposals to proceed with exploration activities as an initial measure that, with discovery and subsequent development, would improve revenue streams through increased employment, population growth, and potential for new industrial development as a consequence of a lower-cost source of energy.

Those opposing the exploration proposals claimed that the risk of damaging the marine environment is too great. They were not prepared to endanger well-established products of known value (i.e., fishery and tourism) in favour of an indefinite benefit of searching for another product (i.e., petroleum). For them, acceptable mitigation measures would require less intrusive search technology, economic and social benefits for coastal communities, and more reliable information about the respective exploration proposals.

Those municipalities favouring exploration argued that some risk is necessary and can be reasonably offset by such measures as a proper environmental impact study conducted according to terms that are

acceptable to those who have to live most directly with the risks, by assurances that the agencies responsible for protecting the environment are able to do their job, and by the economic benefits that will accrue to the locality.

POLICY ISSUES

The nature of the regulatory process for granting exploration rights in the Nova Scotia offshore was an underlying concern to many participants throughout the Hearings, and, in some respects, appeared to be the basis for many of the issues that fell within the mandate of the Commissioner. Many groups criticized the present process because lands were tendered without being subject to adequate environmental or socio-economic assessment and without an opportunity for input into the decision-making process by the public, some of whom have legitimate interests in the management of offshore resources. Fishery representatives, for example, felt that coexistence implied a modicum of equality, which they believed they were denied by the current rights issuance process. A number of fishery organizations urged me to inform government authorities at the two senior levels that the current process is inadequate, that it must be changed, and that the change must embody provisions to include the fishery in it at a point before offshore lands are nominated by industry for tendering. To the extent that this issue was discussed at the hearings, none of the participants strongly objected to this position, especially if it made the regulatory process more certain.

The Nova Scotia Petroleum Directorate, in response to participant concerns about the absence of consultation prior to the nomination of offshore lands for exploration, indicated that, under its new Energy Strategy, the provincial government was committed to public consultation before allowing any new lands within 18 km of shore to stand for nomination. In addition, it said it was also committed to improving consultation prior to offering exploration licences in any Nova Scotia offshore area.

Creating a moratorium was a policy issue which was explicitly debated throughout the Hearings. Most environmental and fishery organizations requested that the Commissioner recommend a moratorium be placed on the licence areas either permanently or until research confirms that exploration and development would not have any adverse effects on the marine environment and the traditional uses that it supports. They argued that other countries in the western world had policies that protected nearshore waters from oil and gas activity. They often cited the moratorium on Georges Bank and some argued that this set a precedent for banning petroleum activities from diverse and biologically productive ecosystems. Those supporting exploration argued that there was no reasonable basis for establishing moratoria to protect the fishery. They contended that the fishery and oil and gas industry coexisted in other parts of the western world and that coexistence worked successfully in the nearshore waters of western Newfoundland. Representatives of the oil and gas industry suggested that moratoria eliminate the opportunity to create forums for addressing environmental and socio-economic issues and diverts financial resources for supporting research from this part of the country to other parts.

I was informed that the Mi'kmaq have constitutional status giving them aboriginal title to lands that include the three licence areas thereby requiring the federal and provincial governments to consult with the Mi'kmaq people before granting licences in connection with those areas. The Commissioner was requested to ". . . recommend early and full consultation by the Crowns as well as the private developers with the Mi'kmaq."

A number of interest groups argued that the CNSOPB has the conflicting, and therefore unacceptable, role of acting as both promoter and regulator of offshore oil and gas activities in the sense that it is responsible for both issuing rights to oil and gas operators and for administering environmental, health and safety practices. Moreover, they suggested, the CNSOPB had demonstrated, particularly through its role in the management of environmental and socio-economic issues associated with these licence areas, that it does not have the capability to effectively address the concerns of those representing other marine interests. The oil and gas industry contended that the CNSOPB has the authority and the responsibility to deal effectively with environmental issues through both its own expertise and those of external agencies with which it coordinates its activities. The fishing industry, on the other hand, suggested

that the DFO, and not the CNSOPB, has the regulatory authority, the responsibility and the expertise to coordinate matters related to the protection of the marine environment.

Representatives from both Prince Edward Island and New Brunswick expressed concern that the Public Review Commission was not given a wider geographic scope to permit it to hold hearings in more communities in PEI and NB.

OIL AND GAS DEVELOPMENT

Many groups and individuals argued that successful exploration by Corridor and/or Hunt would open up the entire inshore region to more exploration which, in turn, could lead to widespread development and consequent environmental degradation and conflicts with fishing activities. Accordingly, they believed that this scenario could only be prevented by declaring a moratorium on exploration for the entire area. Other interests argued that the current regulatory process, which they believed would be augmented in the near future by the incorporation of the provisions of the Canadian Environmental Assessment Act, will ensure that each and every oil and gas activity proposed by industry will be subject to a thorough environmental assessment before any approvals are granted, thereby ensuring the protection of the environment and the fishery.

Many groups, particularly the business community, the building trades, boards of trade, academics, the majority of participating municipalities and the oil and gas industry believed that oil and gas development would be a major boost to the regional economy, particularly industrial Cape Breton. This was countered by others from the environmental and fishing sectors who argued that: the benefits to the community would be small and short term compared to the long term benefits from the fishing community and tourism; the major benefits would go to the oil and gas industry; the resources of the marine environment and traditional resource based industries that depended upon them would face unacceptable risks; and the health of the residents of coastal communities, particularly from pollutants associated with flaring, would be put at risk.

The Save our Seas and Shores Coalition advocated that a full-cost accounting analysis embracing the integrated measurement of social and environmental indicators in addition to traditional economic ones should be made for the proposed activities on the licence areas. The basis for this holistic assessment includes consideration of not only “. . . seismic testing and exploratory drilling, but would have to address the true costs and benefits of all stages of petroleum activity: exploration, development, production and decommissioning.” Others argued that such an analysis was impossible without first acquiring information about the extent and nature of oil and gas resources on the licence areas.

CONCLUSIONS AND RECOMMENDATIONS

In order to make a decision about what ought to be done about the proposals to conduct exploration, the Ministers will want to have reasonable certainty about the nature of the impacts that seismic surveys and exploratory drilling may incur on the environment and its dependent uses. The basis of that decision has to be clear not only for themselves but to be understood by the public.

Confronting Uncertainty

Yes. No. Yes, with limitations. Those are the alternatives open to those who will decide on the question of whether to proceed with exploration and drilling in the Sydney Bight and southwestern Gulf of St. Lawrence regions. The final decision, of course, rests with the Ministers and the CNSOPB.

During the Hearings, I heard a gamut of views favouring one or the other of those alternatives. I heard, for example, that the scientific evidence showed exploration and drilling could be carried out with minor or negligible impact on the fishery and marine ecology, and therefore should be allowed to go forward. But I also heard equally ardent arguments that there is not nearly enough scientific evidence on which to make judgments so those activities should not be allowed to go forward at all. Such dramatically divergent views may be helpful in offering different lenses through which to look at the central question, but taken together, they are inconclusive and offer only a message of uncertainty.

There was much discussion at the hearings about what is known as the “precautionary principle,” the notion that it is always “better to be safe than sorry.” But there were many interpretations of its meaning, and these variations were more likely to interfere with, rather than to promote, constructive dialogue. Many participants, from all interests represented at the Review, seemed more comfortable using the traditional concept of “reasonable certainty” when attempting to identify the type of certainty they felt was an acceptable basis for decision making purposes. I believe this reasonable certainty approach — by which I mean the kind of certainty that one attempts to achieve by taking all possible precaution to avoid error, including consultations with other interests and knowledgeable parties — is the more reasonable approach, and the one I have used in drawing conclusions and making recommendations.

What then can the Ministers conclude from the message of uncertainty that comes from the Hearings? Well, for starters, there was widespread agreement on many matters (see Appendix VIII). This report outlined where people are on the issues and how they related to each other about them. And there is information about the fundamental areas of disagreement. These are the points of uncertainty and are the basis for next steps.

These points of uncertainty suggest there may be gaps in scientific knowledge. To use an example, the scientific knowledge is not clear about whether the effect of seismic testing is greater or less in shallow waters. Many such questions are surrounded by arguments about the quality of the underlying science, about its ability to predict effects generally, about its appropriateness to predict effects in the southern Gulf and Sydney Bight areas, and about how the needed knowledge should be gotten – for example, through the laboratory or by monitoring what happens in the “real life” situation. These are matters for examination among qualified people who together would have a fairly complete overview of the science and experience that are at the base of these uncertainties.

- *There is need for expert examination of the science and experience that is at the root of the remaining uncertainty.*

“Getting the science together” can be a reasonably short-term task. Considerable work has already been done. DFO, for example, has reviewed the science as it relates to the marine environment of the southern Gulf and Sydney Bight regions but has yet to assess the significance of its review for addressing the issues raised by the exploration proposals. Hunt and Corridor have considered the DFO review, along with general scientific literature and worldwide experience and applied it as the basis for evaluating

the potential impacts of their proposed activities on the marine environment. They have also said they will update their plans as a result of some additional information received at the Hearings.

- *The proponents need to update their exploration plan, with particular emphasis on addressing some of the uncertainty which underlies the issues including ways and means to resolve them.*

When the science is assessed in relation to the updated plans, then the decision can be taken about whether more research has to be done. These steps need not take long, but come before a decision about whether to proceed with exploration activities.

In the absence of any rigorous examination of the nature of the current regulatory process during the Review, I am assuming that this assessment of what is known, including attention to the information gaps identified by DFO, can be done within the framework of the existing regulatory process. The CNSOPB approves each activity of licence holders only after an assessment of the proponent's documentation relating to environmental impact and environmental protection. In the case of Hunt and Corridor, it is essential to undertake a critical technical review of their updated environmental and socio-economic assessments.

- *In light of issues raised during the Public Review, the CNSOPB should pay particular attention to:*
 - *The fact that commercially important fisheries, such as snow crab, or fisheries in which the stocks are nearly depleted, are based in close proximity to the proposed exploratory programs*
 - *The fact that munitions dumps are located within some of the licence areas. The CNSOPB should request a full report of their characteristics from the Department of National Defense in order to evaluate their potential impacts.*

Establishing Relationships

In order to ensure that future decisions are reached with as much objectivity as possible, it is critical that the technical review process be open and transparent. In the final analysis it is necessary to achieve consensus about the scientific and experiential evidence being used to reach conclusions about impacts. The Review process of the CNSOPB as stated in January 2001 in fact "recognizes the need for balance among interested parties." As noted in the Background section of this report, I was encouraged by the growing rapport and mutual respect I noticed among the various participants during the public hearing process.

- *The strongly motivated participants having developed a high level of understanding of the issues during the Review process constitutes an important consultative resource for the next stage of the regulatory process.*

When the federal and provincial Ministers instructed the CNSOPB to conduct a public review of the Hunt and Corridor proposals prior to approving any programs associated with them, they were, in part, seeking public participation and engagement. That goal has been achieved.

- *The Ministers now have a responsibility to take advantage of gains made by the various interest groups as a result of the investment those groups made in the Review process.*
- *On the basis of participants' interactions during the hearings, enhanced relationships among interest groups such as the fishing and petroleum industries, the building trades, environmental groups, all levels of government, and business interests can champion a range of specific matters which require particular attention whether through investigation, coordination, co-operation or regulation.*

The specific issues and concerns that are likely to benefit from these forms of attention have been reported. Included among them are:

- getting attention for information needed to provide assurances about the nature of the impacts of oil and gas exploration on the socio-economic and natural environments

- getting assurances about dealing with any adverse effects of exploratory activities
- getting assurances about compensation programs for other users of the marine environment
- getting attention for the fishing industry from policy makers who make decisions regarding the gas and oil industry
- recognizing that the exploration phase yields few socio-economic benefits but is a necessary first step without which the opportunity for benefits will be lost in the short term — and perhaps in the long term as well
- capturing opportunities for the fishing and oil and gas industries to work collaboratively on concrete concerns affecting their respective activities.

Marine Resource

The position put forward in the DFO's Habitat Status Report with respect to the interrelatedness of the southern Gulf and Sydney Bight areas is compelling.

- *The southern Gulf and Sydney Bight areas should be treated as one for impact assessment purposes. Any assessment of potential effects of exploratory activity in either area should take into consideration potential effects, if any, in the other area.*

This conclusion is not intended to tie decisions regarding potential *approvals* for exploration activities in one area to like-minded decisions in the other area. Rather, it is to encourage recognition that what happens in one area may have implications for the other area and that these must be addressed.

I believe that suggestions presented to the hearings concerning the desirability of establishing major systems to protect the fishery through such mechanisms as Marine Protected Areas and Integrated Management Plans are important and necessary initiatives. However, I don't believe that they are appropriate mechanisms for addressing the issue at hand. Integrated planning by its very nature is a highly generalized activity. It encompasses a broad range of marine uses. The task with respect to gas and oil exploration is to address a specific resource. Similarly, it is inappropriate to begin a problem solving exercise with assumptions about the type of solutions required. It prejudices the results of the analytical phase of problem solving.

- *Mechanisms such as Marine Protected Areas and Integrated Management Plans should not detract from the requirement for planning to be problem-centered, and for the method of problem solving to be rooted in an analytical process and not in preconceived ideas.*

The current issue created by the proposals to undertake exploratory activity on the licence areas is a clearly defined problem that is capable of driving such a process.

Beyond the Terms of Reference

In the Findings' External Issues section, I noted several issues that were outside the Terms of Reference. I make no conclusions in connection with these. Being beyond the Commissioner's mandate, they are not open to comment. However, I feel it is appropriate to include them because, by addressing them, the Ministers will strengthen the framework within which they make their decision about information gained through the technical review process outlined above.

Two of those issues are particularly important to resolve if the conclusions I outlined above are to be helpful. They are presented here as advice to be brought to the attention of persons in a position to choose whether to act on them:

(1) Rights Issuance was a central, if not dominant, factor in many of the issues brought before the Commissioner.

- *I advise government agencies, particularly the CNSOPB, to establish effective arrangements to keep*

fishery interests informed, particularly about impending actions associated with rights issuance.

This advice is in keeping with Nova Scotia's Energy Strategy which provides for public consultation before allowing any new lands within 18 km of the shoreline to stand for nomination.

- (2) First Nations. In view of their constitutional status, the Mi'kmaq argued they have aboriginal title to the three licence areas, thereby requiring the federal and provincial governments to consult with the Mi'kmaq people before granting licences in connection with those areas.
- *I advise early and full consultation by the Crowns, as well as the private developers, to pursue the implications of aboriginal title with the Mi'kmaq.*

RECOMMENDATIONS

This report provides a summary of the views of the public and my findings on the effect of potential Activities. In that respect, the Report has already fulfilled the requirements set forth in the Terms of Reference. The Hearings were successful in engaging the public and in gathering a good review of the issues and concerns. There was no expectation to include recommendations. It is not part of my mandate to advise whether the proposed exploration and drilling activities should proceed.

I am mindful of these limitations but I believe it may be useful to offer the following two recommendations as a way to bring together the conclusions presented above.

In view of many valid concerns raised at the Hearings about uncertainty regarding the effects of the proposed exploratory activities; and, in view of the DFO references in its Habitat Status Report to many knowledge gaps with respect to the nature of the marine environment, particularly about commercial fish and shellfish in the southern Gulf of St. Lawrence; and in view of the need to examine the science and experience that is at the root of these uncertainties, I recommend

- *that the necessary scientific, technical and experiential resources be convened to assess the existing base of knowledge in relation to the DFO review, the Hunt and Corridor updated proposals, and the Public Review Commission's Findings.*

I recognize that the process begun by the Ministers to engage the public in discussions about the proposed exploration activities increased the level of engagement during the hearings. That commitment will likely continue if steps are taken to build upon the level of public knowledge of the proposed activities, and to continue to foster the level of constructive involvement. Postponing a conclusion to this process, which has engaged the energy and goodwill of so many, would be both unjust and inefficient. It would be a regressive step. Therefore, I recommend

- *that the Ministers and the CNSOPB broaden the consultative system to apply to the next stage of the decision-making process for the three Licence Areas, to include a cross-section of interests for the purpose of gaining advice about whether or not the proposed activities should proceed, and the specific measures to be taken in the event their decision is to proceed with exploration and drilling activities.*

The system proposed here would include terms of reference for a working group comprised of not more than nine persons, each of whom participated in the Public Review.

I recognize that the next stage of the regulatory process includes an assessment of the scientific, technical and experiential information provided by Hunt and Corridor and a technical assessment of how that information was applied to evaluate potential impacts of their proposed activities. It will be an important determinant for those who decide whether exploration will proceed.

I also recognize that the various stakeholders have just shared in a review of the issues that matter to their respective constituencies and have, in the process, established a rapport for addressing areas of disagreement.

With this background they are in a strong position to have representatives who will work together in an interactive manner to provide advice during the next technical assessment stage of the regulatory process.

The working group would include one representative each from the federal government, the provincial government, the municipal and first nations governments; two representatives from fishery organizations; and one representative each from environmental, business and trade union organizations. These respective interests would be invited to name their representatives.

The life span of the working group would be limited to the time required to complete the next stage of the regulatory process.

[Link for Appendix on next page](#)

Click [here](#) for Appendix