

# CRITIQUE OF THE PROPOSED GLACIER/HOWSER HYDROELECTRIC PROJECT

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prepared for The Purcell Alliance for Wilderness by

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## BACKGROUND

While references to their studies go back to 2001, the Glacier/Howser Hydro Project (GHP) was introduced to the public over one year ago in the media and with their website [www.glacierpowerbc.com](http://www.glacierpowerbc.com). This website was set up by Glacier Power BC Ltd., the company that at the time held a water license for power generation on Glacier Creek. Neil and Sean Murphy moved to Nelson and are the local promoters for the project.

The project was awarded an Electricity Purchase Agreement (EPA) under B.C. Hydro's call for tenders for Independent Power Producers in 2006.

On January 12, 2007, the project description was submitted to the Environmental Assessment Office. This can be viewed at [http://www.eao.gov.bc.ca/epic/output/html/deploy/epic\\_project\\_home\\_282.html](http://www.eao.gov.bc.ca/epic/output/html/deploy/epic_project_home_282.html) (click on Proponent Comments/Correspondence) Although the project description was submitted over 2 months ago and the proponent continues to refer people to their website it is completely outdated so the EAO link should be the one to view.

## PROJECT DESCRIPTION SUMMARY

The description states 3986314 Canada Inc. affiliated to AXOR Group Inc. (Axor), as the development company of the project. Main office is in Montreal; BC office is in Vancouver; website address is [www.axor.com](http://www.axor.com). 3986314 Canada Inc. incorporated on June 19, 2003, under the Canada Business Corporation Act and then as a private B.C. registered company on July 9, 2003. All three directors reside in Quebec and 2 of the directors are the only directors of Axor. No mention is made of Glacier Power BC Ltd. or Nelson, B.C. or the Murphys throughout the entire project description.

Axor "is a Canadian leader in the design, financing, construction and operation of large-scale engineering and construction, and real estate projects" and has "participated in a number of hydroelectric projects in Canada, Asia, Central Europe and South America." (Axor website)

Axor originally held the water license for Howser Creek and East Creek. Now it is 3986314 Canada Inc. alone that holds licenses to Glacier, Howser and East Creeks. These are the only water power licenses held by the company in B.C.

“The purpose of the project is to produce and sell ‘Green Electricity’ to BC Hydro.” The B.C. Hydro electricity purchase agreement is for a project capacity of 90.5 MW, however the proponents are now proposing a potential capacity of 125 MW.

While called run-of-river installations, dams (otherwise called diversion weirs) create reservoirs of .68 ha and 3.14 ha for diversion of 14m<sup>3</sup>/s and 23.15m<sup>3</sup>/s of water through tunnels 6.894km and 8.360km long and 3x3.5m (horseshoe shaped) in diameter in Glacier Creek and Howser Creek, respectively. The water turns turbines in two separate powerhouses near Duncan Lake and the water is then deposited into the lake. In addition, 2 side creeks in Howser, Suck Creek and Behrman Creek, will also be diverted to add to the total tunnel flow. Suck and Behrman are the last two unlogged named creeks in the Howser drainage. Birnam Creek in Glacier Creek will also be diverted. To accomplish all this 3 new bridges and 25 new roads need to be built in addition to upgrading sections of present roads.

91.5 km of transmission line is proposed to be built. The lines from Howser and Glacier generating stations meet at Howser Creek to continue up the length of Howser Creek over Edouard Pass, down Edouard Creek, then Stockdale Creek, on to Horsethief Creek to the Invermere substation. Some private lands may be impacted. The corridor is proposed to be 25-30 meters with selective cutting outside the boundary.

I estimate a minimum length of 23 km of transmission line and accompanying roads to be built through completely unroaded pristine habitat in upper Howser, Edouard and Stockdale Creeks. The proponents simply state that “the requirements for new roads will be limited to the very upper reaches of the Howser and Horsethief valleys.”

### INSTREAM FLOWS

Considering the intakes are 12 km and 10.5 km above the mouths of Glacier Creek and Howser Creek, respectively, the reduced downstream flows will greatly impact the aquatic ecology.

The “Instream Flow Guidelines for B.C. –Working Drafts,” recommends as a minimum, the instream flow requirement to be the median monthly flow during the low flow month. “Recommend” and “requirement” seem at odds but recommend is the overall language of the document and it is expected that the actual flow is a negotiable item.

There are extreme fluctuations in the flows of Glacier and Howser Creeks. Flow measurements for Glacier Creek were recorded by the Water Survey of Canada for part of 1915 and 1961-1966. While these are not current they give some idea of the flows. The mean monthly discharge for these years was 1.46 m<sup>3</sup>/s in March as a low and 32.3 m<sup>3</sup>/s in July as a high. The mean flow for all of the full years recorded was 9.89 m<sup>3</sup>/s. For the original 40.5 MW capacity a 14 m<sup>3</sup>/s flow is required. Only 3 months recorded a mean monthly flow over this 14 m<sup>3</sup>/s capacity. The capacity flows for the proponent’s proposed increase to 125 MW are not stated in the description. The proposed increase in

MW for Glacier Creek is almost 50% --60 MW. Even if the guidelines are followed, very little water will be left in the creek most of the year –1.46 m<sup>3</sup>/s.

## BULL TROUT

Bull Trout (*Salvelinus confluentus*) are blue listed by the B.C. government meaning they are vulnerable to extirpation or extinction. They have disappeared from most of their natural range in Alberta; they have been extirpated from California and they are threatened under the U.S. Endangered Species Act. James Bergdahl's 2003 analysis of Bull Trout in B.C.'s Columbia basin discovered that the status of Bull Trout here is not much better than in the U.S. Healthy populations of Bull Trout are found in both Glacier and Howser Creeks.

In an MOE publication, "Rare Freshwater Fish of B.C.," Bull Trout are described as an indicator species of ecosystem health as they are extremely sensitive to habitat degradation. They are also extremely selective about spawning sites. Some populations have been observed choosing one small area and ignoring other apparently suitable habitat. Not only do they spawn in running water, they can be found in very high gradient areas –up to 30%.

The large diversion of water will certainly negatively effect Bull Trout. Bergdahl has also documented road density as a huge impact on Bull Trout so that the additional roads and bridges for GHP are also of concern. All of this is on top of a situation where "the level of protection provided bull trout populations by existing conservation strategies in this region of B.C. is poor," according to Bergdahl. DFO will have some standing in the environmental review process but it should be noted that the species is not listed with COSEWIC.

## OTHER FISH AND THE AQUATIC/CANYON ECOSYSTEM

Other fish that possibly use the lower sections of the creeks include Brook Trout, Burbot, Chub, Kokanee, Mountain Whitefish, Rainbow Trout, White Sturgeon, Whitefish and Slimy Sculpins. This could be a spawning area for some of these species. White Sturgeon is B.C. red listed and COSEWIC considers it endangered, a species facing imminent extirpation or extinction. All of these species could be impacted and require careful study.

Benthic invertebrates are the only other species presented in the project description to be sampled or studied. There must be many other species affected by low creek flows including amphibians, mosses, lichens, insects, etc. A full ecosystem assessment should be required.

## MAMMALS AND BIRDS

Curiously, there is no mention in the project description of mammals and birds. These creatures also need to be included in a full ecosystem assessment.

An indication of the heavy impacts a water diversion project can have on an ecosystem is Dr. Rick Zammuto's report on the possible environmental consequences of the Kemano completion project. He found 14 mammal and 39 bird species expected to be impacted; 22 mammal and 84 bird species to be severely impacted; and 6 mammal and 20 bird species to be endangered, threatened, sensitive or vulnerable and severely impacted. In conferring with Dr. Zammuto, he acknowledges that some of these species are not present in the Glacier/Hoswer/Horsethief area, but that many of them are and certainly need to be considered in any proposed water diversion project.

Bird impacts are also discussed in the transmission line section.

## JUMBO GLACIER RESORT AND CUMULATIVE IMPACT TO GRIZZLY BEARS

The Jumbo Glacier Resort (JGR) proposal received a favorable project review assessment from B.C.'s Environmental Assessment Office (EAO), the very agency presently reviewing the GHP. The resort has been granted an environmental certificate from the B.C. government and although the project area would need rezoning from regional government, the proponents still fully plan to build their resort. The GHP is located within the study area for this resort.

One of the big concerns of building the resort is its location within the habitat of the Central Purcell Grizzly Bear, a blue listed species in B.C. and of special concern to COSEWIC. The EAO accepted the fact that without mitigation there would be an increased risk of grizzly bear mortality and a reduction of habitat. Matt Austin, provincial large carnivore specialist, was more emphatic: "Based on my review of the documentation it is my opinion that the proposed Jumbo Glacier Alpine Resort has the potential for substantial direct and cumulative impacts to the Central Purcell Grizzly bear population south of Jumbo Creek (including the threatened cross-border Yahk population) with grizzly bear populations to the north."

Brian Horejsi's report exposes just how impacted this area is for grizzlies already. He states: "Existing secondary and industrial road density in the non-wilderness portion of the Jumbo-Purcell study area equals or exceeds critical road density levels that have been reported to cause changes in the distribution of female bears within their home range." (The Purcell Mountains Grizzly Bear: Cumulative Effects and the Proposed Jumbo Glacier Development, 2000). The 25 new roads to be built will exacerbate this problem. In recent years I have personally seen Grizzly Bears in both Suck and Behrman Creeks where new roads are to be built. The maps (figures 9 and 10) on page 26 of the study show clearly that the area has become a bottleneck for grizzlies in the central Purcells. (If the map extended further north showing the adjacent unroaded, pristine drainages of East and Giegerich the map would be even more telling.) Draw another thick red line from Howser to Horsethief representing the proposed transmission line and its 25-30+ meter clearing and road and we have the region completely bisected for the

first time. In fact, this is the first industrial crossing of the Purcell Mountains from the south tip of the Purcell Wilderness Conservancy all the way north to the trans-Canada highway. Horejsi also illustrates the large impact logging has already had on Grizzly Bears in the area.

Despite the present high impacts already documented and the realization by all that the JGR would further harm the Grizzly Bears (we ARE talking about a resort city in the backcountry), the game of the EAO process is to invent mitigations that will somehow offset the huge impact. C. Apps of ENKON Environmental Ltd. needed to come up with mitigations for his client, the proponents of JGR, in the Cumulative Effects Assessment (CEA): “Upon considering mitigation options, the model suggests that the JGR development (1) cannot be mitigated within the Jumbo drainage itself, but (2) can theoretically be mitigated by implementing partial or total restrictions on motorized human access in all or sub-drainages of the Jumbo, Glacier, Howser, Toby, Horsethief, and Brewer/Dutch drainages.” “Theoretically” is the operative word here. This option was met with a huge public outcry with submissions from individuals, the regional government, MOF and others with concerns over closures to vehicle access.

Professional biologist Stefan Himmer with Arctos Wildlife Services also filed a report, “A Review of the Cumulative Effects Assessment of the Proposed Jumbo Glacier Resort development on Grizzly Bear in the Central Purcell Mountains, B.C. with Discussions of Mitigation Strategies and their Impacts to Other Resource Users,”(March 9, 2004). He “strongly” recommended “that the proposed JGR development be reconsidered to prevent probable ‘net impacts’ to a viable grizzly bear population and also to prevent undesirable impacts to present and future resource users.” He noted that “the implications of incomplete data and erroneous assumptions, as presented by the proponents, may in fact under estimate the actual impacts to grizzly bears possibly placing present and potential impacts beyond accepted thresholds for habitat effectiveness and mortality risk.” He further states that the mitigation measures are not proven to work and “both the CEA assumptions and mitigation options have not been properly peer reviewed, as required by the EAO.”

Rather than turn down the JGR proposal or strengthen the mitigation measures the EAO and proponent assure us that recreational vehicle closures will not happen and thus the mitigations are very limited for this huge resort. WLAP somehow “determined that there is a low risk that the Project would result in a reduction of the grizzly bear population of such significance that the population in the Central Purcell GBPU [Grizzly Bear Population Unit] would become threatened. This determination considers that: proposed mitigation for the area within and immediately adjacent to the CRA are fully applied; the Proponent will maintain its proposed monitoring program and will adjust its mitigation programs....” The EAO report does mention: “WLAP further identified concerns regarding potential impacts from increased future activities (above existing levels) in Jumbo Pass and adjacent areas over time, whether the project proceeds or not... WLAP identified the need for government to carefully manage the Jumbo Pass and Glacier Creek areas.”

The EAO is required to consider the cumulative impacts on an area in its deliberations.

Considering,

- the consensus that JGR would have an effect on Grizzly Bear populations
- the already unacceptably high impacts on Grizzly Bears even without the JGR
- that mitigation measures approved were minimal and unproven
- that future activities in this area have been stated as a concern by WLAP (MOE)
- that proposed GHP activities amount to additional impacts on Grizzly Bear populations

GHP should be dismissed by the EAO early on in the process. If not, the EAO needs to be seriously challenged on this issue.

### TUNNELS

The 3m.x 3.5m. tunnel for Glacier Creek is 6.894 km. and for Howser Creek is 8.360 km. Birnam Creek has a 169 m. tunnel and a 118 m. penstock. Suck Creek has a 240 m. penstock and an unspecified length of vertical shaft while Behrman has a 494 m. tunnel and an 870 m. penstock.

The largest impact of the tunnels is the resultant waste rock muck –243,165 m<sup>3</sup> to be exact. This is the equivalent of 31,805 tandem axle dump truck loads (figured at 10 cubic yards per load). According to the proponent's maps, this huge pile of waste is proposed to be dumped alongside the creeks and always at least within several hundred meters of Duncan Lake or Howser and Glacier Creeks. Perhaps siltation will no longer be an issue without the fish. Is the waste rock acid leaching? Does it contain toxic metals? I doubt anyone will really know until the tunnels are built.

In a conversation with regional director Andy Shadrack, Don Scarlett, Kaslo electrician and electricity critic, reports that the tunnels will be cut through weak metamorphic schist rock and he is concerned about roof collapse, cracking and seepage. The much smaller Pingston hydro project on Upper Arrow Lake had serious problems.

### TRANSMISSION LINES

While the proponents state that “the final transmission line layout will be established later on in the process,” a review of what is presented is definitely worthwhile considering the huge environmental impacts. They seem determined to use Edouard Pass, so it can be assumed that it is the details of the routing that may be adjusted.

On the map, the 12.9 km. Glacier powerhouse line and the 3.3 km. Howser powerhouse line cut cross country through forests rather than following present road right of ways to where they meet at Howser Creek. From here the line follows the Howser forestry road to its end. The 25-30+m. corridor will destroy much forest.

For the estimated 23 km. from the end of the Howser road to the Horsethief road the area is presently unroaded, pristine wilderness. From upper Howser Creek to Edouard Pass is a mixture of class 8 and 9 old growth including Hemlock, Cedar, Spruce, Balsam, Whitebark Pine and Larch with greenslide areas. Kootenay Lake Forest District does not have legalized Old Growth Management Areas (OGMAs). What they have are designated old seral patches which are off limits to logging, but not to transmission lines. This area is one of these patches.

On the other side of Edouard Pass are more class 8 and 9 old growth forests of Spruce, Balsam and Alpine Larch. Further down Edouard is a mixture of class 3, 4, 8 and 9 Spruce, Balsam and Lodgepole Pine. Lower Stockdale includes all age classes from 3-8 with Trembling Aspen, Poplar, Spruce, Balsam, Lodgepole Pine and Douglas Fir all included. These drainages are unroaded and pristine and have recently been set aside as reserves in Canfor's forestry plan in their bid for Forest Stewardship Certification. There may be an historic trail in Stockdale.

Finally, the transmission line follows the road on the south side of Horsethief then cuts southeast cross country to the Invermere substation.

As stated earlier, this would be the first industrial crossing of the Purcells north of the Grey Creek Road. This bisection of the mountain range will impede animal migrations and destroy large areas of forest, vegetation and wilderness.

Accompanying transmission lines are the roads for building and maintaining the lines. Roads disrupt water flow patterns, create erosion and interfere with the natural movements of wildlife. Roads bring people to wild places –hunters, miners, atv'ers, recreational users, often to the detriment of the natural world.

Of particular concern, as discussed in the JGR section, is the impact on Grizzly Bears. Brian Horejsi points out that Grizzly Bears not only “may regularly be displaced from habitat and food sources within one kilometer of a road or trail,” but that they also show significant avoidance of roads whether or not vehicles are present.

As with all transmission lines, bird mortality is an issue. Manitoba Hydro cites a study in Manitoba where 40% of line collisions were birds of prey. Larger birds are known to be at greater risk of electrocution with transmission lines. Also electric and magnetic fields (EMF) could cause orientation problems for migrating birds. A raptor migration along the Purcell Mountains has been documented. 600 individual raptors were sighted in a 3 week period in the spring of 2006. Species include Bald Eagle, Golden Eagle, Prairie Falcon, Buteos, Sharp-shinned Hawk, Cooper's Hawk, and Gyrfalcon. It should be noted that the proponents of Jumbo Glacier Resort committed to identify problem areas for raptor collisions, and, if necessary, monitor occurrences of raptor electrocutions and develop an adaptive management plan.

Other problems with transmission lines include the chemicals applied to the poles (if wooden) and herbicides used to keep the corridor vegetation down. Transmission lines also channel the spread of invasive weeds.

## SUSTAINABILITY

There is a question of project sustainability in light of the many glaciers and icefields retreating in these valleys due to climate change. Declining mountain snowpacks further the problem of water availability. The project description gives the percentage of glacier covering the Glacier Creek drainage as 16.4% and Howser Creek at 4.8%. No mention is made as to the significance of these figures. When asked by regional director Shadrack about this issue, promoter Murphy claimed scientists don't know what is going to happen to the glaciers but said most of the water for the project does not come from glaciers. Maybe not most, but certainly a significant portion. Murphy sums up his situation: "The project has 40 years so hopefully the glaciers don't run out until we've at least paid the bills." If the true life of the project is only 40 or so years the project cannot be considered sustainable and certainly all the environmental damage can especially not be justified.

Part of the B.C. Energy Plan is to acquire 50% of new supply from ".B.C. Clean Electricity." It appears that all "run-of river" operations are classified as such. Technically, to qualify the project must use a renewable energy source, have a B.C. Environmental Assessment Certificate, and demonstrate certification criteria for Environment Canada's Environmental Choice Program. Two of the four benefits to be realized in this program are "the displacement of non-renewable fuel by renewable, more sustainable fuel sources" and "the reduction of impacts on aquatic, riparian and terrestrial ecosystems from electricity generating activities." A requirement is that electricity "be generated in a manner such that no adverse impacts are created for any species designated as endangered or threatened." Significant wealth can be generated from carbon credits with such designations.

## EAST CREEK

East Creek is the next large creek north from Howser Creek. This drainage is filled with old growth forests including the ancient huge cedars that have become so rare in the interior. It is believed to be the largest unprotected completely pristine rainforest valley in the southern interior.

With an extensive canyon at its mouth East Creek has protected itself from development. Only trappers have found their way in to date. The necessary road built for hydro development would open up this valley to the loggers as well.

The original project title was Canada-Glacier/Howser/East-project because the full intention is to develop East Creek. Axor transferred the East Creek water license to 398314 Canada, Inc., the development company for GHP. Alex Stoian, Axor project

manager, told me they would not get to East Creek for another 5-10 years. Once the transmission line is built we can expect development of East Creek.

## RECREATION

The GHP proponents admit to having an impact on the MacBeth Icefield Trail, though it will be “minor.” A larger, more detailed and accurate map would be helpful here. They plan to extend the Birnam Creek road another 265 meters. The present road end is the trailhead. A water intake for Birnam Creek is to be built here with no mention as to the size of the headpond (neither are headponds mentioned for Suck or Behrman). A 118 meter penstock will be laid and a 169 meter tunnel built to connect to the main tunnel. This appears to be a major impact. The MacBeth Icefield Trail was placed as one of the six premier hiking trails within the entire West Kootenay in a popular trail guidebook.

The Howser Creek transmission line will be clearly visible from Forster Pass, a popular wilderness hiking area.

The Suck Creek and Behrman Creek intakes and new roads will be visible from the Omo Plateau hiking area.

An historic trail is possibly along Stockdale Creek.

Atv'ers will be ecstatic.

As discussed in the Jumbo Glacier Resort section, recreation users could be locked out of these drainages as a result of mitigation measures for Grizzly Bears due to further industrial development.

The area has been acknowledged for its exceptional recreation opportunities by local residents in their proposal for a Jumbo Regional Recreation Area. The proposed goals include: “conservation of the natural values is a priority;” and “no new commercial or industrial developments or expansions would be allowed.” GHP runs directly contrary to these goals.

## THE 2006 CALL FOR POWER AND ITS ALTERNATIVES

A concise article in the Tyee by Simon Fraser professor John Calvert describes the 2006 call for bids from independent power producers “a bonanza for private energy interests.” B.C. Hydro’s own figures show that \$15.6 billion will go to these private producers of electricity over the terms of the contracts. “Yet for all that money, the public gets no assets, no price protection once the contracts expire and no guarantee that private energy interests won’t export the energy in the future.” As the 2002 Energy Plan prevents B.C. Hydro from building new generation assets, the crown corporation is turning into a purchaser of electricity from private sources rather than its traditional role of generating publicly-owned electricity. The B.C. government is accomplishing this privatization quickly in accepting 3 times the amount of energy in private contracts in this

call for power as they had publicly planned. There has been little public consultation on this important issue.

Aside from the politics of who controls our energy requirements, the 2006 contracts for private electricity were simply a bad deal. From these contracts alone B.C. Hydro calculates an 8.1% increase in rates. While the U.S. Department of Energy predicts energy prices at about \$50MWh at the B.C. border in 2018, B.C. Hydro estimates the indexed price in 2018 for these new contracts will average nearly \$100 MWh.

There are alternatives to this squandering of money and resources:

1. A debate remains as to whether we really need more electricity. One argument in support of this position is that we definitely don't need Jumbo Glacier Resort....
2. Energy conservation needs to be instituted in a much bigger way. For example, Australia just outlawed incandescent light bulbs.
3. Highly discounted energy to major industrial customers must be stopped to give industry an incentive for conservation.
4. Half of the electricity produced as a result of 3 dams (Duncan, Mica, Keenleyside) in our region is ours by way of the Columbia River treaty. Rather than sell this electricity back to the U.S. we should use it. As the electricity is actually generated in the U.S. the B.C. government usually does not include this electricity as ours in their figures. This is insulting when one looks at places like the Duncan dam. That electricity is ours!

## REGIONAL AND LOCAL ISSUES

The southern interior produces half of the electricity for B.C. Our flooded valleys are a sad testament to this. Now this region is expected to degrade our side drainages and cut up our wilderness with yet more hydro projects. Enough is enough!

The only residents of Glacier Creek are firmly opposed to GHP. Gabriella Grabowski wrote a politically astute letter regarding the proposal. She also states that Glacier valley "is precipitous and logged from top to bottom. It is prone to avalanches and great walls of ice have come down before, taking out anything in its path. A dam 3 km. above my place leaves much to be desired." The project description acknowledges a horse farm that warrants special consideration but no details as to what this entails. Finally Grabowski observes: "The only green thing about this plan is the money they hope to generate." She states that she has a letter from Neil Murphy detailing the great amount of money they plan to make.

Some local jobs may be generated during construction. Referring to the regional district meeting January 27, 2007, the Valley Voice writes, "Murphy said that all construction would be done by local companies." A year ago he said that Chant Construction of Ontario would be doing the work. In any case, very few long term jobs are foreseen.

The proponent 3986314 Canada Inc. is certainly not local being located in Montreal with all directors residing in Quebec. The Murphys, while presently living in Nelson, are not directors of the proponent company and hold no water licenses. Their role in the project is unclear.

B.C. Bill 30 denies local governments from effectively opposing these energy projects. This needs to be exposed.