

7. SOCIO-ECONOMIC EFFECTS: BASELINE CONDITIONS, IMPACT ASSESSMENT, MITIGATION REQUIREMENTS AND RESIDUAL EFFECTS

This section of the Application identifies and evaluates the potential social and economic effects of the construction and operation of the Mackenzie Green Energy Centre (MGEC) on the District of Mackenzie and its residents as well as on Treaty 8 First Nations who have expressed an interest in the project. The specific effects of the MGEC on the McLeod Lake, West Moberly, Saulneau and Fort Nelson First Nations (i.e., traditional use, Treaty Rights, employment, business opportunities and transportation) were discussed in Section 6. However, the effects on First Nations individuals, as part of the broader community, are addressed in this section (e.g., all area residents are included in discussions on health care and the broader discussions regarding economic effects).

7.1 GENERAL APPROACH AND METHODS

A socio-economic assessment identifies potential changes in the future social and economic environment of an area that can be directly or indirectly attributable to a specific project. Potential interactions between socio-economic features and project components, activities, and policies during construction and operations are assessed to determine the potential project effects. The findings are used to help ensure that the project is developed in such a manner as to mitigate negative effects and enhance positive effects to the extent possible.

For the MGEC, the socio-economic assessment considers the facility, the short linear utility connections (i.e., electrical transmission, natural gas, water, and effluent), the sub-station, the landfill and the access roads. The assessment focuses on the areas where potential effects were identified. The approach taken to completing the socio-economic assessment was as follows:

- identifying the areas to be assessed and the study areas through the development of the Approved Application Terms of Reference (ATOR);
- identifying the project components that could affect the socio-economic features identified in the ATOR;
- establishing a baseline of the current conditions in the study area;
- describing the effect of the construction and operation of the MGEC on the study area;
- identifying means through which to mitigate negative and enhance positive effects; and
- describing any residual effects.

As per the ATOR, the study area for the socio-economic assessment is the District of Mackenzie. However, to provide context for assessment, a broader region which captures Treaty 8 First Nations communities with an interest in the project is also referenced. It is also recognized that certain effects occur over a broader area (e.g., tax payments, employment). Therefore, for any particular assessment, the study area or portion of the study most appropriate to the item being assessed was considered. For example, the assessment of housing was limited to Mackenzie while the assessment of employment considered a broader area.

A baseline was prepared to describe the study area as it currently exists. Baseline information was gathered from a variety of sources including:

- published reports and information related to the project and study area;
- discussions with Mackenzie area residents and groups, local and regional governments, First Nations, provincial and federal government representatives and organizations; and
- un-published data and information from provincial, regional and local government agencies.

Mackenzie Green Energy Limited Partnership (MGELP) provided information on proponent policies and project design, configuration, construction and operation.

After the baseline and projections were complete, the project features and policies that could affect the socio-economic indicators were identified and overlaid onto the baseline to determine project effects. Through this process, both project effects and effects that would have occurred in the absence of the project but are modified by the project (i.e., accentuated, accelerated, or mitigated) are identified. In this study, the potential economic effects (i.e., employment, income, government revenues, and other economic effects) are described quantitatively where possible while the social assessment provides a more qualitative assessment of potential project effects.

Following the identification of potential effects, means through which to mitigate and enhance the effects were identified. The effects of the project were then reassessed to identify any residual effects.

7.1.1 Project Assessment Parameters

7.1.1.1 Project Location and Components

The MGEC is proposed to be located in the Mackenzie Industrial area, approximately 5 kilometres southwest of the main part of the town-site. It will be situated on land adjacent to Pope & Talbot's Mackenzie Pulp Operations. A portion of the land proposed for the project site is owned by Pope & Talbot and a second portion, adjacent to the Pope & Talbot land, is owned by BC Rail. MGELP will purchase the required lands from Pope & Talbot and BCR Properties.

As described in detail in Section 3, the key components of the MGEC are as follows:

- project site including the generation facility, fuel storage area, other buildings and ancillary equipment as well as construction lay down and parking;
- steam lines and return condensate lines to and from the Pope & Talbot and Canfor mills;
- access roads off of the Pope & Talbot access and potentially, a new access from Coquawaldie Road;
- electrical switchgear and substation and a short (100 meter 138 kV) electricity transmission line;
- a onsite ash landfill; and
- water, waste water, and natural gas connections.

Figure 3.4-1 shows the location of the MGEC and the connecting steam and condensate lines and utility connections while Figure 3.4-2 show the layout of the MGEC, including the access roads, major structures, and the fuel handling system and storage pile.

7.1.1.2 Project Timeline

Construction of the MGEC will take approximately two years and is expected to begin in July 2007. Approximately 50 to 75 people will be onsite until July 2008 when the increase to peak construction begins (See Figure 7.3.1). Peak construction will occur from about October 2008 to April 2009 and it is expected that the facility will be operational in November 2009.

Given that the projected economic life of the project is 30 years or more, project decommissioning and abandonment are not addressed other than to state that at the time of decommissioning and abandonment all relevant environmental regulations will be met.

7.1.1.3 Project Cost

The direct construction cost for the MGEC is currently estimated to be in the order of \$200-\$225 million. However, the final project cost will not be determined until all contracts are signed and all equipment has been purchased.

7.2 OVERVIEW OF LOCAL AND REGIONAL SETTING

This section of the Application provides an overview of the study area as defined in the ATOR. More detailed information on the specific aspects of the area (e.g., population, economy) is contained in the baseline section of the sub-sections that follow.

For the MGEC, the socio-economic study area is defined as the District of Mackenzie. All project components are located within the District. The District of Mackenzie is located within the Regional District of Fraser-Fort George (RDFFG) and within the bounds of Treaty 8. A map is presented in Figure 7.2-1 showing the boundaries of the District of Mackenzie and the Region District of Fraser-Fort George and the locations of communities, roads, major water bodies, and rivers in the area.

For certain economic effects (e.g., specialized employment, procurement, and tax payments) a broader area (e.g., remainder of the RDFFG, BC, and Canada) is referenced. In certain cases, information on the RDFFG and other nearby Regional Districts and communities is included to provide a better understanding of the area surrounding Mackenzie and the Treaty 8 First Nations communities with an interest in the project.

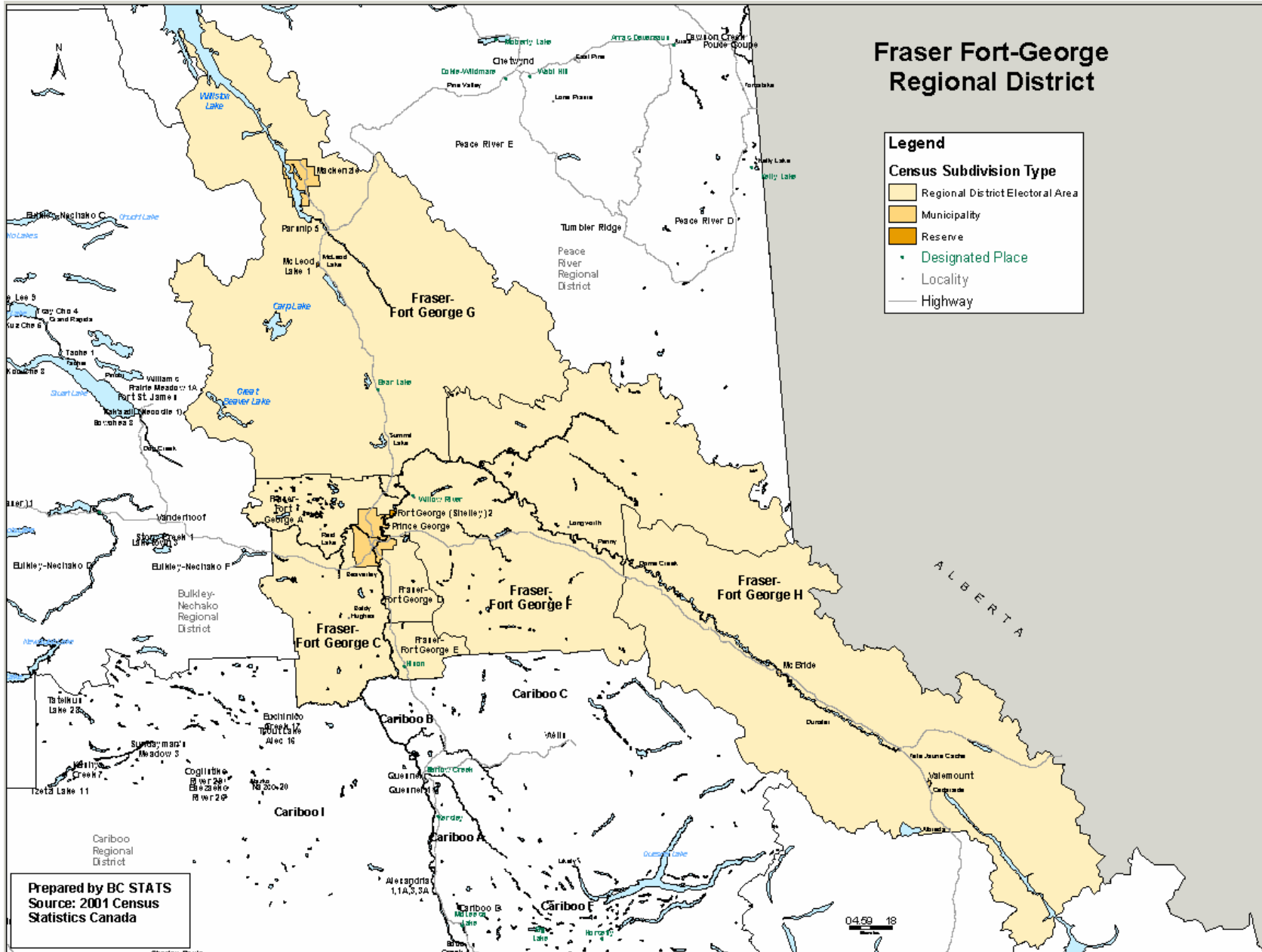


Figure 7.2-1 Map Showing the District of Mackenzie, the Regional District of Fraser-Fort George and Communities

7.2.1 District of Mackenzie

The District of Mackenzie was incorporated in 1966 and covers approximately 220 square kilometres in the northern portion of the RDFFG at the southern end of Williston Lake. The community is situated in the Rocky Mountain Trench between the Omineca Mountains to the west and the Rocky Mountains to the east.

Mackenzie is approximately 190 kilometres north of Prince George on Highway 37, approximately 29 kilometres from the junction of Highway 97 (the John Hart Highway) and Highway 37 and about 180 kilometres west of Chetwynd. Electoral Area G of the RDFFG surrounds Mackenzie. Mackenzie is accessible via air, ground, and rail. Marine transportation links are available to other locations on Williston Lake.

Following completion of the W.A.C. Bennett Dam and creation of Williston Lake in 1968, lumber and pulp operations began locating in Mackenzie and the community began growing. The 2006 population of Mackenzie is estimated at 5,452. This is approximately the same as it was in 2001 but 800 less than in 1996. The population is younger than the provincial average with approximately 77% of the population being under the age of 40 and residents have a higher average family income than the province as a whole.

The District provides a wide range of services and infrastructure to residents including water, sewer, recreation, transportation, and emergency services. Health care facilities and providers are available in the District and the services in Mackenzie are supplemented by those in Prince George which serves as the regional center for health care provision. A full range of social services are also available in the community through government or private sector providers. Temporary and permanent accommodation is also readily available in the District.

The economy of Mackenzie and the surrounding area is more focused on resource industries and, in particular, forestry than is the province as a whole. As such, it is influenced by the economic cycles in the resource sector. Although there was some contraction in the forest industry and an accompanying loss of population in the early part of the decade, the increased availability of beetle kill wood has resulted in an uplift for the industry, albeit a temporary one. Today forestry continues to provide the basis for Mackenzie's economy generating employment in logging, sawmilling, and the manufacturing of pulp, paper, and other value-added products.

As a result of the changes in the forestry sector precipitated by the beetle kill, Mackenzie and many other area communities are preparing for the "post beetle" era by working to diversify their economies. While forestry is still, and likely will continue to be, the main economic driver in the community, Mackenzie is working to diversify its economy and expand into viable secondary industries. Today many local companies and individuals also benefit from opportunities servicing the mining exploration and development, oil and gas and tourism sectors.

7.2.2 Regional Area

Mackenzie, as well as the four Treaty 8 First Nations communities with an interest in the project fall within the bounds of three regional districts - the RDFFG, the Peace River Regional District (PRRD) and the Northern Rockies Regional District (NRRD). As noted earlier, statistical information for the Regional Districts and communities closest to Mackenzie (i.e., Chetwynd and Prince George) is included in the following sections.

7.2.2.1 Regional District of Fraser-Fort George

The FFGRD covers an area from south of Valemount to just north of Mackenzie. Forestry is the main economic driver in the Regional District. Although weak prices had resulted in some contraction of the sector, the increased availability of low-cost beetle-kill wood has more recently allowed the sector to expand. However, it is recognized that this is a short-term uplift and many communities are starting to plan for the “post-beetle” era. Forage and cattle production are the most important sources of agricultural revenue however the sector is not well developed and only a fraction of the arable land has been cleared. Tourism is becoming an increasingly important part of the economy as the University of Northern British Columbia in Prince George has introduced many new people to the area.

Prince George is the largest community in the RDFFG and is the employment and economic center of the Regional District. It also serves as the major economic and service center for central and northern BC.

The population of the RDFFG dropped by 3.7% from 1996 to 2001 (i.e., from 98,974 to 95,315) compared to an increase of 4.9% for the province as a whole. Most notably, the age groups below 45 years of age experienced a drop in population while those in the 45+ age groups rose by almost 4,000 people.

The McLeod Lake First Nation is located in the RDFFG approximately 50 kilometres south of Mackenzie.

7.2.2.2 Peace River Regional District

The economy of the PRRD is based on agriculture, forestry, and mineral exploration and development and is more diversified than that of the RDFFG or NRRD. Municipalities in the PRRD include Chetwynd, Dawson Creek Fort St. John, Hudson’s Hope, Pouce Coupe, Taylor and Tumbler Ridge. The Saulteau and West Moberly First Nations communities are also located in the PRRD north of Chetwynd and south of Hudson’s Hope.

The population of the PRRD dropped by 2.5% from 56,477 in 1996 to 55,080 in 2001 compared to an increase of 4.9% for the province as a whole. There was some notable variation in population change throughout the region. The municipalities of Tumbler Ridge, Chetwynd, Hudson's Hope, Pouce Coupe, and Dawson Creek all experienced decreases in population while the population of Fort St. John, and Taylor increased. As with the RDFFG, age groups below 45 years of age had a drop in population while those in the 45+ age groups rose by approximately 2,000 people.

7.2.2.3 Northern Rockies Regional District

The economy of the NRRD is based on forestry and the petroleum and natural gas sector. Although there is considerable land available for agriculture in the NRRD and the importance of agriculture to the local economy may grow, transportation costs will likely continue to be an inhibiting factor. Tourism (i.e., hunting and fishing) also plays a small role in the local economy.

The population of the NRRD dropped marginally from 5,856 in 1996 to 5,720 in 2001 compared to an increase of 4.9% for the province. As with the RDFFG and PRRD, all age groups below 45 years of age had a drop in population while those in the 45+ age groups rose by over 200 people.

The Fort Nelson First Nation is located in the NRRD.

7.3 EMPLOYMENT, INCOME AND GOVERNMENT REVENUES

The construction and operation of the MGEC will provide employment opportunities and the accompanying economic benefits (e.g., wages, benefits and government revenues) to local, regional, and provincial residents. It is also possible that workers from outside the province will be hired and benefit from the project. Section 7.3.1 describes the existing employment and income characteristics of the study area. Section 7.3.2 describes the potential employment, income, and government revenue effects of the MGEC and Section 7.3.3 identifies measures designed to enhance the project's economic benefits.

7.3.1 Baseline Conditions

This section describes the existing labour force and income characteristics in the District of Mackenzie and surrounding area.

7.3.1.1 Labour Force

Table 7.3-1 summarizes the labour force characteristics for Mackenzie and the regional area based on Statistics Canada's 2001 Census. In addition to reporting the total number of labour force participants, the following information is provided:

- Labour force participation rates – a measure of the population proportion aged fifteen and older who are in the labour force (either working or unemployed).
- Unemployment rates - a measure of the share of labour force participants who are not employed.

Table 7.3-1 Labour Force Overview for Local and Regional Study Areas

	Labour Force (15+)	Employees	Self-employed	Participation Rate (%)	Unemployment Rate (%)
British Columbia	2,059,950	1,715,600	95,185	65.2	8.5
RDFFG	53,860	46,200	1,885	72.4	11.1
Mackenzie	3,040	2,880	45	77.4	7.7
Prince George	40,765	35,430	1,235	72.1	11.4
PRRD	30,515	25,484	1,445	73.4	9.7
Chetwynd	1,385	1,245	10	72.1	19.1
NRRD	3,430	3,055	135	81.5	6.8

Source: Statistics Canada, 2001 Census.

As shown, Mackenzie and the surrounding communities and Regional Districts show higher participation rates than the province overall with Mackenzie and the NRRD having the highest rates. Further, with the exception of Mackenzie and the NRRD, all areas show higher unemployment rates than the province as a whole.

The 2001 Census also provides industrial and occupational characteristics of the labour force. Table 7.3-2 shows a breakdown of the local and regional labour force by industry division. Of particular note are the following statistics:

- Relative to the provincial average (9.6%), manufacturing industries accounted for a larger share of the workforce in all areas with the exception of the PRRD. Most notable was Mackenzie where 45.9% of the workforce is involved in manufacturing.
- Mackenzie also has a higher percentage of its workforce involved in forestry and logging (7.5%) and support activities for forestry (2.2%) compared to the province at 1.2% and .5% respectively and the remainder of the area communities and Regional Districts.
- Given the high level of involvement in manufacturing and forestry activities, labour force activity in almost all other areas was lower than that for the province as a whole.

This reliance on manufacturing and the forest industry is further emphasized in Table 7.3-3, Labour Force by Aggregated Industry, which shows that 54.7% of Mackenzie's labour force is involved in activities related to logging and forest products compared to 4.7% for BC.

Table 7.3-4 shows a breakdown of the labour force for Mackenzie and surrounding communities and Regional Districts by occupation. Relative to the provincial average, the following patterns are noted:

- A very large share of the Mackenzie workforce is employed in occupations unique to processing, manufacturing and utilities, and trades, transport and equipment operators and related occupations (24.9% compared to 4.8% for the province as a whole).
- Overall, the area has relatively smaller labour force shares in the management occupations, business, finance, and administrative, health, natural and applied sciences and culture-related occupations.
- A relatively large share of the broader area labour force was involved in trades, transport and equipment operators and related occupations, and in sales and service occupations.

In summary, the 2001 Census shows a much higher reliance in Mackenzie on manufacturing and jobs related to the forest industry than in either the province or the surrounding communities and Regional Districts. The surrounding area shows a more diverse economy but still has a higher share of jobs related to trades, transport and equipment operations and related occupations given that there is a high level of resource development and agricultural activity in the area.

As shown in Table 7.3-5, in terms of education, the population and, in turn, workers in the area were more likely to have a trade's certificate or college diploma than residents of the province as a whole but less likely to have a university degree.

Table 7.3-2 Labour Force by Industry Division (%)

Industry Division	BC	Mackenzie	RDFFG	Prince George	PRRD	Chetwynd	NRRD
Farms	1.9	0	1.2	.5	5.7	0	.4
Forestry and Logging	1.2	7.5	3.5	2.5	2.3	4.1	1.8
Fishing, hunting and trapping	.3	0	.1	.1	.1	.7	.3
Support activities for farms	.1	.3	.1	0	.1	0	0
Support activities for forestry	.5	2.2	2.1	2.1	.6	1.9	1.3
Mining and oil and gas extraction	.7	0	.4	.5	9.5	4.1	7.6
Utilities	.6	.3	.6	.7	1.6	1.5	4.4
Construction	5.9	2.5	5.7	5.4	9.6	7.8	7.9
Manufacturing	9.6	45.9	14.4	11.9	5.6	20.7	16
Wholesale trade	4.1	.7	3.4	3.6	3.3	2.6	3.5
Retail trade	11.6	7.1	11.8	12.7	10.9	7.8	7.6
Transportation and storage	5.7	2.3	6.5	6.3	7.5	6.3	8.8
Information and cultural	3.1	.8	2.3	2.6	.9	.7	.7
Finance and insurance	4	1.3	2.9	3.2	1.7	3.3	2.3
Real estate and rental/leasing	2.1	.7	1.2	1.4	1.6	1.9	1
Professional, scientific and technical services	6.8	2.2	4.6	4.9	3.2	.7	1
Management of companies	.1	0	0	.1	0	0	0
Administration and support	4	1.7	3	3.2	3	1.5	2.8
Educational services	6.9	5.1	6.8	7.3	7	6.3	4.4
Health and social services	9.9	6.1	9.5	10.3	7.7	5.9	4.4
Arts, entertainment and recreation	2.3	.7	1.6	1.8	1.5	1.1	.7
Accommodation and food service	8.3	5.1	7.8	8	7.6	12.2	10.2
Other service industries	4.9	3.2	5.1	5.3	5.1	5.2	5.7
Public Administration	5.6	4.1	5.6	5.9	4.2	4.1	7.3

Source: Statistics Canada, 2001 Census.

Table 7.3-3 Labour Force by Aggregated Industry (%)

Industry Division	BC	Mackenzie	RDFFG	Prince George	PRRD	Chetwynd	NRRD
Agriculture, Food and Beverage	3	.5	1.5	.8	6.1	0	.6
Fishing and Fish Processing	.5	0	.1	.1	.1	0	0
Logging and Forest Products	4.7	54.7	17	13.6	6.7	24.8	18
Mining and Mineral Products	2	.3	1.6	1.6	9.9	5.2	7.9

Source: Statistics Canada, 2001 Census.

Table 7.3-4 Labour Force by Occupational Division

Occupational Division	BC	Mackenzie	RDFFG	Prince George	PRRD	Chetwynd	NRRD
Management occupations	10.8	5.1	8.3	8.5	8.1	7.4	10.1
Business, finance and administrative occupations	17.6	14.1	16.2	16.9	13.1	11.5	15.7
Natural and applied sciences and related occupations	6.1	5.6	5.5	5.6	3.8	2.2	5.4
Health occupations	5.3	1.8	4.4	4.9	4	2.2	2
Occupations in social science, education, government service and religion	8	4.5	7.3	8.3	6.8	8.9	5
Occupations in art, culture, recreation and sport	3.3	.7	1.5	1.6	1.4	1.9	1
Sales and service occupations	25.6	17.9	25.2	26.3	23.2	24.5	21.1
Trades, transport and equipment operators and related occupations	14.3	20.7	19.2	18	23.5	22.7	22.5
Occupations unique to primary industry	4.2	4.6	4.9	3.7	11.6	4.8	6.1
Occupations unique to processing, manufacturing and utilities	4.8	24.9	7.5	6.3	4.8	14.1	10.7

Source: Statistics Canada, 2001 Census.

Table 7.3-5 Highest Education Levels Attained

	BC	Mackenzie	RDFFG	Prince George	PRRD	Chetwynd	NRRD
Population 20 years and over	2,890,730	3,490	66,435	50,550	37,020	1,680	3,700
Highest Education Level Attained (%):							
Less than Grade 9	6.6	5.3	6.6	6.3	9.4	10.1	7
Some High School	17.7	20.6	20.7	19.8	24.3	20.2	24.6
High School Graduate	12.3	15	13.8	13.3	13.1	17	13.7
Trades Certificate	12.8	17.9	16.4	15.9	17.7	16.1	18.9
College without Diploma	7.2	8.6	9.4	9.7	8.5	9.8	7.4
College Diploma	16.7	18.3	15.7	16.1	14.1	14.3	15.7
Some University	9.2	7.6	7.3	7.7	5.6	4.5	6
University Degree	17.6	6.7	10.1	11.2	7.4	8.3	6.8

Source: Statistics Canada, 2001 Census.

7.3.1.2 Unemployment

Table 7.3-6 shows the average number of work-ready Employment Insurance claimants by occupational grouping for Prince George, Fort St. John, Dawson Creek and Fort Nelson for the one-year period ending January 2007. Claimants were grouped by occupational category, as defined under the National Occupational Classification (NOC) system. Similar information was not available for Mackenzie or Chetwynd.

Table 7.3-6 Average Work-Ready Employment Insurance Claims (Monthly Averages)

	Prince George	Ft. St. John	Dawson Creek	Fort Nelson
MN-021 Mgrs in Eng., Arch., Science & Info. Sys.	2	N/A	N/A	N/A
MN-071 Mgrs in Construction and Transportation	10	1	2	N/A
MN-721 Contractors & Super., Trades & Rel. Wrkrs	60	7	7	2
MN-722 Supervisors, Railway & Motor Trans. Occs.	3	1	2	N/A
MN-723 Machinists and Related Occupations	9	1	1	1
MN-724 Electrical Trades & Telecomm. Occs.	76	8	4	2
MN-725 Plumbers, Pipefitters and Gas Fitters	39	4	6	2
MN-726 Metal Forming, Shaping & Erecting Occs.	107	6	6	1
MN-727 Carpenters and Cabinetmakers	114	4	7	3
MN-728 Masonry and Plastering Trades	25	N/A	1	1
MN-729 Other Construction Trades	60	3	6	N/A
MN-731 Mach. & Trans. Equip. Mechanics (Exc. MV)	61	9	5	1
MN-732 Motor Vehicle Mechanics	49	5	3	2
MN-733 Other Mechanics	5	2	N/A	N/A
MN-735 Stationary Eng.s & Power Stn. & Sys. Ops.	8	3	2	N/A
MN-736 Train Crew Operating Occupations	2	1	N/A	N/A
MN-737 Crane Operators, Drillers and Blasters	15	1	2	N/A
Total (All Occupational Groupings)	6,278	433	599	112

N/A – Not available.

Source: Human Resources Development Canada

As is evident, the number of construction related work-ready insurance claimants is fairly low compared to the total number of claimants in each area. This reflects the current high demand for individuals in the occupational groupings highlighted in the Table. However, despite this, there were an average of 770 work-ready individuals in the trades that will be required during construction available monthly for the last twelve month period. In addition, it is likely that additional workers will be available from Mackenzie and Chetwynd. Based on the above, it is reasonable to expect that there will be qualified workers in certain trades including the carpentry trades, mechanical trades, and metal forming, shaping & erecting trades who can be hired fairly easily for the project from within the local area.

7.3.1.3 Income

Average employment earnings for the province, the District of Mackenzie and surrounding communities and Regional Districts based on the 2001 Census are shown in Table 7.3-7.

With the exception of the PRRD, average employment earnings for all other communities and Regional Districts were higher than that for the province as a whole. Although males in all area communities and Regional Districts earned more than the provincial average, males working in Mackenzie earned considerably more than did males working in other area communities or the province as a whole. Average earnings for females were lower, likely a reflection of the fact that a lower percentage of women in Mackenzie and other area communities and Regional Districts work full time than do women throughout the province and the fact that fewer women are employed in the resource industries.

Table 7.3-7 Average Employment Earnings

Region	Total Average Earnings	Males		Females	
		# persons with earnings	Average Earnings	# persons with earnings	Average Earnings
British Columbia	\$31,544	1,114,860	\$38,039	1,013,690	\$24,401
Mackenzie	\$39,093	1,880	\$50,545	1,300	\$22,533
Prince George	\$32,559	42,095	\$40,637	19,835	\$23,495
RDFFG	\$32,522	29,750	\$40,629	25,675	\$23,127
Chetwynd	\$32,363	825	\$42,426	640	\$19,396
PRRD	\$31,273	17,815	\$39,973	14,245	\$20,395
NRRD	\$34,928	2,020	\$44,396	1,600	\$22,966

Source: Statistics Canada, 2001 Census.

7.3.2 Potential Project Effects

This section describes the anticipated economic impacts (i.e., employment, income and government revenues) from the construction and operation of the MGEC.

7.3.2.1 Methodology

MGELP has estimated the number and types of direct positions. In addition to reviewing these estimates, this section also provides estimates of indirect and induced employment effects.

Indirect employment relates to activity supplying goods and services needed during construction and operation of the MGEC. Induced employment relates to the economic activity generated from workers (direct and indirect) re-spending wage income within their communities. To illustrate the concept of indirect and induced employment, consider the following examples:

- A British Columbia concrete manufacturer may create indirect jobs if it supplies the MGEC with concrete.

- Induced jobs may accrue to a local restaurant, thanks to an increase in patronage by project employees.

The BC Government has prepared a document entitled *Provincial Multipliers and How to Use Them* and the calculation of indirect and induced effects was calculated based on the direction provided in this document. Additionally, the Manager of Business and Economic Statistics at BC Stats was contacted to ensure that appropriate multipliers were used as multipliers specific to industrial construction were not provided in the document.

7.3.2.2 Construction Phase

As shown in Figure 7.3-1, detailed design and site preparation is scheduled to start in July 2007. While project work is expected to take place over a 28-month period, activity over this period will vary with a relatively low level of onsite activity occurring in the initial 12 months and in the final months during commissioning. Peak activity is expected to take place from October 2008 to March 2009. Construction and commissioning will then continue through to November 2009, at which time the plant will become operational.

7.3.2.2.1 Employment

Figure 7.3-1 shows the approximate workforce required in each month of construction. During peak construction, approximately 260 workers will be required at the site. The actual number will depend on the contractors' approach to constructing the facility as well as the amount of offsite prefabrication.

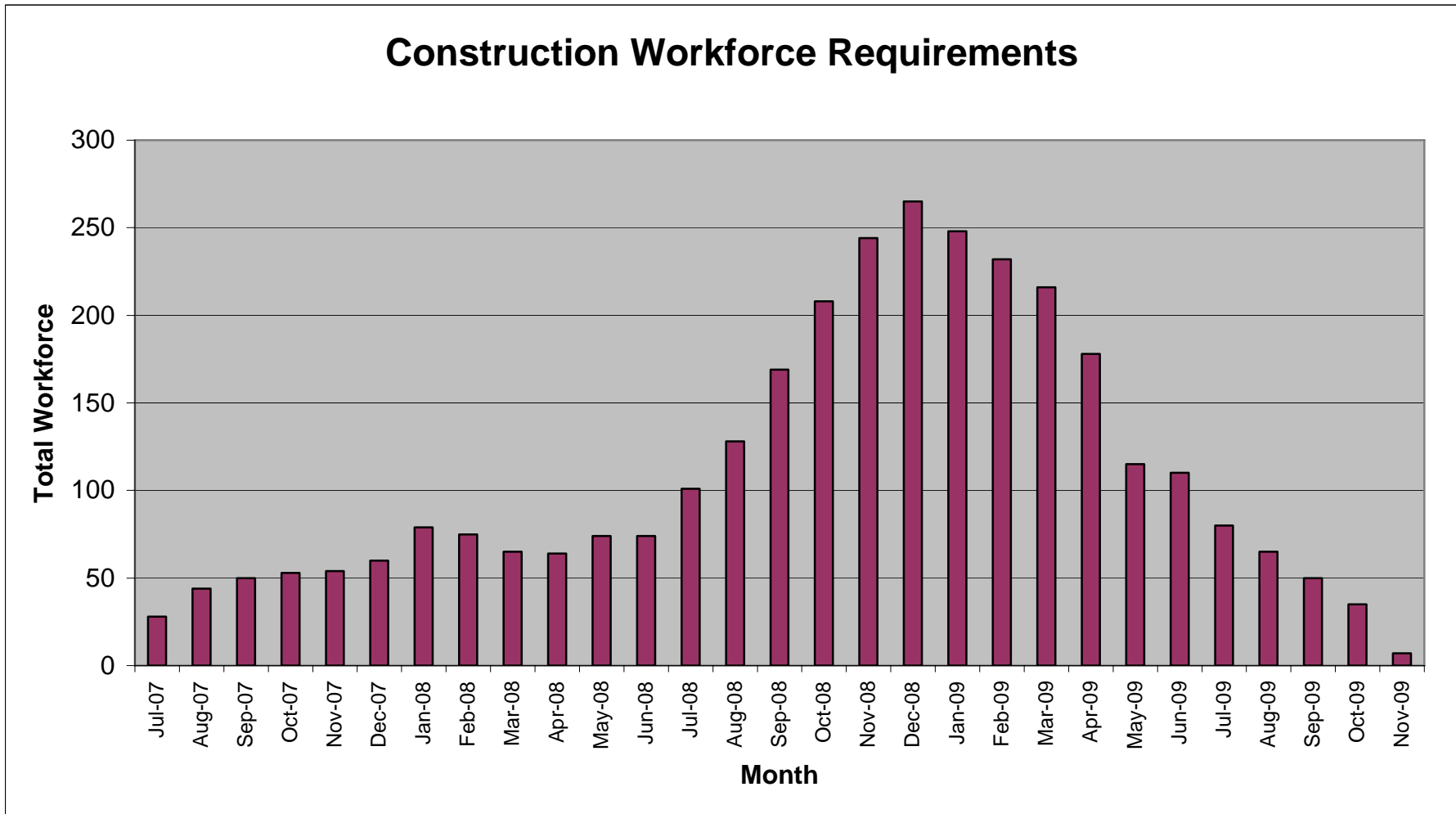


Figure 7.3-1 Approximate Workforce Requirements

A summary of the occupations that may be required during construction is provided in Table 7.3-8. The actual trades used will depend on the contractor hired to build the project (e.g., some contractors may use more boilermakers while others use more pipe fitters and millwrights)

Table 7.3-8 Construction Employment Requirements

Occupational Grouping	
Boilermakers	Painters
Carpenters	Millwrights
Cement Masons	Heavy Equipment Operators
Electricians	Pipefitters
Iron Workers	Teamsters
Welders	Contractor Staff
Labourers	Insulators
Sheet Metal Workers	Floorlayers
Drywallers	Plumbers
Glaziers	Quality Control

Source: MGELP

In measuring the employment benefits in the construction phase, it is necessary to draw a distinction between the number of jobs created, and the number of “person years” of employment. Because construction workers will be required for various lengths of time (often less than a year), it is useful to express benefits in terms of the number of person years (PY). For purposes of this assessment, one PY is defined to reflect one individual working 1,800 hours per year.

For the MGEC, it is estimated that about 580,000 person hours of work will be required for project construction, which is equivalent to about 322 PY of employment. Overall, it is estimated that up to 20% of the peak construction workforce (about 50 workers) could be sourced from within the District of Mackenzie and immediately surrounding area. The remaining workforce would come from other parts of northern BC, BC, or Canada. However, it is important to note that the actual number of workers that can be sourced from the local area could vary significantly depending on other activities occurring in the area and province at the time.

For the 322 PY of onsite construction employment, the value of wages, including overtime, are anticipated to amount to between \$29-33 million. Additional income will be paid through travel allowances, statutory benefits, and non-statutory benefits.

Indirect and Induced Employment and Income

In addition to the direct employment-related benefits noted above, construction of the MGEC is expected to generate additional employment in the province through the purchase of goods and services in British Columbia. Further, the re-spending of the direct and indirect wage income will lead to additional induced employment throughout BC and other areas that workers come from.

Using the provincial multipliers for construction, it is anticipated that an additional 204 indirect and 58 induced jobs could be created by construction of the MGEC. These jobs would be located in Mackenzie and Northern British Columbia as well as in other areas from

which goods and services are sourced and would generate considerable indirect and induced income.

7.3.2.2 Government Revenues

The construction of the MGEC will generate revenues for municipal, regional, provincial and federal governments. Primary sources will be from personal income taxes, provincial sales taxes, and property taxes.

It is estimated that construction expenditures will include approximately \$2 million in provincial sales tax and approximately \$200,000 in other fees to government.

7.3.2.3 Operations Phase

7.3.2.3.1 Employment and Income

MGEC will require a permanent operating staff of about 26 plus two apprentices and they will be augmented by temporary workers during major maintenance periods. A typical operating staff required for the MGEC is outlined in Table 7.3-9.

Table 7.3-9 Operating Staff Requirements for MGEC

Position	Number
Plant Manager	1
Operations Manager	1
Fuel Supply Coordinator	1
Maintenance Engineer	1
Administration Assistant	1
Lead Operating Engineer	5
Assistant Operating Engineer	5
Fuel Handling Operator	5
Mechanic	2
Instrument Technician	2
Pipefitter/welder	2
Apprentices	2
Total	28

Source: MGELP, 2007

As part of an agreement with Pope & Talbot and the Communications, Energy and Paperworkers Union of Canada (CEP) regarding the potential displacement of workers currently involved in steam production at the Pope & Talbot facility, MGELP has committed to evaluating any Pope & Talbot union employees displaced as a result of the MGEC project. Pope & Talbot management are working toward eliminating the possibility of displacing any workers as a result of operational changes brought about by the MGEC. Although the final number will not be known until the facility is operational, for the purposes of this study, we have assumed that 5 positions will be filled with existing Pope & Talbot employees. This leaves 23 positions to be filled with new workers. Of these, it is anticipated that approximately 5-10 could be filled from within the community with the balance to be filled by individuals from outside the community.

It is also recognized that people may come to the community to fill the jobs vacated by those leaving existing occupations to work at MGEC. If workers are hired from outside the community, they will likely relocate to Mackenzie when they assume their positions. Therefore, it is anticipated that approximately 20 new workers could come to the community. However, for purposes of project assessment, we have assumed that all 28 workers would be new to the community and that they would bring their families to the community.

Annual employment income (wages and benefits) associated with the direct operations workforce is estimated to be approximately \$2.5–3 million per year.

7.3.2.3.2 Expenditures

The MGEC will incur ongoing annual expenditures for fuel and other non-labour operating and maintenance (O&M) items. Annual direct O&M is estimated at \$15–20 million including wood supply and transportation costs.

Spin-off economic activity will be derived from the purchases of fuel and other items sourced in BC, as well as from the re-spending of labour income (direct and indirect). This will lead to additional employment, income, and taxes in the province.

7.3.2.3.3 Government Revenues

The operation of the MGEC is expected to generate ongoing government revenues at the local, regional, provincial, and federal levels. Revenues will include personal income taxes, provincial sales tax, GST, property tax, and other sources such as utility charges.

During operations, annual operations and maintenance costs will include approximately \$400,000 in provincial sales tax and \$20,000 in fees to government. In addition, annual property taxes paid to the District of Mackenzie are anticipated to be approximated \$500,000 based on a current estimate. Discussions regarding the actual tax level are ongoing.

7.3.3 Enhancement and Mitigation

MGELP is working to maximize the participation of local residents in the construction and operation of the MGEC. To help ensure that this objective is achieved, MGELP has or will undertake activities aimed at:

- building awareness about the project, opportunities and requirements; and
- shaping recruitment policies in a manner that facilitates participation by qualified local residents.

7.3.3.1 Awareness of Job Opportunities

Before local residents can take advantage of the employment opportunities offered by the project, they have to understand the opportunities that the project presents and the skills required. To ensure that local residents have the information they require to facilitate their participation in the project, MGELP has, or will, undertake the following activities:

- Present information at community events (e.g., Chamber of Commerce luncheons).
- Place project information and employment advertisements in the Mackenzie Times newspaper.

- Prepare an Information Sheet that identifies the jobs that will be available during construction and operations. This Information Sheet will be posted on the MGEC website, sent to First Nations, distributed at the open house, sent to those who request employment information and provided to HRDC and local colleges.
- Encourage project contractors to give preference to qualified workers in the Mackenzie area and from the four First Nations with an interest in MGEC during construction.
- Consider any Pope & Talbot workers displaced as a result of MGEC for a position with MGEC.
- Provide a \$500 bursary to a student from the District of Mackenzie annually from 2010 to 2030. The specific nature of the bursary will be discussed with the District as project planning proceeds.

Other means of increasing awareness of job opportunities will also be considered as discussions with the community continue.

7.3.3.2 Recruitment

Recruitment practices and policies can influence the number of local residents who work on the project. Local HRDC and other appropriate offices in the local study area and Treaty 8 First Nations who have expressed an interest in the project will be provided with the Information Sheets regarding employment and good and services required by the project during construction and operations.

7.3.3.2.1 Construction

MGEC will encourage project contractors to give preference to qualified workers in the Mackenzie area and from the McLeod Lake, Saulteau, Fort Nelson and West Moberly First Nations. This preference will apply to job applicants who meet the qualifications for the positions for which they are applying. The minimum qualifications for construction positions will be specific to each position.

Employment initiatives specific to Treaty 8 First Nations with an interest in the project are discussed in Section 6.5

7.3.3.2.2 Operations

MGELP will give preference for operations employment to qualified local residents. A local worker will be defined as being “qualified” if they offer a similar level of experience, education and proven competency as a worker from outside of the local area. In addition, as noted earlier, any Pope & Talbot workers displaced as a result of Mackenzie Green Energy providing steam to the Pope & Talbot operations will be considered for a position with MGEC.

It is anticipated that, given the level of education and directly related experience required for many of the operations positions, workers may leave existing positions to come and work at MGEC and, if this occurs, workers from outside the community may come to the community to fill the jobs vacated. It is also likely that workers from outside the community will fill some of the operations jobs at MGEC.

7.4 POPULATION

This section examines the current population and projected growth rates for the local and regional study areas. Anticipated project impacts are also described.

7.4.1 Baseline Conditions

Table 7.4-1 provides an overview of the population of Mackenzie and surrounding areas for selected years from 1996 to 2006. As noted earlier, the closest population centres to Mackenzie are Prince George two hours to the south and Chetwynd two hours to the east.

The 2006 population of Mackenzie was estimated at approximately 5,452 which is only a slight increase from the 2001 population of 5,433 but a notable decrease of 803 residents from 1996. As is evident from the table, the population of Mackenzie, Chetwynd, Prince George, and the RDFFG was lower in 2006 than in 1996. From 2001 to 2006 all communities and Regional Districts showed positive growth ranging from 0.4% in Mackenzie to 11.8% in the Peace River Regional District. The Table also shows that percentage growth in population in the PRRD and NRRD was about twice that of the province as a whole while in the RDFFG it was less than half that of the province

Table 7.4-1 Local and Regional Population

Area	Population						% change 2001-06
	1996	2001	2003	2004	2005	2006	
Mackenzie	6,257	5,433	5,389	5,458	5,453	5452	+4
RDFFG	102,994	99,479	100,602	102,215	101,601	101,881	+2.4
Prince George	78,239	75,568	76,643	77,827	77,151	77,343	+2.4
PRRD	58,770	57,479	58,703	62,096	62,961	64,272	+11.8
Chetwynd	3,113	2,704	2,576	2,729	2,770	2,866	+6
NRRD	6,115	5,969	6,127	6,451	6,605	6644	+11.3
B.C.	3,874,276	4,078,447	4,154,591	4,201,867	4,254,522	4,310,452	+5.7

Source: BC Stats, BC Regional District and Municipal Population Estimates December 2006

Table 7.4-2 provides population projections for the RDFFG, PRRD and NRRD from 2006-2031. As is evident when comparing the 2006 figures from Table 7.4-1 and 7.4-2, in some areas the projections for 2006 have already been exceeded while in others they are yet to be met. However, Table 7.4-2 does show that it is expected that population growth in the RDFFG and PRRD will be slower than that in other areas of the province and that the population of the NRRD will grow at the same rate as the province as a whole.

Table 7.4-2 Population Projections 2006 - 2031

Area	Population						%change 2006-31
	2006	2011	2016	2021	2026	2031	
RDFFG	102,412	105,733	108,191	109,823	111,229	111,508	8.9
PRRD	63,620	66,664	69,344	71,584	73,520	74,313	16.8
NRRD	6,700	7,250	7,758	8,170	8,503	8,737	30.4
B.C.	4,303,115	4,580,059	4,873,270	5,150,169	5,397,253	5,610,086	30.4

Source: BC Stats, Quarterly Regional Statistics, Third Quarter 2006

7.4.2 Potential Project Effects

7.4.2.1 Construction

As stated earlier, it is estimated that the project will require approximately 250-60 workers during peak construction from October 2008 to March 2009 (see Figure 7.3-1). Although the actual number could vary widely depending on skilled labour availability, it is anticipated that approximately 20% of these workers could come from the local area. The other 80% will come from Prince George, other Northern BC communities, other parts of BC and Canada. The actual distribution will depend on other construction activities in the local and regional area at the time of construction.

Assuming the above distribution of worker residencies, about 210 workers will require temporary accommodation in the District of Mackenzie during December 2008 when the size of the construction workforce is anticipated to peak. Due to the temporary timeframe over which most construction workers are required, and the fact that construction will peak in the fall and winter months, it is not anticipated that many construction workers will bring family members into the region. Therefore, construction of the project will result in a temporary population increase in the District of Mackenzie equal to approximately the number of construction workers from outside the community working on the project at any given time. As noted above, this is anticipated to peak at approximately 210 workers. However, given that there is some uncertainty regarding the percentage of workers that will be available to be hired from the local study area, we also considered the effect of all workers coming from outside the District of Mackenzie even though this will not likely be the case. Further, given that plans are for workers to work shifts that are 10 days on and 4 days off, it is anticipated that that most workers will leave the community on their days off.

7.4.2.2 Operations

The operation of the MGEC will create 28 new full-time jobs. As discussed earlier, approximately 5 of these positions may be filled with existing Pope & Talbot employees leaving 23 positions to be filled with new workers. Of these, it is anticipated that approximately 5-10 could be filled from within the community which would leave 13-18 to be filled by individuals from outside the community. However, it is also recognized that people may come to the community to fill the jobs vacated by those leaving existing occupations to work at MGEC which could result in about 20 workers coming to the community. However, as noted earlier, for the purpose of this assessment, we have assumed that 28 new workers will be relocating to Mackenzie during operations.

Unlike the construction workforce, it is anticipated that operations staff will relocate with family members. Based on an average family size of about 3.0, the operation of the MGEC could lead to a permanent population increase of up to eighty-four persons. The actual number will likely be lower given that some operations staff as well as staff filling existing positions vacated by people coming to work at MGEC will be hired from the local area.

7.4.2.3 Decommissioning

The facility's expected operating lifetime is 30 years. At the end of operations, the facility will be decommissioned and jobs associated with the facility will cease. The effect of the closure of the facility on the local population will depend on a number of factors, including the availability of alternative jobs in the community and the decisions workers make about staying in the community or seeking employment elsewhere. Given the population of Mackenzie, closure of the facility is not expected to have a notable effect of the District in terms of population.

7.4.3 Enhancement and Mitigation

The effects of the population increase during construction and operations on community services, as well as proposed enhancement and mitigation measures for each specific area are discussed in more detail in Sections 7.6 to 7.10. It is important to note that even if all construction and operations workers come from outside the community, the resulting population will still be considerably lower than that accommodated by the community a decade ago.

7.5 BUSINESS OPPORTUNITIES

7.5.1 Baseline Conditions

The District of Mackenzie is home to a wide variety of businesses including many that may be capable of providing goods or services to the project such as:

- construction material suppliers;
- contractors and sub-contractors (installation, clearing, reclamation);
- construction equipment sales and services;
- bulk fuel dealers;
- transportation companies (employees, fuel, waste);
- food and beverage industries;
- accommodation industries;
- vehicle maintenance companies; and
- entertainment services.

Although many businesses that provide support services or goods to commercial or industrial operations have focused on the forestry sector for the majority of their business, many are now diversifying to serve mining and other sectors.

The project is proposed to be located in the Mackenzie Industrial area which is home to a variety of industrial operations as well as two commercial operations. There is also a considerable amount of undeveloped land in the industrial area which could be developed in the future for new industrial or commercial activities although, according to the District, there are no plans at this time to develop new commercial businesses in the industrial area.

Commercial land is available for purchase from the District of Mackenzie as well as from private sellers. Industrial land is available in the industrial area for new industrial endeavours.

Other area communities, including the First Nations communities, also have the capacity to provide goods and services that may be used by the project.

7.5.2 Potential Project Effects

7.5.2.1.1 Construction

Businesses providing goods and services required by the project and its workers could experience an increase in demand as a result of project related expenditures during construction and operation. The project will generate business opportunities through direct and indirect purchases of materials, equipment, and services and through direct and indirect workers spending their wages, or a portion of their wages, in the region. Opportunities could also be created for a variety of local businesses including those identified in the Baseline section.

It is anticipated that the positive economic effect will be greatest in the District of Mackenzie and other larger regional communities (e.g., Prince George) although businesses from other communities (e.g., First Nations communities) may also benefit from the opportunity of providing goods and services to the project.

7.5.2.1.2 Operations

During operations local businesses will benefit from supplying goods and services directly to MGEC and its employees on an ongoing basis. The ability of local businesses to supply the goods and services required will be explored further as the project studies proceed.

It is also possible that local accommodation, food and other goods and service providers in the District of Mackenzie could benefit from operations and maintenance personnel visiting the region.

Perhaps the most notable effect on business will be on the industrial operations that will be purchasing steam from the MGEC (e.g. Pope & Talbot, Canfor). The provision of low cost energy to the mills from the MGEC will contribute to the overall competitiveness of the mills which will bring longer term economic stability to the region. The economic effect of the MGEC cannot guarantee long term success for the mills but it will certainly help by significantly reducing their energy costs.

Overall, businesses will benefit from the construction and operation of the MGEC. The degree of benefit will vary from business to business. It is not expected that there will be notable negative effects on business or industry in the study area.

7.5.2.1.3 Decommissioning

At the end of its' economic life, the MGEC will be decommissioned and business opportunities associated with the MGEC will cease. The effect of the closure of MGEC on local businesses will depend on a number of factors including the availability of alternative opportunities in the community and region and the degree to which the companies serving the MGEC have diversified. Given that companies serving the facility will know from the outset that the facility has an estimated life of 30 years, they will be able to incorporate this knowledge into their business planning. As such, other than the loss in a portion of business, it is not anticipated that closure of the facility will have a negative impact on local business.

7.5.3 Enhancement and Mitigation

As with employment, the involvement of local businesses in the project will be encouraged for competitively priced items. To help ensure that local businesses are aware of the available opportunities, MGELP will prepare an Information Sheet identifying the goods and services that will be required during construction and operations. This Information Sheet will be posted on the MGEC website, distributed at the open house, sent to those who request information about business opportunities with the project, and sent to First Nations.

Prior to construction and operations beginning, a contractors' open house will be held to:

- provide local businesses with information about purchasing procedures,
- identify qualifications, insurance, and information requirements,
- discuss completion of quotation documents,
- identify major contractors,
- identify anticipated timing and breakdown of contracts, and
- add names to the registry of local businesses.

The open house will be widely advertised in the community.

However, despite the efforts that will be made to encourage local contractors and suppliers to bid on business with the project, it cannot be guaranteed that all of those interested in opportunities with the project will be successful.

7.6 HOUSING

A variety of temporary and permanent accommodation is available in the District of Mackenzie.

7.6.1 Baseline Conditions

7.6.1.1 Temporary Accommodation

Hotel and motel rooms, a municipal campground and RV Park, bed and breakfast rooms and a permanent worker camp provide temporary accommodation in Mackenzie.

There are one hotel and two motels in Mackenzie – the Alexander Mackenzie with 99 rooms, the Williston Lake Lodge with 24 rooms and the Timberman Inn Motel, with 25 rooms for a total of 148 rooms. A number of bed and breakfast rooms are also available although

the total number is not known as many are in private residences. There is also a permanent camp – Camp Watters, located in the industrial area of Mackenzie which can house 400 workers.

The vacancy rate at the hotel and motels varies by season and is generally lower in the summer than in the winter months. For approximately ten days in September each year during the Pope & Talbot shutdown, all rooms in Mackenzie are fully booked. In past years the vacancy rate increased following shutdown but in 2006 demand remained strong and local establishments experienced lower than usual vacancy rates for October, November and early December. Given the number of rooms in Mackenzie and the year-round demand for the rooms, proprietors have stated that any large event in Mackenzie (e.g., hockey tournament) can put a strain on room availability. It is important to note that specific vacancy rates in Mackenzie, as in any other community, can fluctuate significantly from establishment to establishment, day to day, or week to week.

Camp Watters is a permanent camp located in the Mackenzie Industrial area. It has the capacity to house 400 workers and generally has a population of approximately 100 workers although the number can vary significantly. As with the hotel and motels, the Camp is fully booked during the Pope & Talbot shutdown. The camp does not provide accommodation for tourists.

The Mackenzie Municipal Campground and RV Park is open from about May to October, depending on the weather. It has 16 fully-serviced sites, 9 sites with electrical service and 11 sites with no services. The vacancy rate is generally quite low as it is used by both tourists and short-term or temporary workers.

7.6.1.2 Permanent Accommodation

A variety of permanent, affordable accommodation consisting of apartments, single-detached homes, semi-detached homes, duplexes, condominiums, and movable dwellings is available in the District of Mackenzie and immediately surrounding area.

As shown in Table 7.6-1, there were approximately 1,850 occupied private dwellings in Mackenzie at the time of the 2001 Census.

Table 7.6-1 Mackenzie Housing Statistics

Housing Category	Number/Value
Total dwellings	1,850
Owned dwellings	1,485
Rented dwellings	370
Dwellings constructed before 1991	1,725
Dwellings constructed between 1991 and 2001	125
Average value of dwellings	\$96,767

The Canada Mortgage and Housing Corporation (CMHC) started monitoring construction activity in Mackenzie in 2006 and two new single family dwellings were built during the year. According to CMHC and local real estate agents, there was no residential construction activity in Mackenzie during the previous 6 or 7 years. CMHC also indicated that there is currently sufficient housing in Mackenzie and that there is also no demand for condominiums at this time because single family dwellings are still quite affordable.

Table 7.6-2 provides an overview of sales and prices in Mackenzie for the past five years. The increase in units sold and decrease in prices in 2003 illustrate the slump that the community was going through at the time and the subsequent sales and price increases show a renewed optimism and activity in the community. This upward trend has continued into 2006.

Table 7.6-2 Single Family Home Sales Prices (2001-2005)

Year	Units Sold	Average Selling Price
2001	45	95,433
2002	38	79,460
2003	68	74,295
2004	37	91,894
2005	61	97,752

Source: BC Northern Real Estate Board

Currently the number of single family lots available for development in Mackenzie is limited. The District Council has recognized that additional land will be required for residential development should demand increase and the District is currently considering means through which to address the anticipated demand.

As shown in Table 7.6-3, the vacancy rate in apartments and row houses in Mackenzie in October 2005 was 7.8%. This translates into 37 bedrooms being available for rent.

Table 7.6-3 Vacancy Rates for Apartments and Rowhouses (October 2005)

	Bachelor	1 Bedroom	2 Bedroom	3 Bedroom	Total
Units Surveyed (#)	34	73	136	12	255
Vacant Units (#)	0	7	9	4	20
Vacancy Rate (%)	0	9.6	6.6	33.3	7.8

Source: CMHC, November 2006

As shown in Table 7.6-4 the vacancy rate in October 2005 was considerably lower than that in the previous seven years. As is also evident, the number of rental units in Mackenzie has decreased significantly in the past 10 years although CMHC has indicated that 281 units were surveyed in October 2006, an increase from the previous year but still much lower than earlier years. The decrease is a result of a number of factors including conversion to condominiums and removal from the market. It was noted that when vacancy rates are high some owners would rather shut down the suites than fix them up and have them remain empty.

Table 7.6-4 Historic Vacancy Rates for Apartments and Rowhouses (1996-2005)

Date	Units (#)	Vacancy Rate (%)
October 2005	255	7.8
October 2004	283	22.3
October 2003	291	19.6
October 2002	311	28
October 2001	235	20.4
October 2000	311	22.8
October 1999	310	23.9
October 1998	324	29.9
October 1997	329	10.3
October 1996	348	8

Source: CMHC, November 2006

According to CMHC, new construction of rental buildings is not expected to occur in Mackenzie in the near future. It should also be noted that in addition to the vacancies noted below, there are vacancies in duplex units and in rooms rented out in private homes that are not reflected in the vacancy rate indicated in Table 7.6-4.

7.6.2 Potential Project Effects

7.6.2.1 Construction

In project planning a variety of options are considered for housing a construction workforce. These include:

- a construction camp,
- housing the workforce in the community, and
- a combination of a camp and housing workers in the community.

The preferable option for any project depends on a number of factors including the size of the peak workforce, the local hire potential, the housing mix in the project area, and the capability of the community to house the incoming workers. Housing (camp vs. living in the community) is also an important factor in attracting construction workers.

For the MGEC, it is estimated that approximately 20% of the construction workforce will come from the local area. Therefore, at peak construction approximately 210 individuals will require accommodation in Mackenzie. Further, it is not anticipated that many of the incoming workers will bring family members to the area as construction is scheduled to peak during the winter months and most workers will only be in the area for a relatively short period of time.

Given the proximity of Camp Watters to the project site and the availability of rooms at the Camp, construction workers will be offered the option of staying at Camp Watters. It is unknown, however, whether most workers will chose this option. It is possible that some may find other accommodation in Mackenzie (e.g., in private homes, at the campsite in the summer months) or rent apartments.

It is recognized that the Camp is fully booked for approximately seven to ten days each September during the Pope & Talbot shutdown. To help mitigate the effect of the shutdown on project construction, shifts will be planned in such a manner as to have the maximum number of workers offsite during this time. In the event that there is a housing shortage, MGEC will consider partially or completely halting construction in order to ensure that the effects of a temporary housing shortage are minimized. It is possible that some workers who are working on the MGEC may secure employment at Pope & Talbot during the shutdown period.

Given that workers will have access to Camp Watters and that it is likely that many workers will stay at the Camp, it is not anticipated that project construction will have a negative impact on temporary accommodation in Mackenzie. On the contrary, it will have a positive effect on the camp and the goods and service providers who service the camp as well as on temporary accommodation providers on Mackenzie. MGELP recognizes that neither Camp Watters nor other temporary accommodation is available for a 7-10 day period in September annually and is already planning around that time (e.g., scheduling days off to coincide with shutdown). Therefore, the project will not have a negative impact on temporary accommodation during the annual shut down cycle.

However, given that there is some uncertainty regarding the percentage of workers that will be available to be hired from the local study area, the effect of all workers coming from outside the District of Mackenzie was considered even though this will likely not be the case. In this situation, Camp Watters still has sufficient capacity to accommodate the total number

of required workers and the net effect on the community would be similar to that caused if only 80% of the workers came from outside the area. It is anticipated that the actual number of workers that will require accommodation in the community will range from 210 and 260 workers requiring accommodation in the community.

7.6.2.2 Operations

It is anticipated that permanent operations employees will purchase or rent homes in Mackenzie. As discussed in Section 7.2.2.3, it is possible that up to 28 new individuals or families will come to the area as a direct result of the project. As a result, there could be a need for up to 28 permanent accommodation units during operations. There may also be the occasional need for temporary accommodation for project-related personnel that come to the area for short periods of time.

Given the current housing situation in the area and the small number of units that will be required during operations, the housing demand created by MGEC operations staff will be easily accommodated and is not expected to have a notable effect on the Mackenzie housing market. This conclusion would not change even if all workers came from outside the community and required housing in Mackenzie.

7.6.3 Enhancement and Mitigation

By providing incoming employees with the option of staying at Camp Watters or securing alternate accommodation in the community and by encouraging them to stay at Camp Watters during periods when temporary accommodation suppliers are facing high demand from other sources (e.g., hockey tournaments, etc), MGEC will provide considerable benefit to the local economy during construction while not straining local resources.

Enhancement or mitigation measures are not required during operations.

7.7 TRANSPORTATION AND TRAFFIC

7.7.1 Roads

7.7.1.1 Baseline Conditions

Highways and roads in and around the District of Mackenzie serve a range of users including daily residential traffic, commuters, tourists, industry and commercial vehicles.

Highway 97, which runs north/south throughout the province, intersects with Highway 39 approximately 29 kilometres away from the community centre. Highway 39 runs through Mackenzie from Highway 97 in an east/west direction. Both highways are 2-lane with a third lane on Highway 97 for passing on hills and two additional lanes on Highway 39 as it travels through Mackenzie. The Ministry of Transportation is responsible for maintaining highways in the area. The District of Mackenzie maintains the portion of Highway 39 that passes through the community under contract to the Ministry. Legal load limits apply to both highways.

Mackenzie has approximately 72 kilometres of streets and roads with about 80% being paved and the remainder being gravel. A network of municipal roads serves the Mackenzie industrial area. The District of Mackenzie is responsible for public roads in the industrial area

and the individual property owners are responsible for the private roads in the area that service their properties. Roads in the industrial area were built to accommodate industrial traffic and are maintained and upgraded as required. For example, drainage was recently improved on roadways along the BCR property.

The current traffic mix on the roads in the industrial area comprises trucks and other vehicles destined for the industrial area, workers vehicles and a small number of vehicles accessing the two commercial businesses in the area. Traffic volumes are fairly consistent year round and, according to the District of Mackenzie, traffic counts have not been undertaken for the area since the late 1980's. The District has stated that it is unaware of any developments that would result in a notable increase in traffic in the industrial area and that there are currently no plans for expansion of commercial businesses in the area. Traffic accessing the industrial area from outside the community can enter the industrial area off of Highway 39 prior to entering the residential and commercial area.

Mackenzie has several truck transport companies and one taxi company serving the community. Greyhound Bus service is available in Mackenzie as well as at the Mackenzie Junction on Highway 97. Destinations not directly served can be reached via connection services in Dawson Creek or Prince George, where passenger services are scheduled daily. Greyhound also provides package and express delivery.

7.7.1.2 Potential Project Effects

As described in more detail in Section 3.2, the main access to the MGEC site will be from the Pope & Talbot road off the District of Mackenzie-owned Coquawaldie Road. The existing road will split in the future so that the southern fork leads to the main MGEC plant and the northern fork leads to the wood residue unloading facilities. A secondary access road will also be constructed at the north end of the site to connect the plant directly with Coquawaldie Road, thereby bypassing the Pope & Talbot road. This new access will lead to the wood residue handling area. In addition, a small loop road will provide access for the Pope & Talbot trucks to the MGEC soap unloading area. A paved area will be provided on site for employee and visitor parking and for truck manoeuvring in the fuel unloading area.

7.7.1.2.1 Construction

Construction traffic will access the project site by traveling along Highway 97 to the intersection with Highway 39, along Highway 39 to the industrial area and then along Coquawaldie Road to the project site. Some project-related traffic may also use the roads in the District, particularly local businesses supplying goods or services to the project.

Construction of the MGEC will occur over a period of approximately 28 months. Peak construction will occur from about October 2008 to March 2009, at a time when tourist traffic on the highways in the area is at its lowest. Project-related construction traffic will consist of hauling of material cleared from the site, hauling fill, project components, concrete, and other construction materials to the facility and employee vehicle movements.

Traffic in the industrial area and surrounding area during construction of the MGEC will be comprised of existing traffic, employee traffic, truck traffic, and other project-related traffic. As noted above, it is not anticipated that existing traffic patterns will change during project construction.

Employee Traffic

Employee traffic will be generated by local employees accessing the site and by buses transporting workers from Camp Watters. Assuming that 20% of the workers were hired locally, approximately 50 workers would be traveling to and from the site daily. Although the specific percentage is not known, it is anticipated that a portion of the workers would carpool. Therefore, it is anticipated that approximately 30 (assuming 1.5 persons per vehicle) to 50 vehicles would be traveling to and from the site daily at peak construction. Workers staying at Camp Watters would be bussed to the site. However, it is important to note that it is possible and, given the current high employment level in the area, likely that more workers will come from outside the community. The result of workers coming from outside Mackenzie would be a reduction in the number of vehicles traveling to and from the site since more people would be bussed.

Employee traffic would peak at the beginning and end of shifts. It is possible that short-term delays entering or exiting the area may occur at those times. It is anticipated that the delays could be more noticeable at the end of the shift as all workers will be leaving at the same time while at the beginning of the shift workers may arrive over a more extended time period. Any delays could be accentuated if shift times coincided with the Pope & Talbot shifts. However, despite the fact that some delays may be experienced, the delays are expected to be short-term in nature and will be most noticeable during the five-month peak construction period. The steps that will be taken to mitigate traffic effects are identified in Section 7.7.1.3.

Truck Traffic

Construction of the MGEC will increase the number of trucks on area roadways. During site preparation, truck traffic would be generated as a result of site clearing and filling activities. The types of trucks involved in construction will vary from light duty pick-ups to tractor-trailer units. As construction progressed, trucks would be transporting materials such as cement, structural steel and various other construction materials and project components to the site.

Deliveries to the site will travel via Highway 39 and then along roads in the industrial area. Truck deliveries will normally occur between 8:30 a.m. and 4:30 p.m. on weekdays. The numbers and types of vehicles traveling to the site each day will vary depending on site requirements and activities. The largest number of deliveries would be related to facility construction and would occur from March 2008 through June 2009. Any construction related traffic impacts would tend to occur during the construction shift with the exception of specialized deliveries of very heavy project components that will likely occur late at night or very early in the morning. Once again, it is possible that there will be some minor traffic delays entering or exiting the area during peak delivery periods but these should be short-term in nature.

When the need arises to move very heavy or wide loads, the required permits will be obtained. There may also be the occasional need to temporarily close a roadway to allow for passage of large loads. If this is required, MGEC will notify the District in advance and work to ensure that any effects are minimized.

The roads within the industrial park were built to handle industrial traffic and all heavy restrictions will be observed. Therefore, it is not anticipated that the deliveries will result in damage to local roads.

Other Traffic

In addition to employee and truck traffic, the project will generate traffic from other activities related to the construction of the facility including inspectors, couriers, and sightseers. The number of trips generated by other traffic will vary from day to day and it is not expected that these trips will coincide with the start or end of shifts. However, even if some trips were coincidental, it is not anticipated that more than short delays entering or exiting the area would result.

7.7.1.2.2 Operations

During operations, the MGEC will employ 28 workers although not all workers will be onsite at any given time. Operations worker traffic will have no effect on traffic volumes in the area.

Pre-hogged (shredded) wood residue will be delivered to the site by trucks. The majority of these will be self-tipping super B train units although other self unloading trucks may be used as well. Primary clarifier sludge will be delivered by Pope & Talbot in self-dumping trucks. Kraft soap will be delivered by Pope & Talbot in tank trucks and unloaded to a soap storage tank.

The anticipated long-haul truck traffic between Mackenzie and each hog fuel supply area is as follows:

Supply Area	Daily Truck Traffic (in each direction)	Dominant Truck Route
Bear Lake	15, week days only	Highways 97 & 39
Chetwynd	14, week days only	Highway 97
Fort St. James	30, six days per week.	Resource roads

Trucks carrying local sawmill residues and chips from forest residues will be additional to the totals outlined above.

Trucks carrying wood residue will access the project site by traveling along Highway 39 from Highway 97 or the Chetwynd area and then along the industrial area roads to the site. Clarifier sludge and kraft soap will be delivered along internal Pope & Talbot and MGEC roadways. All fuel deliveries (i.e., wood residue, clarifier sludge, kraft soap) will be undertaken by professional drivers.

It is anticipated that there will be 6-10 clarifier sludge and 1-2 kraft soap deliveries per week. These deliveries will occur via an internal road network between the Pope & Talbot facility and MGEC.

Ash residue will be moved from the MGEC to the onsite landfill on a regular basis. It is anticipated that 1-2 truck loads will be moved daily on roads internal to MGEC property. The ash trucks will share the access road with other incoming and outgoing truck traffic.

In addition to the wood residue fuel deliveries, there would also be occasional deliveries of supplies and maintenance materials to the MGEC during operations. This additional traffic volume is expected to be minor and will have no notable effect on traffic volumes in the area.

In conclusion, the project will result in a minor increase in traffic on Highway 97 and Highway 39. Within the District of Mackenzie, any increase in traffic that results from this project will be concentrated in the area immediately surrounding the MGEC. Traffic accessing the site from outside Mackenzie and from any forest service road will not have to travel through the main town center of Mackenzie to access the site. Within the industrial area itself, project-related traffic will be reflective of existing traffic and is not expected to cause negative effects in the area.

7.7.1.3 Enhancement and Mitigation

To help minimize the traffic and transportation effects of the project on the District of Mackenzie, a number of transportation and traffic management strategies will be employed for general project-related traffic. These are described below.

7.7.1.3.1 Construction

MGEC has identified the following mitigation measures to help minimize the effects of project-related construction traffic:

- Workers staying at Camp Watters will be bussed to the site.
- Provide on-site parking for workers who drive to the site.
- Obtain permits for the movement of very heavy or wide loads and notify the Ministry of Transportation and District of Mackenzie.
- Notify the District in advance of road closures and work to minimize effects.
- If a traffic problem arises, plan construction shifts so as to minimize the impact on traffic.
- Provide the District of Mackenzie and local emergency service providers with information pertaining to transportation routes and anticipated traffic volumes during construction.
- Provide stop signs on each side of the railroad crossing and at all road crossings and intersections.
- Visitors will report to the project office when arriving on site.
- Deliveries will be scheduled for non-peak periods.

7.7.1.3.2 Operations

Mitigation measures are not required to deal with a workforce of 28, only a portion of whom will be on site at any given time.

During operations, professional drivers will drive trucks carrying fuel or any hazardous goods.

7.7.2 Air

7.7.2.1 Baseline Conditions

Mackenzie operates a class “C” airport located about 5.6 kilometres west of the community centre. The airport has one runway with 5,000 feet of asphalt and 2,000 feet of sand overrun. The largest aircraft that can access the facility is Hercules Cargo Aircraft. The nearest commercial airport is located in Prince George.

Northern Thunderbird Air and Williston Lake Air Services provide scheduled service to Mackenzie. Charter air services are provided by these two carriers as well as by Pacific Western Helicopters and Yellowhead Helicopters.

7.7.2.2 Project Effects

During construction and operations it is possible that some cargo may be flown to Mackenzie or that project personnel may utilize the airport. However, it is anticipated that the volume will be small and the airport will be able to handle the increase in demand.

An assessment was also undertaken to determine if the plume from the facility would have any effect on air traffic at the airport. The worst-case scenario results indicate that predicted fog and ice impacts due to water vapour emissions from the MGEC will be fairly minimal and localized. The maximum predicted ground-level ice impacts are localized on the western slopes of Williston Lake, approximately 5 km west of the plant site. The maximum predicted ground-level fog impacts that could result from MGEC operations are anticipated to be localized a few kilometres north north-west of the plant site. There were no plume-induced ground-level fog or ice hours predicted to result from MGEC operations at any of the airport receptors. These findings are discussed in more detail in Section 5.4.2.6.

7.7.2.3 Enhancement and Mitigation

As the project will have a minimal effect on air service in the area, mitigation measures are not required.

7.7.3 Rail

7.7.3.1 Baseline Conditions

BC Rail provides service to the Mackenzie area.

7.7.3.2 Project Effects

It is anticipated that the project will have certain materials delivered to Mackenzie by rail during construction but, as construction details have not yet been finalized, the nature of the goods moved by rails and the timing of the movements has not yet been determined.

7.7.3.3 Mitigation and Enhancement

None required.

7.8 EMERGENCY SERVICES

Emergency services in the District of Mackenzie include fire, police, ambulance, and emergency response programs.

7.8.1 Fire

7.8.1.1 *Baseline Conditions*

The District of Mackenzie Fire Department provides fire service within the District borders. The Department consists of a salaried Fire Chief, a Deputy Fire Chief and 36 volunteers operating out of one fire station. In addition to fire fighting and prevention duties, the Department provides vehicle extrication within and outside municipal boundaries.

The Department responds to approximately 100 calls per year (including false alarms). Of these, approximately 20 are to the industrial area and many of those are for minor events (e.g., problems in internal compressor rooms, blown bearings) and about 10-15 are to assist with vehicular accidents.

Average response time within the commercial and residential part of the District is about 5 - 10 minutes while response time to the industrial area is generally 10-15 minutes depending on the time of day and weather conditions.

Given that Mackenzie is located approximately two hours from the closest communities that could provide emergency support (i.e., Prince George and Chetwynd), back-up is provided by emergency response teams from local industry, retired fire fighters, and others in the community.

The MGEC project area has a good water supply system which has sufficient pressure for fire fighting, as does the remainder of the District.

The hazmat capabilities of the Fire Department are limited to an awareness level at present and the closest hazmat team would be in Prince George.

The Deputy Fire Chief has stated that the Mackenzie Fire Department has the capacity to handle an increased level of calls.

7.8.1.2 *Project Effects*

The MGEC will be designed to meet fire codes and other safety requirements. The site will also have adequate water pressure for fire fighting purposes.

As with any industrial project, it is possible that the Fire Department could be called upon to respond to fire, accident, medical, or rescue-related calls during construction and operation of the MGEC. However, given that

- peak construction won't coincide with the tourist season,
- workers will follow stringent safety procedures,
- there will be some level of onsite fire protection, and
- that the facility will be built to high standards,

the project should not place a heavy demand on local fire services. During operations, it is expected that the number of incidents requiring the response of the Fire Department to the project site will be extremely low or non-existent.

The small population increase associated with the project during construction and the fact that the workers will be housed at existing facilities is not expected to result in an increase in the demand for fire services. During operations, the population increase expected to result from the MGEC project is estimated to represent approximately 1% of existing population. This level of population increase will not result in a notable increase in demand for fire services.

Further, as noted above, the Department has indicated that it has the capacity to handle an increase in call volume.

7.8.1.3 Enhancement and Mitigation

The following steps will be taken to help ensure that any effect on fire services is minimized:

- Design MGEC to comply with government and industrial insurance underwriters' guidelines concerning fire and explosion hazards.
- Provide adequate water pressure to the site for fire fighting.
- Meet with the District of Mackenzie fire department to outline construction activities and emergency co-ordination.
- Provide copies of the Emergency Response Plans, Fire Containment Plan, Environmental Protection Plan, relevant portions of the operations and maintenance manual, emergency phone numbers and other relevant materials to the Fire Department.
- Invite fire department representatives to participate in training and safety procedures.
- Work with other companies in the industrial area to discuss and coordinate fire protection and emergency response.

Traffic management and mitigation measures and health and safety enhancement and mitigation measures identified in earlier sections of this Application will minimize fire risk and the need for support services from the District.

7.8.2 Police

7.8.2.1 Baseline Conditions

Police service in Mackenzie is provided by the RCMP. The Mackenzie Detachment has eleven members with eight being assigned to the District of Mackenzie (ratio of one officer to 650 residents). Three members are assigned to service and patrol the surrounding rural areas and First Nations communities although they can also assist the District members in all policing matters as necessary. Although the Detachment has adequate manpower for its current needs and is capable of handling an increase in calls, additional officers are being requested at this time as the manpower process generally takes 1-2 years to complete.

The Detachment covers an area of approximately 54,390 square kilometres from 42 Mile Creek on Highway 97 South to half way to Tsay Keh to the North and from Azouetta Lake Lodge (near the time change sign on the way to Chetwynd) to an area to the east at approximately the edge of the Rocky Mountain Trench and up to Azouetta Mountain and

over to the Peace Arm. If required, the Department receives back-up first from off-duty officers in the area and then from the North District located in Prince George.

According to the Mackenzie Detachment Staff Sergeant, the Detachment deals with a wide variety of policing issues and the caseload varies from year to year. The Detachment responds to a large number of drug and alcohol related calls as well as domestic and other personal violence incidents. However, property crime volumes are generally low as there is not a large transient population in the District given its location. The Detachment does not have many calls to the industrial area and indicated that most calls to the area would likely be transportation-related. As noted above, the Staff Sergeant has indicated that the Detachment is capable of handling an increase in caseload at this time.

The RCMP can work with projects of this type to encourage crime prevention through environmental design and are available to review the final lighting plans, security, and site design.

7.8.2.2 Project Effects

The MGEC is not expected to place a heavy demand on police services during construction or operations. The local RCMP Detachment noted that there could be a slight increase in alcohol and traffic-related offences during the MGEC construction phase. The actual number of such offences would depend on a number of factors including the percentage of local hire, work schedules, and contractor restrictions. Given the small population increase during operations, demand for police service is not expected to be any different than that currently experienced.

Despite best efforts by the contractors and employees, incidents involving project-related personnel, vehicles or activities that require police presence might arise. However, the volume of incidents requiring police presence is expected to be low.

The local Detachment has stated that they expect to be able to handle the increase in demand that may arise during construction and operations, as it would likely not be large and would be short-term in nature. In the case of a major emergency involving the project, they would work closely with other emergency response personnel to deal with the situation.

Given that the Detachment is capable of handling an increase in caseload and that only a small increase in demand is anticipated, the Detachment does not expect that the MGEC will negatively affect police services in the area during construction or operations.

7.8.2.3 Enhancement and Mitigation

The following steps will be taken to help minimize any effect on police services:

- Meet with the RCMP to outline construction activities and emergency co-ordination.
- Apprise the RCMP of oversize construction and materials deliveries and provide an overview of construction activities.
- Provide copies of the Emergency Response Plans, Fire Containment Plan, Environmental Protection Plan, relevant portions of the operations and maintenance manual, emergency phone numbers and other relevant materials to the RCMP.
- Fence the construction site and main operations area.

- Require that all visitors report to the project office.

Traffic management and mitigation measures and health and safety enhancement and mitigation measures identified in earlier Sections will also help to minimize any requirement for police services.

7.8.3 Ambulance

7.8.3.1 Baseline Conditions

Ambulance service in the District is provided by the BC Ambulance Service on a 24-hour per day year-round basis. The Mackenzie Ambulance Service covers an area from 10 kilometres past the Powder King Ski Resort to the north, to 42 Mile Creek (also known as the Crooked River Rest Area) to the south. However, given that the service is a provincial service, ambulances often respond to calls outside these geographic boundaries. The Ambulance Service also provides service to the entire Williston Lake area including two First Nations communities and eight to ten logging camps.

There are two ambulances stationed at the Ambulance station on Centennial Drive. One ambulance is staffed 24 hours a day 7 days a week with two on-call Paramedics. The second ambulance is staffed similarly when paramedic availability allows. However, there is a staff shortage in Mackenzie and the ambulance is currently only staffed approximately 70% of the time. In addition to the ambulances, service to more remote areas is provided by air. Local aircraft, both rotor and fixed wing, are typically contracted out to respond to remote areas. The BC Ambulance Service does have an Advanced Life Support (ALS) Airevac team located in Prince George at the Prince George Airport that operates daily. There are two other ALS airevac stations based out of Vancouver as well as an Infant Transport Team that provide 24-hour a day service to the province.

Ambulance response time to the industrial area averages about 10 to 12 minutes although it can vary slightly depending on how quickly the on-call paramedics can get to the station and where the call is. On average it takes about 7 minutes from when the call goes out to the paramedics for the ambulance to leave the station.

Annual call volume is between 430 and 480 responses per year with the volume increasing slightly from year to year. Statistically, the call volume is higher in the summer than in the winter.

Emergency back-up would be provided by off-duty personnel who are available followed by ambulances dispatched from other Stations. The closest ambulance stations are located in Chetwynd to the north and Bear Lake to the south.

The Unit Chief has indicated that the station has sufficient staff to deal with an increase in call volume. However, given the nature of the service, call response time varies with the demand at any particular time.

7.8.3.2 Project Effects

The project will comply with WCB requirements and is not expected to place a heavy demand on ambulance services during either construction or operations. Potential demand could result from accidents at the job-site or on local roadways or from medical emergencies involving employees. However, as individuals trained in industrial first aid and a first aid

station will be located onsite, it is expected that most incidents occurring onsite will be treated onsite.

In addition, Pope & Talbot has an ambulance that may be available to respond to the MGEC site. The EPC contractor will be responsible for first aid facilities and services and safety meetings. During operations, there will be trained staff in first aid and there will be a first aid station/area.

Although it is not possible to quantify the number of additional calls that will be related to project construction, it is anticipated that the volume will be small and that the effect on ambulance services in Mackenzie will be minimal. The project will have no effect on local ambulance services during normal operations other than the demand arising from operations staff and their families and, given the small size of the population increase associated with this project relative to the resident population, it will be negligible. In the case of an emergency at the facility there may be a short-term increase in demand.

Despite best efforts by the contractors and employees, accidents or incidents involving project-related personnel that require ambulance services could occur (e.g., workplace accidents, and general illness). The Mackenzie Ambulance Station has indicated that it is capable of handling an increase in demand but that response time is dependent on other activity in the area at the time (i.e., if three calls are received at the same time or if an ambulance is already responding to a call, response time will be different than if one call is received).

7.8.3.3 Enhancement and Mitigation

The following steps will be taken to help ensure that an effect on ambulance services is minimized:

- meet with the District of Mackenzie ambulance station to outline construction activities and emergency coordination; and
- provide the unit chief with a tour of the site and copies of the Emergency Response Plan, Fire Containment Plan, Environmental Protection Plan, operations and maintenance manual, emergency phone numbers and other relevant materials.

Traffic management and mitigation measures and health and safety enhancement and mitigation measures identified in earlier Sections will also help minimize any requirement for ambulance services.

7.8.4 Emergency Response

7.8.4.1 Baseline Conditions

7.8.4.1.1 Mackenzie Emergency Plan

Under the BC *Emergency Program Act* all municipalities must develop an emergency plan. The plan forms the basis for organizing local, regional and provincial resources in the event of an emergency.

The District of Mackenzie has prepared an emergency response program to help minimize the effects of a major emergency or disaster in the area. Representatives of the Municipal

Government, local emergency service providers and representatives of the major industrial operations in Mackenzie participate in the Program.

7.8.4.1.2 *Provincial Emergency Program*

The Provincial Emergency Program (PEP) is headquartered in Victoria and works to maintain effective awareness, preparedness, response and recovery programs aimed at reducing the human and financial costs of actual or imminent emergencies and disasters. PEP works with local and regional governments to analyze hazards and risks, develop and test emergency plans, and train and organize emergency staff and volunteers.

PEP maintains a 24-hour Emergency Coordination Center in Victoria. If a major disaster or emergency occurs, PEP, in cooperation with other Ministries, will open a regional emergency operations center from which it will coordinate the provincial response and provide liaison with local and federal agencies.

7.8.4.2 *Potential Project Effects*

A generation facility is a post-disaster facility and, as such, is designed to higher standards than other facilities (i.e., seismic) and would be expected to be available to provide service after a disaster. However, MGEC will develop an emergency plan to ensure that any incident can be handled. However, it is not anticipated that the construction or operation of the MGEC would require implementation of the project plan, the District of Mackenzie plan, or the Provincial Emergency Program.

However, as with any project, there is a chance that an accident directly related to the project could occur. At the same time, there is the possibility that a natural disaster affecting the project could occur. This level of risk exists for any project in any location of the province. Should implementation of all or a portion of the project, provincial, or municipal emergency plan be required, local emergency services (i.e., fire, ambulance, and police) have indicated that they anticipate that they would be able to handle the situation. Further, the District of Mackenzie believes that the emergency plan it has in place would be able to successfully handle a major emergency in the District. As noted above, the project should be included in post "natural disaster" planning process in the area as it is expected that it will be providing service in such a situation.

7.8.4.3 *Enhancement and Mitigation*

As noted above, an emergency response plan (ERP) will be prepared to address potential emergency situations for the MGEC. This plan will serve to protect personnel and plant property, the general public, and the environment. The ERP will be prepared in consultation with appropriate regulatory agencies as well as the District of Mackenzie Emergency Program Co-ordinator to ensure effective and timely response to any potential emergencies. Types of potential emergencies will be defined in the ERP, with plant personnel being assigned specific duties and responsibilities in the event of an emergency. Details of the plan are contained in Section 3.

The proposed MGEC will also be designed to comply with applicable government and industrial insurance underwriters' guidelines concerning fire and explosion hazards.

As described in more detail in Section 3, the operations staff at the proposed facility will be equipped with appropriate emergency response equipment. Staff will be trained to handle

potential emergency situations according to appropriate procedures set out in the ERP. Hazard prevention and emergency preparedness will be fostered through regular employee training in emergency response procedures and in the use of all emergency equipment.

7.9 PUBLIC HEALTH

7.9.1 Baseline Conditions

MGEC will be located in the Northern Interior Health Service Delivery Area, one of three Health Service Delivery Areas comprising the Northern Health Authority. Northern Health is responsible for the delivery of health care across northern British Columbia, including acute care, mental health, public health, addictions, and home and community care services.

Mackenzie offers its citizens a range of health services including the Mackenzie & District Hospital, Mackenzie Health Centre, intermediate and extended care, and a range of medical and alternative practitioners and services.

Mackenzie & District Hospital has 12 acute care beds including 5 in-patient beds, 4 emergency beds and two birthing rooms. The hospital serves the District of Mackenzie and surrounding area including McLeod Lake, Tsay Keh Dene and Kwadacha First Nations communities. The hospital is currently operating at capacity and has a number of long-term care patients waiting for placement. This area, like others in the province, is facing growing demand coupled with funding and staffing challenges.

Hospital services include in-patient care, laboratory services, out-patient care, radiology, dietary services and an emergency room. The emergency room operates 24 hours per day with a doctor available at all times, either in the facility or on call. In the case of major trauma, the patient is stabilized and then sent to Prince George or Vancouver depending on the direction provided by the Provincial Bedline which identifies available facilities for transfers. Surgeries are not performed at the Mackenzie & District Hospital.

The Mackenzie Health Centre, located at the Hospital, also provides a wide range of community health services to the community including maternal and child care, school health resources, youth/adult clinic, needle exchange, pregnancy testing/counselling, immunization programs, communicable disease control and testing, adult travel clinics, pre-natal counselling, and environmental health services

7.9.2 Potential Project Effects

As the majority of the construction workforce is anticipated to be in the 20-55 age group, they will not be large users of general health care. Demand during construction would result from accidents or emergency situations at the site or on roadways as incoming workers would most likely continue to deal with their general health needs in their home communities. Any effect on health facilities during construction will be short-term in nature.

During MGEC operations the existing health services will easily accommodate the incremental demand as the population increase associated with this project is low. In the case of an emergency there could be a short-term increase in demand for services and this could be accommodated.

Due to the small size of the incoming workforce relative to the resident population during construction, and particularly during operations, the MGEC will not result in the need for new

health facilities. As such, local health facilities and service providers anticipate that they will be able to handle the increase in demand placed on them during construction and operations.

With a view to minimizing any effect on community health, the MGEC will be designed to meet all federal and provincial health and safety standards as well as guidelines and regulations regarding air and water emissions and noise. As such, the MGEC is not anticipated to have a negative impact on the health of residents in the study area. During construction and operations, there may be some positive health effects resulting from increased employment and income. Further, the effect of this project overall is expected to result in an improvement in air quality in the region which would be beneficial to the health of local residents as well as to health service providers who may see a decrease in demand.

7.9.3 Enhancement and Mitigation

MGEC will take a number of steps to ensure that any effect on local health services is minimized. Key measures will include:

- preparing an Emergency Response Plan (ERP) in consultation with appropriate regulatory agencies and the District of Mackenzie Emergency Program Co-ordinator;
- requiring that the MGEC EPC contractor have a safety program that complies with WorkSafeBC regulations and that all employees are briefed on safety policies and practices; and
- having staff trained to comply with WorkSafeBC's first aid requirements.

The mitigation and enhancement measures identified in the air quality, and water and effluent sections of this application will help to ensure that potential effects on community health are mitigated to the extent possible.

7.10 UTILITY SERVICES

7.10.1 Water

7.10.1.1 Baseline Conditions

The District of Mackenzie receives its water supply from four wells at Gantahaz and Morfee Lake. The District Water Services Division is responsible for maintaining the distribution systems in Mackenzie and supplying both the residential and industrial areas of Mackenzie.

7.10.1.2 Potential Project Effects

The MGEC will not use the District of Mackenzie's water system and will not use groundwater. Water and fire water will be obtained from Pope & Talbot. Information on the water supply for the MGEC is provided in Section 3.

The population increase associated with the construction and operation of the MGEC will have no effect on water service in Mackenzie. Construction workers for the MGEC will be housed at existing facilities and the total population of Mackenzie has recently decreased. Given that the water system was able to meet the demand of a larger population, it is considered sufficient to meet the projected increase that will result from this project.

7.10.1.3 Enhancement and Mitigation

None required. Use of the Pope & Talbot system mitigates any effect on the District system.

7.10.2 Sanitary Sewer

7.10.2.1 Baseline Conditions

7.10.2.2 Potential Project Effects

The MGEC will not use the District of Mackenzie's sanitary sewer system as sanitary sewer services will be obtained from Pope & Talbot. Information on the sanitary sewer system for the MGEC is provided in Section 3.

The project will have no effect on the District sewer system during construction other than use by construction workers when they are at locations served by the District sewer system.

During operations, the MGEC will use the Pope & Talbot sanitary sewer and waste water treatment facilities and will not place any demand on District facilities for sanitary sewer or waste water. The only use of the District sewer system would occur by incoming workers and the District has indicated that there is more than sufficient capacity to handle the increase in use that would occur.

7.10.2.3 Enhancement and Mitigation

None required. Use of the Pope & Talbot system mitigates any potential effect on the District system.

7.10.3 Solid Waste

7.10.3.1 Baseline Conditions

7.10.3.2 Potential Project Effects

The MGEC will generate wastes during plant construction and from processes and maintenance work during normal operations. Mackenzie Green Energy Limited Partnership (MGELP) intends to manage these wastes to reduce, reuse and recycle wastes where practical, and to ensure all regulatory requirements are met.

The construction of the facility will result in the generation of a variety of waste materials including scrap steel, clean wood, recyclables and other solid wastes. During operations, process wastes will include wastewater, drain tank liquids, spent chemicals, used oils and the like.

During construction and operations, waste material acceptable at the landfill will be deposited there. Special waste materials will be dealt with in an appropriate manner and deposited at designated facilities. The project will not affect solid waste management systems in the area other than to provide some additional business.

Temporary waste storage, if required, will be designed and constructed in conformance with all applicable Provincial regulatory requirements and the building code.

Additional information on waste management can be found in Section 5.15.

7.10.3.3 Enhancement and Mitigation

Waste generation will be minimized at source to the extent practical. Recyclable materials will be recycled through local independent contractors and businesses.

7.10.4 Electricity

7.10.4.1 Baseline Conditions

BC Hydro supplies electricity to the Mackenzie area through a transmission line from the WAC Bennett Dam. Sufficient electricity is available to meet demand in the area.

7.10.4.2 Potential Project Effects

The construction of the MGEC will have no effect on electricity supply or service in Mackenzie or the regional study area.

BC Hydro has indicated that during operations there is sufficient supply and distribution capacity in Mackenzie to accommodate the anticipated population increase. Further, during operations, the facility will play an integral part in generating the electricity required by residents and businesses in the Mackenzie area. Development of the MGEC will help increase security of electricity supply for the Mackenzie area and the province as a whole.

7.10.4.3 Enhancement and Mitigation

None required.

7.10.5 Natural Gas

7.10.5.1 Baseline Conditions

Terasen supplies natural gas to the Mackenzie area via a 30-km lateral off the Westcoast mainline that services Mackenzie. This pipeline is providing gas to the three mills (P&T, Canfor, Abitibi-Consolidated) and the local community. Currently, all the firm transmission capacity in the line is “owned” by the three mills and there is no additional firm space available in the gas line. However, if the mills are not using their full commitment, then there is “interruptible” gas available and, on most days, the mills do not use their full capacity. Further, the large industrial consumers are asked to cut back on their usage during periods when gas supply to the Town is constrained (currently 0-10 days per year).

7.10.5.2 Potential Project Effects

There will be no effect on natural gas supply or service in the Mackenzie area during construction of the MGEC.

Once MGEC becomes operational, steam sales to Pope & Talbot will decrease Pope & Talbot's demand for gas by 50-60% and potential steam sales to Canfor may decrease Canfor's demand for gas by 80-90% thereby freeing up considerable capacity on the lateral. For the most part, MGEC will require gas on an interruptible basis. Given the displacement described above, gas supply for the MGEC may be taken from the Pope & Talbot and Canfor allocations on the Terasen pipeline. MGEC gas requirements are normally significantly less than its total capacity requirement, as most of the gas is used for backup purposes.

The only exception to this would be if the MGEC power boiler is out of service on an unscheduled outage. In this type of scenario, gas would be required by MGEC to continue to provide steam to Pope & Talbot and, possibly, Canfor. In this case, the situation on the lateral would effectively return to the same operating conditions that exist currently. However, given that MGEC expects to have a forced outage rate of less than 5%/yr, the number of days where the pipe is constrained will be significantly less. On a pure probability basis, the number of days of constraint (0-10 days/yr) should fall by 95% (the availability of our boiler) to about 1 day/yr.

The existing natural gas service line on the proposed project site will likely be relocated and a new metering and regulation station to supply gas to MGEC from the existing Pope & Talbot lateral will be developed.

During operation there may be some increased demand from new residents moving to the area. There is sufficient supply to meet the increase in demand that would be generated by approximately 30 new customers.

7.10.5.3 Enhancement and Mitigation

None required.

7.11 SUMMARY

The socio-economic assessment concluded that there would be no significant adverse effects on socio-economic features in the District of Mackenzie as a result of the development and operation of the Mackenzie Green Energy Centre but that there would be ongoing benefit in terms of employment and business opportunities over the lifetime of the project.

The permanent population increase associated with the project will result in a total population that is considerably lower than that of a decade ago and this population increase will help support existing services and businesses.

In terms of housing, the District has recognized that additional land will be required for single family residential development should demand increase and is currently considering means through which to address the anticipated demand.

MGELP has indicated its willingness to work with the community to ensure that the community benefits to the extent possible from the project and to ensure that any potential issues (e.g., high project demand for temporary accommodation during existing peak periods) are addressed in a timely manner.

Employment and business opportunities will provide an ongoing benefit to local residents and businesses. As indicated throughout this section, as well as Section 6, MGEI will work with the community and the First Nations with an interest in the project to facilitate local participation in the employment and business opportunities to the extent possible.

Perhaps most importantly, the development of the MGEC will also improve the economic competitiveness of the industries utilizing steam produced by the facility as will decrease their energy costs. This is beneficial to employees of those industries as well as to the businesses that the industries and their employees support in the District and elsewhere.