

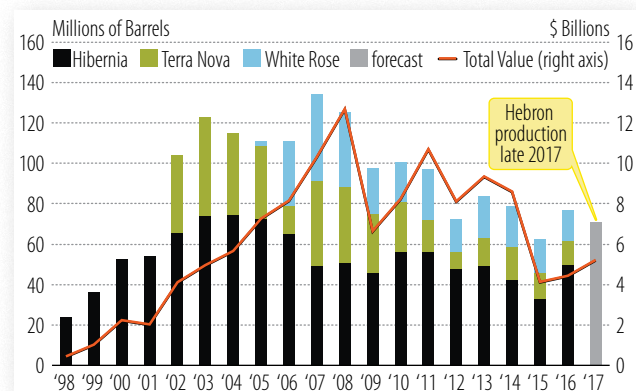


Hebron GBS. Courtesy: ExxonMobil Canada Properties.

# Oil and Gas

The oil and gas industry (including support activities) is the largest contributor to GDP in Newfoundland and Labrador. It is estimated that the industry accounted for 16.7% of the province's nominal GDP in 2015. Annual average employment in the industry in 2016 was approximately 7,000 person years (or 3.0% of total provincial employment). Crude oil production increased by 22.5% in 2016 to 76.7 million barrels (mmbbls) from 62.7 million barrels in 2015, as a result of increased extraction from Hibernia (see chart). The estimated value of production increased by 7.3% to \$4.4 billion as higher production volumes more than offset a decline in annual average crude oil prices. The price of Brent crude oil, a benchmark for Newfoundland and Labrador oil, averaged US\$43.67/barrel in 2016, down 16.5% from an average of US\$52.32/barrel in 2015. Despite recording a lower annual average price in 2016, Brent prices have been trending upward since January 2016 (see chart on next page). As of March 17, 2017, Brent prices stood at US\$50.58/barrel.

## Offshore Oil Production



f: forecast  
Source: Canada-Newfoundland and Labrador Offshore Petroleum Board; Department of Finance

### Hibernia

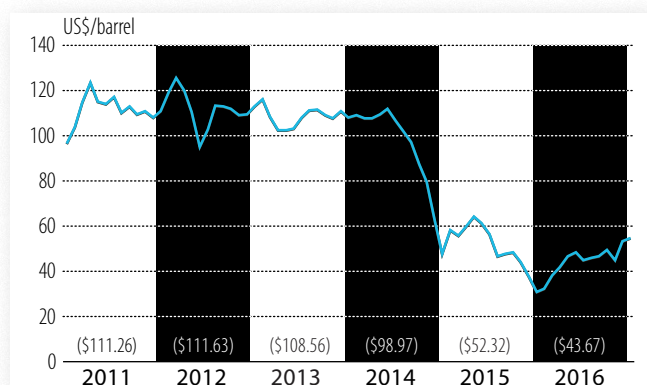
Hibernia, located in the Jeanne d'Arc Basin approximately 315 kilometres (km) southeast of St. John's, was the first offshore oil project to be developed in Newfoundland and Labrador. Hibernia was developed using a stand-alone Gravity Based Structure (GBS) and produced its first oil in November 1997.

On December 21, 2016, the Hibernia project reached a major milestone, pumping its billionth barrel of crude oil. The success of the project is particularly impressive given that when Hibernia was initially proposed for development the project proponents estimated that Hibernia contained approximately 520 million barrels of recoverable oil with field depletion expected to occur within the 2015-2017 timeframe. Since then, Hibernia production has expanded into two satellite areas south of the main field: the AA Blocks and the HSE Unit, which together make up the Hibernia South Extension. It is currently estimated that the Hibernia project contains 1,644 mmbbls of recoverable reserves and the project is expected to continue producing until at least 2040. The Hibernia platform drilling rig underwent a major refurbishment in 2016 allowing utilization for the longer-term field life established with the reserve upgrade. The drill rig is currently operational and is drilling infill development wells in the Hibernia field. The Seadrill semi-submersible *West Aquarius* rig is finishing its contract term with the Hibernia Management and Development Company Ltd. in April 2017.

Hibernia's total production increased by 50.7% (16.7 mmbbls) in 2016 to 49.8 million barrels. This increase was entirely due to higher production from the HSE Unit which increased from 1.7 million barrels in 2015 to 19.1 in 2016. The province, through Nalcor Energy, has a 10% equity stake in the HSE Unit. Production from the main Hibernia field and AA Blocks declined marginally in 2016 to 28.3 million barrels (down 0.4 mmbbls) and 2.3 million barrels (down 0.3 mmbbls), respectively. Cumulative production at Hibernia, since first oil to December 31, 2016, was 1,002 million barrels (61% of reserves), worth an estimated \$68.1 billion.

As of December 31, 2016, there were a total of 1,939 people working in the province on the Hibernia project, of which 1,656 (85.4%) were Newfoundland and Labrador residents.

## Brent Crude Oil Prices, Monthly



Source: U.S. Energy Information Administration

## Terra Nova

The Terra Nova field, located just southeast of the Hibernia field in the Jeanne d'Arc Basin, was the second offshore oil discovery in the province to reach production. The field was developed using a floating production, storage and offloading vessel (*Terra Nova FPSO*) and produced its first oil in January 2002. The current estimate for Terra Nova reserves is 506 million barrels in comparison to 400 million barrels when the project was first proposed for development.

Terra Nova produced 12.1 mmbbls of oil in 2016, a decrease of 1.0 mmbbls (7.8%) compared to 2015. Production was constrained in the first half of 2016 by operational issues but production rates rebounded in July and August and have remained relatively steady since that time. Cumulative production from Terra Nova, since first oil to December 31, 2016, was 391 mmbbls (77% of reserves) with an estimated value of \$27.4 billion.

In October 2016, Suncor signed a 15-month \$119 million contract with Transocean to utilize the deep-water semisubmersible drill rig *Transocean Barents* at the Terra Nova field. The drill rig will be used for both maintenance work and infield drilling operations, which could increase recoverable reserves and extend the life of the Terra Nova field. Work is expected to begin in the third quarter of 2017.

As of December 31, 2016, there were 749 people working in the province on the Terra Nova project, of which 695 (92.8%) were Newfoundland and Labrador residents.

### **White Rose (including North Amethyst)**

The White Rose project is the province's most recent offshore oil development to be brought into production and is also located in the Jeanne d'Arc Basin. The project was developed using the *SeaRose FPSO* and first oil was produced in November 2005. Since its initial discovery, White Rose has expanded to include several satellite areas (North Amethyst, South White Rose Extension and West White Rose). When initially proposed for development, the project proponents estimated that the White Rose project contained 230 million barrels. The current estimated reserves for the entire White Rose project (including North Amethyst and expansions) are 479 million barrels.

The West White Rose satellite field has not yet been fully developed; however, Husky remains committed to the project. A fixed wellhead platform, one of the two development concepts being assessed, received government and regulatory approvals in 2015. A sub-sea development concept is also being evaluated. The project will be considered for sanction in 2017. West White Rose began production as a pilot program in September 2011. Currently, production from the West White Rose producer wells is continuing pending a decision on the development concept.

In early February, Husky Energy made its first sale of crude oil from offshore Newfoundland and Labrador to China. A company spokesperson indicated that favourable freight rates made the sale of oil from the White Rose field economically attractive.

White Rose and its satellite areas produced 14.9 million barrels in 2016, down 10.0% (1.7 mmbbls) from 2015. Cumulative production from White Rose and its satellites since first oil to December 31, 2016

was 269.4 million barrels (56% of reserves) with an estimated value of \$23.7 billion.

As of December 31, 2016, there were a total of 1,361 people working in the province on the White Rose Project (including White Rose, North Amethyst and West White Rose), of which 1,244 (91.4%) were Newfoundland and Labrador residents.

### **Hebron**

The Hebron oil field, located in the Jeanne d'Arc Basin, is estimated to contain over 700 million barrels of recoverable oil. The Hebron development received official sanction on December 31, 2012, becoming the province's fourth stand-alone offshore oil project. Hebron will utilize a GBS similar to, but on a smaller scale than, Hibernia. The Hebron GBS is designed for an oil production rate of 150,000 barrels per day with a 30-year lifespan. The total capital cost for the project is estimated at more than \$14 billion.

Construction of the foundation of the Hebron GBS began in the dry dock at Bull Arm in October 2012. The GBS was floated to the deep water site in July 2014 for continued construction. The topsides of the GBS consist of the following six components: the drilling support module; the derrick equipment set; the utilities process module; the flare boom; the helideck and life-boat stations; and the accommodations module. Four of these components were produced in the province at several locations including Bull Arm; Port aux Basques; Marystown; and Mount Pearl, while the derrick equipment set and the utilities process module were fabricated in South Korea.

The last component to be delivered to the Bull Arm site, the utilities process module, arrived from South Korea in September 2016. Integration of the topsides components and mating onto the GBS was completed in December 2016. Hook up and commissioning is underway and will continue until

the platform is towed to the Hebron field in mid-2017. First oil is expected in late 2017.

As of December 31, 2016, there were 3,756 people working on the Hebron project in the province, of which 3,419 (91.0%) were Newfoundland and Labrador residents.

## Exploration

### Offshore

Over the past four years there have been several oil discoveries in the deepwater Flemish Pass Basin. In 2013, Statoil announced the Harpoon discovery (whose resource potential has yet to be fully assessed) and the Bay du Nord discovery (estimated to contain between 300 and 600 mmbbls of recoverable oil). Both these discoveries are in close proximity (see map) to the 2009 Mizzen discovery (estimated to contain 102 mmbbls of recoverable oil). Statoil holds a 65% interest in the Mizzen, Harpoon and Bay du Nord fields, while Husky Energy holds the remaining 35% interest.

In June 2016, Statoil announced the results of a recently completed 19-month drilling program in the Flemish Pass Basin. Nine wells were drilled including three appraisal wells on the Bay du Nord discovery, four exploration wells in close vicinity of Bay du Nord and two exploration wells in other areas of the Flemish Pass. Statoil confirmed its initial 300 to 600 million barrel estimate for Bay du Nord but noted that it is potentially towards the lower end of that range. The drilling program also resulted in two additional oil discoveries (Bay de Verde and Baccalieu) with resource estimates yet to be determined. Statoil noted that the Flemish Pass is still a frontier area, where only 17 wells have been drilled in the entire 30,000 km<sup>2</sup> basin and that the basin remains a core exploration area for the company. Statoil recently announced that it plans to drill two more exploration wells in mid-2017 in the area of the Bay du Nord discovery. The Seadrill

*West Aquarius* semi-submersible drilling rig will be utilized by Statoil to conduct this campaign.

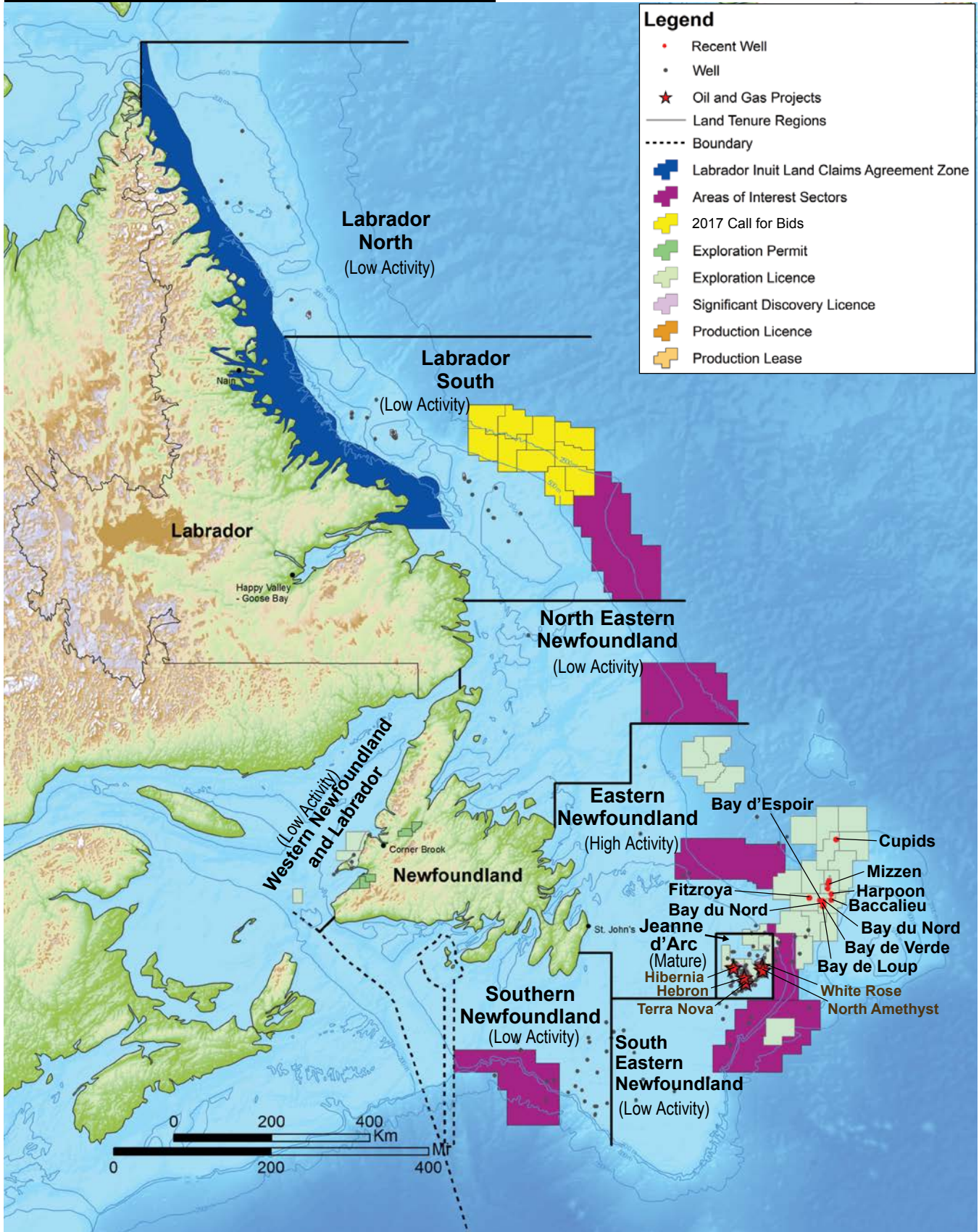
In August 2016, Statoil provided a project description to the Canadian Environmental Assessment Agency (CEAA), for another proposed exploration drilling program in the Flemish Pass Basin. This proposed drilling program would include current and potential future licences held by Statoil and its partners in the area. Statoil estimates that up to 10 wells could be drilled over the course of a 10-year period beginning in 2018.

Statoil recently sold its oil sands assets in northern Alberta. At the time of the announcement of the sale, Statoil indicated that this transaction corresponds with its strategy of portfolio optimization to enhance financial flexibility and focus capital on core activities globally, including offshore Newfoundland, Canada.

In September 2016, Husky Oil Operations Limited provided a project description to the CEAA for a proposed exploration drilling program in the Jeanne d'Arc Basin and the Flemish Pass. The project includes up to 10 wells to be drilled at any time between 2018 and 2026.

Also in September 2016, ExxonMobil Canada Ltd. and its co-venturers provided a project description to the CEAA for a proposed program of exploration drilling and associated activities in the Jeanne d'Arc and Flemish Pass regions. This proposal includes plans for a number of exploration activities including the drilling of up to 35 wells (exploration and delineation) between 2018 and 2030.

# Land Tenure Regions



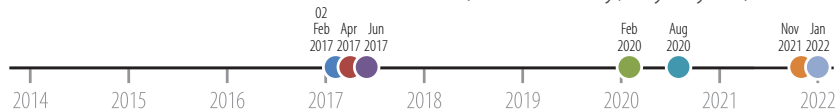
Note: This map is for illustrative and reference purposes only. The C-NLOPB makes no claims and no warranties express or implied concerning the accuracy or validity of the information provided. For legal descriptions of licences, please visit [www.cnlopb.ca](http://www.cnlopb.ca)

Source: Canada-Newfoundland and Labrador Offshore Petroleum Board; Department of Natural Resources

# Active Land Call Rounds Timeline

- Call for Nominations (AOI) Open
- Call for Nominations (AOI) Close
- Sector Identification
- Call for Nominations (Parcels) Open for Six Weeks
- Call for Bids Open
- Call for Bids Close
- Issuance of Licences

## 2017 South Eastern Newfoundland (Low Activity, 4-yr cycle)



## 2016 Jeanne d'Arc (Mature, 1-yr cycle)



## 2016 Eastern Newfoundland (High Activity, 2-yr cycle)



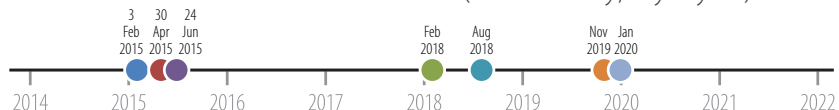
## 2016 Southern Newfoundland (Low Activity, 4-yr cycle)



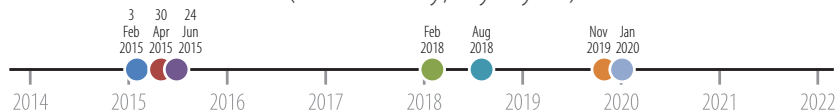
## 2016 North Eastern Newfoundland (Low Activity, 4-yr cycle)



## 2015 South Eastern Newfoundland (Low Activity, 4-yr cycle)



## 2015 Labrador South (Low Activity, 4-yr cycle)



## 2013 Labrador South (Low Activity, 4-yr cycle)



## Onshore and West Coast Newfoundland

Recent developments in oil and gas exploration on the province's west coast include:

- On May 31, 2016, the Province received the final report from the independent panel on hydraulic fracturing within the province. The Department of Natural Resources has assembled a team to review the information and recommendations in the report. In the meantime, the Province's current policy of not accepting applications for hydraulic fracturing will remain in place.

- Black Spruce Exploration (BSE) applied to the Department of Natural Resources for approval to drill an onshore-to-offshore well in the Lark Harbour area. BSE's application is currently under review by the Department of Natural Resources and other government agencies.

- In October 2016, Enegi Oil Plc announced that it had entered into an agreement with PVF Energy Services Inc., a local consortium of oil and gas engineering service and equipment providers, to continue to maintain its production lease at Garden Hill South.

- On January 15, 2017, Corridor Resources received a new four-year term exploration licence over the Old Harry prospect (EL-1153) from the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in exchange for the surrender of EL-1105. A controlled source electromagnetic survey is planned for the area in the fall of 2017, subject to regulatory approvals and vessel availability. Corridor Resources intends to purchase a user licence for this survey data as it becomes available.

- Investcan Energy Corp. has proceeded with abandonment of their eight onshore wells in the Bay St. George Basin on the province's west coast.

## Offshore Oil Exploration Initiatives

In December 2013, the C-NLOPB announced a new scheduled land tenure system. The new system allows longer lead times for exploration companies to conduct geoscientific assessments of the hydrocarbon prospectivity in the lesser explored basins of the Newfoundland and Labrador offshore area, thereby encouraging exploration in frontier areas and fostering a more competitive environment. In addition, the system follows a set schedule for companies to nominate and bid on land parcels for exploration, and improves transparency and predictability. A set land sale schedule, in combination with longer lead times to acquire and analyze data, positions the province to compete with the leading exploration jurisdictions throughout the world. Acquiring geoscience data ahead of licensing rounds is a pillar of the new scheduled land tenure system. The Department of Natural Resources and Nalcor continue to collaborate and invest in data acquisition including satellite seeps, multi-client 2D and 3D broadband seismic, resistivity data, piston core samples and other geoscience data. This data is then used as input to carry out independent resource assessments of Call for Bids (Parcels) ahead of the closing of the bidding round. The data collected is also available for licensing by industry. Geoscience acquisition activity (seismic, gravity, electromagnetic resistivity and seabed sampling) was robust in the Newfoundland and Labrador offshore area in 2016 despite a reduction in global exploration expenditures.

## Independent Oil and Gas Resource Assessments

On August 24, 2016, the Province released the results of an independent oil and gas resource assessment of the nine parcels on offer in the West Orphan Basin within the area of the C-NLOPB's 2016 Eastern Newfoundland Region Call for Bids. The assessment identified an unrisked in-place resource potential of 25.5 billion barrels of oil and

20.6 trillion cubic feet of gas over the 2.0 million hectare area. This assessment area covers approximately 2% of Newfoundland and Labrador's total offshore area. This marks the second time that the Province has commissioned and released the results of independent resource assessments over the pertinent areas prior to bid closing dates. On October 1, 2015, it was announced that the unrisked in-place resource potential for the area covering the 11 parcels offered in the Flemish Pass in the 2015 Call for Bids is 12 billion barrels of oil and 113 trillion cubic feet of gas. Future licence rounds scheduled through 2020 will follow the same process with resource assessment results released prior to the closing of the Call for Bids. This will provide the industry with independent scientifically based data with respect to the oil and gas potential of the blocks on offer and, over time, will ensure a full evaluation of all the province's offshore basins.

## Calls for Nominations and Bids

On September 1, 2016, the C-NLOPB issued a Call for Nominations (Parcels) in the Jeanne d'Arc Region (one-year cycle) and a Call for Nominations (Areas of Interest) in the Eastern Newfoundland Region (two-year cycle). A timeline chart for these activities is on page 27. The Call for Nominations (Parcels) in the Jeanne d'Arc Region will assist the C-NLOPB in selecting parcels to be included in the subsequent Call for Bids scheduled for March 2017. The Call for Nominations (Areas of Interest) in the Eastern Newfoundland Region assisted the C-NLOPB in selecting a sector for introduction into the region, announced early this year. On February 28, 2017, the C-NLOPB announced the 2017 Eastern Newfoundland Sector Identification. In total, two sectors were identified that will be sub-divided into parcels to be made available for licensing in a 2018 Call for Bids.

On November 9, 2016, the C-NLOPB announced the results of the 2016 Call for Bids which saw three new players enter the provincial offshore industry:

Hess Canada Oil and Gas ULC; Noble Energy Canada LLC; and the Delek Group (Navitas Petroleum Ltd. and DKL Investments Ltd.). Of the 16 land parcels up for bids, eight parcels were awarded with overall work commitments totaling \$758 million for exploration rights to 1.5 million hectares. Six parcels were awarded in the Eastern Newfoundland Region consisting of four parcels in the West Orphan Basin (\$461.6 million for 881,081 hectares); and two in the Flemish Pass Basin (\$52.4 million for 433,827 hectares) which were previously offered but went unawarded in the 2015 Call for Bids. In the Jeanne d'Arc Region, two parcels were awarded with work commitments of \$244 million for 211,574 hectares.

On November 29, 2016, the C-NLOPB issued a Call for Bids for 10 parcels in the Labrador South Region. Bids are scheduled to close on November 8, 2017. It is expected that a resource assessment for the area up for bids will be released prior to the bids close.

On February 2, 2017, the C-NLOPB issued a Call for Nominations (Areas of Interest) in the South Eastern Newfoundland Region (four-year cycle). This Call will assist the C-NLOPB in selecting a sector for introduction into the scheduled land tenure system to be identified in June 2017.

Considerable offshore exploration activity continues in the Newfoundland and Labrador offshore area. There are currently \$3.0 billion in outstanding work commitment bids.

## 2017 OUTLOOK

- 2017 will mark the 20<sup>th</sup> full year of oil production in Newfoundland and Labrador.
  - Oil production is expected to decrease 7.8% to 70.8 million barrels with lower production at Hibernia, Terra Nova and White Rose.
  - Hook-up and commissioning of the Hebron GBS will continue and the GBS will be towed to the field in mid-2017. Once the Hebron GBS is positioned onsite and commissioned, the Hebron GBS platform rig will begin infield drilling activity. First oil is expected prior to the end of 2017.
  - Both the *Terra Nova FPSO* and the *SeaRose FPSO* have scheduled 3-week maintenance shutdowns for the third quarter.
  - The West White Rose Extension Project will be considered for sanction in 2017.
  - Statoil intends to drill two more exploration wells in the Flemish Pass Basin.
  - Brent crude prices (Department of Finance forecast) are expected to average US\$55.51 per barrel on a calendar year basis (US\$56.00 per barrel for fiscal year 2017/18).
  - Long-term exploration programs submitted by Statoil, Husky and ExxonMobil for the Jeanne d'Arc and Flemish Pass areas bode well for the future of the oil industry in the province.
-