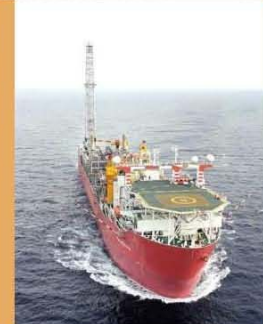


Infrastructure & Supply & Service Requirements & Opportunities for Oil & Gas Industry

Western Newfoundland



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CBCL LIMITED
Consulting Engineers

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Executive Summary

Oil production from Hibernia, White Rose and Terra Nova has made the Province of Newfoundland and Labrador the hydrocarbon hub of the east coast of Canada. The Province today is a key contributor to national energy self sufficiency. Future prospects reside not only on the resources of the Jeanne D'Arc Basin, but on what may be discovered as a result of exploration in other areas including the Orphan Basin, the South Grand Banks/ Laurentian Sub-Basin, onshore and offshore Western Newfoundland and over time in the waters off Labrador. While Western Newfoundland is geographically distant from the major fields producing off the east coast, local leaders and entrepreneurs are cognisant that they have a role to play in what takes place elsewhere in the Province as well as prepare for the hydrocarbon activity that will likely occur within and adjacent to the west coast.

Western Newfoundland is at the epicentre of several sedimentary basins: to the west the Anticosti and Magdalen basins, to the south the Sydney Basin and to the north the St. Anthony Basin. That there is sufficient evidence to attract speculation is indisputable. Indeed, there has been hydrocarbon speculation in the region since the early 19th century. Today activity on and adjacent the west coast is being undertaken by a number of relatively new and smaller players, characteristic of a commercially unproven frontier (see Figure A). The most promising areas in the near term appear to be associated with the drilling being done by several parties in the vicinity of St. Georges Bay, East Bay and in the waters to the north of Corner Brook.

In support of further hydrocarbon exploration, the Greater Corner Brook Board of Trade in association with the Department of Natural Resources established the Western Newfoundland Regional Oil and Gas Steering Committee (the Committee); the latter took the initiative to define the parameters of this study. The intent was twofold:

- i) to identify infrastructure needs, and supply and service opportunities, including direct or indirect employment opportunities, arising from exploration and development of oil and gas resources on the west coast of Newfoundland; and
- ii) to enhance the participation of local business, institutions, associations and individuals in commercial and direct and indirect employment opportunities associated with the oil and gas sector and its development.

CBCL Limited was contracted to undertake this work. To this end, the study team:

- conducted multi-stakeholder workshops in Cow Head and in Corner Brook;
- scheduled meetings in Deer Lake, Corner Brook, Stephenville and St. John's;
- prepared a socio-economic profile of Western Newfoundland;
- documented the physical and social infrastructure serving the region;
- documented how the hydrocarbon industry had been accommodated elsewhere;
- detailed the primary characteristics of the hydrocarbon sector; and
- discussed how the hydrocarbon industry would likely evolve in Western Newfoundland.

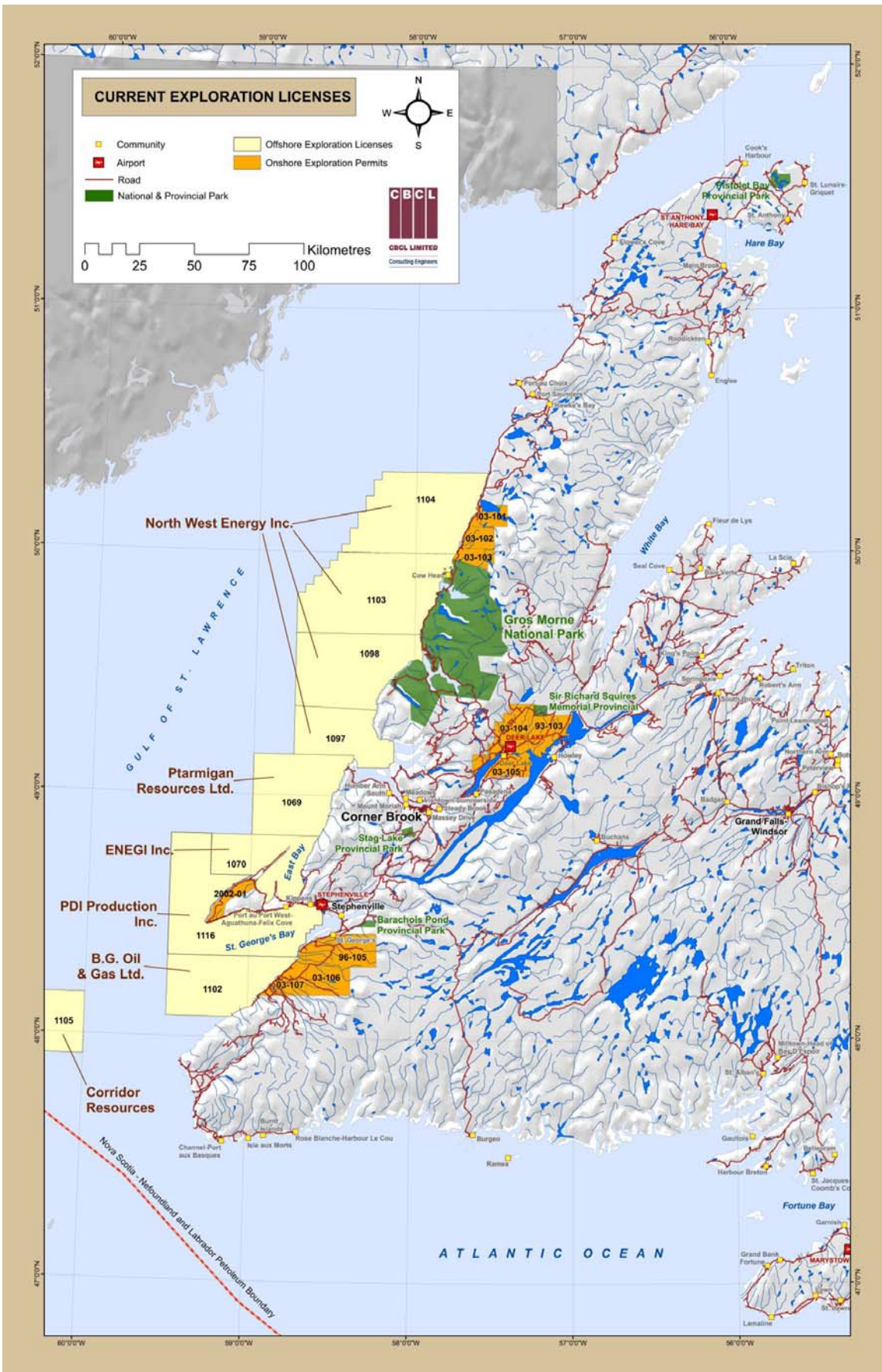


Figure A: Current Exploration Licences

In the absence of a confirmed commercial find in Western Newfoundland, it was difficult to develop the detailed development scenarios sought by the Committee. Many factors such as the nature of such a find, its size and location, would necessarily influence the requirements for infrastructure, services and labour. In the absence of such project specifics, what the study team did was to extrapolate from the materials compiled and their experience. This enabled an examination of the exploration, development and production phases associated with the establishment of a hydrocarbon industry and the articulation of strategic recommendations to accommodate the further evolution of the industry in the region.

To prepare for the establishment of an oil and gas industry in any area, it is important to know what may be involved. The hydrocarbon industry is commonly described in two parts:

- i) upstream activities, i.e., the exploration and production sector of the industry; and
- ii) downstream activities, i.e., the sector that deals with refining and processing of crude oil and gas products, their distribution and marketing.

The Province, based on the hydrocarbon product currently being produced, is striving to increase its participation in downstream activities. In Western Newfoundland for the conceivable future, i.e., the 15 to 20 year time, the focus must be upon upstream activities. Table 1 identifies some of the activities associated with exploration and production and the anticipated in place servicing requirements.

Table 1: Activities Associated with Exploration and Production

<i>Activity</i>	<i>Associated Requirements in Place</i>
Desk Studies: review of geological information from previous work in the field, core samples, if available, etc.	Minimal
Aerial & Field Studies – onshore only	Access to helicopters, field vehicles and support for a minimal number of personnel, largely geological and geotechnical specialists, for limited periods of time
Seismic Surveys (2D & 3D) – by using the different reflective properties of sound waves on rock strata, seismic surveys, both onshore and offshore, can facilitate both the identification of different geological structures and the latter’s hydrocarbon potential	Transportation: boats offshore and field vehicles onshore. Support for a minimal number of personnel for specified periods of time, i.e., weeks as opposed to months
Exploratory Drilling – the only way to confirm the presence of hydrocarbons and the thickness and internal pressure of a reservoir is to drill	<i>Onshore:</i> access for the drilling unit, associated materials, e.g., fluids and muds, and the drill team; means of handling and transporting wastes; accommodation, either in trailers or in local facilities <i>Offshore:</i> boats – may or may not use local wharves as a base
Appraisal Drilling – additional drilling to determine if the reservoir is economically feasible to develop. Several wells may be drilled from a single site, e.g.,	As above, but there may be a tendency to utilize more local facilities if these are readily available

<i>Activity</i>	<i>Associated Requirements in Place</i>
directional drilling at an angle from a site adjacent to the original discovery borehole to appraise other parts of the reservoir	
Development and Production – a small reservoir may be developed using one or more of the appraisal wells; a larger reservoir would more likely require the drilling of specific production wells. The number of wells required varies with the size of the field involved	<p><i>Onshore:</i> this is the most intensive phase and the phase that places most pressure on local resources, transportation equipment and infrastructure, including local roads. There is also a need for storage facilities and to determine the most efficient means of getting product to market.</p> <p><i>Offshore:</i> local demand for wharf and storage space onshore, but such production, particularly if a large field is involved, would just as likely be efficiently serviced by sea</p>
Decommissioning and Rehabilitation – necessary for each of the above activities	Equipment to plug wells, demolish and remove installations and to restore sites

The hydrocarbon players operating in Western Newfoundland are small by industry standards, a phenomenon which is not unexpected in a commercially unproven zone. If commercial quantities of gas and oil are confirmed over the next five years, the industry will grow. The extent of that growth will depend on the size of the proven reserve. There is also a legitimate expectation, particularly if large commercial deposits are confirmed, that the number of junior to intermediate-sized exploration and production companies would decrease through asset transactions to larger players. This is necessary in light of the resulting increase in the costs associated with drilling and subsequent development, particularly if development involves the recovery of offshore oil and gas.

The build up to 20,000 bbls/d of oil and 100 mmcf/d of gas quantities, which indeed could be found, represents a junior industry. This is the scenario being presented by some in the industry as the top end of the likely scale of production in Western Newfoundland over the next 10 years. In this scenario, the build up of related oil and gas infrastructure and associated investment would be slow, and it would be irresponsible of the study team to create an atmosphere of expectation beyond the reality of the situation. Should, however, the build up be pitched at 200,000 bbls/d, i.e., 10 times the referenced amounts, then there is the basis of a viable oil and gas industry generating USD 7.3 bn in total revenue at USD 100 per barrel. This is not to say that the build up to 20,000 bbls/d, perhaps in three small concessions, is insignificant, but it should be placed in context. All of the companies involved in the search and development of oil and gas resources will seek minimal cost exposure. There will not be a significant build up of a local industry until production expectations based on solid evidence of a commercially recoverable resource are proven and can indicate a level of production in the order of at least 100,000 – 200,000 bbls/d.

Given both the dynamic nature of the industry and the stage of exploration, the scenarios that have been explored are a tool for discussion, a tool to facilitate planning and decision making and a tool to be continually subject to review and refinement. It is fully expected that the scenarios as structured will be outdated within six months; local finds, decisions, changes of players, changes in the world price of oil

and gas and events that influence where North America sources its supplies will all influence what happens and the timeframe within which it happens on the west coast of Newfoundland. It is a fluid, dynamic and challenging situation.

The objective, therefore, must be to recognize the inherent locational advantages of Western Newfoundland, to appreciate the dynamics of the hydrocarbon industry globally and to ensure that investment is made in physical and social infrastructure to support both the potential needs of the oil and gas sector and the traditional and potential economic drivers in the region. The latter include the forestry, mining and tourist sectors. Strength in each of these areas and their support by all levels of government will also support exploration and the subsequent development of the oil and gas sector. Improved infrastructure and enhanced services, including strong, supportive and innovative educational institutions, serve all dimensions of the economy, support immigration and investment and enable the responsible nurturing of the environment, a dimension of critical importance to both the tourist and fishing sectors in Western Newfoundland.

The underlying theme is the relationship between the timing and scale of the exploration, the timing of field development and the concomitant needs for infrastructure, both offshore and onshore. The essential elements of the recommended strategy address needs not only for the hydrocarbon players on the west coast, but the community at large. The underlying premise, given the uncertainty both with respect to the availability of global resources to support the further delineation and development of resources on the west coast, is that Western Newfoundland can capitalise on its geographical locational advantages, invest in its people and provide expertise and services to the oil and gas sector operating both in the province and elsewhere. It is a global industry that is short of resources.

Based on the information compiled and the many unknowns it was premature to articulate prescriptive hypothesis. Parallels, however, have been drawn from other jurisdictions and observations made with respect to the infrastructural and supply and service needs that might be associated with a developing mixed hydrocarbon regime. Based on the analysis undertaken and the feedback received from participants in the workshops and meetings, the following objectives underlie the recommended strategic direction:

- provide the regulatory and administrative context to maximize investment in onshore and offshore exploration for hydrocarbons, i.e., both oil and gas, in Western Newfoundland while minimizing financial risk – this is a provincial responsibility and an integral and recognized part of the Energy Plan;
- establish a clear environmental regulatory regime – this is a joint federal/provincial responsibility;
- continue to improve the infrastructural base in Western Newfoundland through selective investment in good transportation facilities, education, hospitals and ensure access to land for commercial and industrial purposes, particularly the land needs of the oil and gas sector;
- ensure the protection of key natural resource areas, including Gros Morne National Park, the Humber Valley and the Bay of Islands, i.e., the environmental resource spine of Western Newfoundland;
- encourage the planning, regeneration and use of existing infrastructure including that in Port aux Basques, Stephenville, Corner Brook, Deer Lake, Port Saunders and St. Anthony;

- identify and promote areas to accommodate the specific needs of hydrocarbon projects, e.g., maintain and upgrade wharves, airport and related facilities at key locations including those at Stephenville and Corner Brook;
- continue to invest in public education and health care, cultural and recreational opportunities to serve the needs of both the region and the Province;
- facilitate training of local people to meet the demand for skills in the oil and gas sector not only in Western Newfoundland, but in the Province as a whole, in Canada and elsewhere; and
- promote Western Newfoundland as a place of opportunity for both families and businesses.

Based on the above objectives, it is recommended that the following action priorities should be addressed in provincial and regional budgets over the next five to 10 years:

- continual twinning of selected portions of the Trans Canada Highway from Port au Basque to St. John's in response to defined traffic and safety requirements;
- upgrading of key routes to the coast as necessary to meet the needs of confirmed hydrocarbon developments;
- review, planning and selected investment for the use of airport and associated infrastructure at Stephenville;
- structural appraisals of the facilities associated with the port at Stephenville and a use study to determine alternative and optimum uses for the associated lands and waters;
- maintenance of the Deer Lake Airport facilities to support local economic investment and including developments taking place in the Humber Valley and vicinity;
- support for active collaboration between the senior levels of government, the universities and key stakeholders to conduct the necessary research and field programs to protect the environment, i.e., the Gros Morne National Park, the Bay of Islands, the Humber Valley, and other identified areas;
- continued investment in further education, particularly in technical and scientific programs, with an emphasis on innovation, flexibility and the development of a highly skilled workforce ready to contribute not only to the regional economy, but beyond.

In the interests of economy, it is essential both to maximize the use of existing infrastructure and also to ensure that such infrastructure continues to support existing economic sectors. In this context Corner Brook and Stephenville must be seen as potentially playing complementary roles; they should work collaboratively to ensure that resources are not unnecessarily duplicated while building on their respective strengths. Progress can be achieved and new investment in hydrocarbon exploration and development accommodated in Western Newfoundland if all involved parties, i.e., the oil and gas companies, the Province, the Municipalities, the development agencies and local communities, work together. Further planning is essential. Investment in infrastructure and in education is essential. This report is a minor, but strategic part, of the planning process. The annual conferences on the subject are another important catalyst for dialogue and the exchange of information. That there are hydrocarbons is not seriously in question, but their identification and development does necessitate prudent investment of both public and private monies to support and accommodate the evolution of a new industrial sector in the region.



1489 Hollis Street, Halifax, NS B3J 3M5
Phone: 902.421.7241 Fax: 902.423.3938 Website: www.cbcl.ca