



Pacific North West Economic Region

Alaska Pipeline Labour Issues Survey

September 2009

This Report was funded in part by the Government of Canada's Sector Council Program

Canada

Executive Summary

“The amount of construction work required for the [Alaska Pipeline Project] will strain the capabilities of the North American construction market”

(TransCanada, 2007, pp. 2.3-2).

There has been significant and meaningful efforts put into identifying the challenges faced by labour markets in the Pacific north west region in responding to the workforce needs of the Alaska pipeline project. Strategies and plans have been developed by the governments affected so that the pipeline may be constructed, and the benefits to be derived maximized.

The governments of Alaska, the Yukon, British Columbia, and Alberta who are directly affected have looked carefully at the supply of labour in the oil and gas sectors and have strategies to respond to the projected need for additional workers and training.

There has also been considerable work put into identifying the magnitude of the project, the labour needs associated with it, and the challenges faced by the oil and gas industry.

Common themes which appeared in the research were the need for:

- More current and relevant data about the labour supply and the market’s needs;
- The need to integrate industry and the private sector in the training process to a greater degree (i.e. – more apprenticeships, funding for training, developing training standards);
- Beginning the training process early enough to enable workers to be ready for pipeline related jobs;
- The need to retain current workers longer, and to attract other groups such as First Nations, women, and immigrants.

The research showed there is significant body of information to begin developing best practices and common strategies. If the plans and policies that have been created could be expanded regionally, the governments involved may be more successful in implementing them. It would help governments plan budgets, develop joint priorities and manage their resources more effectively.

Without any coordination however, the jurisdictions involved will continue to compete unnecessarily with each other for the workforce, rather than working together to increase this vital resource.

Some strategies are aimed at keeping workers within jurisdictions, others were aimed at reducing the need for workers to come in, while another is based on the hopes that people would migrate and work. Yet all jurisdictions are concerned they do not or will not have enough workers to support the sector.

The magnitude of the project will affect all jurisdictions involved significantly, but workforce planning should help all to maximize the benefits of the project. By working together, best practices may be identified and utilized, ensuring the available workforce may be used to its peak capacity while enabling goods and materials to move across jurisdictions without difficulty.

The strategies identified the need to bring government and the private sector together. Findings also confirm there is a need for better harmonizing of policies and planning between jurisdictions, beginning with a coordinated effort to share information both between jurisdictions and industries.

Acknowledgements

The Pacific NorthWest Economic Region would like to gratefully acknowledge Human Resources and Skills Development Canada for their support of this important research.

We thank all of the individuals that have assisted in this work. Your participation has provided direction and valuable feedback to support of this research. Your time and support is gratefully acknowledged.

Disclaimer: The views and recommendations contained in this report do not necessarily represent the positions of the Government of Canada; the Government of the United States; state or provincial governments or the organizations or individuals consulted as part of the research process.

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Report Introduction

About the Project

The purpose of the project is to identify the state of preparedness and planning of the Pacific north west region's private and public sectors as it relates to the construction of the Alaska gas pipeline.

As a cross-border organization representing public and private sector interests in the jurisdictions involved; the Pacific NorthWest Economic Region (PNWER) is well suited to begin the process of creating an awareness of the issues to be addressed. PNWER has been funded by Human Resources and Skill Development Canada (HRSDC) to conduct an initial scoping project to survey public and private sector stakeholders to identify their state of preparedness and planning related to demands of building the Alaska Pipeline.

Through this process it is expected that overall demand, as well as gaps in infrastructure, training and workforce planning and supply can be identified. Workforce supply and logistics issues will need to be addressed and planned for in advance of the beginning of the construction phase. This report can provide the basis for further stakeholder engagement to develop strategies and create a labour environment where large industrial projects may be successful in the future.

About the Alaska Pipeline Project

Denali- The Alaska Gas Pipeline, LLC (Denali); and TransCanada Alaska Company (TransCanada) are actively seeking regulatory approval to develop a natural gas pipeline from Prudhoe Bay, Alaska, connecting to the Alberta Hub and into the lower 48 states.

Both pipeline proposals follow the same route, and will run approximately 2,700 kilometres (1,677 miles) underground through Alaska, the Yukon, British Columbia and into Alberta.

The project will require an enormous planning effort, from both a logistical and a labour point of view. The challenge will be to identify a source of labour that is both skilled enough, and large enough to meet the demands of the project; and establish how to get

the people and the materials to the construction sites in order to optimize progress on the project.

About PNWER

The Pacific NorthWest Economic Region (PNWER) is a forum of Canadian and American public and private sector participants. Its' goal is to encourage and promote global economic competitiveness and while preserving our natural environment. PNWER has been recognized in the United States and Canada as a model for cross-border cooperation. Its' members are Alaska, Alberta, British Columbia, Idaho, Montana, the Northwest Territories, Oregon, Saskatchewan, Washington, and the Yukon.

Research Scope & Methodology

The research for the project involved a scan and analysis of existing policies, initiatives, plans and data available in the public domain. Follow up interviews with stakeholders were conducted for additional information or clarification where appropriate or needed.

The research was limited to information which was publicly available. Proprietary information and internal government documents were neither requested nor used. This was done to enable a discussion of the issues and their solutions to occur without privacy or confidentiality concerns.

The scope of information reviewed included reports, press releases, speeches applications, proposals, plans, web pages, brochures, letters and correspondence.

The projections of anticipated labour supplies vary from source to source, depending on the perspective of the author of each document. State or provincial governments have different projections from Denali or TransCanada, in that their interests go beyond the construction project and into the secondary and support industries as well as the interests of the public.

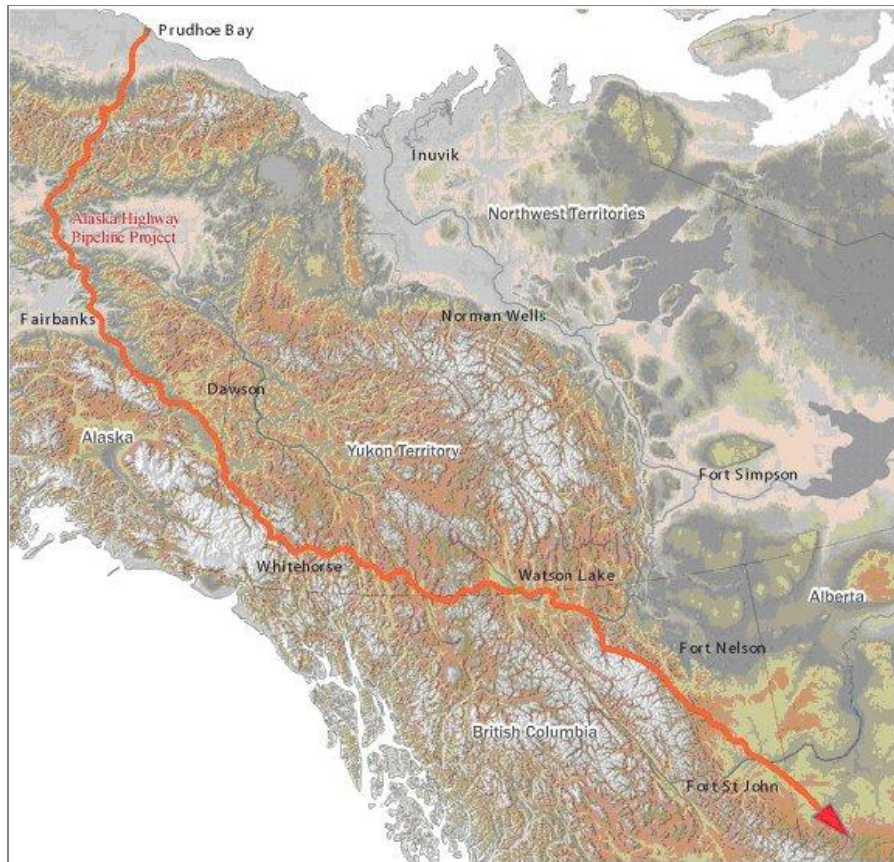
The Pipeline

Denali- The Alaska Gas Pipeline, LLC (Denali), and TransCanada Alaska Company (TransCanada) are actively seeking regulatory approval to develop a natural gas pipeline from Prudhoe Bay, Alaska, connecting to the Alberta Gas Hub and into the lower 48 states. This report makes no distinction between who builds the pipeline, but concerns itself with the overall workforce needs of the project.

The scale of the project is said to be one of the largest construction undertakings in recent history and is predicted to strain the North American labour market (TransCanada, 2007).

The pipeline will extend roughly 2,700 kilometres (1,677 miles) underground through Alaska, the Yukon, British Columbia before linking to the Alberta gas system at Boundary Lake. The Alaska section is approximately 1,200 kilometres (750 miles) long and 122 centimetres (48 inches) in diameter with six compressor stations and five gas delivery points. The Canadian section is 1,550 kilometres (965 miles) long and 122 centimetres (48 inches) in diameter with 10 compressor stations and eight delivery points.

Each station has 44,000 hp gas turbine compressors, supported by two 3,000 hp electric power generators at each station.



(Government of Yukon, 2005)

The project development or construction phase will take roughly five years to complete.

TransCanada estimates that 3.75 million labour hours will be required to complete the development phase at an estimated cost of \$365 million USD.

(TransCanada, 2007, pp. 2.1.5-2.1.10)

Logistical Challenges

Building the pipeline requires the coordinated movement of equipment, machines, pipe, materials, supplies, and people.

Not only are there challenges in getting people and materials to various locations along the construction site, the project will require five to six million tons of steel which will need to be manufactured in a variety of locations from North America or around the world. It is likely that all appropriate means of transportation (marine, rail, road and air) will be used.

Roadway and bridge capacities will be taken into consideration when choosing transportation routes.

The size of the pipe requires specialized equipment to manage the additional weight. Each 12 metre (40 foot) pipeline joint weighs about 10 tons.

(Conoco Philips, 2007)

The Alaska Gasline Inducement Act (AGIA)

The State of Alaska passed the *Alaska Gasline Inducement Act* in 2007 as a way to encourage the development of a gas pipeline and maximize the resulting benefit to Alaskans. The project builder needs to meet a number of requirements in order to advance the project, including local hiring and providing access points to the gas. If the builder meets the conditions under the legislation, they receive a licence and the state provides incentives which match up to \$500 million of the start up costs associated with building the pipeline. Builders are only required to develop their proposal under the AGIA framework if they wish to have access to the matching funding (State of Alaska, 2008).

Benefits

The construction of the pipeline will generate a great deal of economic activity. The secondary and downstream benefits are substantial as well. The most directly impacted industries will be iron and steel manufacturing, oil and gas facility construction, as well as the aircraft and aircraft parts manufacturing sector which produces the compressors (Yukon Energy, Mines and Resources, 2002).

Alberta has found for each job created in the oil and gas sector, more than 4 indirect and induced jobs are created in the manufacturing, industrial construction and transportation sectors (Alberta Employment and Immigration, 2007).

Additional resources will be needed to deliver materials to sites, and to manufacture the materials needed such as pipes and compressors. The secondary spending will lead to employment in other areas.

A study the Yukon conducted in 2002 estimated the Canadian GDP would increase by \$26 to \$31 billion due to construction of the pipeline, which Yukon's GDP would go up by 30 percent. Employment in the Yukon would increase by between 1,000 and 2,000 jobs per year (Yukon Energy, Mines and Resources, 2002).

Gas Treatment Plant

Denali has stated it will build a Gas Treatment Plant (GTP) at Prudhoe Bay to remove carbon dioxide (CO₂), water and other impurities from the gas before it is shipped in the pipeline. The GTP will be the largest plant of its type in the world.

An estimated workforce of 2,500 people will build GTP process modules over a two year period. The modules will be barged to the North Slope where they will be assembled (Denali, 2009).

Building the Pipeline

The construction of a pipeline is a complex undertaking. It involves a number of stages and a large moving workforce over great distances and in this case, in remote areas and in a challenging climate.

Pipeline construction is usually divided into three phases: pre-construction, construction and post-construction.

Pre-Construction

Surveying and Staking

Once the route has been confirmed, survey crews will identify the right-of-way. The right-of-way not only contains the pipeline, but it is also where all construction activities occur. The right-of-way also provides access to the site and storage for equipment and pipe. At this stage, other pipelines that will be crossed are identified and marked.

Occupations needed: Surveyor Party Chiefs, Chainmen, Rodmen.

Preparing the Right-of-Way

The right-of-way must first be cleared of overgrowth. Top soil is removed and saved for reclamation. The right-of-way is levelled and graded to provide access for construction equipment.

Occupations needed: Supervisors, Slashers, Packers, Loggers, Skidder Operators, Timber Stockpiler Operators, Dozer Operators, Truck Drivers.

Trenching

Once the right-of-way is prepared, the trench is dug and the centre line of the trench is surveyed and re-staked.

Occupations needed: Chain Trencher Operators, Track Hoe Operators, Wheel Trencher Operators, Drill Operators, Surveyor Party Chiefs, Chainmen, Rodmen.

Stringing the Pipe

The individual lengths of pipe are brought in from stock pile sites and laid end-to-end in preparation for welding.

Occupations needed: Forklift Operators, Crane Operators, Truck Drivers.

Construction Phase

Bending the Pipe

Geography often requires bends to the pipe. Special machines are used to bend the pipe without distorting its circular profile.

Occupations needed: Pipe Bending Equipment Operators.

Joining the Pipe

Individual lengths of pipe are welded together using either welding machines or manual arc welding. Welding shacks are placed over the joint to prevent wind from affecting the weld. After welding, the integrity of each joint is tested either by X-ray or ultrasonically.

Occupations needed: Pipefitters, Welders, Welders Helpers, Welding Inspectors, X-ray Technicians.

Coating the Pipe

Coatings, on the inside and outside of the pipe, are necessary to prevent corrosion. Welded joints must be coated at the construction site.

Occupations needed: Coating Inspectors, Pipe Coaters, Sandblasters.

Positioning the Pipe in the Trench

The pipeline is lowered into the trench using bulldozers with cranes called sidebooms.

Occupations needed: Sideboom Operators.

Installing Valves and Fittings

Valves and other fittings are installed after the pipeline is in the trench. The valves are used once the line is operational in order to shut off or isolate part of the pipeline.

Occupations needed: Pipefitters, Welders, Welders' Helpers.

Backfilling the Trench

Once the pipeline is in place in the trench, the trench is carefully backfilled so as not to damage the pipe coating.

Occupations needed: Operators; Backhoe Operators, Dozer Operators.

Post-Construction Phase

Pressure Testing

The pipeline is pressure tested for a minimum of eight hours using air, water or a mixture of water and methanol. A pressure-temperature recorder monitors and saves a continuous record of the test to confirm the outcome.

Occupations needed: Supervisors, Test Supervisors, Labourers, Truck Drivers.

Final Cleanup

The right-of-way is restored to its original contour and the top soil which was previously removed is replaced and reseeded. Where necessary, erosion control barriers are constructed.

Occupations needed: Backhoe Operators, Dozer Operators, Landscapers.

Compressor Stations Would be Built at Intervals Along the Pipeline

Occupations needed: Administration, Construction Manager, Foreman, Engineer Manager, Trades, Carpenters, Electricians, Insulators, Instrument Technicians, Ironworkers, Labourers, Machinists, Millwrights, Painters, Sheet Metal Workers, Welders, Inspectors, HSE Coordinator, First Aid Technician, Security Guard, Electrical, Instrumentation, Mechanical, Telecom.

(Canadian Energy Pipeline Association, 2007), (Alaska Highway Aboriginal Pipeline Coalition, 2007).

Related Occupations

As part of the training strategy to support the AGIA, the State of Alaska has identified the following 113 occupations which are needed to build the pipeline. The detailed list is included in Appendix A.

There are a number of the occupations listed are those not directly associated with the laying of the pipe. Some occupations would only be needed at certain phases, such as surveyors or landscape architects. Other occupations, such as paving equipment operators, would only be needed when the pipeline crosses a road. Some occupations would be needed on the pipeline construction site, whereas others would be located elsewhere in administrative offices.

Crafts

- Carpenters
- Cement Masons and Concrete Finishers
- Construction and Building Inspectors
- Construction Labourers
- Construction Managers
- Crushing, Grinding, and Polishing Machine Setters
- Operators, and Tenders
- Electricians
- Explosives Workers, Ordnance Handling Experts, and Blasters
- Fence Erectors
- First-Line Supervisors/Managers of Construction Trades and Extraction Workers
- First-Line Supervisors/Managers of Helpers, Labourers, and Material Movers, Hand
- First-Line Supervisors/Managers of Production and Operating Workers
- Helpers, Construction Trades, All Other
- Helpers--Carpenters
- Helpers--Electricians
- Helpers--Extraction Workers
- Helpers--Installation, Maintenance, and Repair Workers
- Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters
- Helpers--Production Workers
- Highway Maintenance Workers
- Insulation Workers, Floor, Ceiling, and Wall
- Insulation Workers, Mechanical
- Millwrights
- Painters, Construction and Maintenance
- Plumbers, Pipefitters, and Steamfitters
- Sheet Metal Workers

- Structural Iron and Steel Workers
- Welders, Cutters, Solderers, and Brazers
- Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders

Equipment Operators

- Bus and Truck Mechanics and Diesel Engine Specialists
- Crane and Tower Operators
- Excavating and Loading Machine and Dragline Operators
- First-Line Supervisors/Managers of Mechanics, Installers, and Repairers
- Industrial Machinery Mechanics
- Maintenance Workers, Machinery
- Mobile Heavy Equipment Mechanics, Except Engines
- Operating Engineers and Other Construction Equipment Operators
- Paving, Surfacing, and Tamping Equipment Operators
- Pile-Driver Operators
- Truck Drivers, Heavy and Tractor-Trailer

Material Handling

- First-Line Supervisors/Managers of Transportation and Material-Moving Machine and Vehicle Operators
- Labourers and Freight, Stock, and Material Movers, Hand
- Order Clerks
- Stock Clerks and Order Fillers

Logistics

- Bus Drivers, Transit and Intercity
- Dispatchers, Except Police, Fire, and Ambulance
- Purchasing Agents, Except Wholesale, Retail, and Farm Products
- Truck Drivers, Light or Delivery Services

Operations

- Gas Compressor and Gas Pumping Station Operators
- Gas Plant Operators
- Plant and System Operators, All Other

Administration

- Bookkeeping, Accounting, and Auditing Clerks
- Budget Analysts

- Computer and Information Systems Managers
- Computer Programmers
- Computer Support Specialists
- Computer Systems Analysts
- Cost Estimators
- Database Administrators
- Employment, Recruitment, and Placement Specialists
- Executive Secretaries and Administrative Assistants
- File Clerks
- First-Line Supervisors/Managers of Office and Administrative Support Workers
- Human Resources Assistants, Except Payroll and Timekeeping
- Payroll and Timekeeping Clerks
- Receptionists and Information Clerks
- Training and Development Specialists

Camps / Catering

- Cooks, Institution and Cafeteria
- Cooks, Restaurant
- Dishwashers
- Emergency Medical Technicians and Paramedics
- First-Line Supervisors/Managers of Food Preparation and Serving Workers
- First-Line Supervisors/Managers of Housekeeping and Janitorial Workers
- Food Preparation Workers
- Food Service Managers
- Janitors and Cleaners, Except Maids and Housekeeping Cleaners
- Laundry and Dry-Cleaning Workers
- Housekeeping Staff
- Maintenance and Repair Workers, General

Office & Field Engineering

- Architectural and Civil Drafters
- Cartographers and Photogrammetrists
- Chemical Engineers
- Civil Engineering Technicians
- Civil Engineers
- Control and Valve Installers and Repairers, Except Mechanical Door
- Electrical and Electronic Engineering Technicians
- Electrical Engineers
- Engineering Managers
- Engineering Technicians, Except Drafters, All Other
- Environmental Engineers
- Inspectors, Testers, Sorters, Samplers, and Weighers

- Managers, All Other
- Materials Engineers
- Mechanical Drafters
- Mechanical Engineering Technicians
- Mechanical Engineers
- Office and Administrative Support Workers, All Other
- Office Clerks, General
- Procurement Clerks
- Production, Planning, and Expediting Clerks
- Surveying and Mapping Technicians
- Surveyors
- Telecommunications Equipment Installers and Repairers, Except Line Installers
- Weighers, Measurers, Checkers, and Samplers, Recordkeeping

Environmental

- Environmental Engineering Technicians
- Environmental Science and Protection Technicians, Including Health
- Environmental Scientists and Specialists, Including Health
- Hazardous Materials Removal Workers
- Landscape Architects

Safety

- Health and Safety Engineers, Except Mining Safety Engineers and Inspectors
- Occupational Health and Safety Specialists
- Occupational Health and Safety Technicians
- Security Guards

Although this list was generated by Alaska, there would be no difference in the occupations needed all along the pipeline route. The only exceptions may be in the office engineering and administrative occupations, where they would be centrally located.

Notable about this list is the number of occupations which are not “pipeline specific”. The majority of the workforce needed are not trained for pipeline related operations only, but belong to trades that are applicable to other sectors. For example, labourers, pipefitters, plumbers, heavy equipment operators, truck drivers, can be found on most large construction projects.

That means there is already a potential workforce to draw from. It also means that there may also be other major projects competing for the same workers, such as oil sands projects, bitumen upgraders, or other pipeline projects.

This list does not reflect the occupations associated in supplying the project with pipe or any other supporting materials. Nor does it include the demands of a gas treatment plant.

How Many?

TransCanada has estimated that 3.7 million person hours will be required to build the pipeline.

Workforce projections vary from company to company and from year to year. Earlier in the process, TransCanada had projected higher overall numbers, but showed a breakdown by occupation. Denali has provided a more recent projection of similar occupations over the construction period. Although their numbers are comparatively smaller, the overall volume of workers needed remains substantial.

The table below gives a sample of the number of workers needed in the higher demand occupations during the construction phase of the project.

TransCanada 2006 Estimates		Denali 2009 Estimates
Equipment Operators	3,100 – 4,000	2,000
Pipefitters & Welders	1,050 - 1,400	1,650
Labourers	2,000 – 2,700	1,250
Truck Drivers	900 – 1,250	750
Total	7,050 – 9,350	5,650

(TransCanada, 2006)(Denali, 2009)

In 2008, TransCanada estimated the following projection showing the number of workers needed for the project broken down by phases. As expected, the greatest need will be during the construction or execution phase:

Phase	Resources Required
Proposal (2008 – 2010)	100 - 150
Definition (2010 – 2014)	275 - 400
Execution (2014 – 2018)	7000 - 9000
Operations (2018 and on)	50 – 80

(TransCanada, 2008)

Denali is also estimates the need for a substantial amount of machinery for the project.

- 20 Trenchers
- 350 Backhoes/Trackhoes
- 350 Dozers
- 160 Loaders/Graders
- 700 Sidebooms
- 2,200 Pickups/trucks/buses
- 230 Gravel Trucks
- 650 Trailers
- 1,100 Generators/pumps/etc
- 30 Crushers/batch plants

(Denali, 2009)

Related Workforce & Training Strategies

Governments have developed strategies to try to ensure they have enough workers with the appropriate skills and training to complete the pipeline project. They recognize their workforce projections are low and they need to be increasingly strategic about how they approach training and labour needs.

Alaska

Alaska has established a five year strategy in the AGIA Training Strategic Plan (State of Alaska Department of Labour and Workforce Development, 2008). The plan anticipates the creation of 48,000 new jobs over its lifespan. Keeping up with the demand for workers will be the challenge.

The Plan is divided into four elements:

1. Increase awareness of and access to career opportunities in natural resource development.
2. Develop a comprehensive, integrated Career and Technical Education system for Alaska that aligns training institutions and coordinates program delivery.
3. Increase opportunities for registered apprenticeship in skilled occupations and expand other structured training opportunities.
4. Increase opportunities for development of appropriate training programs for operations, technical and management workers.

Each element has actions assigned to it, identifying timelines and funding sources.

Implementing the plan will require significant involvement and support by the State. State funding is to be used to lever private support for structural training, and increase state funding to programs using standard training.

The plan is dependent on the commitment of educators, training institutions, sponsors of apprentices, business and industry both financially and in the execution of the plan's strategies. Best practices also need to be identified and adopted. The plan recognizes the industry's contribution to worker training and identifies the need to leverage industry's involvement even further by expanding public/private sector partnerships.

Accurate information on employment demand and supply is essential, particularly with respect to the number of jobs created by the pipeline project, so that preparation for those jobs can be made a priority.

It is important to note, that a skills gap currently exists, and will continue into the future. Currently 16 percent of the Alaska workforce are not residents of the State, and over 37 percent are 45 years and older.

Alaska's training strategies are as follows:

Strategy 1.0

Increase awareness of and access to career opportunities in natural resource development.

- Conduct a public awareness campaign.
- Develop a comprehensive, one-stop information system on job openings and training opportunities in Alaska.

Strategy 2.0

Develop a comprehensive, integrated Career and Technical Education system for Alaska that aligns training institutions and coordinates program delivery.

- Develop a state initiative for career pathways.
- Incorporate career counselling and planning into the K-12 system.
- Establish and implement standards for Alaskan training programs.
- Coordinate program development and delivery among existing training programs.
- Maintain a robust support system for youth and adult vocational education.

Strategy 3.0

Increase opportunities for registered apprenticeships in skilled occupations and expand other structured training opportunities.

- Increase job training through construction academies, career and tech-prep programs, and pre-apprenticeship programs for entry-level employment.
- Increase employment opportunities for apprenticeships on all construction and infrastructure projects in Alaska.
- Develop training incentives for employers who utilize apprenticeships and other structured on-the-job training.
- Establish a funding mechanism to support apprenticeships and other structured training opportunities.

Strategy 4.0

Increase opportunities for the development of appropriate training programs for operations, technical and management workers.

- Expand programs in the post-secondary system for critical jobs such as engineering, environmental sciences, technical operations and management.
- Recruit more Alaskan high school graduates into programs leading to professional, technical and managerial certificates/degrees.
- Increase internships and work-cooperatives for both secondary and post-secondary students.
- Assure better articulation between incumbent workers and management programs/degrees.

(State of Alaska Department of Labour and Workforce Development, 2008)

Yukon

The Yukon is working to be “pipeline ready” in order to maximize the benefits from both the Alaska pipeline and the Mackenzie Valley pipeline.

In 2002, the Yukon government conducted a detailed study into the economic impacts of the construction of the Alaska pipeline. Although some of study’s data is now dated, it represents a valuable volume of research. The key finding was that the estimated demand for 7000 to 8000 workers in the peak construction year was well in excess of the Yukon labour pool (Yukon Energy, Mines and Resources, 2002). In fact, there is a significant risk of labour shortages in the Yukon.

In the Yukon, the lack of a skilled workforce will limit the full participation of Yukon residents in all aspects of pipeline construction. However, through additional training it’s hoped that the labour shortages may be offset. The Yukon is enhancing its workforce capacity for the oil and gas sector through education, training and employment opportunities (Yukon Government, 2009). Increased resources will be required in the construction trades, management and administration, and in the service industry.

The Yukon government is also working with it’s neighbours to address its labour challenges. It has a cooperation agreement with Alaska. The Yukon, Alberta, and British Columbia have agreed as well to coordinate their efforts to ensure the success of the construction of the Alaska gas pipeline project. Intergovernmental committees have been established by the three provinces to focus on ensuring the regulatory process in Canada is clear and efficient and that First Nations interests are addressed.

The Yukon government is working to avoid issues with stranded gas and to ensure there will be access to the pipeline in order to ship Yukon natural gas as well as extract gas for value-added processing. They are also identifying the associated fiscal advantages to having the pipeline and ensuring there will be employment, training and business opportunities for the jurisdictions involved.

The Yukon government has facilitated and supported the Alaska Highway Aboriginal Pipeline Coalition, to ensure First Nations benefit from the pipeline construction. Yukon First Nations people will be full partners in the economic development of the territory.

(Yukon Energy Mines & Resources, 2008).

British Columbia

The Alaska pipeline is estimated to create 23,000 person years of employment and \$1 billion of employment income in British Columbia (B.C). However, there are too few people in north-east B.C. to meet both the current and projected labour needs in the oil and gas sector. The impacts of not having enough workers were evident in B.C. over the winter of 2004/05 when labour shortages caused the loss of over 300 drilling days (British Columbia Oil and Gas Education and Training Consortium, 2006).

British Columbia has conducted a comprehensive assessment and analysis of its present labour supply and future demand in the oil and gas sector. While the analysis was not specifically aimed at pipeline workforce needs, many of the occupations needed in the oil and gas sector in north east British Columbia are also needed in pipeline construction.

British Columbia's 2007 Labour Market Needs study identified gaps in the labour market which could negatively impact oil and gas development:

"The research in this project found significant labour market and human resource issues in the B.C. oil and gas industry that if not addressed in a timely manner could affect the industry's growth and productivity" (British Columbia Ministry of Energy, Mines and Petroleum Resources, Ministry of Economic Development; and Petroleum Human Resources Council of Canada, 2007, p. iii)

The study also found that significant shortages of Industrial and Manufacturing Engineers, Geological Engineers, and Petroleum Engineers could occur. In addition, there is the potential for shortages in the following technical positions:

- Geological and Mineral Technologists and Technicians
- Mechanical Engineering Technologists and Technicians
- Industrial Engineering and Manufacturing Technologists and Technicians
- Industrial Instrument Technicians and Mechanics
- Non-destructive Testers and Inspectors
- Engineering Inspectors and Regulatory Officers

More importantly there were significant shortages anticipated in trades, operators and labourers. These shortages could have an impact on the workforce needed for pipeline construction:

Industrial Electricians
Crane Operators
Drillers and Blasters - Surface
Mining
Quarrying and Construction
Truck Drivers
Heavy Equipment Operators
(Except Crane)
Supervisors
Oil and Gas Drilling and Service

Oil and Gas Well Drillers
Servicers
Testers and Related Workers
Oil and Gas Well Drilling Workers

Services Operators
Oil and Gas Drilling
Servicing and Related Labourers
Petroleum, Gas and Chemical
Process Operators

(British Columbia Ministry of Energy, Mines and Petroleum Resources, Ministry of Economic Development; and Petroleum Human Resources Council of Canada, 2007, p. 19)

To try to deal with these potential shortages, the Labour Needs Study recommended the following areas be addressed:

Recruitment

Current attempts at recruitment are not enough to overcome skills shortages in the oil and gas sector. As a result, recruitment efforts are expanding to previously untapped labour sources such as First Nations and immigrants. However, these efforts are inhibited by a poor image of working conditions in the oil and gas industry, and a lack of promotion of available oil and gas careers.

The study was not able to identify up to date, reliable oil and gas labour market data in B.C.. Better data is needed on current and future labour market supply estimates.

Retention

Retaining experienced workers is a challenge for the oil and gas sector. The workforce is increasingly mobile - it moves between geographic areas, between companies within the sector, and between sectors. Compounding the retention issues is an aging, retiring workforce. Little evidence was found of efforts to keep older workers.

Working Environment

The working conditions around oil and gas worksites have a negative effect on recruitment efforts and lead to higher turnover rates. Prospective workers such as women, First Nations, youth and immigrants have found the social conditions associated with the industry to be a disincentive to joining the industry.

First Nations

Efforts need to be made to involve First Nations in north eastern B.C. as partners in the development of the oil and gas sector. Supports to enhance that involvement would include promotion and assistance to move willing First Nations workers to where the jobs are.

Post-Secondary Education

Industry and other stakeholders called for post-secondary institutions to be more responsive and flexible in their training programming and delivery. There also needs to be more collaboration and coordination between institutions, and greater recognition of the credentials of foreign trained engineering professionals.

(British Columbia Ministry of Energy, Mines and Petroleum Resources, Ministry of Economic Development; and Petroleum Human Resources Council of Canada, 2007, p. 37).

Other recommendations to minimize potential labour shortages come from the British Columbia Oil and Gas Education and Training Consortium. The Consortium was created with industry, educators, aboriginal organizations and government in 2004 to try to increase the number of British Columbians in the oil and gas sector by coordinating training efforts.

Although several training initiatives are in place, the Consortium has recommended that apprenticeship and other on-the-job training programs be promoted and expanded. They also recognize that training programs need to be aligned with industry practices.

The Labour Needs Study also recommended that labour regulations and employment standards need to be standardized.

(British Columbia Oil and Gas Education and Training Consortium, 2006)

Alberta

The pipeline connects to the Alberta gas network near Boundary Lake, on the Alberta/B.C. border. Although the pipeline does not travel far into the province, Albertans have significant pipeline building experience. Alberta is regarded as a world leader in the oil and gas industry.

In Alberta, industry is leading the implementation of workforce strategy actions, with the support of the government. A 10 year labour force development strategy has been developed with a range of stakeholders.

From October 2006 to February 2007 the Alberta Chamber of Resources and the Construction owners Association of Alberta brought together stakeholders¹ to participate in discussions.

“Alberta is faced with labour and skill shortages, which if not addressed, will constrain continued economic growth and prosperity” (Alberta Employment and Immigration, 2007, p. 2).

For each job created in the oil and gas sector, more than 4 indirect and induced jobs are created (manufacturing, industrial construction and transportation sectors). The total number of Albertans working in the energy sector was estimated at 146,000 in 2006, 2,000 of which were in pipeline. Alberta has recognized that new pipelines from Alaska and the Northwest Territories will place increasing demands on the labour market. Oil and gas projects are also competing with other construction projects in western and northern Canada for skilled and unskilled labour.

The demand for workers outside of Alberta has the potential to pull workers away or, limit the ability of companies to attract workers to the province.

The energy sector relies on the transportation sector for movement of labour, equipment and materials. Due to the interdependency between the energy and manufacturing, construction and transportation sectors, any competition for workers in those sectors could take workers and growth away from the energy sector.

¹ The following organizations contributed to the development of this workforce strategy:

Alberta Building Trades Council, Alberta Chamber of Resources, Alberta Forest Products Association, Albian Sands Energy Inc., Association of Professional Engineers, Geologists and Geophysicists of Alberta, Canadian Association of Petroleum Producers, Canadian Natural Resources Ltd., Coal Association of Canada, Construction Labour Relations of Alberta, Construction Owners Association of Alberta, Construction Sector Council of Canada, Devon Canada Corporation, Dynatec Corporation, Electricity Sector Council, Elk Valley Coal Corporation, Enbridge Pipelines Inc., EnCana Corporation, Enform Canada, EPCOR Utilities, Horizon Construction Management Ltd., Harvest Energy Trust, Keyano College Foundation, Ledcor Industrial Limited, Mackenzie Aboriginal Corp., NewGen Synergistics Inc., Nexen Inc., Petro-Canada, Petroleum Human Resources Council of Canada, Petroleum Service Association of Canada, SGS Canada Inc., Shell Canada Limited, Statoil, Suncor Energy, Syncrude, Synenco Energy, The Focus Corporation, TransAlta.

Other challenges faced by the Alberta oil and gas sector are:

- Aging workforce.
- Increased worker mobility with increased competition.
- Increased skill requirements.
- Perception about the stability of the sector.
- Difficult working conditions.
- Lack of labour market information regarding supply and demand.

In order to respond to those challenges, the stakeholders recommended the following actions:

- Develop labour market demand and supply forecast model.
- Coordinate the development of labour supply forecasts.
- Develop best practices inventory or initiatives with First Nations.
- Develop/provide information on career opportunities.
- Develop new approaches on altering perceptions about the industry.
- Improve supports for new immigrants.
- Work to improve labour mobility in Canada.
- Improve Foreign Credential Recognition.
- Support increased completion rates for apprentices.
- Develop best practices to encourage increased hiring and training of apprentices.
- Work with the Government of Alberta to ensure training is available for occupations in high demand.
- Provide information and workplace internships to trades and technical paths.
- Make effective use of the Aboriginal Skills and Employment Partnership Program.
- Address barriers to productivity.
- Work with government to build inviting communities where people will want to live and work.
- Create welcoming environments for immigrants.
- Increase awareness and appreciation of succession planning.
- Develop solutions to address absenteeism and workplace turnover.
- Develop strategies to encourage mature workers to remain engaged.

Industry and government will be working together to monitor the success of this workforce strategy over its lifespan. The Government of Alberta will support the energy industry in implementing the workforce strategy by promoting collaboration within and between industry sectors.

(Alberta Employment and Immigration, 2007)

Analysis & Observations

Significant efforts have been put into identifying the challenges faced by labour markets in the region in responding to the workforce requirements of the Alaska pipeline project. Strategies and plans have been developed by the governments involved so that the pipeline may be constructed, and the benefits to be derived are maximized.

All the governments directly affected have looked carefully at the supply of labour supporting the oil and gas sectors in their jurisdictions and have developed strategies to respond to the projected need for additional workers and training. Those strategies may be aimed at the workforce needs of the Alaska pipeline project or at needs of the oil and gas sector in general, depending on the interests of the government involved.

Many of the strategies are similar. Common themes which appeared in the research were the need for:

- More current and relevant data about the labour supply and the market needs.
- Integrating industry and the private sector in the training process to a greater degree (i.e. – more apprenticeships, funding for training, developing training standards).
- Beginning the training cycle earlier.
- Retaining current workers longer.
- Attracting other groups such as First Nations, women, and immigrants.

Although the strategies have been well thought out and are very relevant to the individual jurisdictions, there are some observations that may be made from a broader regional perspective that may bring some issues into focus.

Timing

Many of the stakeholders involved appear to be waiting for a signal or trigger to aggressively pursue their related strategies. This trigger could be the approval by regulatory bodies for the project to proceed. This would then signal companies to begin detailed operational planning (initiating tendering for sub-contractors for production shipping, construction, housing, etc.) and for governments to begin building up their training initiatives.

What remains outstanding is a sense of timing of the implementation of those strategies. For example, the stakeholders need to confirm how soon changes will be required, and how fast the changes can be implemented. Under the present economic conditions, governments may be challenged to fully implement the labour strategies they need to be ready for the construction of the pipeline. While the economic downturn has caused an increase in available workers in the oil and gas and related industries, budget limitations have prevented governments from taking advantage of the situation and pursue training opportunities. There is also the risk that workers will leave the industry for other sectors and migrate to where the work is.

Competition for the Workforce

The AGIA list of occupations shows there are relatively few workers needed in “pipeline specific” occupations, with the majority of the workforce being those who can work on other construction projects or in other sectors. For example, labourers, pipefitters, plumbers, heavy equipment operators, and truck drivers, can be found on most large construction projects across the region. That means there is already a potential workforce to draw from. It also means that there may also be other major projects competing for the same workers, such as oil sands projects, bitumen upgraders, or other pipeline projects.

A number of the sources used were cautionary about their jurisdiction’s ability to meet present labour needs around the oil and gas sector. Although those concerns were raised during a period of rapid economic growth and the price of oil at record highs, the concerns remain valid. If the workforce was challenged by planned oil and gas activities during the “boom”, then they will remain challenged through an economic recovery, and even more so by a project the scale of the Alaska gas pipeline.

Collecting and Sharing Information

Efforts are needed to develop and maintain relevant data about jobs that are available and the workforce that is available. Public sector agencies could better coordinate their activities so that their data is current and consistent.

Many of the strategies identified the need to bring government and the private sector together. There is a need for better coordination of policies and planning between jurisdictions, starting with a coordinated effort to share information both between jurisdictions and industries, and the major pipeline consortiums.

Clearly there is a significant body of information from which to begin developing best practices and common strategies. If the plans and policies that have been created could be shared and focused regionally, the governments involved may be more successful in implementing them. It would help governments plan budgets, develop joint priorities and manage their resources more effectively. A mechanism that allows for both the public and private sector to share plans and information beyond jurisdictional boundaries may reduce delays and reduce costs during the implementation and construction phases of the Alaska gas pipeline.

Coordination and Planning

Some of the strategies reviewed were aimed at keeping workers within jurisdictions, others were aimed at reducing the need for workers to come in, another was based on the hopes that people would migrate and work. Yet all jurisdictions were concerned they do not or will not have enough workers to support the sector. Governments expecting increased activity in their labour markets are concerned with the balance between further growth and the demands of a pipeline project.

This clearly points to the need for greater coordination and workforce planning. Without any coordination, the states and provinces involved will continue to compete unnecessarily with each other for a workforce, rather than working together to grow that resource.

The magnitude of the project will affect all stakeholders involved, but the economic benefits of joint planning could help significantly.

By working together, best practices may be identified and utilized by both the private and public sectors involved, and the available workforce may be used more efficiently and goods and materials can move freely.

The workforce also need to be able to move unimpeded, and governments will need to ensure cross-jurisdictional labour mobility. Increased labour standards and harmonization of those standards may need to be considered.

Further Planning to Come

Although manufacturing, logistics and transportation are recognized as issues to be addressed by the parties involved, detailed planning for those components of the project has not yet begun.

Some areas that stakeholders will need to continue to further develop strategies for include:

- Sourcing of materials.
- Sourcing of equipment (where to obtain over 4500 pieces of equipment and how to get it to the site?).
- Identifying transportation routes and methods (air, rail, sea, road).
- Identifying needed infrastructure (access roads, upgrades to existing infrastructure).
- Identifying other logistical requirements (work camps, catering, worker transportation).

There are variables and conditions which would affect how quickly (or detailed) continuing work is done. However, so long as a pipeline connecting North Slope gas sources with the lower 48 states is needed, the work will be required.

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Appendices

Appendix A

Individuals and Organizations Consulted

Appendix B

AGIA List of Pipeline Occupations

Appendix A: Individuals and Organizations Consulted

The following individuals and organizations provided valuable insight and guidance into the research of this work.

Alaska

Fred Dyson, Senator, Alaska

Lesil McGuire, Senator, Alaska

Alberta

Bob Bleaney, Denali Canada

Bill Cade, University of Lethbridge

Shannon Campbell, Human Resources and Skill Development Canada

Alana Delong, Member of the Legislative Assembly of Alberta

Goldie Edworthy, Alberta Environment

Kyle Fawcett, Member of the Legislative Assembly of Alberta

Hector Goudreau, Minister of Alberta Employment and Immigration

Doug Griffiths, Member of the Legislative Assembly of Alberta

David Hodgins, Alberta Emergency Management

Mel Johnson, TransCanada

Don Keech, Alberta Energy

Randy Kerr, Conoco Phillips

Mel Knight, Minister of Alberta Energy

Peter Kruselnicki, TransCanada

Richard Marz, Member of the Legislative Assembly of Alberta

Diana McQueen, Member of the Legislative Assembly of Alberta

Len Mitzel, Member of the Legislative Assembly of Alberta

David Montenero, TransCanada

Tony Palmer, TransCanada

Ray Prins, Member of the Legislative Assembly of Alberta

Rob Renner, Minister of Alberta Environment

Betty Rice, University of Calgary

Len Webber, Member of the Legislative Assembly of Alberta

Neil Windsor, APEGGA

Tim Shultz, ACCTI

British Columbia

Keith Evans, Industry Training Authority for B. C.

Margaret Li, APEGBC

Ralph Nilson, University of Victoria

John Van Dongen, Member of the Legislative Assembly of British Columbia

Idaho

George Eskridge, Idaho State Representative

Richard Holman, Idaho National Labs

Ted Kielley, B.A. Communications

Northwest Territories

Bob McLeod, Minister for NWT Industry, Tourism and Investment

Floyd Roland, Premier of the NWT

Peter Vician, NWT Industry, Tourism and Investment

Oregon

Scott Farris, TransCanada

Saskatchewan

Michael Chisholm, Member of the Legislative Assembly of Saskatchewan

John Nilson, Member of the Legislative Assembly of Saskatchewan

Yukon

James Kenyon, Minister of Yukon Economic Development

Brian Love, Yukon Energy, Mines & Resources

Steve Rose, Yukon Economic Development

Appendix B: AGIA List of Pipeline Occupations

This is an excerpt from the State of Alaska Department of Labour and Workforce Development's *AGIA Training Strategic Plan*.