PREFACE

The Mackenzie Green Energy Centre (MGEC) was awarded an Electricity Purchase Agreement (EPA) by BC Hydro under its Fall 2006 Open Call for Power. The EPA between BC Hydro and Mackenzie Green Energy LP (MGELP), the owner of the MGEC, took effect on August 29, 2006 and was approved by the BC Utilities Commission on September 21, 2006 (Order E-7-06).

The Mackenzie Green Energy Limited Partnership (MGELP) is submitting this application to the BC Environmental Assessment Office (EAO) for an Environmental Assessment Certificate (EAC), which would allow it to construct and operate the MGEC. The MGEC is subject to review under the BC Environmental Assessment Act pursuant to a request by MGELP and a Section 10 Order (dated March 9, 2006) issued by the EAO. MGELP anticipates applying for funding for the MGEC under the recently announced federal ecoENERGY Renewable Initiative, or any other future federal incentive programs. The MGEC is therefore subject to review under the Canadian Environmental Assessment Act, which MGELP expects will be harmonized with the provincial review. MGELP intends to apply for the required permits to commence construction of the plant immediately upon receipt of an EAC.

This Application has been developed pursuant to the Approved Application Terms of Reference (dated January 31, 2007) issued by the EAO and instructions provided in the Section 11 Order (dated June 19, 2006).

Consultation with local First Nations, government agencies, the public and other interested parties in regard to the MGEC began in mid-2005 in anticipation of the BC Hydro 2006 Call for Power. For the purpose of this Application, the period from mid-2005 to submission of the Application is considered the pre-Application period. The formal pre-Application consultation program for the MGEC began in February 2006 and continued through to submission of the Application,

Consultation undertaken from 2005 to submission of the Application focussed on discussions with government officials, Treaty 8 First Nations with an interest in the project, the public, and stakeholder groups. The following Treaty 8 First Nations have indicated an interest in the project: the Fort Nelson First Nation; the McLeod Lake Indian Band; the Saulteau First Nations; and the West Moberly First Nations.

EXECUTIVE SUMMARY

PROJECT DESIGN

Mackenzie Green Energy Limited Partnership (MGELP) is proposing to construct and operate the Mackenzie Green Energy Centre (MGEC) in the District of Mackenzie, located approximately 175 km (2 hours) north of Prince George by road. The MGEC will be a biomass energy cogeneration facility designed to deliver an average of 59 MW of electricity to BC Hydro and approximately 272 GJ/h of steam for process and heating applications to the Pope & Talbot pulp mill and, potentially, to the Canfor sawmill. The MGEC will have a net output capacity of up to 75 MW if all of the facility's steam capacity is used for electricity generation.

The MGEC was awarded an Electricity Purchase Agreement (EPA) by BC Hydro under its Fall 2006 Open Call for Power. The EPA between BC Hydro and Mackenzie Green Energy LP took effect on August 29, 2006 and was approved by the BC Utilities Commission on September 21, 2006 (Order E-7-06). Electricity (net output) from the MGEC will be sold to BC Hydro.

Under average operating conditions, the MGEC will deliver 480 GWh of electricity to BC Hydro and 2,226 TJ of thermal energy as steam, annually. The MGEC will supply the annual electrical needs of approximately 50,000 households. The facility's expected operating lifetime is 30 years.

The primary fuel for the facility will be wood residue obtained from sawmills within approximately 100 km of the plant site. A small percentage of the energy input to the MGEC will be from biomass derived fuels supplied by the Pope & Talbot pulp mill, with an average of about 2% from kraft soap, a by-product of the pulping process, and 1% from primary clarifier sludge, which is composed largely of wood fibre. Kraft soap is now shipped to Prince George and used as fuel, while primary clarifier sludge is being landfilled. To a small extent chips produced in the region from forest slash remaining after logging may also be used. Natural gas fired auxiliary boilers will be used to provide backup steam generation capability when the wood-fired boiler is shut down temporarily for repairs and maintenance, or during times of high electricity demand to meet steam sales commitments.

A total of approximately 89 trucks per day will deliver wood residue to the MGEC from suppliers in Mackenzie, Chetwynd, Bear Lake, and Fort St. James. Fuel deliveries are likely to be contracted to independent trucking firms. Trucks will use existing industrial roads for fuel deliveries originating in Mackenzie, and will use Highways 97 and 39 for fuel deliveries originating from Bear Lake and Chetwynd. Forestry roads will be used for fuel deliveries originating from Fort St James.

The MGEC will generate electricity and steam using a modern high-pressure stoker boiler, a steam cycle and a condensing steam turbine-generator. An efficient electrostatic precipitator will be installed to reduce the concentration of particulate matter in the stack gas to the lowest permitted level of comparable wood-fired power boilers in British Columbia. Good combustion practices and an advanced computerized boiler control system will be utilized to minimize emissions of other pollutants. The main components of the proposed facility are:

- A wood residue-fired boiler with supplemental natural gas-firing capability;
- A condensing steam turbine generator;
- Natural gas-fired auxiliary boilers for backup steam supply;

- Steam and condensate pipelines to provide steam to local mills and return condensate to the MGEC for re-use in the boiler;
- Wood residue and primary clarifier sludge unloading equipment, storage area, and reclamation, conveying, and feeding equipment;
- Kraft soap storage, handling and feeding equipment;
- Particulate matter emission control equipment;
- Stacks for discharge of flue gases to the atmosphere;
- A cooling tower;
- An onsite electrical substation and switch gear, and a short power transmission line to connect to the BC Hydro power transmission line;
- A short natural gas feeder pipeline and a metering and regulation station to provide fuel needed for plant start-ups, in case of upsets in wood firing, and for the auxiliary boilers;
- A water supply and associated pipeline from Pope & Talbot Inc. under its existing water license;
- Wastewater effluent discharge to the advanced effluent treatment system at the Pope & Talbot's Mackenzie Pulp Operations mill;
- Sanitary sewer discharge to Pope & Talbot's sanitary waste treatment system;
- An onsite landfill for disposal of wood ash for the 30-year service lifetime of the MGEC;
- A building to house the power boiler, auxiliary boilers, steam turbine and ancillary equipment; and
- Primary and secondary truck and vehicle access to the MGEC site from existing industrial roads.

The site proposed for the MGEC is 43.1 hectares in area and located approximately 5 km from Mackenzie. The site is comprised of two privately owned parcels that will be purchased by MGELP. The portion of the site owned by Mackenzie Pulp Land Ltd. is zoned by the District of Mackenzie for electric power generation (Heavy Industrial - M3 zone). The portion of the site owned by BCR Properties Ltd. is in the process of being rezoned to Heavy Industrial zoning independently of the MGEC project. The nearest residentially zoned land is 2 kilometres east of the proposed site.

The MGEC site has been extensively disturbed by past developments and logging activities and on-going use. This site is located within less than 500 m of the Pope & Talbot pulp mill and the Canfor sawmill, thus facilitating delivery of steam to the mills and return of condensate to the MGEC. Existing infrastructure will be used for primary road access, water supply, wastewater treatment, delivery of electric power to the grid, and access to natural gas supply.

The costs and employment numbers for construction and operation of the MGEC are expected to be:

Costs:

Construction cost:	$200-225 million
Annual operating cost:	$15-20 million (includes fuel supply and transportation).

Employment:

Construction	322 person-years; and a peak number of workers of 260.
Operation	28 full-time and apprentice positions.

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.

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.

Site construction work is expected to start in the summer of 2007. Installation of equipment and materials and construction of buildings and above ground structures is planned to start in January 2008. Plant commissioning activities should commence during the summer of 2009 with performance testing following in the fall of 2009. The MGEC is scheduled to start commercial service in December 2009.

ENVIRONMENTAL ASSESSMENT

A comprehensive environmental assessment was conducted in accordance with the Approved Application Terms of Reference developed in consultation with government agencies, First Nations, stakeholder groups and the public. The environmental assessment found there would be no significant adverse environmental effects in the baseline study areas, the District of Mackenzie, or the MGEC fuel supply areas with the mitigation measures proposed by MGELP. This includes consideration of potential direct, indirect and cumulative effects from construction, operation, dismantling and abandonment of the MGEC.

The main environmental issues identified through consultation activities were the potential effects of the MGEC on air quality, ground-level fog, noise, water quality (surface and groundwater), and wildlife.

Operation of the MGEC will reduce pollutant and greenhouse gas emissions by enabling the shut down of the old wood and natural gas-fired power boiler at the Pope & Talbot pulp mill and, potentially, the switching of the lumber dry kilns at the Canfor sawmill from natural gas to steam heating. Ambient particulate concentrations in Mackenzie will decline as a result of the proposed project. The greenhouse gas emission intensity of the MGEC will be low, at only 23 kg/MWh net ouput. This is 6.4% of the level typical of natural gas-fired combined cycle gas turbine technology, and 3% of the level typical of the most efficient commercial coal-fired power generation technology. Benefits to air and water quality will also be realized from the MGEC in communities located in fuel supply areas due to the reduction in the quantity of wood residue incinerated in beehive burners, or landfilled.

Because of past development and existing use of the proposed MGEC site, in combination with the mitigation measures proposed by the MGELP, potential impacts to vegetation and

wildlife during construction and operation of the MGEC are expected to be minimal to low. There will be no direct effects to aquatic life as there is no fish habitat on the site. The proposed Storm Water Management Plan will mitigate potential effects from storm water and sediment transport during construction and operation of the MGEC.

The MGEC will discharge process wastewater to the Pope & Talbot pulp mill's effluent treatment system for treatment prior to discharge in accordance with the mill's current effluent permit. No adverse effects are expected to occur from the MGEC effluent due to its low strength (high quality) and the low average discharge flow rate (0.8% of the mill's average discharge flow rate). Advanced mitigative measures have been included to collect and treat storm water runoff and leachate from both the wood residue storage area and the wood ash landfill area prior to this effluent being discharged to the adjacent wetland. This plan is consistent with the long-term use of this manmade wetland by the Pope & Talbot pulp mill, in accordance with its effluent permit, and will help sustain the water flow through the wetland that will decrease when the mill's power boiler is shut down. The quality of the outflow from the wetland is expected to continue to meet current permit criteria. No adverse effects are likely to occur to wildlife using the wetland.

The operational noise from the MGEC will be significantly below 65 dBA, the noise level typically used as a noise limit in commercial/industrial areas in British Columbia. The MGELP has proposed measures to mitigate construction and operational noise.

Table S-1 summarizes the results of the environmental assessment and the monitoring of residual effects proposed by MGELP. Table S-2 summarizes the results of the cumulative effects assessment.

FIRST NATIONS EFFECTS ASSESSMENT

The proposed MGEC site is located within the bounds of the Treaty 8 lands. All Treaty 8 First Nations have an equal right to utilize the land within the bounds of Treaty 8. Therefore, in early 2006, the BC EAO advised all Treaty 8 First Nations that a project was being considered within their territory and invited them to participate in the project review should they so desire. The following Treaty 8 First Nations indicated an interest in the project:

- Fort Nelson First Nation
- McLeod Lake Indian Band
- Saulteau First Nations
- West Moberly First Nations

Socio-economic issues specific to the First Nations with an interest in the project were addressed, including traditional use, treaty rights, employment, business opportunities and transportation and traffic as it relates to potential interactions between wildlife and project vehicles. No significant adverse project effects on traditional use, treaty rights, or wildlife are expected based on implementation of the proposed mitigation measures. MGELP will work to maintain an open and ongoing relationship with the four First Nations expressing an interest in the project. Employment and business opportunities will provide an ongoing benefit to local First Nations interested in taking advantage of them.

SOCIO-ECONOMIC ASSESSMENT

The socio-economic assessment found 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 MGEC, but that there would be ongoing benefit in terms of employment, business opportunities, and government revenues. MGELP will work with the community to ensure that the community benefits to the extent possible from the project and to ensure that any potential issues are addressed in a timely manner. Employment and business opportunities will provide an ongoing benefit to local residents and businesses. The development of the MGEC will also improve the economic competitiveness of the industries utilizing steam produced by the facility.

CONSULTATION ACTIVITIES

MGELP recognized early in the project planning process that it was important for interested parties to be informed about the project and to have the opportunity to provide input to the project proponent. MGELP also recognized that a proactive approach would help ensure that potential issues were identified and that positive effects were enhanced and negative effects mitigated.

An initial list of interested parties was prepared based on discussions with local, regional, federal and provincial governments, local First Nations and community groups and organizations, as well as on internet searches for active groups in the project area.

The following issues were identified during the pre-application consultation program:

- **Project Design Issues:**
  - Project design
  - Site selection
- **Air Quality Issues:**
  - Emission control technologies
  - Modelling criteria/details for air quality assessment
  - Air quality
- **Surface Water Quality Issues:**
  - Sanitary sewer and effluent
  - Water quality monitoring
- **Groundwater Quality Issues:**
  - Wood residue handling and storage
  - Ash handling
  - Water quality monitoring
- **Water Supply Issues:**
  - Water usage
- **Waste Management Issues:**
  - Waste management
  - Ash handling
- **Biophysical Issues:**
  - Effects of traffic on wildlife
  - Effects on wildlife and migratory birds
- **Environmental Management Issues:**
  - Environmental management plans
- **Socio-economic Issues:**
  - Employee housing
  - Economic impact
  - Increased truck traffic
  - Operations employment
  - Economic opportunities
- **First Nations Specific Issues:**
  - Treaty 8 Bands have the right to use all Treaty 8 lands
  - Protection for sensitive vegetation identified in TLUS

COMMITMENTS

The mitigation and monitoring commitments made in this Application for the construction, operation and decommissioning of the MGEC are summarized in Section 10 of the Application. Design and operational commitments have been made by MGELP to mitigate the potential environmental, First Nations and socio-economic effects of the MGEC. The list

of commitments will be used by MGELP to assist tracking the status of implementation of the commitments for the MGEC following receipt of an Environmental Assessment Certificate.

The MGELP has developed a preliminary Environmental Management Program (EMP) for implementation during construction and throughout the operating lifetime of the MGEC. The component plans that comprise the EMP are summarized in Section 9 of the Application, and are provided in detail in the appendices to this Application. Environmental monitoring has been included in these plans where warranted. The proposed EMP is concluded to be adequate to ensure the proposed design and operating measures assessed in this Application mitigate the potential effects of construction and operation of the MGEC.

CONCLUSIONS

Overall, it is concluded that the MGEC will have a number of positive environmental and socio-economic effects and will have no significant adverse effects.

Table S- 1 Summary of Assessment, Mitigation and Monitoring for MGEC

Issue/VEC	Residual Impact Assessment Indicators							Supplemental Mitigation Planned*	Monitoring Proposed
	Geographic Extent	Direction	Magnitude	Duration & Frequency	Reversibility	Significance	Confidence		
AIR QUALITY									
Nitrogen Dioxide	Sub-Regional	Negative	Low	Long-term; Continuous	Reversible	Not significant	Good	None	Continuous emission monitoring will be conducted for NOx, in-stack opacity and flow rate. Stack emission monitoring will be conducted for PM, NOx and flow rate.
Sulphur Dioxide	Sub-Regional	Neutral	Low	Long-term; Continuous	Reversible	Not significant	Good	None	
Carbon Monoxide	Sub-Regional	Negative	Low	Long-term; Continuous	Reversible	Not significant	Good	None	
Particulate Matter (PM_{10} & $PM_{2.5}$)	Sub-Regional	Positive	Low	Long-term; Continuous	Reversible	Not significant	Good	None	
Visibility									
Fog & Ice from cooling tower water vapour	Sub-Regional	Negative-Neutral	Low	Long-term; Seasonal	Reversible	Not significant	Good	None	None
NOISE									
Construction	Local	Negative	Moderate	Medium-term; Intermittent	Reversible	Not significant	Good	Will respond to mitigate noise complaints.	None
Traffic Noise	Local	Negative	Minimal	Long-term; Intermittent	Reversible	Not significant	Fair		None
Operating Noise	Local	Negative	Low	Long-term; Continuous	Reversible	Not significant	Good		None
GREENHOUSE GAS Emissions	Provincial-Global	Positive	Low-Medium	Long-term; Continuous	Reversible	Significant	Good	None	Greenhouse gas emissions will be reported to Statistics Canada, as required.
PROCESS WASTEWATER & RECEIVING WATER QUALITY	Local	Negative-neutral	Nil	Long-term; Continuous	Reversible	Not significant	Good	None	Responsibility for monitoring will be retained by Pope & Talbot under its effluent permit.
STORM WATER RUNOFF QUALITY	Local	Neutral	Low	Long-term; Intermittent	Irreversible	Not significant	Good	None	Conduct baseline monitoring at north end of wetland prior to start of construction. Continue monitoring TSS and oil & grease during construction.
LEACHATE RUNOFF & RECEIVING WATER QUALITY	Local	Neutral to Negative	Low	Long-term; Continuous	Reversible	Not significant	Fair to Good	Optimize treatment if required to meet permit criteria	• Conduct seasonal baseline monitoring study for sewage effluent, ash pond effluent and wetland prior to start-up. • During operation, Pope & Talbot will monitor BOD_5, TSS, toxicity (rainbow trout) and flow rate at the discharge from the Pope & Talbot ash pond.
GROUNDWATER QUALITY	Local	Positive	Low	Long-term; Continuous	Reversible	Not significant	Fair to Good	None	Monitor 2 wells on the perimeter of the wood storage area and wells on each of four sides of the wood ash landfill for specific contaminants.
WATER SUPPLY	Local	Neutral	Nil	Long-term; Continuous	Reversible	Not significant	Excellent	None	In accordance with Pope & Talbot's water licence.
AQUATIC RESOURCES	Local	Neutral	Nil-Low	Long-term; Continuous	Reversible	Not significant	Good		As per Storm Water Management Plan.
WILDLIFE & VEGETATION									
Construction & operation	Local	Negative	Minimal-Low	Long-term; Continuous	Reversible	Not significant	Good	None	Conduct field assessment prior to clearing to confirm presence/absence of new species. Conduct site inspections during construction.
Wood residue truck traffic (wildlife)	Regional	Negative	Low	Long-term; Continuous	Reversible	Not significant	Good	None	Monitor reports of truck collisions with large animals.
SOILS	Local	Neutral	Minimal to Nil	Long-term; Continuous	Reversible	Not significant	Good	None	None
ARCHAEOLOGY	Local	Neutral	Nil	Permanent	Irreversible	Not significant	Good	If archaeological resources found.	If archaeological resources found, will monitor as required by permit.
WASTE MANAGEMENT	Local	Negative	Low	Long-term; Continuous	Irreversible	Not significant	Good		See Groundwater Quality VEC for monitoring of ash landfill.
LAND USE	Local	Neutral	Moderate	Long-term; Continuous	Reversible	Not Significant	Good	None	None

* Supplemental to the mitigation committed to in the appropriate section of the Application, on which the impact assessment is based.

Table S- 2 Summary of Cumulative Effects Assessment, Mitigation and Monitoring for MGEC

Issue/VEC	Residual Impact Assessment Indicators						
	Geographic Extent	Direction	Magnitude	Duration & Frequency	Reversibility	Significance	Confidence
AIR QUALITY							
MGEC emissions							
Nitrogen Dioxide	Sub-Regional	Negative	Low	Long-term; Continuous	Reversible	Not significant	Good
Sulphur Dioxide	Sub-Regional	Neutral	Low	Long-term; Continuous	Reversible	Not significant	Good
Carbon Monoxide	Sub-Regional	Negative	Low	Long-term; Continuous	Reversible	Not significant	Good
Particulate Matter (PM_{10} & $PM_{2.5}$)	Sub-Regional	Positive	Low	Long-term; Continuous	Reversible	Not significant	Good
AIR QUALITY							
Regional beehive burner emissions							
Nitrogen Dioxide	Regional	Positive	Medium	Long-term; Intermittent	Reversible	Significant*	Fair
Sulphur Dioxide	Regional	Positive	Medium	Long-term; Intermittent	Reversible	Significant*	Fair
Carbon Monoxide	Regional	Positive	Medium	Long-term; Intermittent	Reversible	Significant*	Fair
Particulate Matter (PM_{10} & $PM_{2.5}$)	Regional	Positive	Medium	Long-term; Intermittent	Reversible	Significant*	Fair
GREENHOUSE GAS Emissions	Provincial-Global	Positive	Low-Medium	Long-term; Continuous	Reversible	Not significant	Good
NOISE							
Operating Noise	Local	Negative	Low	Long-term; Continuous	Reversible	Not significant	Good
WILDLIFE & VEGETATION							
Construction & operation	Local	Negative to Neutral	Minimal	Long-term; Continuous	Reversible	Not significant	Fair
SOCIO-ECONOMIC							
Temporary Housing during Construction	Local	Negative to Neutral	Minimal	Short-term, intermittent	Reversible	Not significant	Good

* Applies to the benefit of reduced exposure to air pollutants.