

**2015–2024**

Construction and Maintenance Looking Forward

Construction Trades Outlook for Major Projects in Canada's Territories

The 2015 *Construction and Maintenance Looking Forward* scenario for Canada's territories tracks current and proposed resource development projects in the Northwest Territories, Yukon and Nunavut. Compared to last year's market assessment, several major projects have been postponed and this has significantly lowered the demand for construction trades and occupations across the North. Key projects with announced delays include the Gahcho Kué Mine in the Northwest Territories, three mines in the Yukon (Brewery Creek, Carmacks Copper and the Casino Mine), and the Mary River project in Nunavut. Under the 2015 outlook scenario, major project demand for construction workers is estimated to peak in 2015 at almost 900 workers and then decline across the remainder of the scenario period to 2024.

The BuildForce labour market information (LMI) system has been tracking these developments and assessing the impacts on labour markets for 34 specific trades and occupations¹ in each province. Large construction projects regularly drive up labour requirements, creating peak demands, shortages of skilled trades and significant recruiting challenges. These demands have grown even more specialized in the last five years as resource projects in northern communities draw on a national workforce. This pattern is now being tracked as a separate group of "centres of resource construction" where project demands pull specialized trades to remote northern communities. A specialized workforce is emerging to meet these needs, and the mobility of these skilled trades and the timing of requirements is a crucial factor in resource developments.

While BuildForce produces outlooks for construction trades for the provinces, the lack of detailed historical labour market information for Canada's territories makes it difficult to provide similar outlooks for these regions. Nevertheless, there are a number of major construction projects proposed for the territories, mainly in the mining sector, that will draw on the same skilled labour pool needed for other major resource projects underway and proposed across Canada. The purpose of this document is to identify such projects and provide estimates of construction trades requirements for them.

The information on the major projects was collected from a number of sources. These sources include company websites and the assistance of government officials in the territories, who provided views on the likelihood that the announced projects would go ahead as announced in the next few years.

¹ The 2015 BuildForce LMI system has been enhanced to include measures of office employment in construction that was excluded in earlier labour force measures.

Table 1: Real GDP of the territories (millions of 2007 dollars*)

| Territory | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|-----------------------|---------|---------|---------|---------|---------|---------|---------|
| Yukon | \$1,776 | \$1,923 | \$2,067 | \$2,153 | \$2,245 | \$2,303 | \$2,283 |
| | | 8.3% | 7.5% | 4.2% | 4.3% | 2.6% | -0.9% |
| Northwest Territories | \$4,638 | \$4,195 | \$3,649 | \$3,733 | \$3,432 | \$3,508 | \$3,632 |
| | | -9.6% | -13.0% | 2.3% | -8.1% | 2.2% | 3.5% |
| Nunavut | \$1,369 | \$1,539 | \$1,416 | \$1,722 | \$1,804 | \$1,826 | \$2,030 |
| | | 12.4% | -8.0% | 21.6% | 4.8% | 1.2% | 11.2% |

* Millions of 2007 dollars indicates that the investment values are in year 2007 dollars (base year), that is, adjusted for inflation. This is used to calculate the real physical year-to-year change of the value of construction, factoring out growth (increase value) due to increases in prices.

Source: Statistics Canada

BACKGROUND

The economy in the Northwest Territories was relatively stable over the last two years following years of sharp declines. The Yukon economy contracted a small amount in 2013 following a period of sustained and steady progress. Real GDP in Nunavut increased sharply by 11 percent in 2013. (See Table 1.)

These divergent patterns are primarily due to the differing development paths of the mining industry across the territories. In the Northwest Territories, the diamond mining sector has reached maturity and production declines can be expected in the future. The Diavik and Ekati mines are to be shut down over the next decade and production from the new Gahcho Kué mine will not be a sufficient offset for the industry in the Northwest Territories. Construction has also been postponed for the Mary River project in Nunavut and for three new mines in the Yukon.

PLANNED MAJOR CONSTRUCTION PROJECTS IN THE TERRITORIES

This section provides some details on major construction projects that are scheduled to occur over the next few years in Canada's territories. A summary of the projects is first presented, followed by more information on them.

Table 2 provides a summary of the major projects for the territories, including the estimated capital costs associated with the construction phase, as well as the start and end date for this work. The estimated capital cost is the basis for our estimate of trade requirements. A number of projects have been postponed in our inventory, including Gahcho Kué, Brewery Creek, Carmacks Copper, Casino Mine and Mary River. The start and end dates for these projects are shown as indeterminate.

Gahcho Kué Diamond Mine, Northwest Territories

The Gahcho Kué Diamond Mine, located at Kennady Lake, which is 280 kilometres northeast of Yellowknife, is a joint venture of DeBeers Canada and Mountain Province Diamonds. The mine plan includes the extraction and processing of more than 31 million tonnes of ore and the recovery of 49 million carats of diamonds over an operating period from 2016 to 2026. In September, the N.W.T. Minister of Environment and Natural Resources approved the water license for the mine. The company still needs to secure final construction and operational permits before full construction gets underway. The capital cost during construction is estimated at \$600 million. This project is postponed in our inventory.

Inuvik to Tuktoyaktuk Highway, Northwest Territories

The 140-kilometre long highway will link the town of Inuvik with the hamlet of Tuktoyaktuk. During the previous winter 330 people worked on the project. The capital cost during construction is estimated at \$300 million. Construction was started in 2014 and is expected to be complete by the winter of 2018.

Nechalacho (Thor Lake) Project, Northwest Territories

The Nechalacho Rare Earth Elements Deposit is one of the largest undeveloped rare earth elements resources in the world. Located at Thor Lake, five kilometres north of the Hearne Channel of Great Slave Lake and 100 kilometres southeast of Yellowknife, it was acquired by Avalon Rare Metals in 2005. The completion of a feasibility study awaits a revised cost estimate for a hydrometallurgical plant. Efforts to arrange project financing and product off-take agreements continue, along with project implementation planning and

Table 2: Major projects and capital costs

| Territory | Projects | Construction | | Capital cost (millions) |
|-----------------------|--------------------------------|--------------|----------|-------------------------|
| | | Start year | End year | |
| Northwest Territories | Gahcho Kué Mine | – | – | \$600 |
| | Inuvik to Tuktoyaktuk Highway | 2014 | 2018 | \$300 |
| | Nechalacho (Thor Lake) Project | 2015 | 2017 | \$902 |
| | Prairie Creek | 2014 | 2014 | \$120 |
| | Yellowknife Gold Project | 2016 | 2017 | \$193 |
| | NICO Project | 2015 | 2016 | \$210 |
| | Giant Mine Remediation Project | 2015 | 2023 | \$900 |
| | Pine Point Mine | 2015 | 2015 | \$140 |
| | | | | \$3,365 |
| Nunavut | Mary River project | – | – | \$740 |
| | Meliadine gold mine | 2015 | 2017 | \$45 |
| | | | | \$785 |
| Yukon | Whitehorse Copper | 2015 | 2015 | \$5 |
| | Victoria Gold | 2015 | 2016 | \$430 |
| | Brewery Creek | – | – | \$200 |
| | Carmacks Copper | – | – | \$178 |
| | Casino Mine | – | – | \$2,450 |
| | | | | \$3,263 |

Sources: Yukon Economic Development, NWT Bureau of Statistics, Nunavut Bureau of Statistics and company websites

permitting. The company expects construction work to begin by the summer. Construction is expected to occur over a three-year period with an estimated capital cost of \$902 million.

Prairie Creek Mine, Northwest Territories

The Prairie Creek Mine is located in the Mackenzie Mountains and is owned by Canadian Zinc Corporation. Last October the company announced the start-up of its underground program at its zinc, lead and silver mine. Estimated construction cost is \$120 million.

Yellowknife Gold Project, Northwest Territories

The Yellowknife Gold Project is located in the South Mackenzie Mining District in an area that extends from 50 to 90 kilometres north of Yellowknife. It is owned by Tyhee Development Corp. The mine will process approximately 857,000 to 1,225,000 tonnes of ore per year. Last March the Mackenzie Valley Review Board gave itself 21 months to complete an environmental assessment. A two-year mine construction period is expected, with an estimated capital cost of \$193 million.

NICO Project, Northwest Territories

The NICO deposit is located 150 kilometres northwest of Yellowknife. It contains open-pit and underground proven and probable mineral reserves totaling 33 million tonnes. Last summer the Wek'èezhii Land and Water Board recommended that the gold, cobalt, bismuth and copper project should be approved. Fortune Minerals wants the project to become a producing mine in about three years. The estimated capital cost is \$210 million.

Giant Mine Remediation Project, Northwest Territories

The Giant Mine was a large gold mine located on the Ingraham Trail just outside of Yellowknife. As an active mine it produced more than seven million troy ounces of gold. It also produced 237,000 tonnes of arsenic trioxide dust. A remediation plan was put in place to prevent the release of arsenic into the groundwater around the mine. Last summer the Government of Canada accepted the final environmental assessment, an important step forward in the remediation process. The preparations for regulatory approvals can now proceed. The estimated remediation cost now stands at \$900 million and work is expected to continue until 2023.

Pine Point Mine, Northwest Territories

The Pine Point Mine, located west of Fort Resolution on the south shore of Great Slave Lake, produced lead and zinc ores from 1964 to 1988. Tamerlane Ventures would like to bring the Pine Point property back into production and is currently in negotiations for funding with larger mining companies. The estimated capital cost is \$140 million. We assume that infrastructure construction will begin this year. Once completed, one million tonnes of zinc-lead ore will be mined underground.

Whitehorse Copper Project, Yukon

The Whitehorse Copper mine operated from the late 1960s until its closure in 1982 and left behind 10 million tonnes of tailings. Eagle Whitehorse plans to truck ore from the mine to the port of Skagway to be shipped to market. The Yukon government provided its approval after a positive recommendation from the Yukon Environmental and Socio-economic Assessment Board. More recently, however, the world price for magnetite has fallen sharply and the company has said it will be difficult to continue with the project with prices at this level. The capital cost for the project is \$5 million and the construction period is six to seven months.

Victoria Gold, Yukon

Victoria's Eagle Gold Project is located 375 kilometres north of Whitehorse. The project is shovel-ready and will produce 200,000 ounces of gold annually at a cost of \$600 per ounce. The estimated capital cost of construction is \$430 million. The company is currently seeking financing.

Brewery Creek, Yukon

Golden Predator holds a quartz mining license, a land-use permit and a water license at the former gold mine. The company has plans to submit an application to the Yukon Environmental and Socio-economic Assessment Board for the re-opening of the mine later this year. Construction costs are estimated at \$200 million and will extend over a two-year period. This project is postponed in our inventory.

Carmacks Copper, Yukon

The Carmacks Copper Project is located 198 kilometres north of Whitehorse. The company received a mining license from the territorial government, but the Yukon

Water Board has refused to issue a water license because of concerns related to the company's heap leach extraction method. In October, the project owner announced that it retained Beijing General Research Institute of Mining and Metallurgy to design a process to recover the copper, gold and silver. Construction costs are estimated at \$178 million and will extend over a two-year period. The mine is expected to have an operating life of seven years. This project is postponed in our inventory.

Casino mine, Yukon

Western Copper and Gold Corporation's Casino mine project is located 150 kilometres northwest of Carmacks and 300 kilometres northwest of Whitehorse. The property is believed to contain close to two million tonnes of copper, along with deposits of gold and molybdenum. The construction of an open-pit mine will carry an estimated cost of \$2.45 billion. Construction will be delayed, however, because of a lawsuit filed by a First Nations group that claims they have not yet been properly consulted. They recommend that the Yukon Environmental and Socio-Economic Assessment Board should not consider the project. This project is postponed in our inventory.

Mary River project, Nunavut

The Mary River Property, located on North Baffin Island in the Qikqtani Region, is one of the largest and richest undeveloped iron ore projects in the world. The project proposal involves conventional open-pit mining of iron ore at a rate of 18 million tonnes per year over a projected 21-year lifespan. Baffinland Iron Mines Corp. needs to raise \$5 billion to pay for infrastructure to support the mine. The project is also being impacted by plunging iron ore prices. Construction costs are estimated at \$740 million and will extend over a four-year period. This project is currently postponed in our inventory.

Meliadine mine, Nunavut

The Meliadine project is located 25 kilometres northwest of Rankin Inlet. The project consists of one underground mine, five open pits and a network of access roads. Last fall, the Nunavut Impact Review Board recommended that the federal government approve the proposed gold mine. In the near future, Agnico Eagle will receive a project certificate from the federal government. Construction is expected to occur over a three-year period, with production at the mine expected to begin in 2017.

TRADE REQUIREMENTS

The construction and operation of a mine often faces challenges in attracting and training skilled workers. This is especially problematic for mines located in remote locations. Companies are reporting that skilled workers are becoming increasingly difficult to find and this problem is being accentuated by an aging workforce and a wave of retirements from the industry.

The development of the mining sector in Canada's territories will require key construction trades and occupations that are common to engineering and industrial work in other industries and provinces. The demand for these construction trades has grown steadily for at least a decade and, consequently, these skills have been in short supply and have required workers, industry groups and governments to invest in recruiting and training plans.

The BuildForce LMI tracking system is limited to broad occupational classifications. The requirements of mine construction and related resource projects have traditionally focused on the following trades and occupations:

- boilermakers
- carpenters
- construction estimators
- construction managers
- contractors and supervisors
- drillers and blasters
- electricians
- heavy equipment operators
- heavy-duty equipment mechanics
- ironworkers and structural metal and plate work fabricators and fitters
- plumbers, steamfitters and pipefitters
- trades helpers and labourers
- truck drivers
- welders

The estimated capital cost for each project and additional information on occupation requirements associated with heavy construction inform our estimate of trade requirements. The analysis includes a discussion of postponed major resource development projects, but the projects are excluded from the estimation of construction trade requirements.

Tables 3 and 4 provide estimates of trades requirements that are generated by the construction of the various projects over the next few years. The total number of workers required for all projects by territory is shown in Table 3. The time pattern for the projects in the territories as a whole is shown in Table 4.

The total number of trades tracked by BuildForce² required for the projects as a whole is 2,878 workers. The largest number of requirements is for heavy equipment operators at 1,228, followed by more than 524 for trades helpers and labourers, and almost 256 for truck drivers. The peak year for requirements is 2015 at 897 workers.

CONCLUSIONS – LABOUR REQUIREMENTS IN THE NATIONAL CONTEXT

There is a long list of proposed major projects across Canada and it includes many opportunities for training and sharing human resources, but the size and the timing of the projects make it clear that inter- and intra-provincial mobility may not meet all of industry's needs. In some cases, cycles and systems will cooperate and work to meet needs from within Canada. The decline in the price of oil has slowed Alberta's new oil sands construction; however, sustaining capital³ and maintenance⁴ work are expected to proceed as scheduled. Renewed growth is expected after 2017 as oil prices increase, and activity will rise across the scenario period to 2024. In British Columbia, current and proposed resource developments will translate into significant employment demands over the medium term, with activity expected to peak in 2018. Major mining projects continue in Saskatchewan over the next several years and a major hydro development and transmission project continues to sustain strong demand in Manitoba.

In addition, industry has to address the increasing challenge of an aging workforce. An estimated 250,000 skilled construction workers are expected to retire over the next decade. This represents a significant loss of skilled workers. Construction will face competition replacing these workers as most other industries face similar demographic challenges.

The labour requirements for projects in the Northwest Territories, Yukon and Nunavut add to the complexity of the growing demand for construction trades and

² The BuildForce labour market information system tracks labour market conditions for 34 trades and occupations, plus all other trades and occupations as a whole in the construction industry.

³ Sustaining capital refers to the periodic addition (or replacement) of capital, which is required to maintain operations at existing levels.

⁴ Maintenance refers to the process of maintaining equipment, including routine or on-stream work and turnaround/shutdown work, where an operating unit may be temporarily taken out of production.

Table 3: Construction trades demand by territory

| Trades and occupations | Northwest Territories | Yukon | Nunavut | Total |
|--|-----------------------|------------|-----------|--------------|
| Boilermakers | 35 | 6 | 1 | 41 |
| Construction estimators | 89 | 12 | 1 | 102 |
| Construction managers | 47 | 7 | 1 | 56 |
| Construction millwrights and industrial mechanics (except textile) | 11 | 2 | 0 | 13 |
| Contractors and supervisors | 95 | 15 | 2 | 111 |
| Crane operators | 114 | 18 | 2 | 134 |
| Drillers and blasters | 103 | 17 | 2 | 122 |
| Electricians | 10 | 2 | 0 | 12 |
| Heavy equipment operators (except crane) | 1,055 | 156 | 16 | 1,228 |
| Heavy-duty equipment mechanics | 80 | 11 | 1 | 82 |
| Ironworkers and structural metal and platework fabricators and fitters | 58 | 9 | 1 | 68 |
| Sheet metal workers | 3 | 1 | 0 | 4 |
| Steamfitters, pipefitters and sprinkler system installers | 11 | 2 | 0 | 13 |
| Trades helpers and labourers | 462 | 56 | 6 | 524 |
| Truck drivers | 223 | 30 | 3 | 256 |
| Welders and related machine operators | 87 | 13 | 1 | 102 |
| Total | 2,484 | 358 | 37 | 2,878 |

Sources: Yukon Economic Development, NWT Bureau of Statistics, Nunavut Bureau of Statistics, company websites and BuildForce Canada

Table 4: Construction trades demand (all projects)

| Trades and occupations | 2014 | 2015 | 2016 | 2017 | 2018 | 2019–24 average |
|--|------------|------------|------------|------------|------------|-----------------|
| Boilermakers | 11 | 14 | 8 | 1 | 1 | 6 |
| Construction estimators | 26 | 31 | 19 | 7 | 7 | 12 |
| Construction managers | 15 | 18 | 10 | 3 | 3 | 8 |
| Construction millwrights and industrial mechanics (except textile) | 4 | 4 | 2 | 1 | 1 | 2 |
| Contractors and supervisors | 29 | 36 | 21 | 5 | 5 | 15 |
| Crane operators | 35 | 43 | 25 | 6 | 6 | 19 |
| Drillers and blasters | 33 | 40 | 23 | 5 | 5 | 18 |
| Electricians | 3 | 4 | 2 | 0 | 0 | 2 |
| Heavy equipment operators (except crane) | 319 | 386 | 229 | 66 | 66 | 162 |
| Heavy-duty equipment mechanics | 23 | 28 | 17 | 6 | 6 | 11 |
| Ironworkers and structural metal and platework fabricators and fitters | 18 | 22 | 13 | 3 | 3 | 10 |
| Sheet metal workers | 1 | 1 | 1 | 0 | 0 | 1 |
| Steamfitters, pipefitters and sprinkler system installers | 4 | 4 | 2 | 1 | 1 | 2 |
| Trades helpers and labourers | 131 | 155 | 99 | 41 | 41 | 58 |
| Truck drivers | 65 | 78 | 48 | 16 | 16 | 31 |
| Welders and related machine operators | 27 | 32 | 19 | 5 | 5 | 14 |
| Total | 744 | 897 | 537 | 165 | 165 | 370 |

Sources: Yukon Economic Development, NWT Bureau of Statistics, Nunavut Bureau of Statistics, company websites and BuildForce Canada

occupations. Most of the proposed projects are scheduled between 2014 and 2016, the same time that work is expected to pick up in British Columbia. The re-scheduling of projects currently on hold may add to long-term recruiting and human resources planning challenges for the North.

Meeting demand requirements for resource projects adds to the construction industry's need to invest in the recruiting and training of new workers. These are skilled

jobs with high qualifications and compensation that will be attractive to young Canadians, but this workforce is limited. Some new workers can be drawn from the populations of the Northwest Territories, the Yukon and Nunavut. Others will have to be drawn to the territories from outside the construction industry in the North.

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www.constructionmapapp.ca



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