Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their needs!
Bruntland Report “Our Common Future”
From the United Nations Commission on Environment and Development on Sustainability, 1987

As a planning and decision-making tool, environmental assessment provides an effective means of integrating environmental factors into federal planning and decision-making processes in a manner that contributes to sustainable development.
Canadian Environmental Assessment Web site

"In the long run, sustainable development is not an end point, but an approach to decision making that reflects a commitment to improving the quality of life today while considering the economic, social, and environment needs of future generations."
The Honourable David Anderson
Minister of the Environment, October 2, 2001

“The Government of Canada seeks to achieve sustainable development by conserving and enhancing environmental quality and by encouraging and promoting economic development that conserves and enhances environmental quality.”…..
Canadian Environmental Assessment Agency Web Site

International Hydropower association guidelines on sustainability:
Eco-efficiency
All power generation options should be based on life-cycle analysis of alternative technologies.

Proposed Lower Churchill Hydro Project/Labrador Island Transmission Link

Presentation to the Happy Valley-Goose Bay Town Council
May 20th 2010
By Grand Riverkeeper® Labrador, Inc.
Member: Waterkeeper Alliance®

One tree island, Grand River

The Lure of the Labrador is the Lure of the wilderness. The Grand River watershed covers a full 93,000 sq km of near-pristine boreal forest. *A jewel in our midst that could be marketed to the world through eco-tourism!* The extent of the proposed ecological damage to the Grand River Valley will render it un-marketable as wilderness territory. Cultural and historic sites will be destroyed. Future Generations will be left with controlled reservoirs that they may never be able to access. Knowing we live alongside this mighty river promotes pride in our surroundings and improves our quality of life even more than the Mealy Mountains National Park or the Torngat National Park can! This River IS CENTRAL LABRADOR! Damming the Grand nullifies environmental Sustainability!

There are a number of areas in the Environmental Impact Statement of the Lower Churchill Hydroelectric Project and the Labrador-Island Transmission Link that directly affect the Town's municipal infrastructure, programs and services, the social fabric of our community as well as cultural, historic and ecological effects.

Some of those impacts are identified and discussed in this presentation.
They, by no means, constitute all issues!

Infrastructure Impacts of Hydro and other large Resource Development projects Boom/Bust

Increased number of Residents and Transient Workers create increased usage in the following areas:

- Fire protection (for increased number of buildings and homes)
- Recreation facilities (swimming pool, arena, parks etc)
- Water (system is already taxed with some residents complaining of low pressure)
- Sewage (more pollution at outfalls and/or impediment of river's ability to flush effluent from new lagoon system)
- Solid Waste (due to more residents, more industrial waste, increase in hazardous materials , decrease in lifespan of the dump)
- Land development (proportional demand for housing and lots. Secondary/support industry will need more commercial land)
- Roads (wage economies create more vehicles and more vehicles per capita. Industrial activities necessitate more and heavier vehicles.)
- Local Government Employment (LCHP positions closely related to community government positions..Some qualified people likely to leave to pursue higher pay)

These types of increases have already occurred and created a housing crisis and other social. (see info in the *HV-GB Community Plan for Addressing Homelessness and Transition Housing (Jill)*

Community and Infrastructure issues/impacts cont…

- Socio-economic issues related to boom/bust resource extraction economy!
  - Unwanted pregnancies (transient worker problems)
  - Housing (rising rental rates and housing prices) (currently poor people bank up-live with relatives, creates tension, family stress)
  - Emergency shelter use (by our most vulnerable people who cannot afford housing or have stressed family life)
  - Crisis workers (financial and family life stresses rise)
  - Stressed family life (due to high rents, high prices, unwanted pregnancies)
  - Labor force/employment/training (34% of HV-GB citizens earn less than $15,000 and 25% earn less than $29,000) (=59% earning less than $30,000)
  - Loss of Traditional culture/values
  - Loss of Heritage resources
  - Health care facilities and services (already taxed, but needs will increase with influx of more residents and transient workers)
  - Medical staff (already overworked-extra 2000 workers will stress further)

Past experience shows Municipalities bare the brunt of costs!

- Municipalities have tended in the past to bear the cost of the increased use of their infrastructure including increases in administrative and employment costs, insurance and deferred maintenance and capital costs. HV-GB needs to be prepared in advance to negotiate with industry and other orders of government to mitigate the effects of a likely substantial increase in the use of our physical infrastructure. Benefits to the community from this Project will outweigh the negative impacts, only if the community is adequately prepared to take advantage of opportunities!

NO POWER for Labrador

- Labrador North Chamber of Commerce comments on the EIS
  - *"power must be made available throughout Labrador …." (Sterling Peyton, Labrador North Chamber of Commerce, Letter to the Joint Panel, May 22, 2009*

The Transmission Link document/map CLEARLY shows, NO Power is slated for Labrador!

Town of Happy Valley comments on the EIS

- *"Transmission lines will either be going back to Churchill Falls into Quebec or directly across Labrador to the Island with no energy access available for Labrador communities from this project." "we require 25MW of power…in order to attract potential business ventures." (Mayor Leo Abbass, letter to Joint Panel May 22, 2009*

Former town Planner, Dennis Peck on Hydro Power:

- *"NL Hydro has reached it's capacity to provide electricity…unless new power lines are installed"*
- *"The Town is of the opinion that NL Hydro has not adequately planned for future development."….."says it can build to meet demand, but issue is cost."*
- *"Hydro's indecisiveness stifles our ability to develop accurate future economic development plans that will attract investment."*

No Infrastructure Money for Labrador

- *"without additional financial assistance the enormity of this development will greatly stress the infrastructure of a municipality of our size." (Mayor Leo Abbass, letter to the Joint Panel, May 22, 2009)*

  Voisey's Bay Nickle-Inco invested several million dollars in the local Hospital!

  Hydro Quebec has invested millions in communities near the La Romaine project!

  <u>Nalcor can be approached to do likewise</u>! It's the cost of doing business and the business is the extraction of resources from our area with absolutely no guarantee of what will ever come back! Grand Riverkeeper Labrador has already submitted comments stating there needs to be an Impact Benefit's Agreement or a Share agreement for all of Labrador before the project proceeds!

Possible solutions to some of these socio-economic and infrastructure issues

- Lobby Government through Municipalities Act and Landlords and Tenants Act for changes allowing rent control
- Lobby Nalcor for funding to upgrade existing community crisis centres and other impacted infrastructure
- Withhold support of the project unless Power is supplied to all of Labrador
- Withhold support unless an Impact's Benefit Agreement signed for the Town and for all of Labrador's communities
- Lobby Government for funds to prepare for hearings (Municipalities, Provincial and Federal)
- Review Municipal by-laws now to be certain that any changes needed are in place before the Proposed Project begins
- Hold town meetings outlining the infrastructure and social impacts of the Project and ask for input (Educate, Educate, Educate)

Possible ways to be pro-active in dealing with this proposed mega-project are outlined in Infrastructure Canada's report listed below

- Incorporate local environmental impact assessments into community planning process.
- Ensure that Nalcor clearly indicates how project-specific infrastructure will be used once project is completed or provides plans for decommissioning.
- Provide baseline data on condition of current infrastructure at start of Project
- Technical support, written guidelines etc. exist with Infrastructure Canada and other Government agencies on issues such as total life cycle costs of infrastructure, resources for negotiating with other governments and industry etc. Workshops can be targeted to Council and managers. See reference below!

(see Infrastructure Canada's report *"Northern Communities, Boom, Bust and the Role of Infrastructure. On line!)*

ECOLOGICAL ISSUES
Each of These will be discussed separately

Generation Project

- Ashkui
- Fish and Fish habitat loss/altered and compensation/downstream effects/mercury/cumulative effects
- Downstream effects/Lk Melville/Goose Bay
- Fish mortality
- Greenhouse gas/methane/CO2
- Loss of tourism potential
- Flushing ability of River compromised with an altered flow/sewage issue
- Salt intrusion
- Reservoir induced earthquakes/flooding
- No net loss of wetlands
- Reservoir clearing/preparation
- Decommissioning of the project

Transmission Project

- Subsea cables Electrodes/EMF emissions
- Overlap of transmission line and low level flight path
- Cummulative effects

  Project splitting- Generation and Transmission

  AND: not all transmission included.

Ashkui

- Formation of new Ashkui (open water areas)

"may not replace habitat lost when natural ashkui are flooded." And " the ecological function of the new ashkui may not be the same as those that are lost." (Environment Canada) (IR# JRP.154)

Migrating waterfowl return year after year to open areas along the river on their way north to breed. Natural ashkui provide nutrients and resting spots. It could take years for new ashkui to become productive and it is not known where new ashkui will form or even if it will form.

Direct Fish Mortality/Fish Kills

Direct fish mortality from turbine operations was not adequately addressed in the EIS!

DFO scientists state: “the impact of direct fish mortality from turbine operations was not addressed in a population context.”

Fish that manage to escape being chewed up in the Gull Island turbine will develop bubble disease from too much oxygen and will not have time to recover before entering the Muskrat turbine.

Fish and Fish Habitat concerns

- Downstream effects below the falls not adequately studied. (Lake Melville and beyond) (DFO Science evaluation of the EIS)
- Uncertainty that reservoirs will exhibit a similar fish habitat usage pattern as is described for Lake Winokapau (DFO)
- Reservoir filling at Gull Island followed by turbine operation can have significant consequences for fish populations between Gull Island and Muskrat Falls. (DFO)
- Sample sizes are small and limited both in spatial and temporal coverage. And therefore add a heightened level of risk and uncertainty to any predictions or analysis based on this date.(DFO)
- Fish passage not assessed for Muskrat falls (DFO)
- Fish Habitat Compensation plans historically work approximately 35% of the time. (DFO Director, Jason Quigley,)
- Mercury contamination will increase in fish and up the food chain, especially if the no-cut scenario is adopted for river bank vegetation.
- Habitat altered is considerably larger than the habitat lost and will therefore have a great impact on the fishes in the river and the application of DFO's No Net Loss Policy.. (DFO)
- Cumulative effects of all past, current and proposed projects on the River must be assessed, including "any residual effects of the Upper Churchill project." (DFO)

Greenhouse Gas/methane/CO2 displacement

- The Panel requested in JRP.7 that Nalcor provide "a comparative analysis of GHG displacement scenarios for possible electricity markets served and generation sources displaced" and reiterated their request in JRP.S/85S

  Nalcor has not yet provided this information which is needed to determine the amount of GHG likely to be displaced by the project
- Methane is constantly produced in reservoirs due to rotting vegetation and is 27 times more effective as a greenhouse gas than CO2, These emissions must be taken into consideration when deciding on GHG displacement scenarios.

Salt Intrusion

- Nalcor's salt intrusion model only valid as far as southern part of Lake Melville-thus impossible to predict any changes outside Goose Bay, model not applicable to the question of changes seaward.
- From the magnitude of the effects predicted at the river mouth it is inferred that no significant effects in Lake Melville. "**This appears to be a logically unsound conclusion".** (DFO Science Evaluation of the EIS)
- Salt Intrusion during reservoir filling most likely will contaminate water wells in Mudlake, North West River and possibly Town wells.

Reservoir induced earthquakes and dam breaks

Per IR # JRP.162-Nalcor has yet to provide

- a dam failure study,
- an updated dam break model with inundation mapping,
- an outline of integrated emergency planning for each of the scenarios involving the Upper Churchill, Gull Island and Muskrat Falls
- a dam breach analysis for construction phase cofferdams
- and, estimates of economic losses from dam failure. (i.e. not just residential dwellings)

Due to the existence of fault lines near Gull Island, Nalcor's dam failure study must include models of possible dam induced earthquakes and possible resulting dam failure.

Town should also produce emergency evacuation plan and educate, educate, educate!

Even though this event is unlikely, if it happened, it would be **catastrophic.**

Calls for the "precautionary principle" rather than "risk-based" decision making!

Wetlands

- CWS (Canadian Wildlife Service) states they cannot determine if the project will cause significant impacts on the abundance and distribution of wetlands and their provisioning of ecological functions based on the information provided by Nalcor.
- Canada signed on to North American Wetlands Conservation Act: No Net Loss Wetlands Agreement and Nalcor must comply by creating wetlands for those lost.

The Panel has asked Nalcor to provide a reference map, a summary table of information and discussion on the proportions of each wetland type lost or impacted by the Project.

Reservoir Clearing/Preparation (Ecological/Economic &Socio-Economic)

- Nalcor has "failed to adequately justify the proposed approach to reservoir clearing as required by the EIS Guidelines" IR# JRP.148

The Panel has asked that Nalcor compare and analyze the different clearing scenarios, i.e. partial clearing, no clearing and full clearing, in relation to their environmental and social costs and benefits and include those alternatives which cost more to build or operate but which might result in reduced environmental effects. (i.e. reduced methyl-mercury contamination)

This has yet to be provided!

Decommissioning of the Project at its life's end. Ecological and Economic

- EIS Guidelines require Nalcor to "present an approach for the decommissioning phase of the Project, which sets out a commitment to address: environmental planning and mitigation measures; socio-economic mitigation measures; and public health and safety proceedures."

Nalcor stated they have no plans to ever decommission the Project.

Therefore,the Panel's original request for the information below was not provided!

However, the Panel has again asked Nalcor to provide an overview of the range of options that exist for decommissioning hydroelectric facilities, including environmental planning and mitigation measures, socio-economic mitigation measures, public health and safety procedures and costs (order of magnitude estimates)

The Panel also asks Nalcor to discuss how dam decommissioning would change environmental conditions, whether the pre-Project river system and associated habitats could be re-established and how long this might take. IR# JRP 150

Sub-sea Cables/Electrodes

Issues surrounding electrodes

- **Underwater noise** (caused during installation and operation. Still large gaps in knowledge of sound emissions and sound perception by marine animals.)
- **Temperature effects** (various marine organisms react sensitively to minor increase of ambient temperature)
- **Electromagnetic fields** (electroreception in fish has been recorded for a number of species. Other species have been shown to use electromagnetic fields as an orientation cue. Limited number of studies undertaken to date to form any conclusion regarding impacts of EMF on aquatic species and systems per OSPAR Commission. Request that Nalcor do more primary studies.
- **Risk of Contamination** from seabed disturbance or cable itself and from turbidity!

Economics

- Thoughts on the Dis-economies of large dams
  - Huge expenditure on dams creates cuts in public expenditures in health, education and other services. What other, possibly better, uses could 12 to 14 billion dollars be put to in our sparsely populated Territory to benefit everyone?

Example from Dr. Murray Rudd (Education)

Alternatives to the Project (Economics)

- EIS guidelines requires Nalcor to "include an evaluation of the threshold for economic viability and indicate under what circumstances a change in economic conditions might influence its selection of preferred alternatives"

(IR # JRP 147)

- Information not yet provided: Therefore difficult to determine whether this project is the best "bang for our bucks"

Need Purpose and Rationale for the Project (Economics)

- EIS Guidelines requires that the "EIS shall provide a comprehensive explanation of the need, purpose and rationale for the project….justification shall be presented in both energy and economic terms,…"

  Sufficient information has not been supplied and In IR# JRP 146, the Panel asks that Nalcor provide "order of magnitude estimates, financial analysis, risk assessments and sensitivities normally or generally available at the feasibility stage of a Project of this nature."

  - Ecosystem services the River provides not quantified as suggested by Dr. Murray Rudd, Canadian Chair in Ecological Economics.

Without this information it will be difficult, if not, impossible to determine whether the benefits outweigh the costs of this project!


Thank you for listening
Feel free to contact us any time!