

*Bill 39*

**Gordon D Hebb - Review of Bill 39 (Uranium Ban)**

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October 29, 2009  
 Members of Law Amendments Committee.

A prior appointment prevents me from attending the Law Amendments Committee's review of Bill 39 "Uranium Exploration and Mining Prohibition Act" this afternoon, but I would like to make the following comments.

- 1) The government deserves congratulation for bringing forward this bill and establishing suitable legislation in what was previously a vague general expression of intent.
- 2) The legislation, as framed, clearly takes extensive pains not to inhibit other mining ventures. Indeed, the proposed fine for infraction of "not more than \$2000" is strikingly trivial.
- 3) It was mentioned during debate of this bill that personnel from the Department of Natural Resources intend to make presentations to the Law Amendments Committee. It is important that these interventions are put in their proper context:
  - a) The Mineral Resources Division of DNR is somewhat unlike other government departments in that it serves as a kind of revolving door to the mining industry with its personnel routinely taking employment with mining companies after serving in the department. In this respect their position is one that speaks strictly on behalf of industry rather than acting as advocates for the common good.
  - b) Because uranium has never been mined in the Maritimes, few, if any, DNR personnel have direct experience of that form of mining. It may be as a result of this lack of direct experience that the presentations of the Mining Association and the often-quoted 1994-96 DNR report on uranium mining are full of misleading assertions. See attached appendix of the 2008 CAPE Brief to Voluntary Planning.
  - c) The Mining Association of Nova Scotia and its advocates in DNR have used a "last ditch" argument in favour of uranium exploration that this indirectly serves public safety by identifying areas of potential radiation hazard. It seems incredible that such an argument can have much traction for the following reasons. 1) The extensive exploratory mapping undertaken during the 1980s provided a detailed picture of potentially hazardous areas. 2) Radon testing and testing for uranium levels in well water are a highly effective and direct means of identifying possible health hazards. 3) The invasive nature of exploration in itself increases the potential radiation hazard.

Respectfully submitted,

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## **Appendix: Background materials on uranium mining in Nova Scotia**

Some documents and presentations are referred to repeatedly in public discussions on the uranium issue. Until recently, the full text of some of these has been difficult to obtain. The Department of Natural Resources is to be congratulated on their decision to make the 1985 McCleave Report as well as the 1994 Report of the Inter-departmental Uranium Committee available on their web-site. It is useful to put both these documents as well as a more recent presentation by the Mining Association in context to show their relevance to the current situation in Nova Scotia.

### **1) The McCleave Report (1985)**

During the late 1970s and early 1980s many residents of rural areas of mainland Nova Scotia discovered that invasive mineral exploration was being carried out on their properties. Farmers and woodlot owners found survey tapes, felled trees, and trenches dug on their land. Over time, it emerged that all of these activities were being carried out by over a dozen mining companies, some of them large multinationals such as Aquitaine, Shell and Saarberg, all of them exploring for uranium.

The extent of these incursions into agricultural and forest land, combined with self-education of many Nova Scotians about the environmental and health consequences of uranium exploration and mining, led to the matter becoming a major political issue by 1981. The response of the provincial government of the time was to establish a public inquiry with a provincial court judge, Robert J. McCleave, as sole commissioner. Judge McCleave invited briefs and submissions from the general public, the mining industry and its government advocates and from federal nuclear and regulatory agencies. The level of public concern and the sophistication of public knowledge was well-demonstrated by the number and range of briefs and presentations put before the commission. Of over 200 briefs, many of them giving detailed scientific background and references, there was only one, other than those presented by the industry and its government representatives, favouring uranium exploration and mining. As the hearings continued it became increasingly clear that the general public was not only rather well-informed, but also energetically opposed to Nova Scotia's becoming involved in uranium mining. Detailed and fully researched briefs opposing uranium exploration and mining were submitted by the Nova Scotia Medical Society, the Nova Scotia Federation of Labour, the Nova Scotia Federation of Agriculture as well as a host of community, wildlife and environmental groups. These briefs and submissions were heard and recorded in Stage One of the Inquiry which was scheduled to proceed to Stage Two which was to have consisted of expert technical testimony. Stage Two of the Inquiry never took place since the government of the day rendered it redundant by placing a moratorium on uranium exploration. In January 1985, Judge McCleave completed and released his report based on the submissions heard.

For those who attended many of the commission's hearings and who have read the subsequent report in its entirety, it is perplexing to find its contents cited by a DNR spokesperson as having deemed uranium exploration and mining "safe." [Chronicle

Herald, July 2008]<sup>1</sup> Despite his many estimable qualities, the late Judge Robert McCleave was neither tasked nor trained to make a scientific or technical evaluation of the material placed before him. The report itself, while it contains a good deal of useful and relevant information, has no particular analytical method or any set of criteria by which "safety" could possibly be measured. Public statements by DNR officials have suggested that the McCleave Inquiry concluded that uranium mining could be conducted "safely" in Nova Scotia. In fact, the Commissioner's statements about "safety" are quite ambiguous and even at odds with the evidence to which he seems to refer. For example, under "General Conclusions" the following appears:

"The inquiry accepts the argument that it would be improper to permit exploration but withhold the right to mine what has been found, at least until a re-determination is made during 1990. It is however satisfied that exploration can be carried out safely **within provisions suggested by the Medical Society of Nova Scotia**, [emphasis added] and it may be in the public interest to have better knowledge of the extent of the uranium resources which could be mined. In short the matter of exploration should be reviewed even if the ban on mining is to continue for another period of time, but that the 1990 consideration should report the technical and technological changes that would make it more likely that uranium mining could be carried out with its long-term tailings disposal properly secured. Apart from the tailings issue, the Inquiry clearly finds that the mining of uranium can be carried out if proper precautions are taken for the health of the miners and that the techniques also exist at the milling stage."

The brief by the Medical Society of Nova Scotia to which he refers recommended a comprehensive system of monitoring and inspection of all explorations (which has never been instituted) and, most importantly, concluded: "**We maintain the belief that uranium mining would be an unacceptable health risk for Nova Scotia.**" This was a position unanimously adopted by the Medical Society of Nova Scotia at its annual meeting preceding the submission of its brief to the Inquiry.

While many of the briefs themselves, such as those submitted by the Medical Society and Environment Canada, contain useful background information which is still relevant, the manner in which much of this information is digested in the final report is considerably less useful than their original form.

## **2) Interdepartmental Uranium Committee Report June 1994 (DNR Open File Report ME 1994-6**

Seemingly intended to fill the many gaps in technical analysis in the McCleave report as well as to make a case for lifting the moratorium on uranium exploration, this document displays many of the troubling consequences of DNR's role as both the promoter and regulator of mining activities. Recently, it has often been cited as providing information

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on the technical advances which have supposedly taken place in uranium mining methods since 1985. Section 4 ("Recent Advances in Uranium Mining Technology") is of particular interest in this regard. It acknowledges that unique problems are posed in attempting to contain uranium mine wastes, though it makes no reference to the numerous notable containment failures that have occurred. However, section 4.2.3. recommends the pervious surround method of tailings containment now being attempted at the Rabbit Lake Mine in Northern Saskatchewan. The willingness with which this method is embraced as a panacea for tailings containment is worrying on a number of counts:

- a) Here, as elsewhere in the report, there is no acknowledgement that the high grade ores in Northern Saskatchewan are an economic justification for expenditures unlikely to be regarded as feasible in areas like Nova Scotia with low-grade ores and consequent slimmer financial margins.
- b) The pervious surround system is inevitably very expensive because it requires continuous pumping and decontamination for a minimum of 15 years after the mine has closed down. No identification in this report of the probable bearer of this financial burden after mine closure, although presumably the cost would fall to the province.
- c) Similarly, no acknowledgement here or elsewhere in the report that thinly populated areas like Northern Saskatchewan face an entirely different risk scenario than that posed in a small province like Nova Scotia where numerous towns as well as the province's largest city are all geographically close to any potential uranium mine.
- d) Pervious surround is described in the report as if it is already the industry standard. This is far from the case, since it has so far only been used at Rabbit Lake for a few years. Since "safe" containment of uranium tailings essentially requires that they are sequestered in perpetuity, the system can only be regarded as an experiment.
- e) It is worth noting that since this method was so uncritically lauded in this report, there have already been some serious problems resulting from higher-than-expected groundwater flows. Environment Canada noted in its brief to the McCleave Inquiry that, "In Nova Scotia, the wet climate, generally high water table, and generally acidic waters may pose special problems to radioactive waste management." [Environment Canada, 1982]

The report goes on to praise "Other technological advances in Mining" (4.2.4), notably the jet-boring method of extracting ore from the high-grade ore body at Cigar Lake in Northern Saskatchewan. In an otherwise standard description of this technique, a crucial fact is omitted. The indispensable first step of this technology is for the ore body to be frozen solid in order to attain "geotechnical stability." While this can be assumed as a matter of course in a Northern Saskatchewan winter where temperatures commonly remain as much as -60 degrees for considerable periods, it has no possible chance of occurring in Nova Scotia's latitude. That this essential piece of information is missing from the account presents the worrying question that here, and perhaps elsewhere in the document, the impulse to present uranium mining

in the most favourable possible light has overwhelmed a scrupulous regard for accuracy.

### **3) Hansard transcript of Mr. Gordon Dickie's April 15 presentation to the Legislature's Select Committee on Resources regarding the province's uranium moratorium.**

In general, lobbying of government by the mining industry is conducted in private, so the public is without access to the assertions that have been made. However, some indication of the content of the industry's argument for abolishing the existing moratorium can be inferred by the presentation to the Select Committee on April 15, 2008, on behalf of the Mining Association of Nova Scotia.

We are concerned that Mr. Dickie's information was inaccurate or misleading in several areas. While there is no indication that he intentionally mis-informed the Committee, he himself admitted that the information he was presenting was 26 years old, and it was evident that he had not recently re-familiarized himself with the subject.

Briefly, these are the areas on which the information needs correction:

#### **a) Uranium mining in France:**

Mr. Dickie rightly notes that the geology of France (as well as the UK and Spain ) resembles Nova Scotia's. He refers, however, to French uranium mines as follows:

" . . .they are blessed with significant quantities of uranium mineralization. Toward two underground mines in Limoges, in order to get there we drove through the countryside - farms not unlike the Annapolis Valley - and came upon the first of two sites that day. The mine was just off of the highway and in all directions was farmland and working farms.

I guess that's an indirect way of indicating to you what the French do and how they've managed their industry. It's not northern Saskatchewan, it's sort of in the middle of farmland around what's called the Massif Central in France. Each particular mine and each particular ore body has its own set of criteria that need to be dealt with, and that's done through the environmental assessment process."

However, the fact is that France no longer mines uranium. The last mine closed in the summer of 2001. Rather than mine its own reserves, France now imports uranium from Australia and Canada as well as from mines in its former colonies in Africa. There have also been significant environmental problems with the French mines since their closure. There are numerous examples of leakage from tailings and waste rock piles reaching local rivers and lakes and even of criminal charges being brought against the national uranium mining company COGEMA. Even mines that have long been decommissioned and supposedly "reclaimed" have been

identified as polluters. For example, seriously elevated radiation levels have been found around the former open pit uranium mine and mill at St Pierre du Cantal. Concentrations of radium-226 in soil on public grounds were found at up to 76,000 Bq/kg (that is up to 700 times the natural level in the area).

This information is easy to find from numerous reliable sources including the World Information Service on Energy and from French government documents.

The example of uranium mining in France should serve, not as a model for Nova Scotia, as Mr Dickie suggests, but as a warning.

**b) On the radon hazard:**

Mr. Dickie testified to the Committee as follows:

“ There's a good thing about radon, though, and this is another concept of half-life, which means how much time is required for half of the radon to disappear, to transmute into the next daughter - it's three days. So that's why ventilation works so well with radon that as you extract it, it transmutes into something else and so you eliminate the issue of breathing radon in and having damage caused by alpha particles.

MR. CHAIRMAN: What does it transmute into?

MR. DICKIE: The next series down - I don't have that right in front of me but we'll provide that sort of decay chain of uranium for you. There are, I don't know, 15 or 20 different ones . . .

Anyone unfamiliar with the topic might assume from this that the radon is made to vanish by means of ventilation. The radon does not vanish with ventilation because it is being continuously produced by its predecessors (Radium 226, Thorium 230, Uranium 234, Proactinium 234, Thorium 234) in the Uranium 238 decay chain. So a continuous stream of radon is downwind from the ventilation system. Furthermore, radon's own decay products as the chain continues are extremely hazardous, including the deadly Polonium 210 which was used in the 2006 murder of Russian dissident Alexander Litvenenko. While these alpha emitters can't penetrate skin, they are dangerous when ingested via eating or breathing. Mr. Dickie's vagueness about the so-called “daughter products” of radon is particularly worrying since it's precisely those “daughter products” which have been responsible for the high rates of lung cancer for uranium miners.

Mr. Dickie also seems to imply that radon's short half-life makes it less dangerous. In fact, the reverse is true, because of the intense energy emitted by short-lived isotopes.

**c) On uranium exploration:**

Mr. Dickie presents the frequently-heard fall-back position of mining companies eager to overturn the uranium moratorium—i.e. that, given the environmental hazards posed by naturally occurring uranium, that mining companies are doing the public a favour by locating it. In his words,

“the problem with the moratorium is we don't collect the information. If we don't collect the information then we don't know anything about the risk, do we? “

To give him credit, he does not, as do some mining company representatives, falsely claim that mining is “taking the uranium away.”

There are many ways in which the potential uranium risks can be determined without the ground disturbance which, in itself, increases the level of hazard. The most obvious is water sampling, an inexpensive tool already widely in use for commercial uranium exploration. Geobotanical surveys are now also used more frequently as a way of locating mineral deposits without land disturbance. [McLemore and Turner, 2006] However, when the sole motive is to locate an economically viable mineral deposit, exploration has very limited usefulness in assisting communities to evaluate potential health risks. It is much more helpful when water sampling and geobotanical surveys are conducted in conjunction with epidemiological evaluation of the population which may be at risk. One model for this is the extensive study undertaken in south central Virginia. [Wyatt, Reitz, Croley *et al*, 2008]

Exploration for uranium with the government's blessing provides a clear political signal that mining will be allowed to proceed if deemed commercially viable. While it's frequently implied that this would be many years in the future, the reality is that when Kidd Creek Mines were required to cease activity at their Millet Brook site near Windsor in the 1980s, they had already delineated what they considered to be a commercially viable ore body. They were poised to embark on the next stage of “exploration” which is bulk sampling. When asked by the Committee's Chair to clarify what he meant by “additional work” at that stage of exploration, Mr. Dickie, quite rightly responded,

“Beyond the drilling stage, the next stage of exploration typically is a bulk sample - you would extract perhaps between one ton and 20,000 tons for mill test work, is typically what you would do.”

In effect, bulk sampling is comparable to mining on a small scale but without any of the environmental restraints which would apply to an actual mine. Most worryingly, if the uranium moratorium were to be overturned as the Mining Association is requesting and as Natural Resources Minister, David Morse appears to favour, bulk sampling could be underway very quickly. In other words, Nova Scotia would be rapidly

on its way to becoming a uranium mining province with a government seemingly unaware of the consequences, a population which has been encouraged to think that the issue has gone away, and with mining regulations woefully incapable of either monitoring or controlling a type of mining which poses quite unique hazards.