



Petroleum
Human Resources
Council of Canada

Conseil canadien des
ressources humaines
de l'industrie du pétrole

**UPDATE TO
*THE STRATEGIC HUMAN
RESOURCES STUDY OF THE
UPSTREAM PETROLEUM
INDUSTRY: THE DECADE
AHEAD***

April 2004



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Canada

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Dear Reader:

Subsequent to the publication of *The Strategic Human Resources Study of the Upstream Petroleum Industry: The Decade Ahead*, updated East Coast information has become available to the Petroleum Council. This update continues our commitment to provide you with accurate human resources-related information.

Page 4

Eighth paragraph should now read:

Under the high case scenario, a fourfold increase in gas production is possible. Newfoundland and Labrador oil production will be roughly one-third of the Canadian light oil production once the White Rose field comes into production. The positive changes indicated in the East Coast high case demand scenario could accelerate the pace of the industry in the region and create labour supply/demand issues.

Page 41 and continued to top of page 42 (updated paragraphs are italicized)

streamline regulatory review through development of an integrated and co-ordinated approach that does not sacrifice public policy priorities.

The East Coast industry has the potential to have a significant economic impact on Atlantic Canada; however, the region is in mid- to late-startup phase. Drilling success must be demonstrated soon if further development is to occur.

Basic expectations:

- Policies and regulations are complex with ongoing efforts to streamline for efficiency; boundary issues within the Gulf of St. Lawrence may emerge;
- Technology will be developed, tested and demonstrated in the area;
- There is a high degree of early risk-taking and large investments are expected as potential reserves are significant;
- There is a high level of concern about environmental issues and social benefits in the area;
- The management style is one of adapting existing technologies and processes from more mature offshore areas (e.g. the North Sea); and
- As with other regions in startup or growth mode, construction is an important consideration as the industry moves along the life cycle. Predicted shortages of skilled labour and trades can affect the timing and cost of projects.

The need to streamline the complex regulatory process has been recognized and is underway.

Occupational Supply/Demand Analysis

Under the high case scenario for Nova Scotia, the net increase in employment is approximately 2,305 person-years over the forecast period. Under the low case scenario, employment levels are relatively flat over the forecast period with a net increase of approximately 67 person-years.

Under the high case scenario for Newfoundland and Labrador, the total increase in employment over current levels is approximately 2,733 positions or 116 per cent. Under the low case scenario, a more moderate increase of 1,094 positions, or 43 per cent, occurs.

Two separate studies were utilized to identify labour demand for Newfoundland and Labrador and Nova Scotia. Employment levels for Newfoundland and Labrador are measured by number of positions, while employment levels for Nova Scotia are measured in person-years. These measurements are not congruent; therefore, it is not accurate to make a comparison of employment levels between these two provinces.

The significant differences between the forecasts under the high and low scenarios for Nova Scotia and Newfoundland and Labrador is an indication that potential labour supply/demand issues will be driven largely by actual industry activity levels, which will be impacted by the exploration success of the industry in the region.

The nature of the industry on the East Coast creates some occupational supply/demand challenges. The changes in labour demand driven by offshore exploration and development drilling activity are often termed as “lumpy” because it is relatively sporadic in nature. An example of this is seismic work in Newfoundland and Labrador that can only be completed during a 12- to 16-week period in the summer. The seismic “season” in Nova Scotia is significantly longer at 25 to 32 weeks, but still not year-round. The success of exploration directly impacts overall industry activity levels. To date, there is not enough industry activity on Canada’s East Coast to sustain a local or regional workforce for some specialized exploration and development drilling occupations; therefore, companies manage work assignments by supplementing a core of local employees with skilled and experienced workers brought in from other locations (foreign and domestic) for the duration of the project. Workers interested in long-term offshore drilling and well service careers must be prepared to be part of a larger international labour pool.

New production facilities create an immediate increase in labour demand, with jobs at the facilities permanently located on the East Coast. At the current development rate of new production facilities,

the operating company/partner has sufficient lead time for proper workforce planning and is able to hire locals and train them for production positions. This results in fewer concerns about meeting occupational demand. As well, internal company human resource strategies such as secondments and succession planning are used to fill critical senior roles from internal ranks.

Increased concerns related to occupational supply/demand will occur if the development pace of production projects were to accelerate. It is anticipated this could result in increased competition for skilled workers, as well as senior operating roles critical to the industry. There is potential for these supply/demand issues to develop if the high case scenario for either Newfoundland and Labrador or Nova Scotia is realized.

While two separate studies were utilized to identify labour demand for Newfoundland and Labrador and Nova Scotia, there were some consistencies found in the high-demand occupations. The current occupational demand most commonly cited for the East Coast includes some engineering roles, a variety of technician/technologist positions, marine officer positions, specialized offshore drilling and development drilling positions, some maintenance positions, as well as project management. The most significant supply factor is the lack of sufficient experience in the offshore environment and the high degree of specialization required for many of the positions. A secondary factor impacting the labour supply is the short-term or project-based nature of employment.

Page 42

Replace table with the following:

| OCCUPATIONS EXPECTED TO BE IN SIGNIFICANT DEMAND IN NEWFOUNDLAND AND LABRADOR** DURING THE NEXT DECADE | |
|---|---------------------------|
| Position | Number of New Jobs |
| Deck Hand | 179 |
| Roustabout | 96 |
| Roughneck | 84 |
| Engineering Technologist/Technician | 60 |
| Captain | 53 |
| Chief Engineer | 48 |
| Maintenance Mechanic | 48 |
| Electric Wireline Operator/Technician | 48 |
| First Mate | 46 |
| Electronic Technologist | 44 |
| Second Engineer | 44 |
| Engine Room Assistant | 42 |
| Second Mate | 41 |
| Surveyor Technologist | 41 |
| Well Testing | 41 |
| Case Running Specialist/Tubular Handling | 40 |
| Measurement While Drilling/Logging While Drilling positions | 38 |
| Instrumentation/Electronics Technician | 36 |
| Maintenance Electrician | 36 |
| Production Technician | 36 |
| Geologist/Mudlogger/Mudlogging Coordinator | 35 |
| Pipefitter | 33 |
| Welder | 32 |
| Project Manager | 31 |
| Offshore Crane Operator | 30 |
| Weather/Ice Observer | 29 |
| Mechanical Technician | 27 |
| Directional Driller | 24 |
| Drilling Supervisory | 24 |
| Toolpusher | 24 |

OCCUPATIONS EXPECTED TO BE IN SIGNIFICANT DEMAND IN NEWFOUNDLAND AND LABRADOR DURING THE NEXT DECADE**

| | |
|---------------------------|----|
| Electrician | 24 |
| Mudlogging Sample Catcher | 24 |
| Electrical Technician | 20 |
| Mechanical Engineer | 20 |

** High case scenario positions showing greatest increase in demand from 2002 to 2012.
 For further detailed information related to employment in the Newfoundland and Labrador offshore oil and gas supply and service sector, please refer to the "Labour Market Assessment of the Offshore Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador" published by the Petroleum Industry Human Resources Committee (PIHRC), May 2003. Go to www.noianet.com/pihrc to view the full report.

OCCUPATIONS EXPECTED TO BE IN SIGNIFICANT DEMAND IN NOVA SCOTIA* DURING THE NEXT DECADE

| Position | Number of Person Years |
|--------------------------|-------------------------------|
| General Labourer** | 462 |
| Seaman | 445 |
| Engine Room Operator | 196 |
| Ship's Officer | 130 |
| Drilling Technician | 67 |
| Draughtsman | 61 |
| Well Technician | 53 |
| Maintenance Technician | 49 |
| Barge Engineer | 48 |
| Drilling Superintendent | 48 |
| Production Technician | 42 |
| Captain | 41 |
| Marine Engineer | 40 |
| Well Engineer | 38 |
| Mechanic | 38 |
| Project Management | 33 |
| Drilling Engineer | 32 |
| Onshore Project Manager | 26 |
| Geologist | 24 |
| Logistics Superintendent | 23 |
| Diver | 23 |
| Structural Engineer | 22 |
| DP Operator | 21 |
| Crane Operator | 20 |
| Electrician | 20 |

*Moderate/high case scenario positions showing greatest increase in demand from 2002 to 2012.
 ** General labourer includes a variety of drilling occupations, e.g. roustabout, roughneck, derrickman, etc.
 For further detailed information related to employment in the Nova Scotia petroleum industry, please refer to the "Nova Scotia Offshore Labour Demand Model" published by Petroleum Research Atlantic Canada, 2002. Go to www.pr-ac.ca to view the full report.

*Editor's note: Construction occupations in the development phases were estimated and have been removed from the original list published in **The Decade Ahead** study to maintain consistency with the scope of study.*

Page 45

Replace first bullet point under "East Coast" section with the following:

The East Coast high case demand scenario could accelerate the pace of the industry in the region and create labour supply/demand issues.

Page 52

Replace first bullet point under “East Coast” section with the following:

Recent labour demand studies done by Petroleum Research Atlantic Canada (Nova Scotia) and the Petroleum Industry Human Resources Committee (Newfoundland and Labrador) provided information for this study that assisted in creating the national upstream petroleum labour supply/demand picture.

Replace third bullet point under “East Coast” section with the following:

The East Coast high case demand scenario could accelerate the pace of the industry in the region and create labour supply/demand issues.

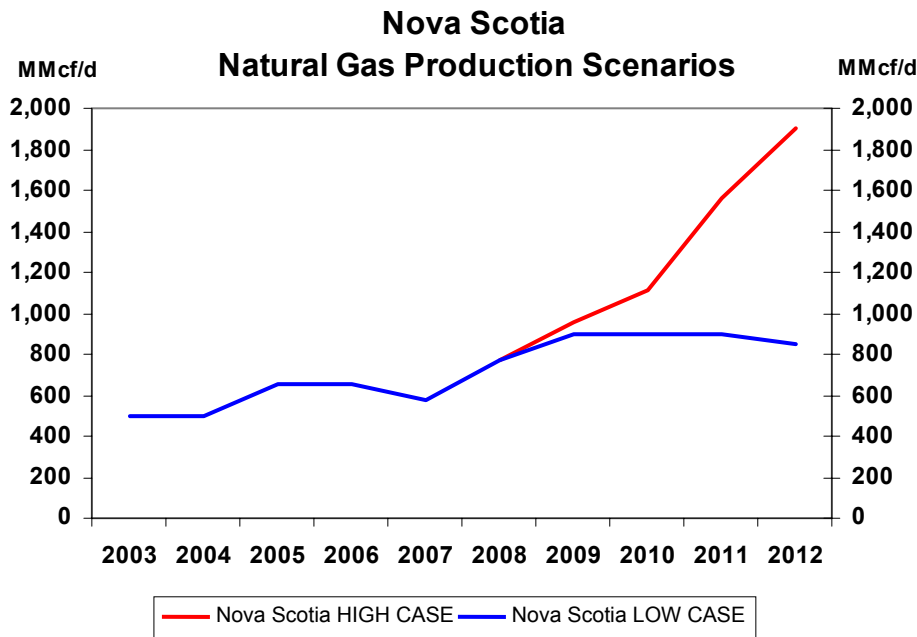
Page 56

Replace first bullet point under “East Coast” section with the following:

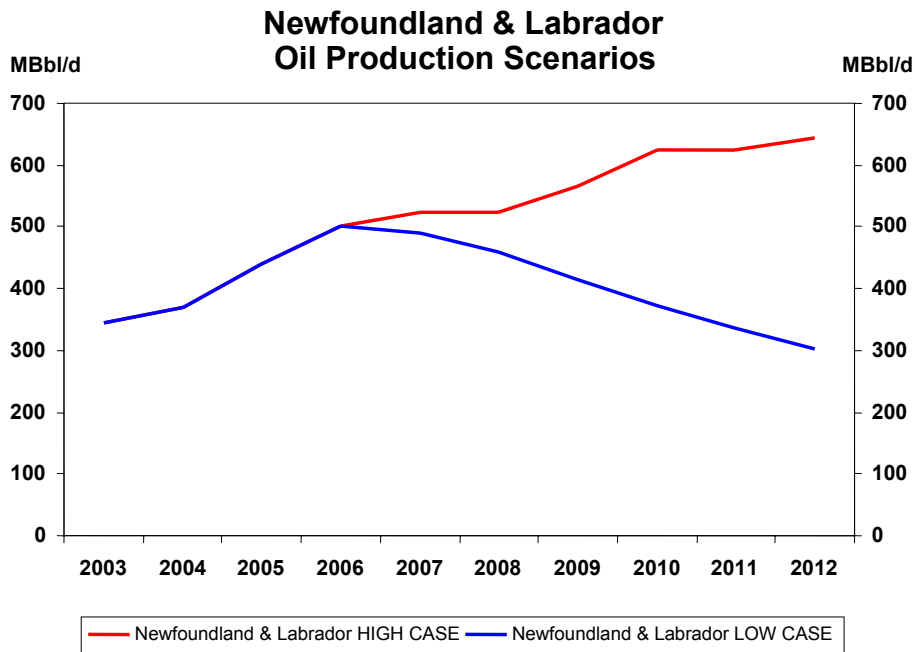
The East Coast high case demand scenario could accelerate the pace of the industry in the region and create labour supply/demand issues.

Page 92

Replace chart with the following:



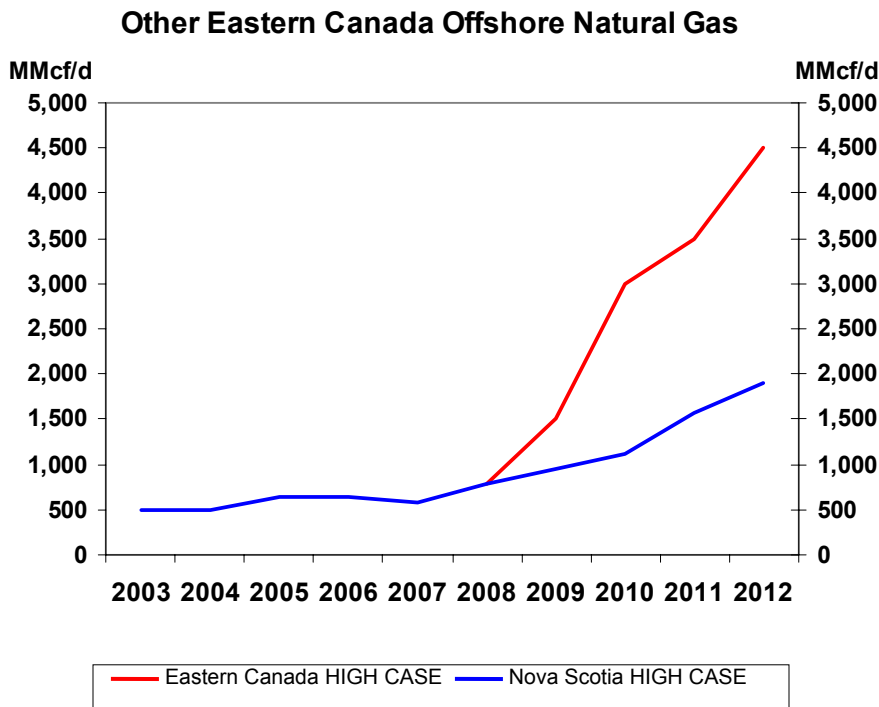
Replace chart with the following:



Add this paragraph to the top of the page:

The high case scenario for Newfoundland and Labrador identifies three additional oil production facilities within the scope of this study, but the chart above accounts for production increases related to two. It is therefore assumed that oil production in Newfoundland and Labrador would further increase by up to 200 MBbl/day in the high case scenario.

Replace chart with the following:



Fourth paragraph should now read:

For the East Coast, there have been recent labour demand analyses for both Newfoundland and Labrador (by the Petroleum Industry Human Resources Committee - PIHRC) and Nova Scotia (by Petroleum Research Atlantic Canada – PRAC). Although both studies forecast labour demand, the PRAC study (Nova Scotia) focuses on 81 occupations across all phases of the industry, while the PIHRC study (Newfoundland and Labrador) looks at 340 industry occupations including those in the supply and service sector associated with offshore production. Both studies have used industry experts to forecast the labour requirements of each project. It is difficult to draw a regional conclusion by combining the findings of the two studies because they use differing occupational lists and assumptions related to the industry scenarios, and define industry scope differently. As well, the PIHRC study reported employment levels by the number of positions created while PRAC estimated direct employment levels based on person-years. Given the differences, skill demand and forecast is presented separately for Nova Scotia and Newfoundland and Labrador.

Sixth paragraph should now read:

Petroleum Research Atlantic Canada (PRAC) commissioned a demand model for human resources in 2002. It predicts the human resources needs for the industry in Nova Scotia based on scenarios that reflect specific assumptions. For the purposes of this study, the scenarios in the PRAC study were adjusted to match the Nova Scotia high and low case scenarios developed for module one. Since the focus of the PRAC model was to forecast future labour demand, existing employment levels were not gathered. According to StatsCan 2000 census data, the number of persons identified to be employed in the Nova Scotia upstream petroleum industry is 1,565.

Seventh paragraph (continued on page 114) should now read:

Under the high case scenario for Nova Scotia, the net increase in employment is approximately 2,305 person-years over the forecast period. Under the low case scenario, employment levels are relatively flat over the forecast period with a net increase of approximately 67 person-years. The changes in labour demand are driven by offshore exploration and development activity, which is “lumpy”; change is not constant throughout the forecast period. Under the high case scenario, there is a short-term peak in labour demand in 2007 (at 3,224), which falls off and then peaks again during 2012 (at 3,863) from a 2002 level of 1,558.

Page 114 (updated paragraphs are italicized)

The overall data indicate that the workforce distribution for workers in the age 15 to 29 category and the age 45 and older category are approximately equivalent. The largest concentration of workers is in the age 30 to 44 category at 46 per cent.

In May 2003, the Petroleum Industry Human Resources Committee (PIHRC) whose members include representatives of NOIA, CAPP, the Provincial Government of Newfoundland and Labrador and the federal government, published the “Labour Market Assessment of the Offshore Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador”. This study is a comprehensive review of current occupations linked directly and indirectly to the upstream oil and gas industry in the region. The study quantifies the number of current incumbents in approximately 340 occupations and projects the number of incumbents that will be required based on potential demand scenarios. The scope of the PIHRC study did not include the exploration phase that was in-scope for this study. To address the use of semi-submersibles for exploration, this study takes the employment numbers identified in the PIHRC study and matches it to exploration activity level for the high case scenario. To forecast seismic activity, employment levels identified for 2-D and 3-D seismic vessels in the PRAC study were matched to the Newfoundland and Labrador scenarios to determine labour demand.

Since the scope of the PIHRC study is different from this study, the number of existing employees within the upstream petroleum industry was gathered from StatsCan 2000 census data. Under the high case, employment rises by 2,733 positions from a current level of 2,345 for a total of 5,078 positions.

Under the low case, employment increases more moderately by 1,094 from the current level of 2,345 for a total of 3,439 positions.

Supply/demand gaps on the East Coast have been identified by the PRAC and PIHRC studies and through primary data gathering in this study. The current occupational demand most commonly cited for the East Coast includes some engineering roles, a variety of technician/technologist positions, marine officer positions, specialized offshore drilling and development positions, some maintenance positions, as well as project management. The most significant supply factor is the lack of sufficient experience in the offshore environment and the high degree of specialization required for many of the positions. A secondary factor impacting the labour supply is the short-term or project-based nature of employment.

Page 120

Third paragraph should now read:

East Coast

Given the vast differences in the two studies used as demand data sources for this study, it is not possible to create a regional labour demand picture. What is recognized, however, is that under the

high case scenarios for both Nova Scotia and Newfoundland and Labrador, there is potential for substantial increase in labour demand. Labour demand and potential labour supply/demand gaps will be largely driven by actual industry activity levels, which will reflect the success of activity in this relatively new area.

Pages 121 through 123

Replace table with the following:

| OCCUPATIONS EXPECTED TO HAVE SIGNIFICANT CHANGES IN DEMAND IN THE NEXT DECADE | | | | |
|--|---|---|--|--|
| WCSB | Oil Sands | Nova Scotia (Number of person-years) | Newfoundland and Labrador | North |
| Electrical Engineer | Operations: Heavy Equipment Operator (2,313 increase) | General Labourer (462 increase) | Deck Hand (179 increase) | Total of approximately 50 positions in four classifications are forecasted for pipeline operations |
| Instrumentation Engineer | Operations: Process Operator (1,433 increase) | Seaman (445 increase) | Roustabout (96 increase) | Process/Field Operator (20 increase) |
| Instrumentation Technician | Maintenance: Heavy Duty Mechanic (1,138 increase) | Engine Room Operator (196 increase) | Roughneck (84 increase) | Technician (General) (13 increase) |
| Industrial Electrician | Operations: Power Engineer (375 increase) | Ship's Officer (130 increase) | Engineering Technologist/ Technician (60 increase) | Mechanic (5 increase) |
| Industrial Millwright | Maintenance: Electrician (317 increase) | Drilling Technician (67 increase) | Captain (53 increase) | Welder (3 increase) |
| Measurement While Drilling Specialist | Maintenance: Motor Vehicle Mechanic (246 increase) | Draughtsman (61 increase) | Chief Engineer (48 increase) | Electrical/ Instrumentation (6 increase) |
| Measurement While Drilling Coordinator | Maintenance: Millwright (244 increase) | Well Technician (53 increase) | Maintenance Mechanic (48 increase) | |
| Stationary Engineer | Maintenance: Instrument Technician (187 increase) | Maintenance Technician (49 increase) | Electric Wireline Operator/ Technician (48 increase) | |
| Quality Assurance Analyst | Maintenance: Other (181 increase) | Barge Engineer (48 increase) | First Mate (46 increase) | |
| Process Operator | Maintenance: Steamfitter/Pipe-fitter/Gasfitter (166 increase) | Drilling Superintendent (48 increase) | Electronic Technologist (44 increase) | |
| Supervisor, Oil and Gas Drilling & Services | Administrative: Supervision/ Management (137 increase) | Production Technician (42 increase) | Second Engineer (44 increase) | |
| | Maintenance: Welder (132 increase) | Captain (41 increase) | Engine Room Assistant (42 increase) | |

**OCCUPATIONS EXPECTED TO HAVE SIGNIFICANT CHANGES IN DEMAND
IN THE NEXT DECADE**

| WCSB | Oil Sands | Nova Scotia (Number of person-years) | Newfoundland and Labrador | North |
|---|--|---|---|--------------|
| Seismic Acquisition – Seismic Permitting Coordinator (Decrease) | Technical Engineer: Process (123 increase) | Marine Engineer (40 increase) | Second Mate (41 increase) | |
| | Technical Engineer: Mechanical (79 increase) | Well Engineer (38 increase) | Surveyor Technologist (41 increase) | |
| | Technical Engineer: Other (63 increase) | Mechanic (38 increase) | Well Testing (41 increase) | |
| | Technical Engineer: Chemical (54 increase) | Project Management (33 increase) | Case Running Specialist/ Tubular Handling (40 increase) | |
| | Technical Engineer: Mining (53 increase) | Drilling Engineer (32 increase) | Measurement While Drilling/Logging While Drilling positions (38 increase) | |
| | Technical Engineer: Geotechnical (49 increase) | Onshore Project Manager (26 increase) | Instrumentation/ Electronics Technician (36 increase) | |
| | Technical Engineer: Environmental (45 increase) | Geologist (24 increase) | Maintenance Electrician (36 increase) | |
| | | Logistics Superintendent (23 increase) | Production Technician (36 increase) | |
| | | Diver (23 increase) | Geologist/ Mudlogger/ Mudlogger Coordinator (35 increase) | |
| | | Structural Engineer (22 increase) | Pipefitter (33 increase) | |
| | | DP Operator (21 increase) | Welder (32 increase) | |
| | | Crane Operator (20 increase) | Project Manager (31 increase) | |
| | | Electrician (20 increase) | Offshore Crane Operator (30 increase) | |
| | | | Weather/Ice Observer (29 increase) | |
| | | | Mechanical Technician (27 increase) | |

**OCCUPATIONS EXPECTED TO HAVE SIGNIFICANT CHANGES IN DEMAND
IN THE NEXT DECADE**

| WCSB | Oil Sands | Nova Scotia (Number of person-years) | Newfoundland and Labrador | North |
|-------------|------------------|---|---|--------------|
| | | | Directional Driller (24 increase) | |
| | | | Drilling Supervisory (24 increase) | |
| | | | Toolpusher (24 increase) | |
| | | | Electrician (24 increase) | |
| | | | Mudlogging Sample Catcher (24 increase) | |
| | | | Electrical Technician (20 increase) | |
| | | | Mechanical Engineer (20 increase) | |

NOTES:

Oil sands positions showing greatest change in demand from 2002 to 2012.

Moderate/high case scenario positions in Nova Scotia showing greatest increase in demand from 2002 to 2012.

In Nova Scotia column, "general labourer" includes a variety of drilling occupations, e.g. roustabout, roughneck, derrickman, etc. Construction occupations in the development phases were estimated and have been removed from the original list published to maintain consistency with the scope of *The Decade Ahead* study.

High case scenario positions in Newfoundland and Labrador showing greatest increase in demand from 2002 to 2012.

The WCSB high demand occupations cannot be reported in absolute numbers due to the data collection methodology utilized. Statistical data according to the NOC (National Occupational Classification) codes has been utilized for the WCSB.

Each NOC code includes several job classes. For example: NOC 2145 Petroleum Engineers includes the positions of Drilling, Petroleum, Reservoir, Well Services (Testing, Field, Wireline) and Field Engineer. The discreet number of these engineering job classes is not available within this aggregate data.

Based on the total employment modeling of the WCSB, (which indicated a downward trend in employment for this region), expert analysis of each job class within the NOC codes has been undertaken. Job classes where growth is expected to occur, notwithstanding the downward trend predicted in employment levels, are reported above.