Presentation to the Nunavut Planning Commission
Discussion on Uranium Mining
Graham Simpson, Saskatoon
(June 5th 2007)

A. I wish to thank the Commission for inviting me to bring some experiences of the Inter-Church Uranium Committee Educational Co-operative (ICUCEC) of Saskatoon.

B. I am a retired Prof. of Plant Sciences at the University of Saskatchewan where I taught and did research for 40 years in the field of plant physiology. I am particularly concerned about the deterioration in the environment and biosphere by radioactive pollution that can have long-term genetic effects in all living things. I have been a member of ICUCEC since it began.

C. I will give you a brief history of ICUCEC that has been in existence now for 27 years. Following the Cluff Lake Enquiry in Saskatchewan in 1978 the Provincial Government decided to permit new uranium mines in the Wollaston Lake basin in the far north of the Province. The nuclear industry decided to quietly buy up land owned by Mennonite dairy farmers close to Saskatoon, with the object of building a uranium refinery to avoid sending yellowcake all the way to Port Hope in Ontario. The farmers were angry at the deceit and called on local churches of different denominations to oppose a refinery when hearings were held by the Saskatchewan Government. The United Church, Catholic, Anglican, Lutheran and Mennonite churches banded together in an organisation initially called the Inter-Church Uranium Committee (ICUC) that made a convincing case to the hearings against having a refinery(1).

The committee then focussed on the expanding uranium mines and for ethical reasons opposed them on the grounds that uranium was going from Saskatchewan to atom bombs (The Cold War was on) also to nuclear reactors that created huge amounts of radioactive waste posing a threat to the environment and humans for ages to come. The committee made as a primary objective the halting of uranium mining in Saskatchewan. British Columbia had just declared a moratorium on uranium mining for at least 7 years.

In 1983 a Joint Statement was issued to the Government of Saskatchewan by all the Church Leaders who were in total agreement that a moratorium should be put in place against uranium mining. It is unusual to get different denominations to agree on anything !

In 1991 and again in 1993 ICUC and the church leaders reiterated their requests to the government without effect. The committee then changed its name to be an educational cooperative with the object of bringing an alternative view to the public about the claims and propaganda of the nuclear and uranium mining industry. Atomic Energy Limited of Canada (AECL) tried to bring a proposed 'Slowpoke' nuclear reactor to the Univ. of Sask. in 1989-90 after being turned down by the people of Sherbrooke(2) .The intent of AECL was to get a foot in the door in Saskatchewan to show their proposed small reactor could be used in the north or sold overseas. ICUCEC together with several other organisations and the University Faculty opposed the concept and any need for a reactor so AECL withdrew the project.

At the same time AECL set up a million dollar building in Saskatoon with 140 personnel to draw up plans for a CANDU-3, medium sized reactor, and bombarded the public, schools and organisations with propaganda costing millions of dollars (3). With a change in Government and much public opposition from ICUCEC and the public, AECL withdrew from Saskatchewan after spending about $40 millions of taxpayers' money to no avail.

In 1989 Saskatoon was declared a Nuclear Weapons Free Zone as a symbol of opposition to nuclear war, adopted by many cities in North America and the Commonwealth. ICUCEC spearheaded this action (4).

During the 1990's ICUCEC and many individuals made representations to the various regulatory hearings around new uranium mines, high-level nuclear waste disposal (The SEABORN commission) and the Joint Federal/Provincial Panel hearings on new uranium mines, particularly the proposed McArthur River mine with its very high grades of ore and associated high levels of radioactive wastes, using untried methods.

In 2002 ICUCEC took the Canadian Nuclear Safety Commission (CNSC) (Previously called the Atomic Energy Control Board (AECB))to a Federal court for failing to initiate an Environmental Assessment for changes proposed by the French mining company Cogema (Now called AREVA) at its McClean Lake mine and mill. Judge Campbell upheld ICUCEC but the CNSC still didn't stop the ongoing activities of the mine and mill despite the court decision. Cogema and the Government of Saskatchewan and one aboriginal band, who feared they would lose trucking work if the mine was shut down until an assessment was concluded, joined together in an appeal to the Federal Appeal Court against the judgement of Mr. Justice Campbell. It took 2 years for the verdict (June 8th 2004) which reversed Judge Campbell's decision.

This Appeal Court decision was further appealed by ICUCEC to the Supreme Court which decided for reasons, not given, to reject the appeal. It is one of the only court cases in Canada related to the uranium mining and nuclear industry where a voluntary organisation has taken action on behalf of the public. It demonstrated how difficult it is to get past the layers of Federal, Provincial, CNSC and industry influence to combat matters of public concern. It is literally a David and Goliath situation in terms of the opposition that comes to those who dare to question the vested interests of powerful companies and government bureaucracy. There is a lesson there to be learned by the people of Nunavut – expect lots of problems whether you say NO or YES to uranium mining as there are many forces in front of you.

In recent years ICUCEC has been making a strong case for the CNSC, the Federal Dept of Health and Federal Dept of the Environment, and Provincial counterparts, to recognize the long-term effects of radon gas, and its product alpha-radiation as the primary cause of lung cancer in uranium miners. New research shows that alpha radiation has been downplayed in the past for its effect on humans and has been underestimated for its genetic effects on all other biota. The CNSC has been reluctant to accept that new research is needed to understand the effects of radioactive wastes on all biota in the environment of uranium mines.

D. History of uranium mining and the nuclear industry.

Radium was mined along with uranium near Lake Athabasca in the 1920's and 30's and when the second World War commenced and uranium was needed to make bombs, mining was renewed at Gunnar and Beaverlodge and it came under the control of the Federal Govt. by turning the private company Eldorado into a Crown corporation, Eldorado Nuclear. Uranium was needed for atomic weapons and the CANDU reactor was designed firstly to make plutonium from weakly enriched uranium. Atomic Energy of Canada Limited (AECL) became the Federal Crown Corporation that designed and researched nuclear reactors and gave guidance on matters to do with uranium mining and radioactive waste disposal. It has received more than $74.9 billion dollars since its creation, all of it by cabinet decision without debate in parliament (5,6). Eventually the Federal Government created the Atomic Energy Control Board (AECB) (now called CNSC) to regulate the various aspects of the nuclear and uranium industries. Health and Environmental issues remained the prime responsibility of the Federal and Provincial Departments.

This has led to conflicts between the Federal and Provincial Departments about jurisdictions and the application of regulations. This confusion has been used

by industry and mining companies to get away with all kinds of issues. The NWT was under the jurisdiction of Federal Laws until the division that created Nunavut. As an example of the games that are played we can look at the Athabasca region mined first in the 1930's (e.g., Gunnar and Beaverlodge and many smaller mines) that dumped wastes straight into a bay of Lake Athabasca. When these mines ended they were abandoned without decommissioning. This left the public carrying responsibility for any long-term problems except where companies like Cameco, that were formed years later, had taken over previous mining rights .

In the early days little was understood about the short- and long-term hazards of uranium mining and wastes. With the gradual acquisition of health and environmental protection legislation at the Federal and Provincial levels it was decided about ten years ago that these old mines and wastes needed to be cleaned up (7). The Province of Saskatchewan wanted the Federal Government to pay, and *vice versa*, so they argued for a few years and sixty years after the mines closed they have agreed, two years ago, to each put up $12 M toward decommissioning but to date nothing has been done except to study what to do ! In fact Mr. Anderson the Federal Minister of the late Federal Liberal Govt is on record as saying "they didn't really want to get involved as they know it is going to cost at least one billion dollars to clean up uranium mine wastes !"

So, in the meantime RA waste is dispersing itself in the north while the bureaucrats play games. By 2002 Canada had accumulated 200 million tonnes of uranium mine waste, mostly in Ontario because of the low ore grades there, compared to the new high-grade ores in the mines of Saskatchewan. The Saskatchewan mines have about 22 million tonnes from 38 years of mining; mines that contain ores with much higher proportions of radioactivity than other places in the world (8).

A study around the Key Lake Mine area in 1997 (9) concluded that uranium, radium-226, lead-210 and polonium-210, all dangerous to the biosphere, were present in plants and soils and animals in amounts well above permissible limits for humans. The highest amounts were for polonium-210, a breakdown product of radon gas that enters the atmosphere from uranium mines and mills and can spread around the globe.(Polonium was recently used by the Russians to kill Litvinenko in England and it is more dangerous to humans than plutonium in extremely low doses.) Radon gas has been the principal cause of lung cancer in uranium miners. Over 90% of the radioactivity in uranium mine wastes comes from radium-226 which has a half-life of around 1600 years.

E. Some unresolved health issues related to uranium mining.

The CNSC has concluded there is no further need to do epidemiological studies of uranium mine workers on the grounds that the regulations are now protective enough to prevent over exposure to radioactive materials. However the provincial and federal government health departments cannot even agree on what are the allowable limits of exposure and these have been changing quickly in the last few years as international studies have shown the need to lower the limits of exposure. For example the International Commission for Radiological Protection (ICRP) said in 1991 that for members of the public like you and me the maximum exposure is 2 msv/yr (10). The AECB in 1990 said the public can have 5 msv/yr but miners can have 30 msv over 3 months or 50 msv/yr (11) .This means miners can have ten times more exposure than you or me. The Sask Dept of Health in 1993 said 20 msv averaged over 5 yrs or 50 msv in one year (12) . In 2000 CNSC announced new regulations of 20 msv for miners and 1 msv /annum for the public, fourteen years after the knowledge that at least 6000 workers in Canada exceeded permissible dosages (13). The governing principle for the CNSC is the so called 'ALARA' principle which means 'as low as reasonably achievable' indicating that there is an element of health risk for all uranium miners at some point in the work place. An epidemiological study of 15,000 miners who had worked at the Elliott Lake and Bancroft mines in Ontario showed they had 81% more deaths from lung cancer than the general population (14). Of 30 Dene who worked at Port Radium 14 died from lung cancer (15) and American studies show that 30% of uranium miners are likely to die from lung cancer (16) so regardless of the new regulations accidents happen so the risk to uranium miners is high. International health scientists are now in agreement that even the lowest doses can cause cancer. Recent accidents such as the flooding of the McArthur River and Cigar Lake mines exposed some miners to exceptionally high levels of radon gas but the consequences may take years before they are seen as cancers.

F. There is laxity in the regulations governing radiation protection for uranium exploration where geologists and drill workers handle radioactive rock samples. A well known uranium geologist, Strnad, drew attention to this (17) in the Key Lake mine development in 1998 and died soon after of cancer.

The regulations governing uranium mining seem to be merely guidelines and when accidents happen the companies are forgiven and told to get in line. None of the health and environmental agencies have the personnel to monitor the day to day activities of mines and mills so they rely on the companies to provide the data from

their own monitoring. This is a case of putting the fox in charge of the rabbits as data can be fudged or not disclosed. In a case at Cluff Lake mine aboriginal workers were subjected to lie detector tests, after a 100 cubic metre spill of liquid, suggesting that cover ups were suspected and blamed on the workers (18). The CNSC hearing about amending the operating licence at Key Lake in January 2007(19) disclosed that the walls of waste pits were slumping , mill effluents were escaping downstream such that the water quality 10 km down river was causing selenium toxicity in fish and genetic abnormalities. Fifteen workers exceeded permissible doses of radiation and there were many minor accidents. The performance ratings in the areas of waste management, health, environmental protection etc. were all either B or C level meaning they were poor performance yet the CNSC renewed the license with simply a warning for Cameco to get its act together. I suspect the history of every uranium mine is similar and unless there is a major accident the public is unaware of what is really happening to miners and the environment.

Public hearings for scoping sessions and environmental assessments are, from my personal experience, mockeries of proper process and evaluation because the mining companies and government bureaucrats descend from the cities and expect local inhabitants to be able to understand and make decisions about the lengthy briefs and engineering propositions couched in highly technical language. There are never enough publicly-supported or interested groups with the scientific and technical knowledge to make the independent evaluations that are essential for protecting the interests of the general public. The CNSC usually plays the key role in hearings and most of the appointees tend to be experts previously associated with the nuclear industry and they rely on a small group of technical advisers. There is a bias in the CNSC toward defending the interests of the mining companies rather than protecting the public and it sponsors very little research.

All the predictions about how mines will operate under the governing regulations have been confounded many times because mining requires experimenting with new techniques and accidents too frequently happen. Selenium, arsenic, radium and other toxic chemicals have been leaked time and time again into the northern water shed of Saskatchewan, most of which flows out eventually into Hudson Bay via the Churchill River system. Every one of the waste storage pits has encountered problems mainly due to escaping liquids containing toxic materials. In the long term, predictions about containment will fail due to the huge volumes of underground and aboveground water movement in Saskatchewan's interconnected system of thousands of lakes. Almost every mine is named for being sited on a lake or river. The financial costs associated with new techniques can be disastrous as Cameco is currently

learning with the flooding accident at Cigar Lake (20) but the environmental damage can be even worse in the long run. But mining is all about taking what is there and then leaving, not about guarding the future of the environment.

G. One of the characteristics of the whole nuclear chain (uranium mining, refineries, nuclear reactors and atomic bombs) that is totally opposite to the natural cycles of nature is the fact that everything ends up as waste. High level nuclear waste from reactors, waste from mines and refineries and waste when bombs or DU weapons are used are all accumulating in huge volumes. The economic costs of the nuclear chain, since the first bombs and reactors were built, have largely been born by governments for national interests, initially for military reasons.

The Federal Government has never allowed a full parliamentary debate on nuclear energy. In fact it has spent money liberally on the nuclear industry and even secretly consorted with uranium mining companies to engage in an international cartel dominated by US interests to control the price of uranium. I had to resort to the freedom of information act to get cabinet minutes to show that it actively supported the fixing of prices between Sept 1st 1970 to April 1, 1978 by six uranium mining companies (Eldorado Nuclear, Uranium Canada, Denison Mines, Gulf Minerals, Rio Algom and Uranerz). At the time, the government denied it was involved.

The influence on and constant lobbying of governments by all sectors of the nuclear industry subverts other national interests and has diverted huge amounts of capital away from other sectors of industry and research. In Saskatchewan the government has spent at least one billion dollars in subsidies to the uranium industry and recaptured in royalties about ten percent. The mining companies claim they bring wealth and jobs to the province but last year the combined contribution of all the uranium mining companies was only about 6.5% of the Gross Domestic Product (GDP) of Saskatchewan. The profits go out of the province to corporate shareholders.

The debt of Ontario for its nuclear reactors, most of them with troubles, is in the order of $40 billion in 2005 (21) and AECL subsidies from the Federal Government have been $74.9 billion, which constitutes 12% of Canada's National Debt.

Right now the price of uranium has skyrocketed mainly through speculation (22). With Canada producing about 30% of world supply the failure of the Cigar Lake mine to start producing after a disastrous flood combined with a shortage of currently available world supplies has set off a frenzy of exploration. The nuclear industry is claiming a 'renaissance of interest in building new reactors' but a report released by Greenpeace a month ago (23) in Europe shows clearly that with the

exception of China and India nuclear is in decline everywhere else and has been for twenty years. As the price of uranium rises the cost of nuclear power rises thus making reactors even less competitive than they already are. So my prediction is that the bubble will burst soon and the prospecting and excitement will have been in vain. Nuclear reactors in an age of climate warming caused by burning fossil fuel cannot substitute for fossil fuel and create 'clean air'. Reactors liberate radiation and produce the most dangerous toxic wastes known to mankind and no country has found a way to safely dispose of their wastes or the reactors when they are closed down. These wastes remain dangerous for tens of thousands of years. Canada has spent over $700 M trying to find ways. Proposals to date by the Nuclear Waste Management Organisation (NWMO) (24) are horrendously expensive ($20-40 billion) and uncertain and unacceptable to the public according to the 7-year long Seaborn Commission. Aboriginal lands, far away from the big cities, are the favoured sites for nuclear waste disposal (25). The cities are not friends of Canadians who happen to live in the more distant places of this huge country.

H. I have tried to paint you a picture of some of the experiences of ICUCEC and my personal perspective as an observer of the uranium chain. At the age of 76 I have learned to speak my mind with the hope that future generations are not going to suffer from the mistakes of the present consumer-oriented society that has become isolated from the realities of the ecosystem that supports our survival as a human species. We are doing enormous damage to forests, fisheries and landscapes because of over-population and the wasteful consumption of natural resources in the Western world. It is all just to create a style of life that cannot be sustained for long and certainly not enjoyed by a majority of humankind.

The people of Nunavut who lived here for thousands of years learned how to strike a balance between nature and their lifestyle. The people in cities have lost that knowledge in a technological society and have little regard for those who live in distant places.

I end by saying this to you . All the people of Nunavut have to do is say NO to uranium mining and you can avoid all the problems that are certain to arise and make your life even more difficult than you think it is already. You said NO once before (26). The promises and coercion from the mining industry and the encouragement from Government Bureaucrats that will accompany them are not really about benefiting you, but rather them. Think very carefully about strangers who bring gifts.

References:

1. Christian Leaders call for critical reflection on uranium mining and the nuclear industry in Saskatchewan. 1993. Final Document -13 pp. April, 28.
2. Vandermuelen, T. A slowpoke reactor for Saskatoon ? Why Sherbrooke said no. Typescript of talk-19pp., Saskatoon public library, July 24, 1989.
3. Burton, R. Saskatchewan goes nuclear. $40-million deal with AECL brings 140 jobs to Saskatoon. Dec.22,1992. Saskatoon Star Phoenix.
4. Nuclear Weapons Free Zone Campaign. 1989. ICUC and United Church Task Force with Project Ploughshares. 14pp. Brochure and Kit for church groups.
5. Exporting disaster. The cost of selling CANDU reactors. $15 billion . Campaign for Nuclear Phaseout. 4pp..1998.
6. Atomic Energy of Canada Ltd. responsible for 12% of national debt. Internet Press Release, Energy Probe. January 2006. $196.4 billion in today's dollars.
7. Swanson, S. 1992. Levels and effects of radionuclides in aquatic fauna of the Beaverlodge area (Saskatchewan). Sask. Research Council Pub. No. C-806-5-E-82. (187pp.).
8. Simpson, G. M. 2002. Radioactive waste. Canadian Environmental Network Forum at the World Summit on Sustainable Development, Johannesburg, S. Africa., April 1.
9. Thomas, P.A. 1997. The ecological distribution and bioavailability of uranium-series radionuclides in terrestrial food chains. Key Lake Uranium Operations, Northern Saskatchewan. 139 pp. plus appendix. Environment Canada.
10. International Commission on Radiological Protection. New suggested regulations for exposure to radiation. Values suggested about one half of those previously used around the globe. 15 msv/annum for humans. New Scientist, Feb. 1, 1992.
11. Atomic Energy Control Board of Canada. Regulatory Document R-91. March 1 1990
12. Alderman, J. 1993. Overview of worker protection regulation. Director Resource Policy Saskatchewan Government. Typescript Presentation. Joint Federal Provincial Governments Environmental Assessment Review of Uranium Mining in Northern Saskatchewan. 4pp. March 23, 1993.
13. Mittelstaedt, R. 2000. Regulator wants tighter limits on public exposure to radiation. Globe and Mail, March 16.
14. Malarek, V. 1986. Lung cancer deaths among uranium miners up steeply in Ontario. Globe and Mail, Jan.30.
15. Nikiforuk, A. 1998. Echoes of the atomic age. Cancer kills fourteen aboriginal uranium workers. <http://www.ccnr.org/deline_deats.html>
16. Park, R.M., Bailer,A.J., Stayner, L.T., Halperin, W., Gilbert, S.J. 2002. An alternate characterization of hazard in occupational epidemiology: years of life lost per years worked. Am. J. Ind .Med. **42** (1)1-10.
17. Strnad, J. G. 1998. Uranium mining problems not always far afield. Saskatoon Star Phoenix, June 12.
18. Lyons, M. 2002. Spill investigation rankles mine workers. Cogema just following government regulations. Saskatoon Star Phoenix, April 20.
19. Canadian Nuclear Safety Commission, January 207. Amendment to the Key Lake (Cameco) Operation uranium mill operating licence. (CMD-07–H5, CMD-04-H18). Public Hearing. January 25.
20. Lyons, M. 2006. Can Cameco keep up !Second richest mine flooded twice in six months. Saskatoon Star Phoenix, October 24.
21. Mehta, M. D. 2005. Nuclear power poor economic choice. Saskatoon Star Phoenix. November 4.
22. Partridge, J. 2007. Case for uranium more bullish. Nuclear renaissance pushes prices higher, new futures contracts add to liquidity. Globe and Mail. May 16.
23. Greenpeace International. 2007. The economics of nuclear power. Report prepared by Thomas, P., Frogatt, A., Bradford, P. and Milborrow, D. May 2nd. 63 pp. <http://www.greenpeace.org/international/press/reports/the-economics-of-nuclear-power>
24. Nuclear Waste Management Organisation. 2005. Choosing the way forward.. The future management of Canada's used Nuclear Fuel. Final Study, 455 pp. November. Toronto.
25. Declaration of the Indigenous World Uranium Summit. 2006. Navajo Nation. December 4th. Summit declaration Demands worldwide ban on Uranium. Based on "disproportional impacts" of the nuclear fuel chain on Indigenous Peoples.
26. McKay, P. 1989. Snow job. Doing the uranium hustle in the NWT. This Magazine. pp.14-18. About Baker Lake.