



# Petroleum Development

## 2008 Annual Report



**Newfoundland  
Labrador**  
Natural Resources

# Department of Natural Resources

## Petroleum Development

### Annual Report - 2008

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## Executive Summary

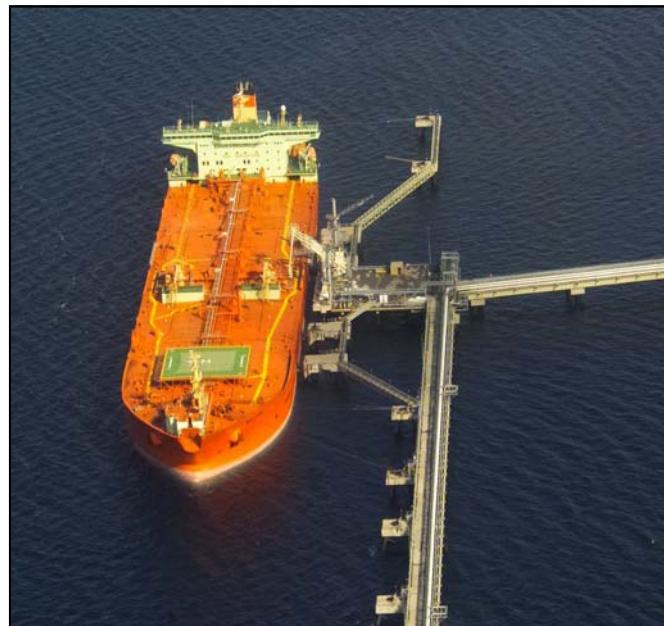
Newfoundland and Labrador produced first oil from the offshore in 1997 and since that time has established itself as a major player in the international energy sector. While volatility in energy prices had a major affect on world economic performance in 2008, Newfoundland and Labrador continued to perform strongly in oil and gas development.

The province's three producing oil projects; Hibernia, Terra Nova and White Rose, produced in excess of 125 million barrels of oil, representing approximately 40% of Canada's conventional light crude output, and raised cumulative oil production to almost one billion barrels.

While other national and international energy projects were either being delayed or cancelled, Newfoundland and Labrador was able to secure agreements with industry representatives on two new offshore projects encompassing in excess of 900 million barrels of oil.

The Hebron project will see a new gravity based structure built at a cost of \$4-6 billion to recover the approximately 581 million barrels of oil contained in the field. Further, the Province reached agreement with the co-venture partners in the White Rose Extension-project. This project will see approximately 200 million barrels of additional oil produced using the existing Sea Rose Floating Production Storage and Offloading (FPSO) vessel, at an estimated cost of approximately \$3.5 billion.

Negotiations are also continuing on the Hibernia South Extension (HSE) project. HSE includes recoverable reserves estimated to be 223 million barrels of oil.



**The Mattea at Whiffen Head transshipment facility**

Land sales completed in 2008 generated total work expenditure bids in excess of \$300 million demonstrating industry's continuing confidence in the prospectivity of Newfoundland and Labrador's offshore basins. The 2007 and 2008 Call for Bids attracted new and existing players. The new players include Repsol Exploration, S.A., a subsidiary of Repsol YPF S.A., an integrated oil and gas company based in Spain and Investcan Energy, a subsidiary of SCDM, a French based investment holding company with significant international interest. The gas rich lands off Labrador also generated significant interest once again with the recent Labrador land sale attracting successful bids of \$186.4 million. This total dollar value of work commitments represents the third highest received for a Call for Bids in the province's history. At the end of 2008, total outstanding work expenditure commitments were in excess \$850 million.

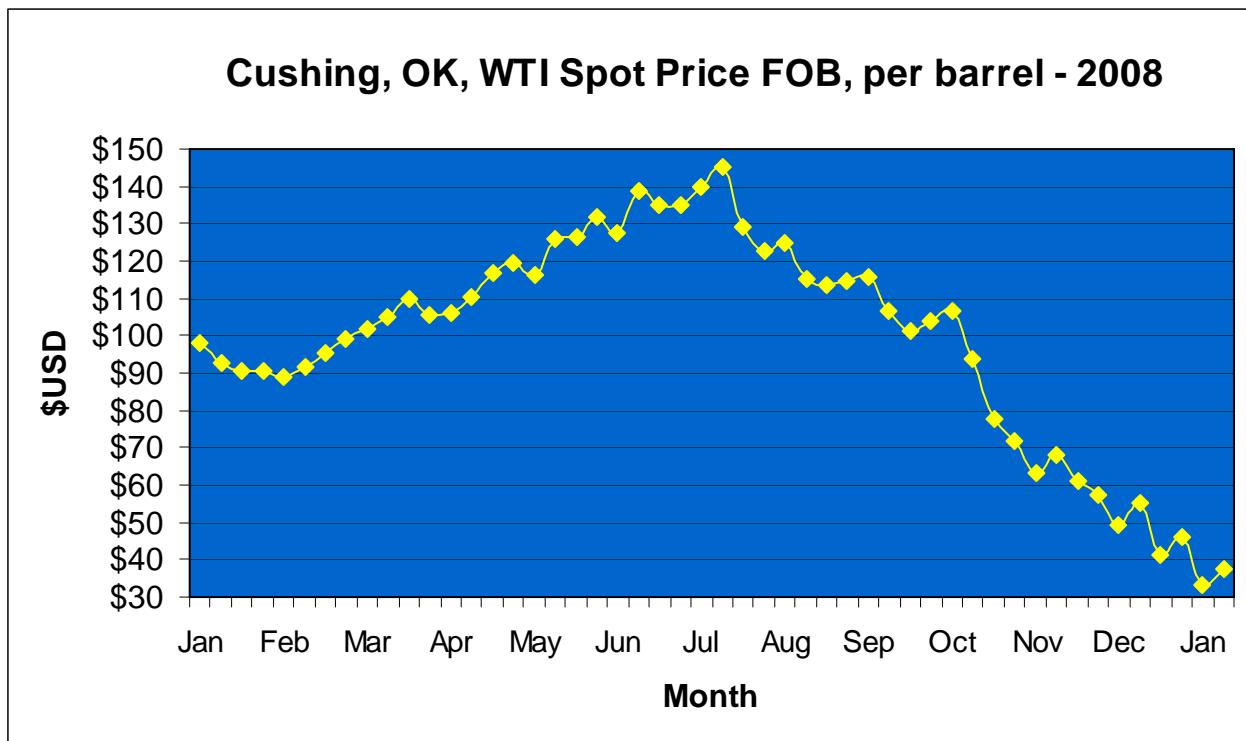
Exploration and development activity continued both onshore and offshore in 2008. Approximately \$30 million was spent on two exploration wells in western Newfoundland in 2008. As of December 31, 2008, PDI Production Inc., a subsidiary of Enegi Oil & Gas Plc was flow testing one of these wells at the Garden Hill South site on the Port au Port Peninsula. Offshore activity continued to be strong with a total of 14 new wells spudded in 2008. A rig-sharing agreement signed in 2008 for the semi-submersible drill rig, Henry Goodrich between StatoilHydro, Husky Energy, and Petro-Canada will see additional capacity for these operators to expand their exploration and development programs.

Large scale seismic programs were conducted throughout the offshore region in 2008 including new frontier areas in the northern portion of the Labrador Sea and also in the Anticosti Basin on the west coast of the province. To date, Newfoundland and Labrador has discovered reserves in excess of three billion barrels of oil and ten trillion cubic feet of natural gas. Geoscience data indicate a further six billion barrels of oil and 60 trillion cubic feet of natural gas remain undiscovered. With world class discoveries already in production and large acreage available, both onshore and offshore, Newfoundland and Labrador is positioned as an excellent area for continued exploration and development in 2009 and beyond.

## Introduction

Newfoundland and Labrador, one of the ten provinces of Canada, is located on the eastern edge of North America and is home to numerous sedimentary basins with hydrocarbon potential. This report discusses petroleum development activity both on-shore and off-shore Newfoundland and Labrador in 2008. Volatility in world oil prices (as shown in Figure 1 below) and, hence global market conditions, highlighted 2008. Record high oil prices were followed by lows not seen since early 2004 creating uncertainty for all facets of the industry including explorers, operators, service companies and financial intermediaries. Newfoundland and Labrador was not immune to these changes but still experienced a very successful year.

**Figure #1 - WTI Spot Price**



Currently Newfoundland and Labrador has in excess of seven million hectares held under licence in the offshore area and approximately 245,000 hectares onshore. In the offshore approximately three million hectares are located off the east coast, two million off the south coast and one million off both the west coast and Labrador. The total potential acreage is in excess of 80 million hectares offshore and 1.5 million hectares onshore. Note that onshore activity is confined to the Western portion of the province only, whereas, offshore activity occurs throughout much of the entire region.

**Table #1 - Petroleum Reserves<sup>1</sup> and Resources<sup>2</sup> Newfoundland Offshore Area**

Field Name	Oil		Gas		NGLs <sup>3</sup>	
	Million m <sup>3</sup>	MMBbls	Billion m <sup>3</sup>	bcf	Million m <sup>3</sup>	MMBbls
Hibernia	197.8	1244	50.6	1794	32.2	202
Terra Nova	56.3	354	1.3	45	0.5	3
Hebron	92.4	581				
White Rose	48.4	305	85.3	3023	15.3	96
Ben Nevis	18.1	114	12.1	429	4.7	30
West Bonne Bay	5.7	36				
North Amethyst	10.8	68	8.9	315		
West Ben Nevis	5.7	36				
Mara	3.6	23				
North Ben Nevis	2.9	18	3.3	116	0.7	4
Springdale	2.2	14	6.7	238		
Nautilus	2.1	13				
King's Cove	1.6	10				
South Tempest	1.3	8				
East Rankin	1.1	7				
Fortune	0.9	6				
South Mara	0.6	4	4.1	144	1.2	8
North Dana			13.3	472	1.8	11
Trave			0.8	30	0.2	1
<b>Sub Total (Grand Banks)</b>	<b>451.5</b>	<b>2841</b>	<b>186.4</b>	<b>6,606</b>	<b>56.6</b>	<b>355</b>
North Bjarni			63.3	2247	13.1	82
Gudrid			26	924	1	6
Bjarni			24.3	863	5	31
Hopedale			3	105	0.4	2
Snorri			3	105	0.4	2
<b>Sub Total (Labrador Shelf)</b>			<b>119.6</b>	<b>4244</b>	<b>19.9</b>	<b>123</b>
<b>Total</b>	<b>451.5</b>	<b>2841</b>	<b>306</b>	<b>10,850</b>	<b>76.5</b>	<b>478</b>

1 "Reserves" are volumes of hydrocarbons proven by drilling, testing and interpretation of geological, geophysical and engineering data, that are considered to be recoverable using current technology and under present and anticipated economic conditions. Oil reported for Hibernia, Terra Nova, and White Rose fields are classified as reserves.

2 "Resources" are volumes of hydrocarbons, expressed at 50% probability, assessed to be technically recoverable that have not been delineated and have unknown economic viability. Gas, NGLs<sup>3</sup>, and oil in undeveloped fields are currently classified as resources.

3 "Natural Gas Liquids" (NGLs) are derived from natural gas, which is the portion of petroleum that exists in either the gaseous phase or in solution in crude oil in natural underground reservoirs.

The Canada Newfoundland Offshore Petroleum Board (C-NLOPB) is responsible, on behalf of the Government of Canada and the Government of Newfoundland and Labrador, for petroleum resource management in the Newfoundland and Labrador offshore area. With respect to onshore activity, the Government of Newfoundland and Labrador has sole petroleum management authority.

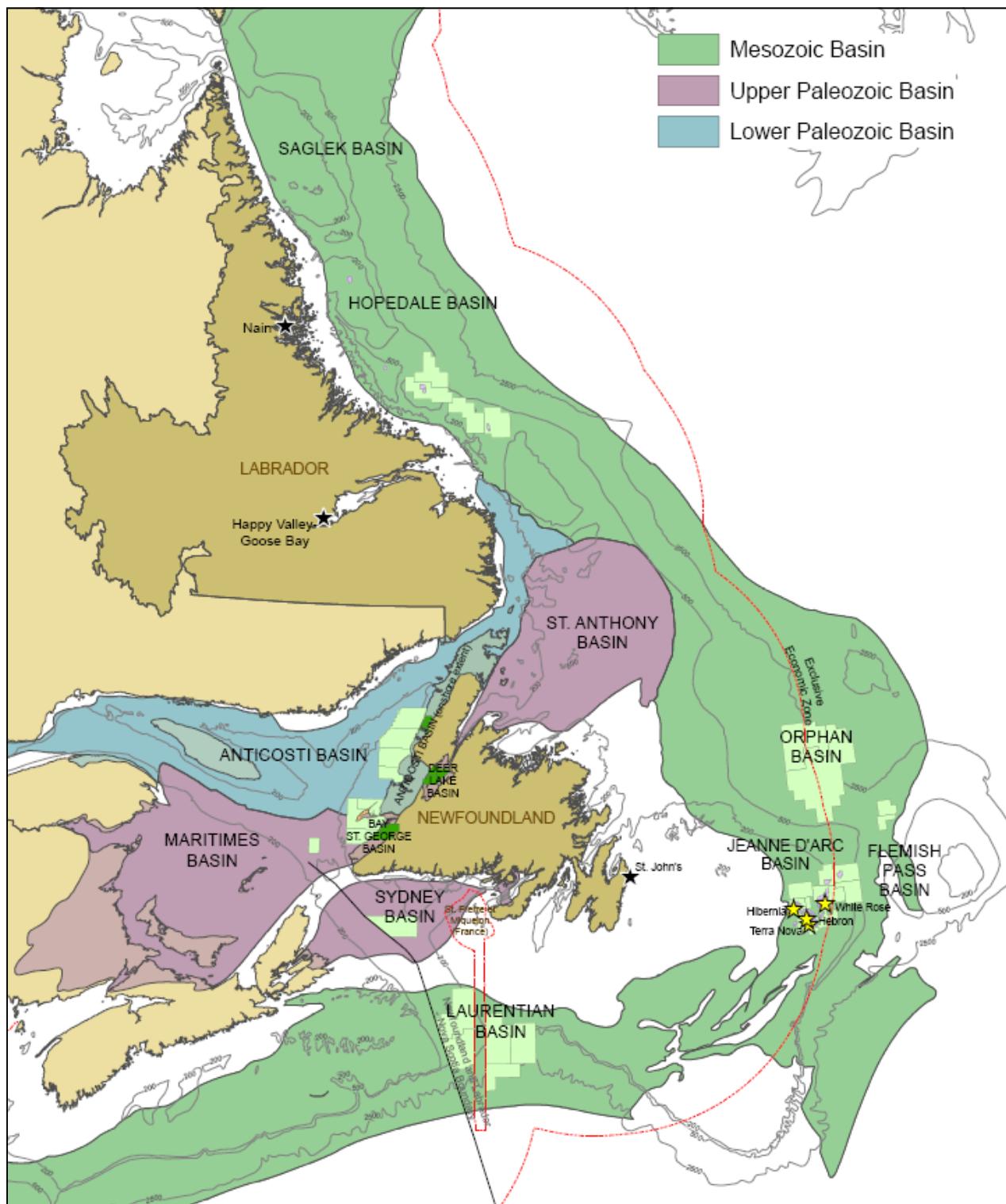
In 2008 a total of 14 new offshore wells were spudded including; 4 exploration, 8 delineation and 2 development wells, bringing the total number of wells spudded offshore to 342. These have resulted in 50 Significant Discovery Licenses being issued by the C-NLOPB in 24 areas including 5 on the Labrador Shelf and 19 on the east coast Grand Banks. For offshore Labrador, the total discovered recoverable resource (C-NLOPB estimate; expressed at a 50% probability of occurrence) is 4.24 trillion cubic feet of natural gas and 123 million barrels of natural gas liquids. For the northeast Grand Banks region, total discovered recoverable resource is estimated by the C-NLOPB at 2.84 billion barrels of oil, 6.6 trillion cubic feet of natural gas and 355 million barrels of natural gas liquids (Table #1 - page 2).

As of December 31, 2008 there were 22 Exploration Licenses issued offshore. During 2008 successful work expenditure bids were obtained on an additional 11 offshore parcels. Exploration licenses for these parcels will be issued early in 2009 when all relevant terms and conditions are met by the successful parties. The total value of work expenditure bids received for the 2007 and 2008 land sales were \$318.7 million and the total outstanding work commitments at the end of the year were in excess of \$850 million. For the parcels off Labrador, work expenditure bids totaled \$186.4 million which represented the third largest Call for Bids (based on total dollar value) received in the Province for a land sale. A complete breakdown showing the various parcels and work expenditure bids is outlined in the Regional Activity Update in Section 4, commencing on page 20 of this report.

A total of 6800 km of new 2D seismic and 129,406 km of new 3D were acquired offshore Newfoundland and Labrador in 2008. This brings the total amount of offshore 2D seismic completed to 649,619 km and 3D km to 1,432,834. In addition 1056 line km of 2D seismic data has been obtained onshore western Newfoundland.

As of December 31, 2008 there were nine onshore exploration permits and one onshore production lease in western Newfoundland. The exploration permits are issued in three general areas; Flat Bay, Deer Lake and Parsons Pond and a total of 228,500 hectares is held under permit. A production lease has been issued onshore at the Garden Hill South

**Figure #2 - Sedimentary Basins of Atlantic Canada**



site located on the Port au Port Peninsula in western Newfoundland. Section 3 of this report discusses this production lease at Garden Hill South in greater detail.

The Province currently has three offshore producing projects, Hibernia, Terra Nova and White Rose. During 2008 these three projects produced 125.3 million barrels of oil and the cumulative production as of Dec 31, 2008, was 992.4 million barrels. Details on each of these three projects are outlined in Section 2 of this report commencing on page 6.

In 2008 agreements were reached on the development of a stand alone offshore project (Hebron) and a tie-back to an existing field (White Rose Extensions-North Amethyst). Negotiations continue on another project, the Hibernia South Extension. Details on each of these new projects are included in Section 3, beginning on page 14.

During much of 2008 exploration and development activity was limited by the availability of offshore drilling rigs capable of operating in the environment and deep waters in the Newfoundland and Labrador offshore area. StatoilHydro, Petro-Canada and Husky Energy signed a rig sharing agreement for the semi-submersible oil rig, Henry Goodrich and, as a result, it is expected to operate in Newfoundland and Labrador's offshore until mid 2010. In 2008 the rig drilled a pair of delineation wells for Husky in the White Rose Extension fields before moving to the Flemish Pass late in the year to commence an exploration well for StatoilHydro at their Mizzen prospect. With the semi-submersible rig Global Santa Fe (GSF) Grand Banks on contract to Husky Energy throughout 2009, the addition of the Henry Goodrich should result in increased drilling activity in the region.

## Producing Projects Summary

### Hibernia



**Hibernia GBS**

The Hibernia field, discovered in 1979, is located about 315 kilometres east southeast of St. John's in 80 metres of water. A fixed production platform, consisting of a gravity-based structure (GBS) and topsides drilling and production facilities, has been installed to produce the field. The GBS and one of the five topside super modules were built at Bull Arm, Newfoundland, and the four other super modules were fabricated in Korea and Italy

before being transported to Bull Arm for assembly. The platform is 224 metres tall, weighs 1.2 million tonnes and can store 1.3 million barrels of oil. Shipments of oil from Hibernia are offloaded at the purpose built transshipment facility at Whiffen Head, Placentia Bay, NL.

First oil occurred on November 17<sup>th</sup>, 1997, at 1:40 p.m., with the first tanker load of crude oil off-loaded in late December, 1997. Hibernia field development was based on original recoverable oil reserve estimates of 520 million barrels and an average annual oil production rate (APR) of 110,000 barrels of oil per day (bopd). In November

1997, Hibernia Management Development Corporation (HMDC) announced that it increased its estimate of Hibernia recoverable reserves from 615 to 750 million barrels and obtained an APR of 135,000 bopd. Further increases in the APR have been granted, with the latest being in 2003 when the approved rate was increased to 220,000 bopd.

<b>Hibernia Ownership</b>	
Exxon-Mobil	33.125%
Chevron	26.875%
Petro-Canada	20%
Canadian Hibernia Holding Corp.	8.50%
Murphy Oil	6.50%
StatoilHydro	5%

The latest C-NLOPB recoverable reserve estimates for Hibernia include 1.244 billion barrels of oil, 1.794 tcf of natural gas, and 202 million barrels of natural gas liquids. As of December 31, 2008 there were a total 61 development wells utilized at the Hibernia Field including the Hibernia and Ben Nevis/Avalon reservoirs. They included 32 oil producers, 23 water injectors and 6 gas injectors. Hibernia produced 50.7 million barrels of oil during 2008 giving an average daily production of 138,613 bopd. Cumulative production to

December 31, 2008, was 620.7 million barrels, with remaining field life anticipated at 10-15 years.

Hibernia is breaking new ground in directional drilling. Development wells are being directionally drilled from two rigs on the GBS into the Hibernia Sandstone which lies at a depth of about 3,800 metres and the Ben Nevis/Avalon Sandstone at about 2,400 metres. Since 1998, Hibernia has continued to break its own records. In 2004 the *B-16 36* well intercepted the Hibernia Sands at a depth of 3,960 metres with a horizontal displacement of 7,232 metres, establishing a world record for horizontal displacement at such a depth. In 2005, Hibernia drilled and completed a dual injection well, *Hibernia B-16 50*, which penetrated two targets through two different reservoirs.

This strategy was pursued again in 2007 with the *B-16 55* well. The Hibernia well construction team has established itself as a world leader in extended reach drilling, and continues to prove that it can provide creative technical solutions that are required to optimize resource recovery. This experience will be critical as the team attempts to explore and develop the southern region of the field.

**Figure #3 - Hibernia Field Geological Cross Section**

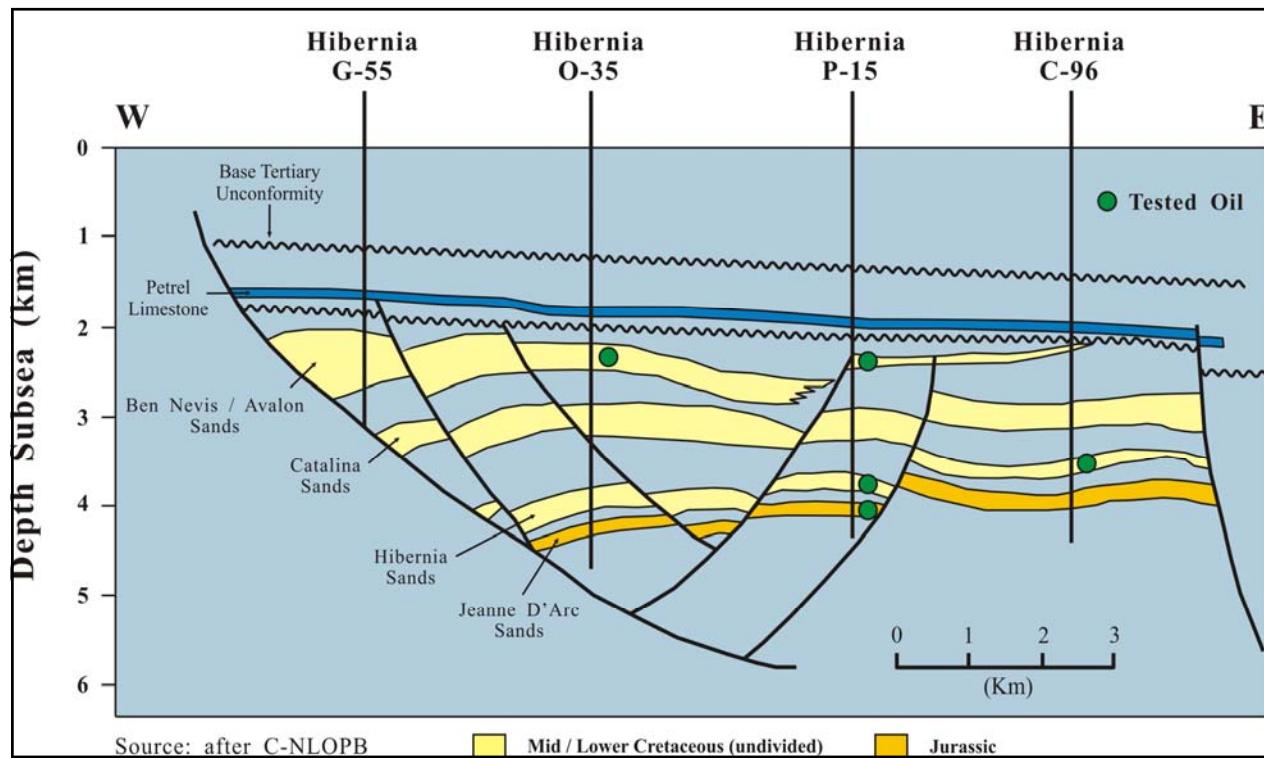
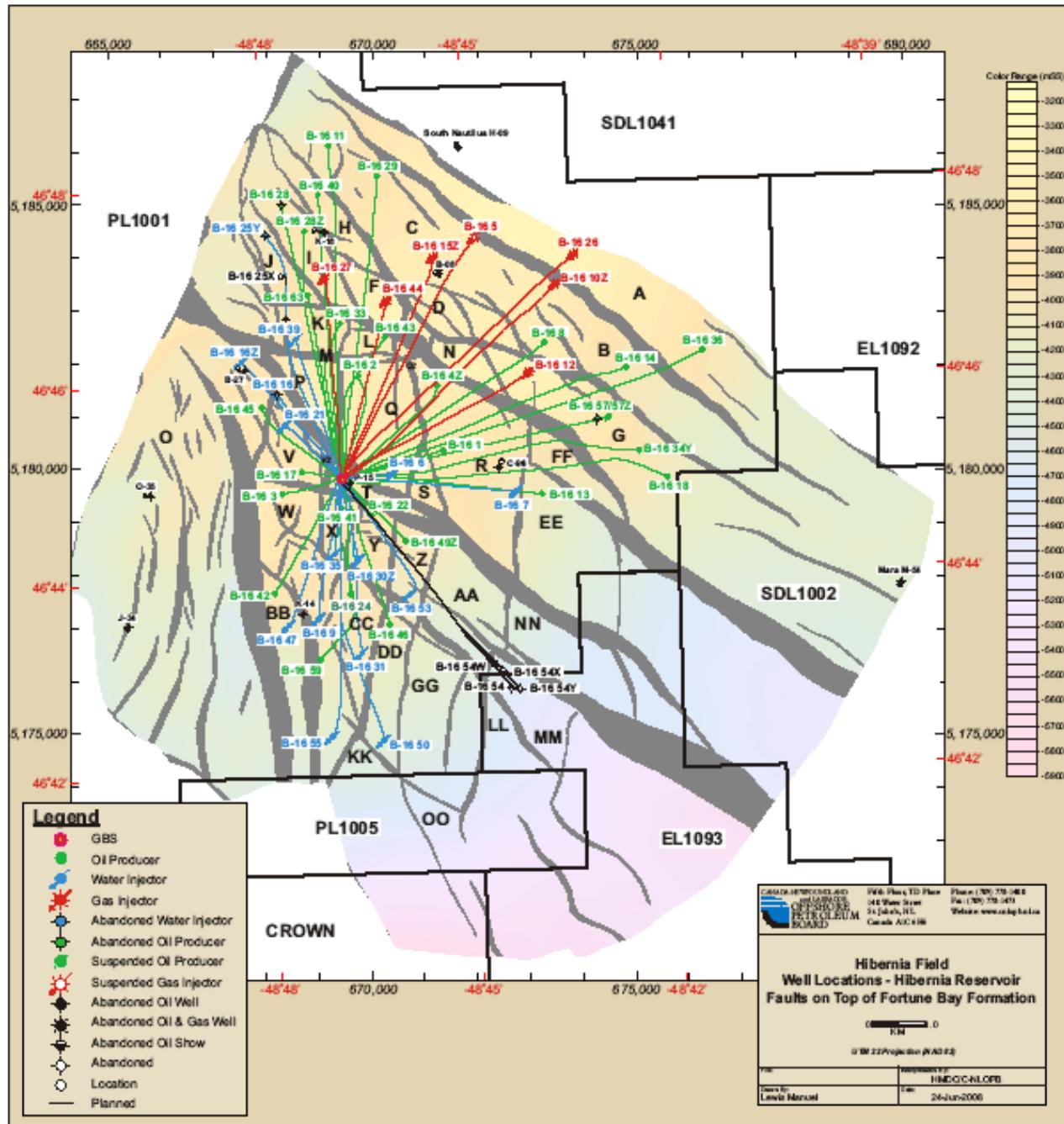


Figure #4 - Structure Map of Hibernia Reservoir



## Terra Nova

The Terra Nova field was discovered by Petro-Canada in 1984 about 35 km southeast of Hibernia, in 90 metres of water. The *Terra Nova K-08* discovery well flow-tested 10,000 barrels of oil per day from the Jurassic Jeanne d'Arc Sands. Five successful delineation wells tested at rates ranging from 5,000 to 25,000 bopd. On August 4<sup>th</sup>, 2001, the Terra Nova Floating Production Storage and Offloading (FPSO) vessel arrived at the field, and first-oil flowed on January 20<sup>th</sup>, 2002. The expected life of the field is approximately 14 years.



**Terra Nova FPSO**

**Figure #5 - Terra Nova Floating Production Storage and Offloading Facility**



Terra Nova Ownership	
Petro-Canada	29%
Exxon-Mobil	22%
Husky Oil	17.50%
StatoilHydro	15%
Murphy Oil	12%
Mosbacher Operating	3.50%
Chevron Canada	1%

The Terra Nova FPSO was the first of its kind to be used in North America and included the largest disconnectable turret mooring system in the world. It is double hulled, with oil cargo tanks capable of holding up to 960,000 barrels of oil. It can stay anchored in a storm with up to 30 metre waves and 100 km/hr winds. The under-water portion of the production system is pro-

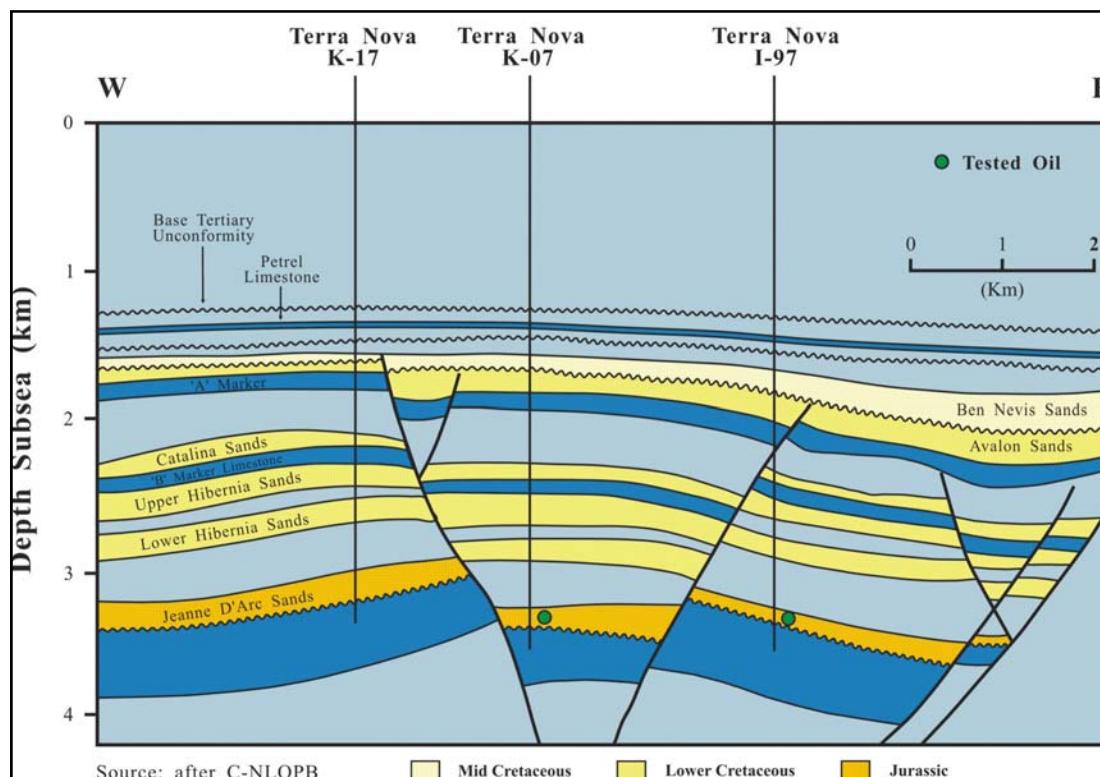
tected from the environment as glory holes were excavated in the seabed to protect the subsea templates from iceberg scour (See Figure 5, page 9).

Geologically, the field consists of three fault-defined blocks designated as the Graben, East Flank and Far East blocks. The latest C-NLOPB recoverable reserve estimates for Terra Nova are 354 million barrels of oil, 45 bcf gas and 3 million barrels of gas liquids.

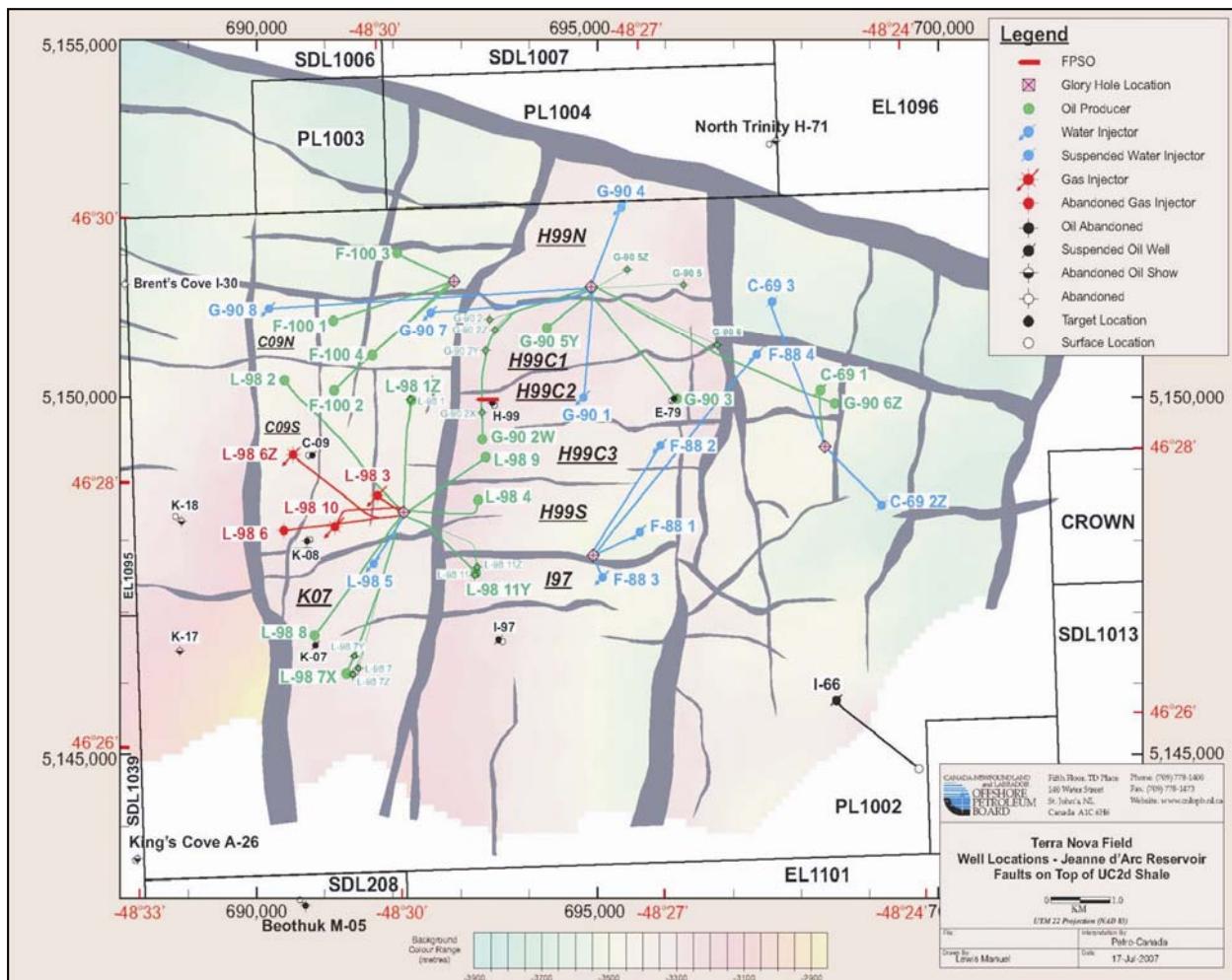
The original plan contemplated producing oil from the Graben and East Flank for the first six years at an average of 115,000 barrels of oil per day. However, based on the productive capacity of the wells, the C-NLOPB has allowed production rates to be increased to 180,000 barrels per day.

As of December 31, 2008 wells drilled included 15 oil producers, 9 water injectors and 3 gas injectors. The field averaged 102,596 bopd during 2008 with production for the year of 37.6 million barrels. Cumulative field production to the end of 2008 was 257.4 million barrels.

**Figure #6 - Terra Nova Field Geological Cross Section**



## Figure #7 - Structure Map of Jeanne d'Arc Reservoir



## White Rose

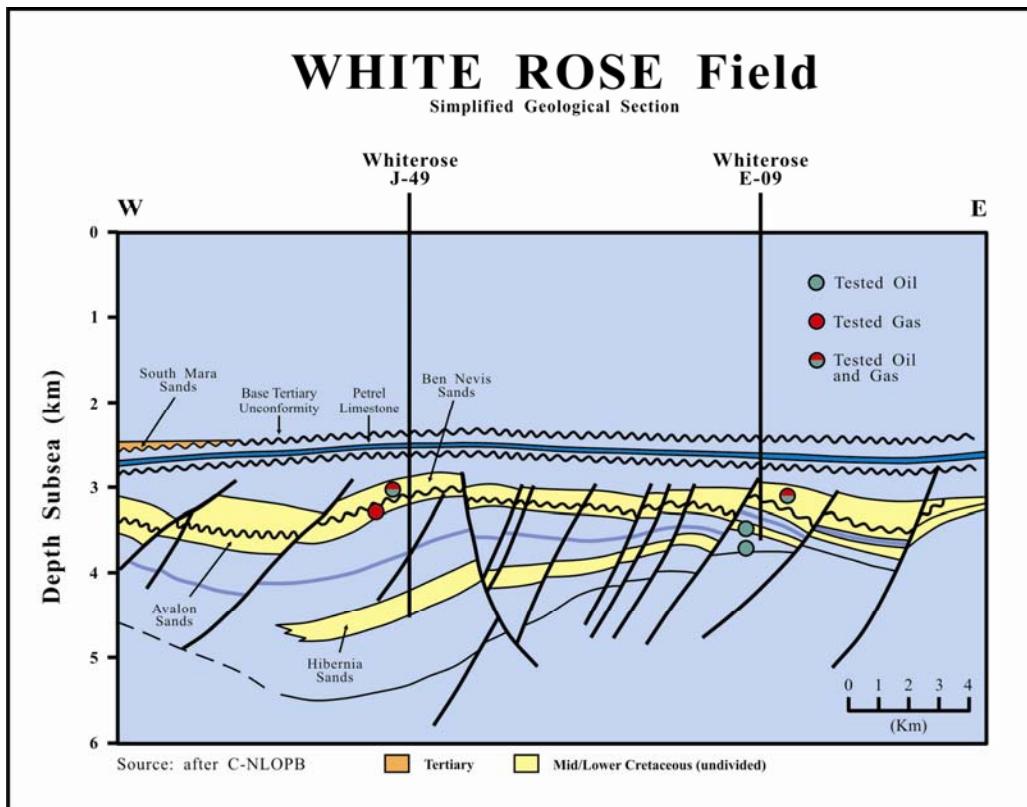
Discovered in 1984 by Husky Energy, the White Rose field is located in the Jeanne d'Arc Basin approximately 350 kms southeast of St. John's. In 1984, the *White Rose N-22* discovery well tested at 900 bopd, 25 million cubic feet per day of natural gas and 840 bopd of condensate.

White Rose Ownership	
Husky Energy	72.50%
Petro-Canada	27.50%

During 1987-88, the *White Rose E-09* delineation well encountered 94 metres of net oil pay and tested at 5,000 bopd and 4 million cubic feet per day of natural gas from the Avalon Sandstone. In addition, the *J-49* delineation well flowed oil at 3,000 bopd and gas at 10 million cubic feet per day and the *L-61* delineation well tested gas at 24 million cubic feet per day and condensate at 436 bopd.

On January 15<sup>th</sup>, 2001, Husky submitted a development plan application proposing White Rose development by FPSO. On March 28<sup>th</sup>, 2002, Husky and its partner Petro-Canada announced their decision to proceed with the project.

**Figure #8 - White Rose Field Geological Cross Section**





## Sea Rose FPSO

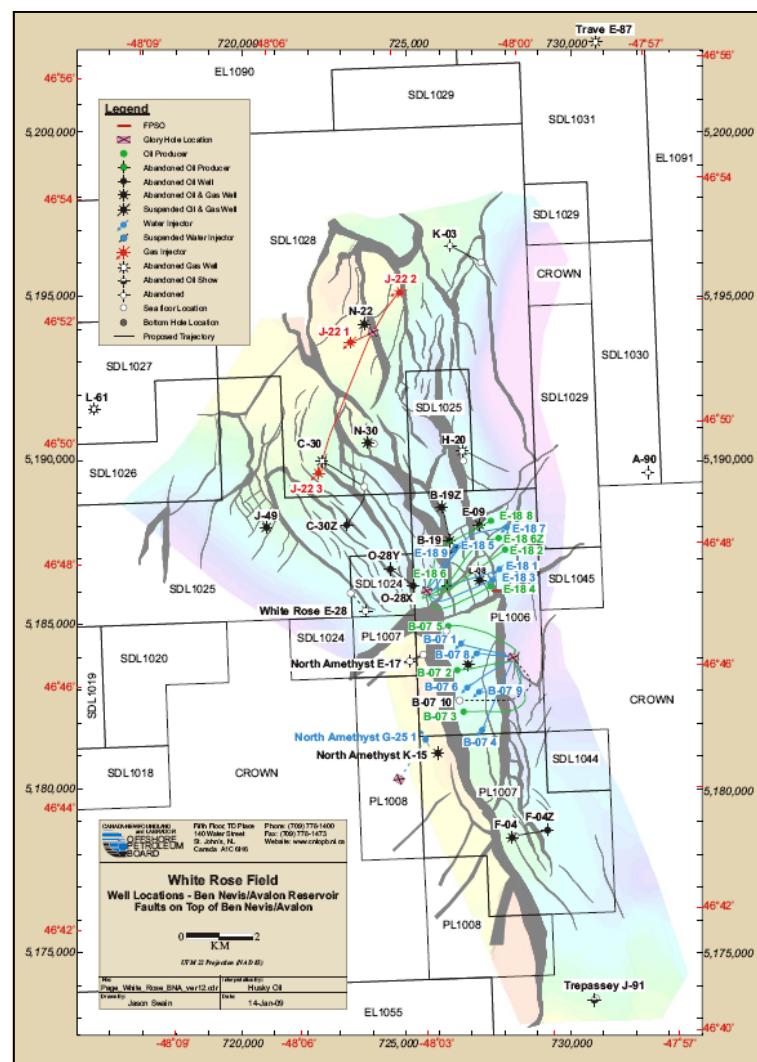
Commissioning was completed on the Sea Rose on November 12<sup>th</sup>, 2005. The project has an estimated 10 - 15 year production life.

The C-NLOPB has recently increased its resource estimates for the field from 286 to 305 million barrels of oil, from 2.7 tcf to 3.02 tcf of natural gas, and from 58 to 96 million barrels of natural gas liquids.

As of December 31, 2008, 20 wells were drilled at White Rose including 8 oil production wells, 10 water injectors and 2 gas injectors. The White Rose field produced 37.0 million barrels of oil in 2008 for an average daily production of 100,990 bopd. Cumulative field production to the end of December 31, 2008, was 114.3 million barrels.

The field is being developed using the Sea Rose FPSO which is similar to the Terra Nova FPSO vessel. It has a storage capacity of 940,000 barrels oil and a production rate of 137,000 bopd. The ice strengthened double hull was completed in South Korea and final fabrication, installation and commissioning of topsides was completed at the Cow Head Fabrication Facility in Marystow, NL. The topsides consist of modules that process and treat oil, gas and water, generate power, inject water into the producing reservoir and reinject gas into the North pool for gas conservation.

## Figure #9 - Structure Map of White Rose Reservoir

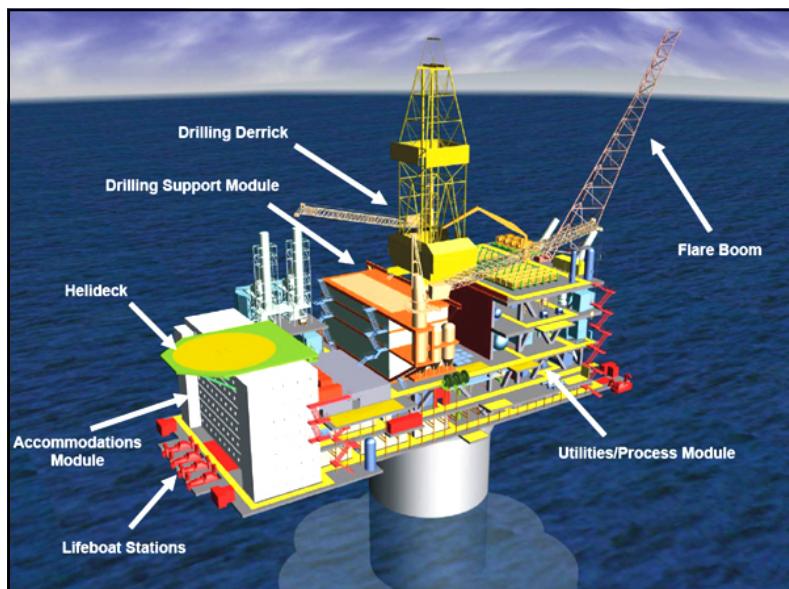


## Projects Under Development

### Hebron / Ben Nevis

On August 20, 2008, the Government of Newfoundland and Labrador signed a formal agreement with the co-venture partners to develop the Hebron offshore development project. As part of the agreement the Province purchased a 4.9 percent equity ownership in the project through Nalcor Energy, the Province's wholly owned energy corporation. Initial development in the Hebron Project Area will consist of developing oil reserves from the Hebron Field only, and the injection of surplus gas into the West Ben Nevis field. Because of the close proximity of the Ben Nevis

Hebron/Ben Nevis	
Chevron Canada	26.7%
ExxonMobil	36%
Petro-Canada	22.7%
StatoilHydro	9.7%
Nalcor Energy	4.9%



**Hebron Development Concept**

and West Ben Nevis fields, further development of reserves within the Hebron Project Area is anticipated in the future. The C-NLOPB reserve estimates for the Hebron/Ben Nevis complex are 731 million barrels of oil, 429 bcf of natural gas and 30 million barrels of natural gas liquids.

Hebron is located in the Jeanne d'Arc Basin, 350 kilometres southeast of St. John's. It is approximately eight kilo-

metres north of Terra Nova, approximately 31 kilometres southeast of the Hibernia development, and approximately 46 kilometres from White Rose. The water depth at Hebron ranges from 88 to 102 metres.

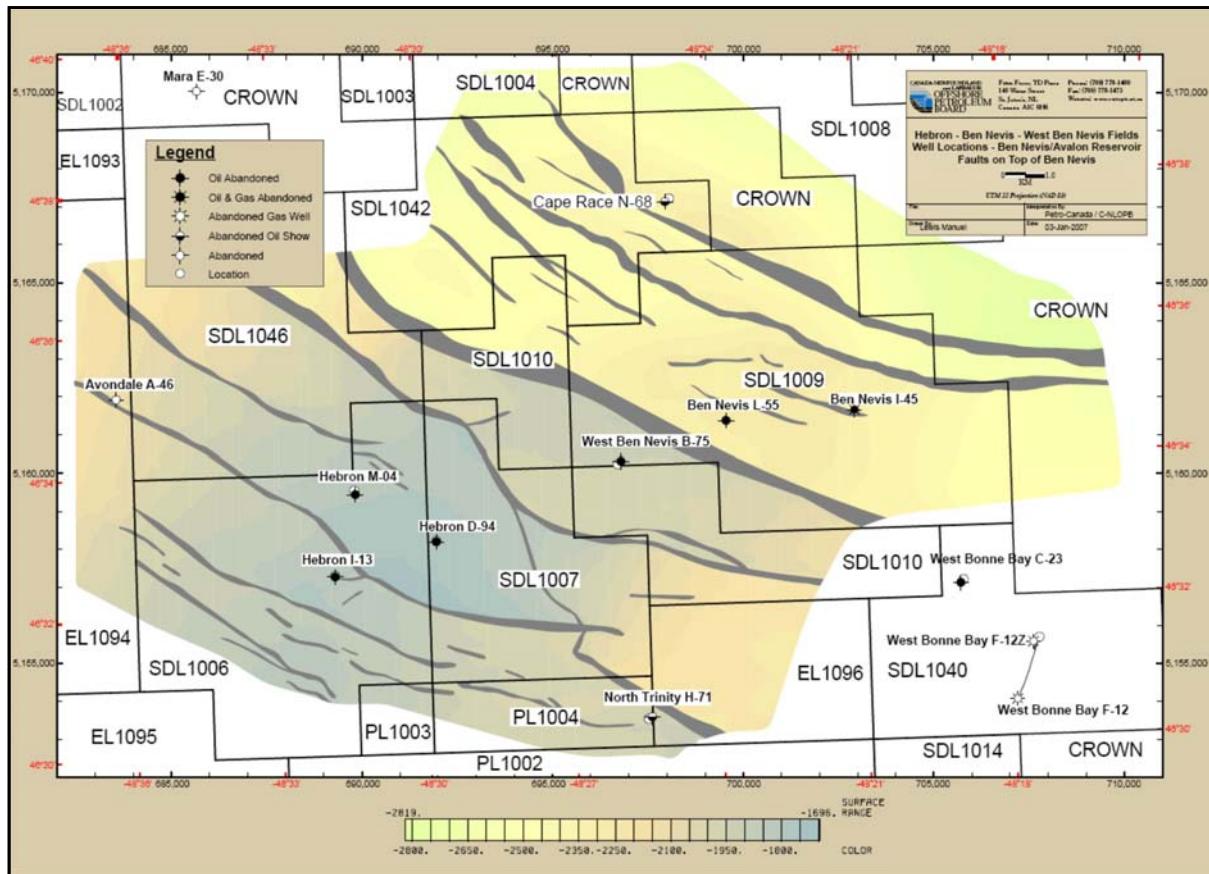
The *Mobil et al Hebron I-13* discovery well, drilled in 1981 in about 92 metres of water, recovered hydrocarbons from five intervals with a combined flow rate of 9,070 bopd. The Ben Nevis field (discovered in 1980) and West Ben Nevis field (discovered in 1984) are located in fault blocks that lie to the northeast and adjacent to Hebron.

During 1999, the *Hebron D-94* delineation well encountered 86 metres of net oil pay in a 92 metre interval within the Ben Nevis Sandstone. A representative flow test from the 1,842 to 1,908 metre interval recovered 21 degree API oil at a rate of 3,500 barrels per day.

A second delineation well, *Chevron et al Ben Nevis L-55*, tested 1,150 bopd of 30 degree API oil from a 71.3 metre pay interval. An additional delineation well, *Hebron M-04*, drilled in the Spring of 2000 tested 2,250 bopd and 1.6 million cubic feet per day of natural gas from the Jeanne d'Arc Sandstone.

Construction and fabrication of the Gravity Based Structure (GBS) with an estimated cost between \$4-6 billion, is expected to begin at the Bull Arm construction site in 2012. First oil is expected between 2016 and 2018 with peak production of approximately 150,000 barrels a day. ExxonMobil, the designated operator, is currently working towards establishing a project office in the City of St. John's in the second quarter of 2009. The production life of the project is expected to be 30 years.

**Figure #10 - Structure Map of Avalon/Ben Nevis Sandstone**



## White Rose Extensions

The White Rose Extensions project includes the development of several smaller discoveries around the White Rose field including North Amethyst, West White Rose and South White Rose. In April 2008 Husky Energy Inc. received approval from the C-NLOPB regarding the North Amethyst Tie-Back Project development near the White Rose oil field, 350 kilometres southeast of St. John's. An application to develop the South White Rose Extension tie-back received government approval in September 2007, and evaluation of the resource potential at the West White Rose Extension continues.

White Rose Extensions Ownership	
Husky Energy	68.875%
Petro-Canada	26.125%
Nalcor Energy	5.0%

In 2008 the co-venture partners; Husky Energy and Petro-Canada, and the province signed a development agreement which applied to lands surrounding the original White Rose development only. As part of the extension agreement the Nalcor purchased a 5% equity stake in the new project. The terms of the original White Rose development remain unchanged.

**Figure #11 - Concept of White Rose Extension**



A project team based in St. John's continues to advance engineering, design and future development for all three tie-ins. Husky plans to develop these through a series of sub-sea tie-backs to the Sea Rose FPSO.

The North Amethyst oil field is the first of three satellite oil pools to be developed adjacent to the White Rose oil field in the Jeanne d'Arc Basin. Construction has commenced on the sub-sea components and first oil is planned for late 2009 or early 2010. The North Amethyst oil pool was identified by exploratory drilling in 2006 and the CNLOPB estimates additional reserves of 68 million barrels of oil. The total reserve estimate for all satellite field is approximately 200 million barrels of oil and the project has an estimated capital cost of \$3.5 billion.

## Hibernia South Extension (HSE)

Hibernia Management and Development Company continue to work on development of satellite fields surrounding the Hibernia offshore development. A project description has

been filed with the CNLOPB as part of the Canadian Environmental Assessment Agency screening process.



**Hibernia Rig with supply vessel**

Additional drilling in the Hibernia Field in 2005 and 2006 confirmed significant upside reserves in the southern area of the field and the CNLOPB has assigned reserves of 223 million barrels of recoverable oil.

These additional reserves are reported as part of the total 1.244 billion barrels as detailed on page 6. The current selected concept for Hibernia South development includes a combination of platform wells and sub sea wells. Up to 14 wells could be drilled in total. The construction and installation schedule for the HSE is tentatively planned for 2010-2012.

## Garden Hill South

Garden Hill South is located onshore western Newfoundland on the Port au Port Peninsula. PDI Production Inc (PDIP), a subsidiary of Enegi Oil Plc, is sole owner and operator of the development under a production lease issued by the Province of Newfoundland and Labrador. Enegi Oil, an independent oil and gas group operating in Atlantic Canada, is listed on the Alternative Investment Market of the London Stock Exchange and the Bourse de Luxembourg.

Activity at the Garden Hill site commenced back in September, 1994 when Hunt/Pan Canadian drilled *Port au Port #1* well (figure 13, page 19). The well encountered two hydrocarbon bearing intervals within Aguathuna Formation dolostones, with flow rates, respectively, at 1,528 and 1,742 barrels per day of 51 degree API oil, and, 2.6 and 2.3 million cubic feet per day of natural gas, plus associated water. An extended test conducted over a nine day period on one of the intervals produced a total of 5,012 barrels of oil and 9.2 million cubic feet of gas. Further development and evaluation of the site in 2008 resulted in PDIP abandoning *PAP # 1 Sidetrack # 2* well and drilling *PAP # 1 Sidetrack # 3* well utilizing Nabors #C45 drill rig. This well which was completed late in 2008 is a horizontal sidetrack that entered into the Aguathuna formation.

Previous production tests produced a total of approximately 25,000 barrels of 51 degree API oil. Further flow testing is expected to be completed early in 2009.



**Nabors C45 drill rig  
at Garden Hill South**

Figure #12 Port au Port Geological Cross Section

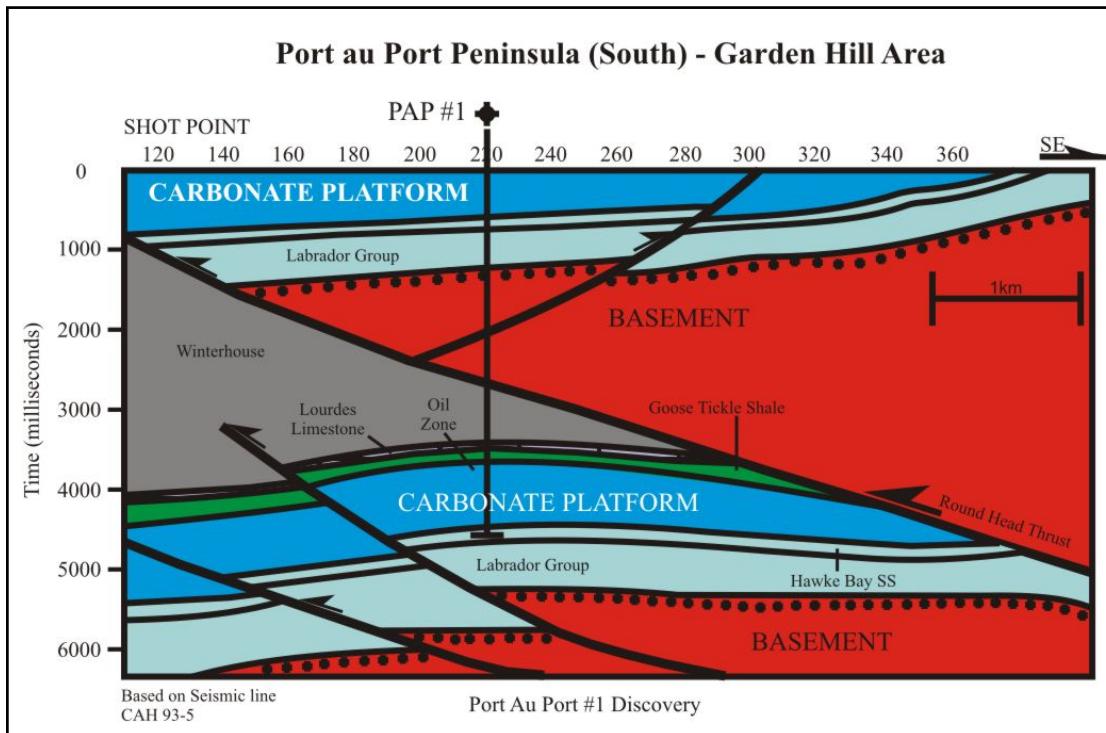
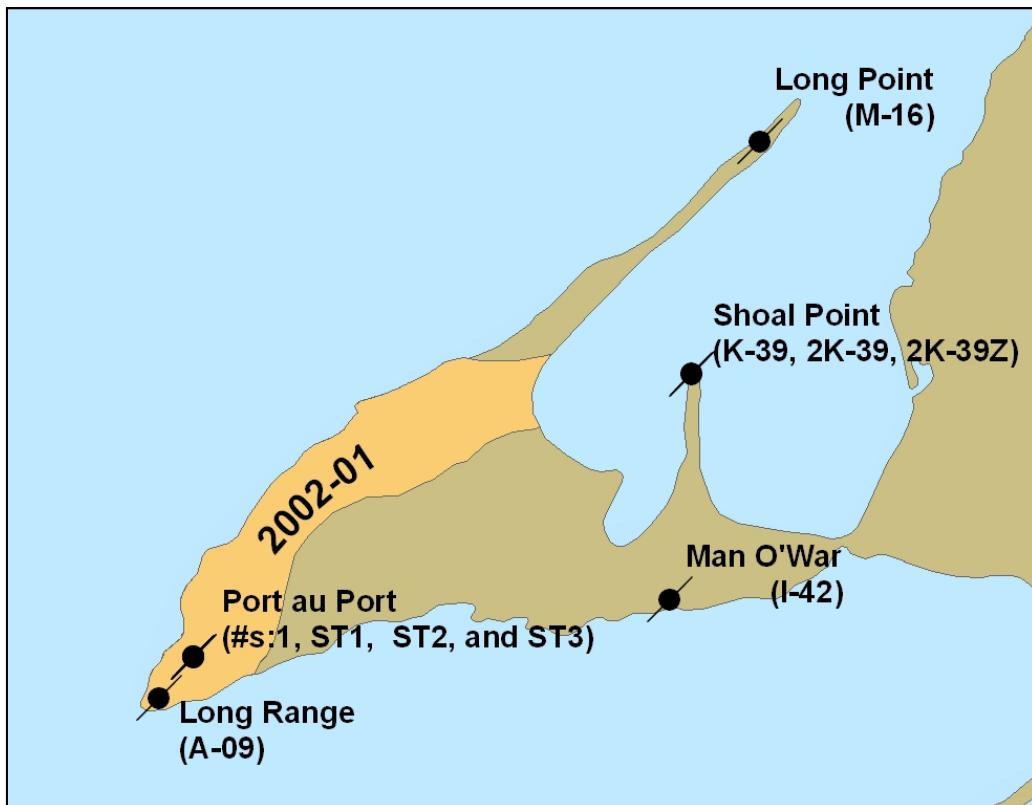


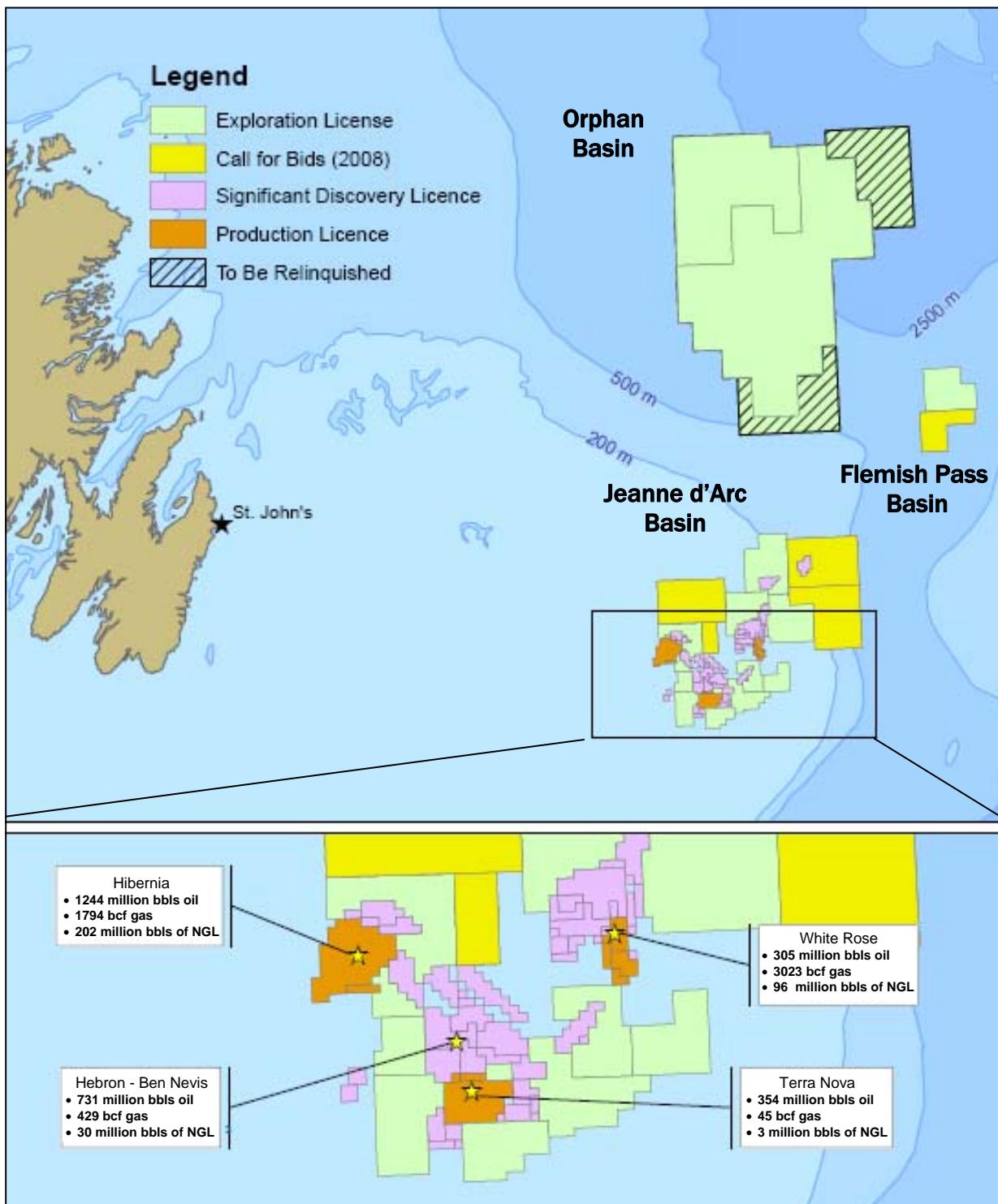
Figure #13 - Well Locations Port au Port



# Regional Activity Update

## East Coast Offshore

Figure #14 - North East Grand Banks Petroleum Rights

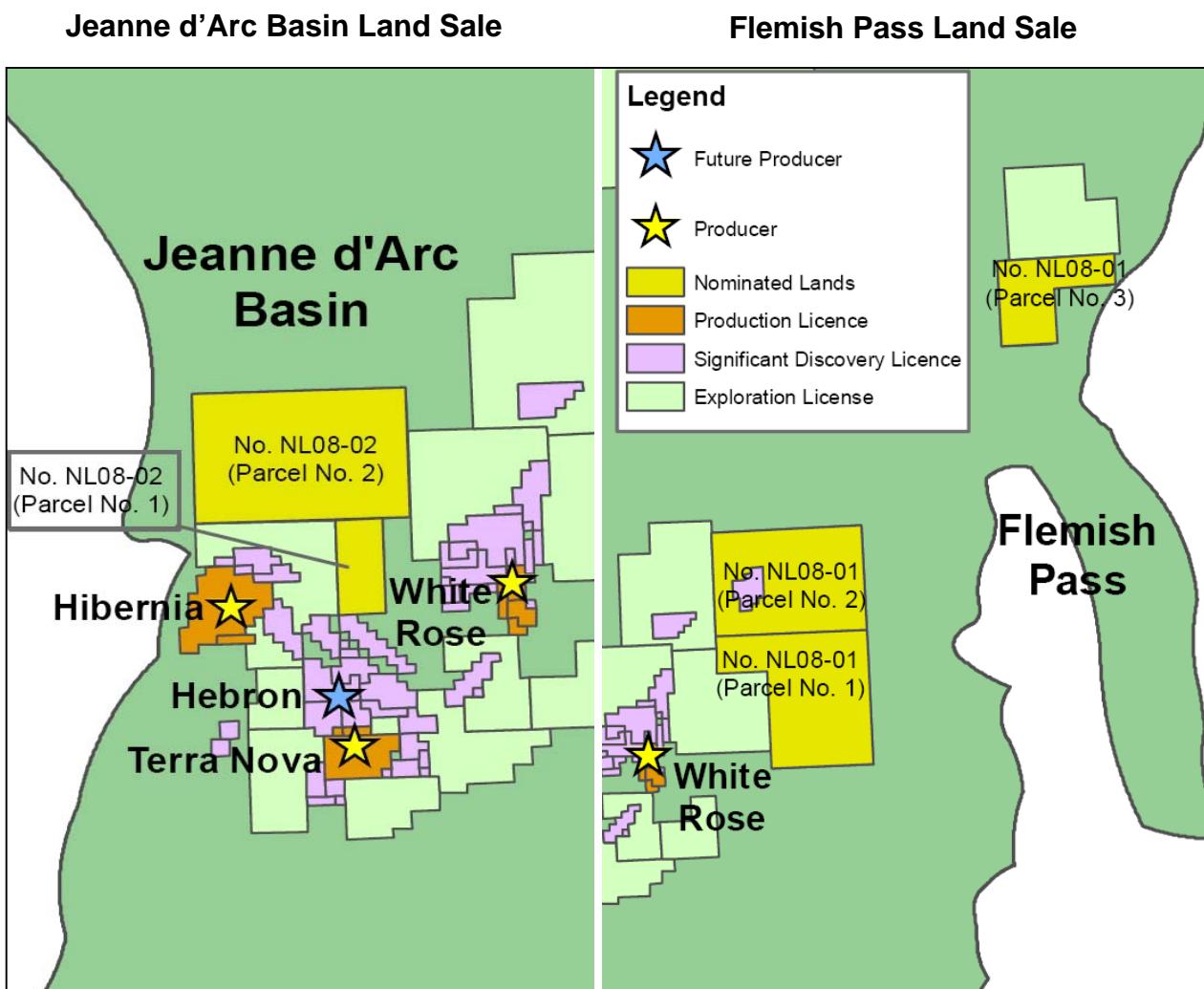


## Offshore Land Sale—Call for Bids

There were two land sales encompassing five offshore parcels completed off the east coast by the C-NLOPB in 2008; NL 08-1 (Central Ridge/Flemish Pass) and NL 08-2 (Jeanne d'Arc Basin). Note that the successful bidders (Table 2 and 3, page 22) were those that committed to spend the highest amount of work expenditures on the respective land parcels. A total of \$129.9 million was bid for the two land sales.

The successful bidders included new and existing players to Newfoundland and Labrador's offshore. The new player; Repsol Exploracion,S.A., a subsidiary of Repsol YPF S.A., is an integrated international oil and gas company based in Spain. Repsol have partnered on two parcels in the Central Ridge/Flemish Pass and one parcel in the Jeanne d'Arc Basin.

Figure #15 - East Coast offshore land sale



**Table # 2**

<b><u>Call for Bids, NL08-1 (Central Ridge/Flemish Pass)</u></b>	
<u>Parcel #1 (138,200 ha)</u>	Bid amount
Husky Oil (40%)	
Petro-Canada (40%)	
Repsol Exploracion, S.A. (20%)	\$18,600,000
<u>Parcel #2 (134,227 ha)</u>	
Husky Oil (67%)	
Repsol Exploracion, S.A. (33%)	\$1,188,000
<u>Parcel #3 9 (55,954 ha)</u>	
StatoilHydro Canada Ltd. (65%)	
Husky Oil (35%)	\$18,724,000
<b>Total</b>	<b>\$38,512,000</b>

**Table # 3**

<b><u>Call for Bids, NL08-2 (Jeanne d'Arc Basin)</u></b>	
<u>Parcel #1 (19,430 ha)</u>	Bid amount
Petro-Canada (50%)	
StatoilHydro Canada Ltd. (50%)	\$81,900,000
<u>Parcel #2 (121,348 ha)</u>	
Husky Oil (67%)	
Repsol Exploracion, S.A. (33%)	\$9,480,000
<b>Total</b>	<b>\$91,380,000</b>

## Drilling Activity

Drilling directly from the Hibernia platform in 2008 the Hibernia Management and Development Company (HMDC) re-entered Hibernia *B-16 25* oil producer to abandon and commence the drilling of sidetrack well, Hibernia *B-16 25Z*. After operational problems forced the abandonment of this well and subsequent sidetrack, Hibernia *B-16 25Y*,

HMDC successfully drilled and completed Hibernia *B-16 25X*, a dual water injector in September 2008.

HMDC also drilled and completed two oil producers (*Hibernia B-16 58Z* and *B-16 63*), one other water injector (*Hibernia B-16 55*) and completed one rig related well intervention on water injector, *Hibernia B-16 52Z*. Another pre-spud well, *Hibernia B-16 61*, was re-entered in December 2008 with drilling operations continuing into 2009.

Development of the White Rose field also continued in 2008. The Global Santa Fe (GSF) Grand Banks was first used to drill White Rose *B-07 10*. After operational issues required the well to be abandoned, sidetrack White Rose *B-07 10Z* was drilled and completed as an oil producer. The rig then drilled water injector White Rose *E-18 9* and in October spudded a development well, White Rose *J-22*, with operations continuing into 2009. Husky also used the drilling rig, the Henry Goodrich, to carry out a delineation program in 2008, drilling two wells, *North Amethyst E-17* and *White Rose E-28*.

## Exploration Activity

StatoilHydro acquired an exclusive 3D seismic survey in 2008 covering 52,779 CMP (common mid point) kilometers. This survey covered the Petro-Canada-operated Terra Nova production licences, which StatoilHydro holds a 15% interest, and Exploration Licences 1100 and 1101 in the Jeanne d'Arc Basin, in which they are the lead representative. Husky Energy also acquired an exclusive 3D survey covering 76,627 CMP kilometers over portions of the White Rose field and land covered under their Exploration Licence 1099. In total 129,406 CMP kilometers of 3D seismic data was acquired using the vessel M/V CGG Veritas Vantage. In addition to these large 3D surveys, a 123 kilometer 2D well site survey was conducted for Petro-Canada over their Exploration Licence 1092.

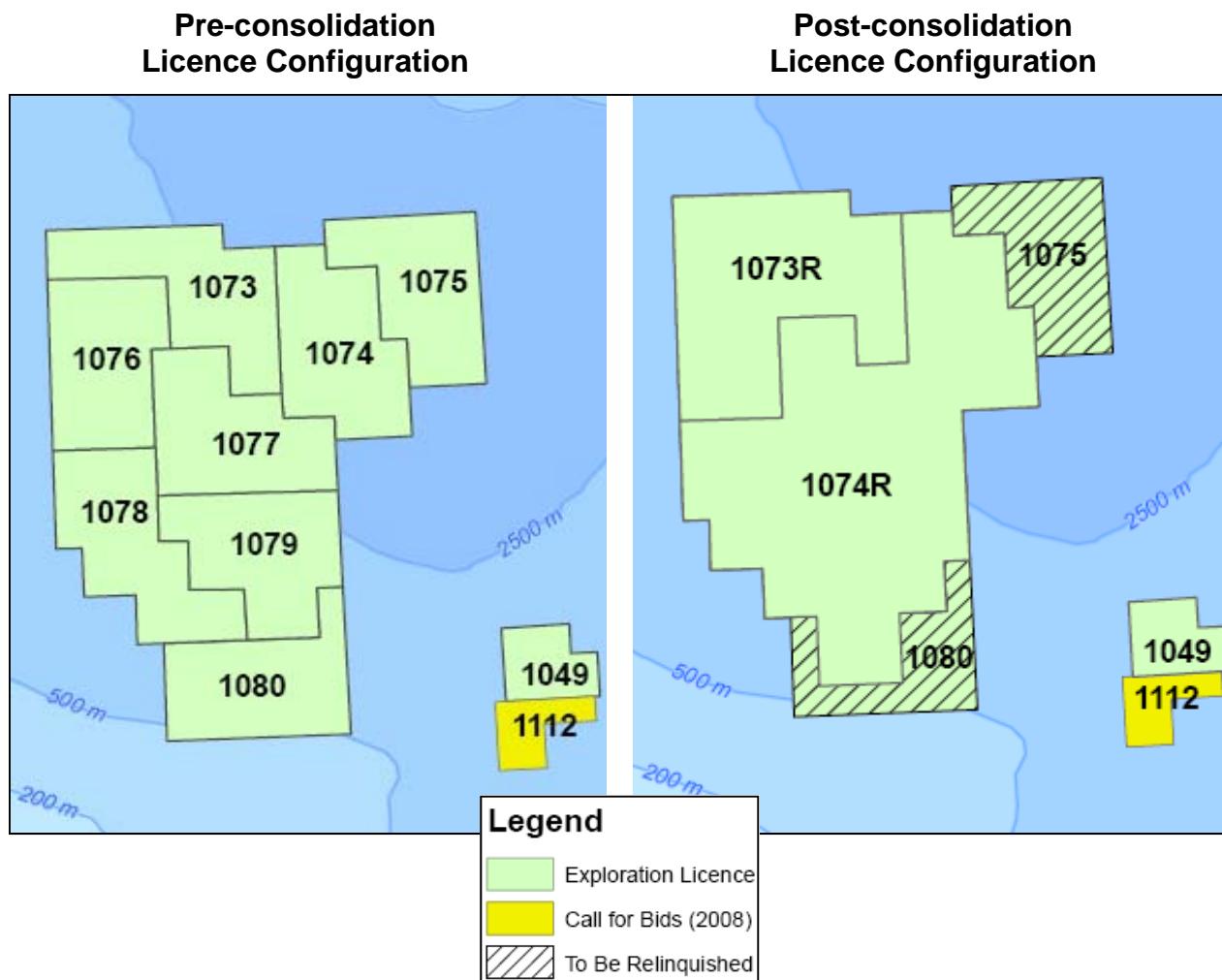
There was only one exploration well spudded on the east coast offshore in 2008. In December StatoilHydro spudded the *Mizzen 0-15* well on Exploration Licence 1049 in the Flemish Pass Basin utilizing the semi-submersible rig, the Henry Goodrich. StatoilHydro are hoping the oil show encountered in exploration well *Mizzen I-11* drilled in 2003 will translate into sufficient flows of hydrocarbons to enable the issuance of a Significant Discovery License by the C-NLOPB in 2009. Drilling of this exploration well is to continue into 2009.

## License Amendments and Consolidation

Also in 2008, the license holders in the Orphan Basin represented by Chevron Canada received approval from the C-NLOPB for a license consolidation in the region. The effect of which saw their license holdings being reduced from eight licenses (ELs 1073-1080) down to four (ELs 1073R, 1074R, 1075 and 1080) . As a condition of the consolidation, EL1075 and a portion of EL1080, would be relinquished back to the crown on the anniversary date of January 15, 2009. The net effect will see Chevron Canada holding two remaining exploration licences, EL 1073R and EL1074R.

This consolidation was granted to give some flexibility to the co-venture partners to perform further evaluation in anticipation of future exploratory drilling in the area in 2009 or 2010.

**Figure #16 - Licence parcels in the Orphan Basin**

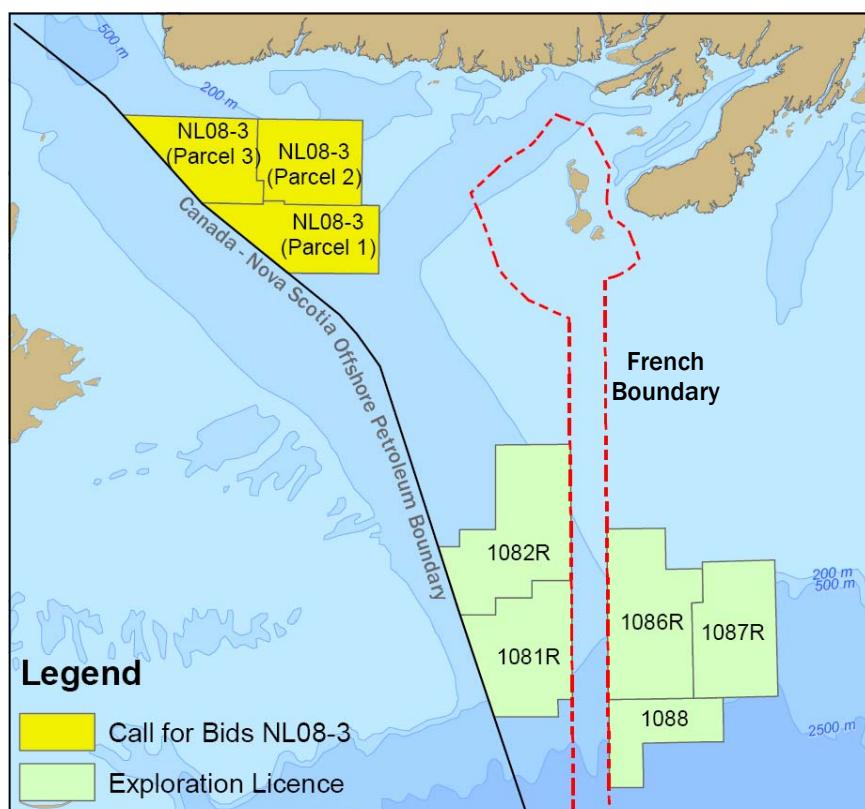


## South Coast Offshore

### Offshore Land Sale—Call for Bids

One offshore land sale was completed in 2008 in the south coast offshore under Call for Bids NL 08-3 (Sydney Basin). While three parcels were nominated in the relatively un-explored Sydney Basin only one parcel attracted a successful bid of \$1.8 million. The successful bidder was Husky Oil. Previously Husky had interest in land parcels on the East Coast and Labrador only so this marks a new focus area for the company.

**Figure #17 - South Coast call for bids**



**Table # 4**

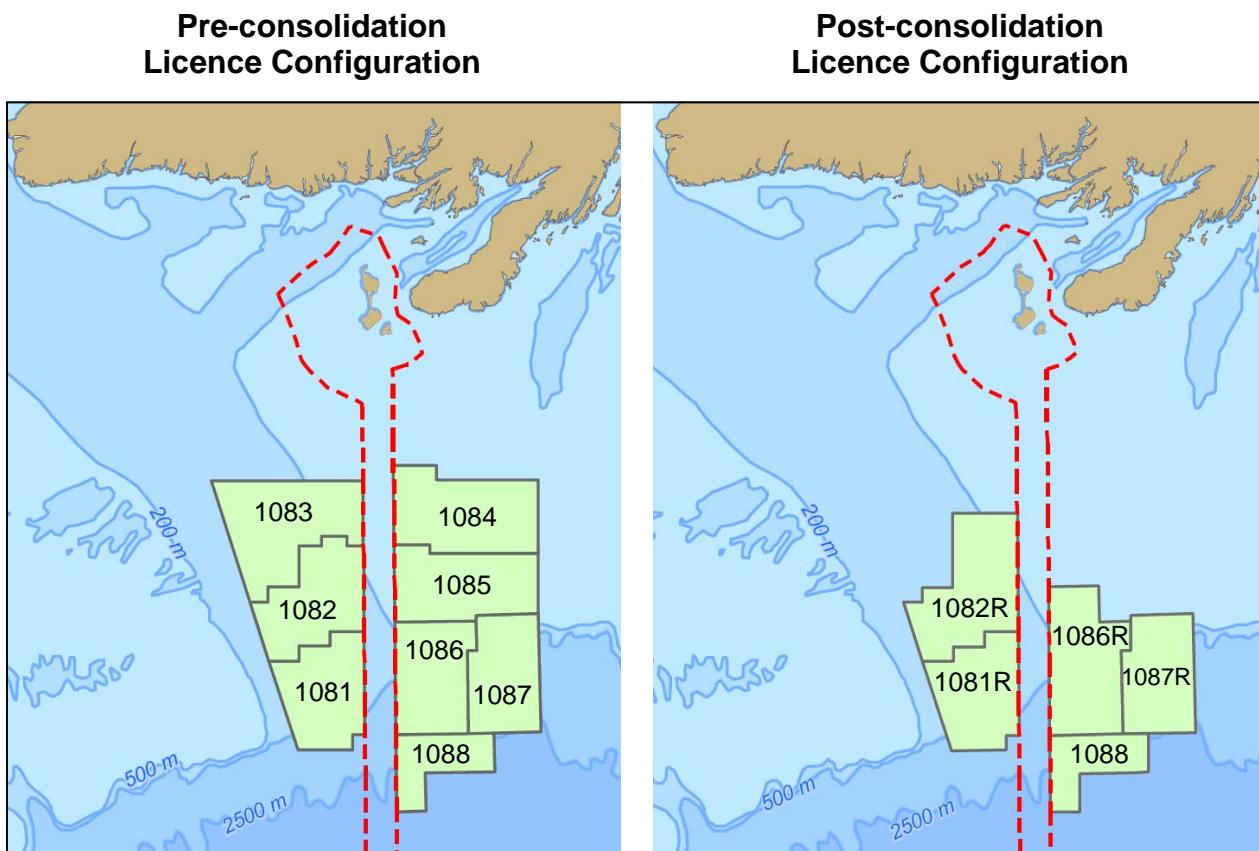
#### Call for Bids, NL08-3 (Sydney Basin)

Parcel #1 (271,891 ha)	Bid amount
Husky Oil (100%)	\$1,800,000
Parcel #2 (256,352 ha)	None
Parcel #3 (243,352 ha)	None
<b>Total</b>	<b>\$1,800,000</b>

## License Amendments and Consolidation

During 2008 ConocoPhillips applied for, and received approval from C-NLOPB to consolidate their seven exploration licenses (ELs 1081-1087) held in the Laurentian Basin down to four (EL1081R, EL1082R, EL1086R, EL1087R). This consolidation agreement provided additional time and flexibility for ConocoPhillips to conduct exploration activity in the region in 2009/2010 pending rig availability, regulatory and owner approvals. Figure 18 illustrates the various exploration licences held prior to and post consolidation.

Figure #18 Licence parcels in the Laurentian Basin



## West Coast Offshore and Onshore

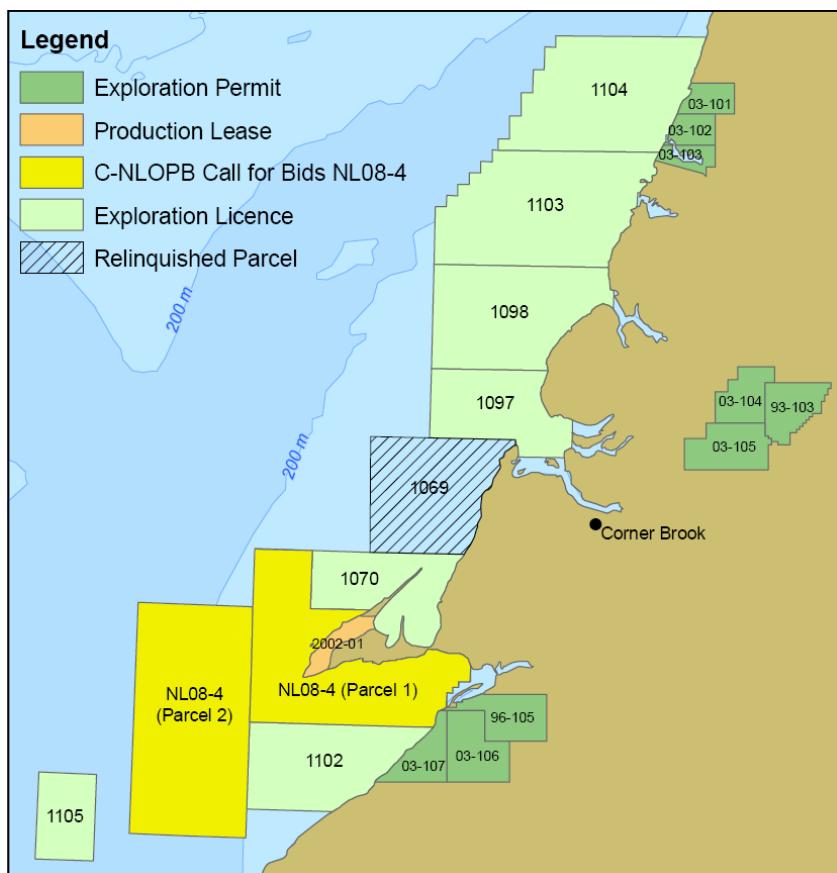
### Offshore Land Sale - Call for Bids

In November, 2008 a successful bid was received on Call for Bids NL08-4 (Western Newfoundland and Labrador) for one of two parcels off the Port au Port Peninsula in the amount of \$600,000.

The successful bidder was PDI Production Inc. who are currently developing the Garden Hill site as discussed on page 18 of this report.

The company believes that some of the onshore geological structures that they are evaluating onshore at Garden Hill extend into the offshore. As the successful bidder on the adjacent offshore parcels, they now have rights to evaluate and explore what they believe to be the whole structure.

**Figure #19 - West Coast Call for Bids**



**Table # 5**

<b>Call for Bids, NL08-4 (Western Newfoundland and Labrador)</b>	
Parcel #1 (211,985 ha)	Bid amount
PDI Production Inc. (100%)	\$600,000
Parcel #2 (121,348 ha)	None
<b>Total</b>	<b>\$600,000</b>

## Drilling Activity

During the spring and summer of 2008, Shoal Point Energy drilled the onshore to off-shore exploration well *SPE et al Shoal Point 2K-39* and its sidetrack 2K-39Z into Port au Port Bay from an onshore site at Shoal Point (figure 13, page 19). This validated their offshore Exploration Licence EL 1070 until January 15, 2011. Well logs did not identify the presence of an active hydrocarbon system in the main hole section but there were significant gas shows while drilling the intermediate hole section. Evaluation of the drilling results is ongoing.

Also in 2008 Tekoil & Gas Corporation, through a farm-in agreement with Ptarmigan Resources Ltd., received approval to commence drilling the *Glori E-67* onshore to off-shore well on Exploration Licence 1069 (figure 19, page 27). The conductor hole was drilled and casing set in January 2008. Due to financial difficulties and time constraints the remainder of the hole was not drilled and the exploration licence was subsequently relinquished.

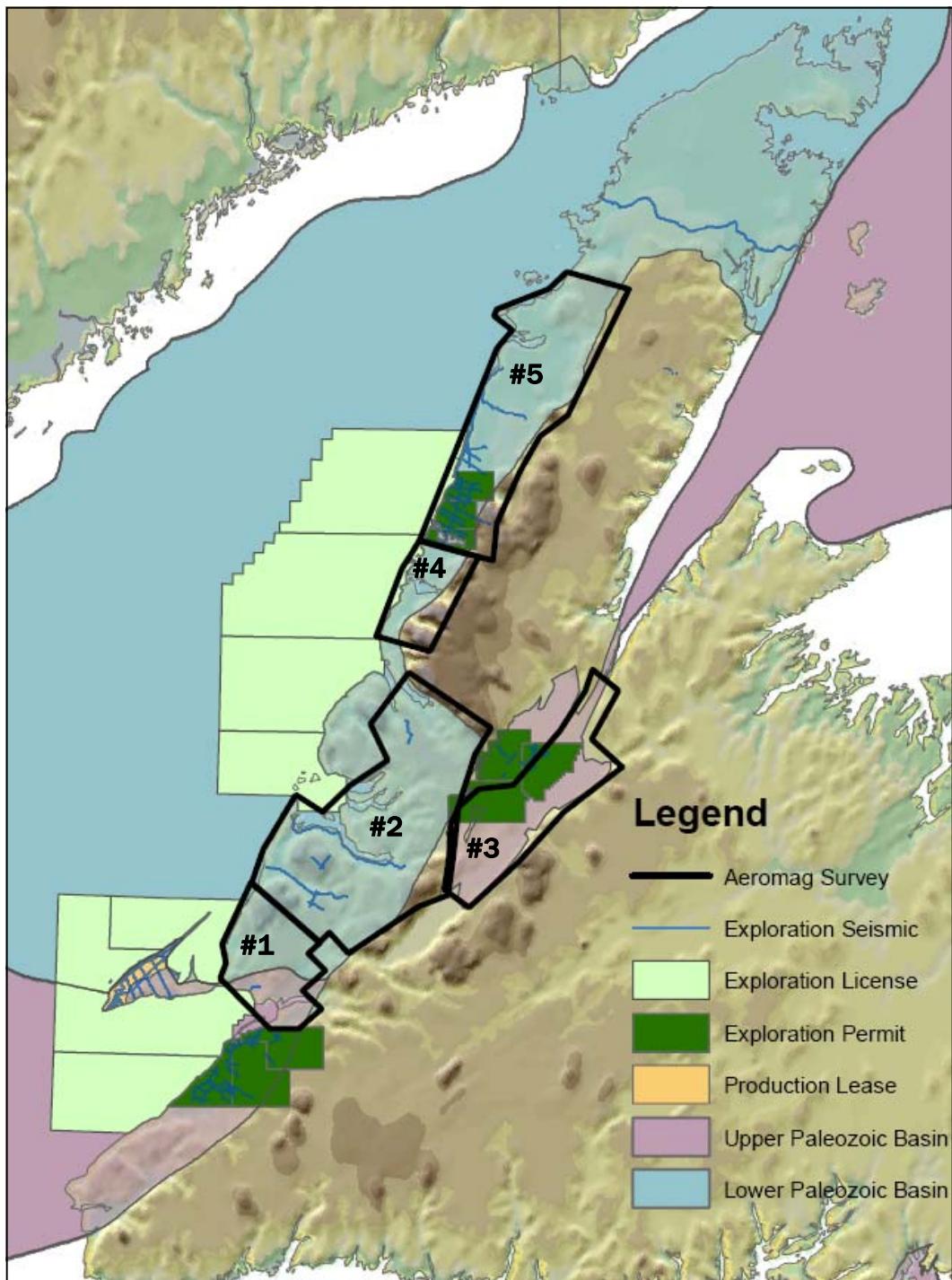
## Exploration Activity

In late December, Geophysical Services Inc. (GSI) completed an offshore non-exclusive 2D seismic survey over the Anticosti Basin. The extent of the survey was 2555 line kilometers within a survey area totaling approximately 500 square kilometers. NWest Energy Inc., a junior oil and gas company based in St. John's, holds about 1.6 million acres of prospective property over four areas off the west coast (EL 1097, 1098, 1103 and 1104 in figure 19, page 27). Several key geophysical targets were surveyed and that data, which will be processed and interpreted in 2009, will assist the company in defining specific drill targets for the future.

An onshore high resolution aeromagnetic survey was also commenced in 2008 as shown in figure 20, page 29. The program is a joint venture between Nalcor Energy Oil and Gas Inc. and the Department of Natural Resources – Petroleum Development and Geological Survey. Nalcor is acquiring data over three areas, covering a total of 7150 square kilometers (~36,000 line kilometers). The Geological Survey will be acquiring data covering a total of 5,000 square kilometers (~26,000 line kilometers). Block #1 in Stephenville and block #3 in the Deer Lake Basin have been completed. The Corner Brook region (block #2), Port au Choix extension (block #4) and Port au Choix (block #5) are to be completed in Spring, 2009. Data is expected to be available to the public in mid 2009.

Nalcor Energy's component of the survey was funded under the Petroleum Exploration Enhancement Program (PEEP). PEEP is a initiative of the provincial Energy Plan and is focused on improving geoscience knowledge of onshore hydrocarbon potential in the province.

**Figure #20 Geoscience Initiative**

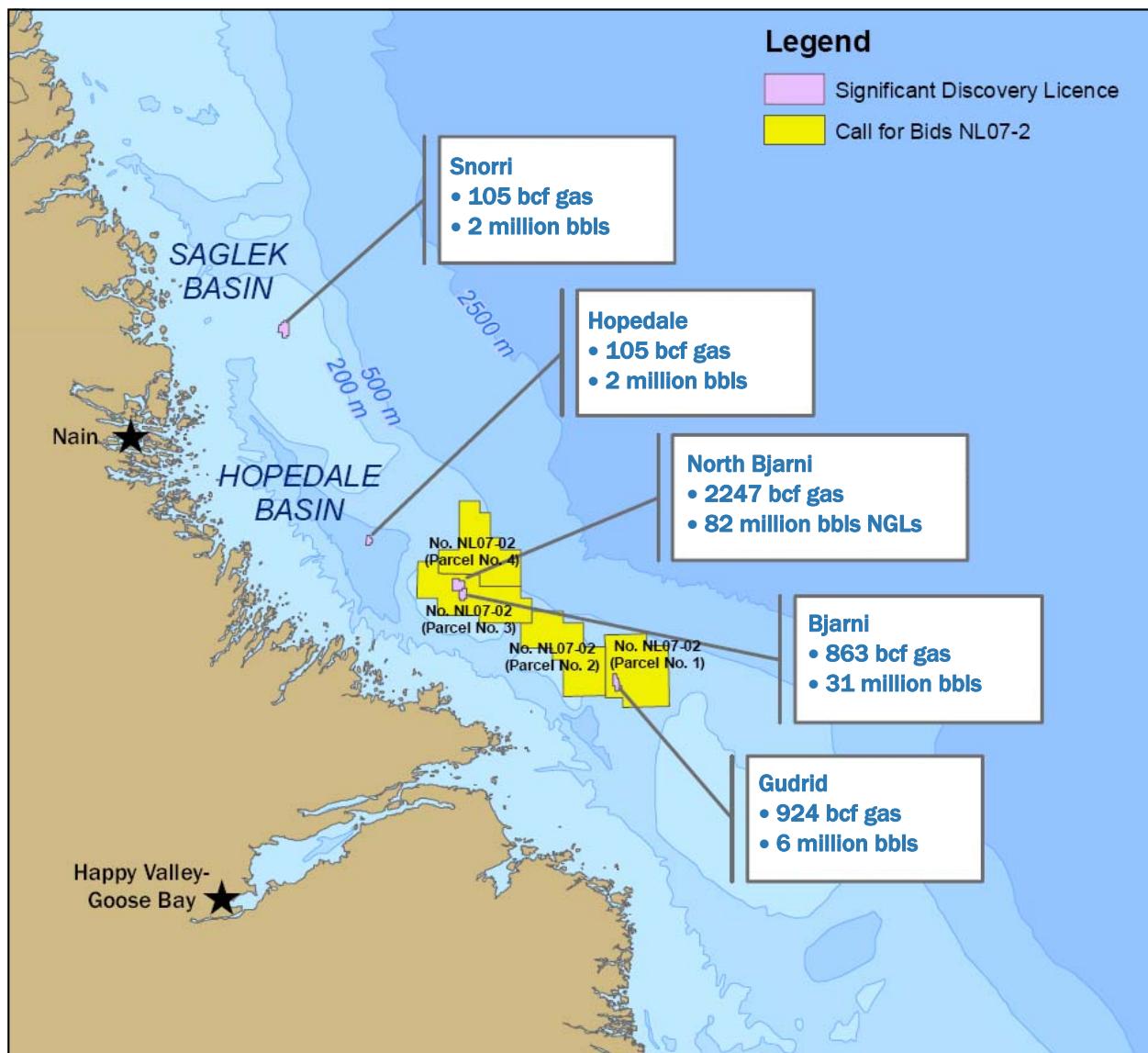


## Labrador Offshore

### Offshore Land Sale—Call for Bids

In September, 2008 the C-NLOPB announced the results of the 2007 Call for Bids for exploration rights in the Labrador Offshore Region. Bids were awarded on four parcels of land totaling \$186.4 million as outlined in Table 6, page 31. The total dollar value of work commitments received in this round represents the third largest in the province's history.

**Figure #21 - Off shore Labrador 2008 Land Sale Parcels and Significant Discoveries**



These parcels are adjacent to significant discovery licenses where over four trillion cubic feet of gas has been discovered to date. New and returning investors demonstrate the great prospectivity and the confidence industry has in the region. Investcan Energy, a subsidiary of SCDM, a France based investment holding company with significant international interest, partnered with Vulcan Minerals, a local junior exploration company, and were the successful bidders on one parcel. This marks the first time that Investcan has been involved in a Newfoundland and Labrador offshore license.

**Table # 6**

Call for Bids, NL07-2 (Labrador Offshore Region)	
<u>Parcel #1 (236,981 ha)</u>	Bid amount
Husky Oil (100%)	\$10,162,800
<u>Parcel #2 (236,525 ha)</u>	
Vulcan Minerals Inc. (50%)	
Investcan Energy Corp. (50%)	\$9,601,000
<u>Parcel #3 (233,712 ha)</u>	
Husky Oil (75%)	
Suncor Energy (25%)	\$120,166,880
<u>Parcel #4 (232,460 ha)</u>	
Chevron Canada (100%)	<u>\$46,500,000</u>
<b>Total</b>	<b>\$186,430,680</b>

## Drilling and Exploration Activity

During 2008 there was no drilling activity in the Labrador region.

Geophysical Services Inc. (GSI) conducted a non-exclusive seismic survey across 4122 kilometers of the Labrador Shelf just north of the land sale parcels in the Hopedale Basin.

**Photo credits:**  
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**CNLOPB**  
**NOIA**



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