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Environmental Assessment Office,

By Fax – 250-387-2208

PO Box 9426 Stn Prov Govt

Victoria, BC V8W 9V1

Attn. Teresa Morris, Project Assessment Manager

Dear Madames and Sirs,

Regarding Progress Energy's Exemption Applications regarding its Lily and Town Dams

I am writing in response to Progress Energy's request to the Environmental Assessment Office or EAO to exempt from assessment two dams that the company has already built and that should have been subject to required assessments before they ever proceeded to construction.

For the reasons outlined below, I feel that the company's exemption request should be denied. To instill public confidence in the provincial environmental assessment process, your office should conduct a thorough assessment of both facilities. It should also broaden the assessment to include related facilities and activities in light of emerging evidence of a widespread network of unauthorized or unlicensed dams built by the company and its competitors in recent years throughout northeast BC.

With its application, Progress Energy is essentially asking the EAO to rule after the fact that the ongoing environmental impacts of the dams are unworthy of consideration as is the company's decision to build the dams without following relevant environmental regulations.

Not only were the company's Lily and Town dams built without the EAO's office assessing the projects first, but the company that built them appears to have failed to do two other important things before proceeding to build the structures. It did not apply for water licences or submit engineering specifications to provincial Dam Safety Officers.

In my capacity as a researcher and policy analyst with the Canadian Centre for Policy Alternatives, I produced the first public reports on the two dams in question and on what appeared to be widespread non-compliance with relevant provincial regulations in the face of evidence that companies had built potentially “dozens” of similar earthen dams while failing first to obtain proper provincial authorizations.

A link to my initial research on this subject was published in early May and is available here <http://www.policynote.ca/dam-big-problem/>.

That research noted that Progress Energy had built at least 16 large unauthorized dams. It also noted that the natural gas industry had likely built many more such dams. Subsequent information requests to the Oil and Gas Commission (OGC), Ministry of Forests, Lands and Natural Resource Operations (FLNRO), and the EAO revealed that the problem is far greater than originally reported.

Documents that I subsequently obtained through Freedom of Information and other related requests (to the OGC, FLNRO and the EAO) after that first publication now show that at least 57 large, unlicensed dams were built to impound freshwater used in hydraulic fracturing or fracking operations on Crown lands in northeast BC. Progress Energy built approximately half of those dams.

This vast network of unlicensed or unauthorized dams was built for one express purpose: to capture and store large volumes of freshwater used in natural gas industry hydraulic fracturing or fracking operations.

Numerous more such dams were built without permits on private lands, in some cases lands in the Agricultural Land Reserve.

It now falls to provincial Dam Safety Officers to retroactively approve the dams, or to order that the dams be modified to protect human health and the environment, or that they be dismantled. Retroactive determinations must also now be made on dozens of water licences that were never applied for, as required by law. It is entirely unclear at this point how provincial agencies plan to retroactively and simultaneously review dozens of unlicensed dams and rule on dozens of related water licence applications. It is equally unclear how, having failed to properly inform First Nations in the first place about what was to be built, the provincial government plans to conduct long overdue, fulsome consultations with those First Nations most directly impacted.

The EAO’s office has known since last year that Progress intended to file exemption applications on its Lily and Town dams.

In July, the EAO received Progress's formal exemption applications. In August, the EAO posted Progress's exemption applications (one for each of the two dams) on its project registry site and told members of the public that they had 28 days to respond to the company's application. The deadline for public submissions is September 21.

The applications and supporting documents are here:

<https://projects.eao.gov.bc.ca/p/progress-energy-lily-dam/detail>

<https://projects.eao.gov.bc.ca/p/progress-energy-town-dam/detail>

I have reviewed materials before the EAO in support of Progress's application. I believe those documents show that there are worrisome deficiencies or emissions in what has been filed.

Of note:

ENGINEERING OBSERVATIONS

The main report before the EAO in support of Progress's Lily dam project (Progress Energy Lily Dam – Project Description) describes a nearly 23-metre-high earthen structure, or a dam roughly as tall as a seven-storey apartment building. The report includes a review of the structure by engineers in which some issues of concern are noted.

For example, the engineers found that equipment installed to measure subsurface movements of the dam itself broke due to "vertical settlement" of the dam's walls. They also determined that portions of the dam's berms or earthen walls appeared to consist of "inadequately moisture conditioned and under-compacted fill."

The engineers found signs of obvious "settlement" of the dam's walls, including "large tension cracks" at the dam's northwest corner.

"Signs of potential seepage" or water leaking from behind the dam were also noted, leading the engineers to warn that "these areas should be monitored for increases in either the volume or turbidity of seepage, either of which could be a sign of potential internal erosion and/or piping of the berm structure. Internal erosion/piping is the second most common cause (46%) of failure in earth fill dams."

Lastly, the engineers noted, an outlet was “not graded properly to allow water to flow away from the dam and is also unarmoured. Failure of the outlet during a flood event could cause severe erosion of the dam structure and potentially failure. The outlet should be reconstructed as a properly sized and engineered open channel trapezoidal spillway.”

All of these observations, made in December of last year, came two years after the dam was built, underscoring a key problem for the EAO and other provincial agencies. Dam designs and engineering specifications do not appear to have been fully reviewed by relevant provincial authorities *before* the dams were built.

RECOMMENDATION 1 - *Progress’s exemption request to the EAO should be denied. The EAO should conduct a review of the Lily and Town dams that fully takes into account whether or not they were built to sufficient engineering standards, especially in light of what the dams are there for.*

ARE THE DAMS BUILT TO WITHSTAND INDUCED EARTHQUAKES?

Both the Town and Lily Dams are built to store water used in natural gas industry fracking operations. Fracking operations are known to trigger earthquakes.

The largest-ever induced earthquake in a natural gas industry fracking operation (magnitude 4.6) occurred in 2015 at a Progress Energy drill pad in northeast BC, in the same basin where Progress’s Town and Lily dams are located.

In both the Town and Lily project description reports, concerns about earthquakes are noted:

“In the event of a significant earthquake occurring within 50 km of the dam (i.e. magnitude 4.0 or greater), an inspection should be completed. The upstream and downstream slopes should be inspected, as should the crest and spillway. Any signs of cracks, tension, or settlement within the dam and the inspector should contact the Technical Representative to complete a thorough inspection of the dam and completed instrumentation readings.”

Neither report notes, however, that BC Hydro, which has two large dams on the Peace River that are both critical public infrastructure projects and that were both subject to public oversight before and during their construction, has worked with the BC Oil and Gas Commission to create zones around its Peace River facilities, including the proposed Site C dam, where gas drilling and fracking is prohibited.

The subject of induced earthquakes and their impacts on critical infrastructure such as dams is never discussed in Progress’s project description reports in the critical context that it ought to be. The very company that built the unlicensed dams is responsible for generating significant earthquakes in its own fracking operations. Moreover, the two dams and others built by the company and its competitors are purpose-built to corral large volumes of freshwater nearby where fracking operations will occur. Thus, the seismic standards to which dams are built ought to be a top public concern and assessment priority.

RECOMMENDATION 2 - *In assessing the Progress dams, the EAO should determine whether or not the earthen structures are properly built to withstand ground motions from induced earthquakes, given their proximity to fracking operations. If the EAO determines that this is not the case, then the company should either be ordered to dismantle the facilities or re-engineer them to accepted seismic standards. The EAO should also assess whether fracking exclusion zones are warranted around the two dams specifically and other fracking dams more generally.*

PROJECTED WATER USE IN FRACKING OPERATIONS

In the Town and Lily Dam project descriptions, the dams are described as freshwater storage sites where water is to be collected for use in fracking operations.

Both dams are located in the Montney Basin, a large shale gas play. The documents project the amount of water to be used in the “typical” fracking operations stating:

“In the Montney, completion of a typical well can require 10 frac stages, each requiring up to 1,800 m³ of fluid for a total of 18,000 m³ per well.”

A recent report (February 2017) in the *Bulletin of the Seismological Society of America*

https://www.researchgate.net/publication/314352256_Fluid_Injection_and_Seismic_Activity_in_the_Northern_Montney_Play_British_Columbia_Canada_with_Special_Reference_to_the_17_August_2015_M_w_4.6_Induced_Earthquake suggests, however, that in one notable case, Progress Energy actually used nearly nine times more water at one of its fracking operations in the same basin.

This is the well, noted above, where the 4.6 magnitude earthquake was triggered during fracking operations. The *Bulletin* article found that:

“ . . . hydraulic fracturing well 10, which is associated with seismicity in August and September . . . had 132 stages from 11 August to 8 September and injected more than

160,000 m³ during this period . . . Before the occurrence of the M_w 4.6 event on 17 August, this well had injected more than 65,000 m³ of fluid in just 6 days.”

RECOMMENDATION 3 - *Under the Environmental Assessment Act environmental assessments can be broadened to include related facilities and activities. Given that at least 57 unlicensed fracking dams have been built to date on Crown lands in northeast BC – half of them Progress Energy dams - a broad environmental assessment is warranted that examines water usage and water demand in natural gas industry fracking operations and that fully considers cumulative environmental impacts.*

It is important to reiterate that the EAO has powers to broaden assessments to include related facilities and activities. A broader assessment is entirely appropriate in this case.

WERE FIRST NATIONS CONSULTED OPENLY AND HONESTLY?

Documents noted in Progress Energy’s Lily Dam project description as “Aboriginal Consultation Records” are absent from the record before the EAO.

For example, in the documents submitted in support of Progress’s application, the original “Crown Land Application Form” that was sent to the Blueberry River First Nation or BRFN is missing. Other documents that Progress identifies as being sent to the BRFN are also absent from the company’s filings to the EAO. Those documents include:

- A fiber utilization form
- A survey/construction plan
- A 1/20,000 BCGS sketch plan
- A 1/50,000 program map
- A 1/250,000 access map

Some of these missing documents I subsequently obtained by request from the Oil and Gas Commission.

In both the incomplete information before the EAO and in documents subsequently obtained from the OGC, the Aboriginal Consultation Records fail ever to mention the word “dam” in describing the Lily project.

The dam is either referred to as a “water storage site”, or a “proposed irregular shaped water storage site” or a “water storage pit”.

A pit is a hole in the ground, not a massive dam with a berm that is nearly 23 metres tall.

How can “consultation” with First Nations come remotely close to meeting the most basic standards when neither the company that proposes to build the project or the provincial regulator that approves the “water storage site” (the Oil and Gas Commission) fails to provide basic, essential information about what the project is?

RECOMMENDATION 4 - *The EAO should include in its review a broad inquiry into the consultation record regarding the two dams. What were First Nations told was to be built? If First Nations were not informed that the projects were dams, how could they have possibly foreseen that key provincial acts and regulations were at risk of being violated, to say nothing of their Constitutionally-protected and treaty-protected rights?*

HOW DID THE LILY AND TOWN DAMS GET BUILT WITHOUT BEING REFERRED TO THE EAO FIRST?

Progress Energy’s Lily and Town dams are both over 15 metres high and fully qualify as major projects under the *Environmental Assessment Act*.

Either field staff with the provincial Oil and Gas Commission, which regulates energy industry activities, were unaware that these large structures were being built, or they knew that they were being built but they did not consider them dams, or they knew they were being built and that they qualified as dams but did nothing about it. None of these scenarios inspires public confidence that our shared environment is being protected.

For reasons that have yet to be explained, the Commission allowed the two projects to proceed even though the dams were clearly “reviewable” projects under the *Act* and should have first been referred to the EAO’s office for assessment.

It is a violation of the *Act* for another government agency to issue an approval for a project without that project first going before the EAO. That did not happen in either the Lily or Town dam cases.

More troubling, it appears that the OGC allowed dozens of other dams that qualified as such under provincial Dam Safety Regulations (DSR) to proceed without companies first applying for water licences and submitting plans to Dam Safety Officers, as required by regulation.

Dam Safety Officials with the provincial Ministry of Natural Resource Operations are supposed to vet any plans to build structures that qualify as dams under the DSR. Those

officials appear in numerous cases to have not been referred dam engineering and construction plans either by the OGC or the companies that built the dams.

In at least 57 cases involving unauthorized or unlicensed dams on Crown lands, and numerous other such dams built on private lands, there appears to have been significant regulatory breakdown within the OGC and FLNRO.

RECOMMENDATION 5 - *The EAO should conduct a wide-ranging assessment of the Lily and Town Dams that seeks to answer why regulators allowed the projects to proceed without them first being referred to the EAO. This should include a review of the much broader network of unlicensed dams built throughout northeast BC in recent years to corral water used in natural gas industry fracking operations.*

In closing, I trust that your office will give careful consideration to this request and to those of others that have filed responses to the EAO regarding Progress Energy's extraordinary and potentially unprecedented request to retroactively exempt the Lily and Town dams from environmental reviews.

Sincerely,

Ben Parfitt,

Resource Policy Analyst,

Canadian Centre for Policy Alternatives, BC Office.