Elizabeth Dowdswell
President, Nuclear Waste Management Organization
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INUIT TAPIRIIT KANATAMI

March 31, 2005

Dear Ms. Dowdswell,

On behalf of Inuit Tapiriit Kanatami (ITK), I am pleased to submit the January-March 2005 quarterly report regarding the National Inuit Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste.

The status of the dialogue process as it has been conducted to date is outlined in the attached document.

It is important to note that ITK, with the help of Inuit Land Claim Organizations, has made great strides in the preparations, conducting and conclusion of the National Inuit Dialogues on the Long-Term Management of Nuclear Fuel Waste. To date dialogues have taken place in the following communities:

1. Iqaluit, Nunavut - November 9-10, 2004
2. Inuvik, Inuvialuit Settlement Region - November 17-18, 2004
3. Kuujuak, Nunavik/Northern Québec - January 27-28, 2005
4. Makkovik, Nunatsiavut/Labrador - February 9-10, 2005

The meetings that will, however, be reported on within this report are the meetings that took place in Kuujjuaq, Nunavik and in Makkovik, Nunatsiavut.

Should you have any questions or comments regarding the materials in this package, please do not hesitate to contact me at any time.

Sincerely,

Soha Kneen, M.A.
Coordinator of the National Inuit Specific Dialogue on the
Long-Term Management of Nuclear Fuel Waste
Environment Department
Inuit Tapiriit Kanatami

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Quarterly Report on the National Inuit Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste (January – March 2005)

Submitted to:

Elizabeth Dowdswell
President
Nuclear Waste Management Organization (NWMO)

By:

Soha Kneen, M.A.
Environment Department Coordinator
Environment Department, Inuit Tapiriit Kanatami

Outline of January – March 2005 Activities

Throughout the past three months, ITK, with the help of the National Task Force Members of the Inuit Landclaim Organizations, has been actively engaged in the organization, coordination and execution of the final two Regional Inuit-Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste. These dialogues took place in Kuujuaq, Nunavik/Northern Québec and in Makkovik, Nunatsiavut/Labrador

The particulars of ITK's recent activities in preparation for these dialogues will be addressed as follows:

1. Expert Presenters;
2. Statements of Expectation made at the two Regional Inuit-Specific Dialogues (Kuujuaq/Makkovik);
3. NWMO Sponsored Community Feast/Participant Dinner;
4. Regional Reports (Nunavut, Inuvialuit Settlement Region, Nunavik, Nunatsiavut);
5. National Inuit Youth Summit (Nain, Nunatsiavut);
6. Review of Discussion Documents #1 and #2;
7. Final Reports from Inuit Landclaim Regions;
8. Next Steps.

1. Expert Presenters

The experts that presented at the final two of the Inuit-Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste in Canada are listed as follows.

Kuujjuaq (Nunavik/Northern Québec):

1. Michael Krizanc	NWMO
2. Dr. Gordon Edwards	Campaign for Nuclear Responsibility
3. Robert Del Tredici	Atomic Photographers' Guild/Campaign for Nuclear Responsibility

Makkovik (Nunatsiavut/Labrador):

1. Michael Krizanc	NWMO
2. Dr. Gordon Edwards	Campaign for Nuclear Responsibility
3. Robert Del Tredici	Atomic Photographers' Guild/Campaign for Nuclear Responsibility

** Dr. Edwards and Mr. Del Tredici conducted a joint presentation at each of the dialogues**

The presentations, which were made at the Kuujuaq, Nunavik and Makkovik, Nunatsiavut dialogues were very well received by the attendees of these two meetings. As a result of these presentations the participants at both dialogues asked many relevant and related questions as these presentations had clarified the issue of the Long-Term Management of

Nuclear Fuel Waste in Canada immensely for them. Of particular interest throughout the Makkovik dialogue was, however, that the attendees of this meeting expanded the topic of their questions to apply to the subject of uranium mining. This issue has a very high profile in the Nunatsiavut region at the moment, as prospecting for uranium is currently taking place.

2. Statements of Expectation:

The dialogues (each lasted two days) were very well received by the attendees of each meeting. As was the case at the previous two dialogues, the first day of the dialogues, which took place in Kuujjuaq and Makkovik were designed as educational days. The morning was spent with general introductions, as well as the attendees' expectations from the meetings. This was later followed by the ITK, NWMO and expert presentations.

The attendees of both dialogues included in their statements of expectation that they were in attendance to receive the following information.

Kuujjuaq, Nunavik:

- One participant stated that his goal was to get more information on a potential regional environmental concern and his hope was that Inuit could have input;
- Other participants anticipated asking constructive questions, while gaining an understanding of the issue and providing recommendations.

Makkovik, Nunatsiavut:

- A participant from the Labrador Inuit Association (LIA) said he did not know much about the issue and was interested in learning more because of potential uranium development in Labrador;
- Another said he had renewed interest in the dialogues because he suspected they are actually about uranium mining rather than Nuclear Fuel Waste;
- A third said his interest came from the point of view of exploration and of a worker at the local fish plant;
- Another said she was interested because environmental health is one of her responsibilities;
- Other participants said they were attending to learn as much as they could.

These statements served as an interesting starting point of each of these dialogues as they indicated the level or lack of information on the issue of the Long-Term Management of Nuclear Fuel Waste in Canada within Nunavik and Nunatsiavut up until this point in time.

3. DRAFT Recommendations/Comments:

Listed below are the DRAFT recommendations that were compiled by the attendees of the meetings, which took place in Kuujjuaq and Makkovik Inuit-Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste in Canada.

Attached to this document are also the four final reports from the Inuit-Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste in Canada. ITK is currently engaged in the writing of the draft Final Report, which is to be submitted to the NWMO on June 30, 2005. This report will, however, have to be submitted to ITK's Board of directors prior to the June 2005 deadline for their final approval of this document prior to its formal submission. Once this approval process has been concluded, the report will be formally submitted to in the NWMO for inclusion in the NWMO recommendations that will be submitted to the Minister on November 15, 2004.

Kuujjuaq

Preamble:

These recommendations are provided with the understanding that they are informal submissions resulting from a regional dialogue, which took place in Kuujjuaq, Nunavik on January 27-28, 2005.

Not enough time and funding were allocated in order to conduct a formal consultation that would be effective, meaningful and culturally appropriate. Section 12(7) the Nuclear Fuel Waste Act states that they shall consult the general public and in particular Aboriginal (Inuit, First Nations, Métis) people. The meeting that has taken place over the past couple of days cannot be considered a consultation under this act.

Attending at this meeting were representatives from the Kativik Environmental Advisory Committee (KEAC); National Inuit Youth Council (NIYC); Nunavik Hunters, Fishers and Trappers Association; KRG; Northern Village of Kuujjuaq; Makivik Corporation; and individual community members.

Those present stated their appreciation that ITK had organized this workshop and that ITK staff had ensured that both sides of the issue had been made available to the regional participants of this meeting.

Draft Recommendations:

At this meeting the following was agreed on by those present:

- Attendees could not understand why the question of the disposal/management methods of Nuclear Fuel Waste was posed to this region, as the region neither consumes energy derived from Nuclear Reactors nor produces Nuclear Fuel Waste as a result of the energy production process;
- Although attendees understood that this is an issue of concern to all Canadians, they did not feel that the region should have to shoulder the burden of having to deal with the issue of Nuclear Fuel Waste in any manner;
- None of the options that were presented to attendees contribute to a long-term solution to the nuclear fuel waste problem at the national level. Any decision on which option to pick will be misinterpreted as consent to the nuclear industry's activities on this matter;

- Attendees further stated clearly that they did not want to choose any of the proposed options. Rather they stated that nuclear energy should cease to be produced (and the resulting Nuclear Fuel Waste should not continue to be accumulated) and that focus should be placed on solving the current issue of managing the existing Nuclear Fuel Waste;
- Attendees further stated that an emphasis should be placed on research that would examine alternative and low risk energy sources and that extensive funding should be directed into this area (including energy efficiency research - how to use more efficiently) ;
- Attendees wanted to further state clearly that they are in direct opposition to any Nuclear Fuel Waste to be stored, disposed of or transported through their territory. They further stated that these materials should also not be stored, disposed of or transported through territories near or adjacent to Nunavik (this includes transportation through the Northwest Passage and other northern routes);
- Attendees further wanted to send a clear message to the Minister (NRCan) and the province of Québec that they are advocating the discontinuing of the use of energy derived from nuclear reactors (shutting down reactors);
- Attendees felt that the NWMO should be able to consider options (such as the discontinuation of energy derived from nuclear reactors) within a public dialogue process (such as what was proposed by Seaborn panel);
- Attendees are in direct opposition to the reprocessing of Nuclear Fuel Waste in Canada, as it will result in the possible extraction of plutonium;
- Attendees stated that the NWMO's code of ethics should always be kept in mind and to carry that code to the end of this process (in a meaningful manner);
- Attendees further stated that the Government of Canada should maintain its promise to hold public hearings on the question whether nuclear reactors should be shut down or not (as had been intended by Dr. Seaborn);
- Assuming that the nuclear industry doesn't shut down overnight – an impartial and independent organization (not funded by the industry) should direct and conduct a public hearings process on the issue of whether or not nuclear energy should be continued to be used in Canada;
- Attendees recommended that a balanced educational program (using multi-media) on the broad issue of Nuclear Energy (uranium mining, production of nuclear energy, disposal/management of NFW, Environmental and Health impacts of Nuclear Fuel Waste) should be specifically designed for the North and that this program should be initiated across northern Canada. This type of educational program must be designed and conducted by external (from the Government), independent agencies and/or National organization (Aboriginal or otherwise).

Attendees at this dialogue hoped that science would solve the problem of the disposal/management of Nuclear Fuel Waste some day. This is, however, not possible today. Until the time until there is a completely satisfactory solution to the problem of Nuclear Fuel Waste, nuclear reactors should be shut down and no more Nuclear Fuel Waste should be generated at this point in time.

Makkovik

Preamble:

These comments are provided with the understanding that they are informal submissions resulting from a regional Inuit dialogue, which took place in Makkovik, Nunatsiavut (Labrador) on February 9–10, 2005.

It was formally stated by the participants of this meeting that it is not recognized as a consultation process, but as an information session. The reasoning for this is that not enough time and funding was allocated to conduct a formal consultation that would be effective, meaningful, and culturally appropriate. Section 12(7) of the Nuclear Fuel Waste Act states that they shall consult the general public and in particular Aboriginal (Inuit, First Nations, Métis) people. The meeting that has taken place over the past couple of days cannot be considered a consultation under this act.

In order for this to be considered a consultation, more time and funding should have been allocated in order to conduct full community consultations in each community in Nunatsiavut.

Some present also stated that it would be very difficult to have recommendations resulting from this dialogue, as there are not enough people present from the region to have a valid set of recommendations as a result. It is not representative. As a result, their feedback is submitted in the form of comments on this subject matter.

Comments:

- All present were in opposition to the storage/disposal of Nuclear Fuel Waste in Nunatsiavut and the Canadian Arctic;
- Nuclear Fuel Waste should remain on-site as opposed to moving it into an unpopulated or remote area.
- All present came to agreement that all three of the nuclear waste management options are extremely dangerous (list options here). More emphasis should be placed on safety and elimination Nuclear Fuel Waste; however, for the time being this seems the only option available;
- Participants were concerned about the possible risks involved during transport;
- The Government of Canada should in the House of Commons declare that the Arctic is a Nuclear Free Zone; Inuit in Nunatsiavut will be encouraged to contact their MPs to raise the issue in Parliament;
- In addition any lands recognized as Inuit home lands should be included as a Nuclear Free Zone;
- Landuse/use of sea or other environs should be included in a point here!!!
- Statement emerged that both the producers and the consumers should be responsible for the safe storage/disposal of nuclear fuel waste;
- Problems with contaminants already in the system—don't want to add any more;
- Ask the Government of Canada and the producers of waste to put a lot more funding into finding ways of getting rid of the Nuclear Fuel Waste;
- The government should look into the development of alternative energy options;

- More education needs to take place in general as well as within the public school system on the issue of nuclear power and the resulting Nuclear Fuel Waste;
- Need to protect already existing industry and resources that are already present (land, water, animals, environment);
- Those present agreed that the Government should stop calling nuclear energy a clean energy as it results in the production of Nuclear Fuel Waste;
- The nuclear industry should be required to conduct studies using external experts in order to conduct scientific studies into what effects radiation has on human health and the environment when exposure occurs;
- The NWMO should be an independent body—and not led by industry (as outlined by the Seaborn Panel);
- For amount of nuclear waste produced and the amount of electricity produced—what levels/amounts of energy are produced by the use of other energy sources (use of fossil fuel, etc.)—also questioned safety of these approaches (incl. emissions and pollution as a result); comparison studies need to be presented to the public.

Around this table there wasn't consensus as some felt that the nuclear industry should be shut down, whereas others did not feel this way. Their comments were as follows:

- Nuclear Industry should be shut down and should put more emphasis on the Canadian Government and industry to get rid of the tailings and waste;
- Health and safety should be considered before production;
- It was stated that representatives of the nuclear industry should be brought into communities via consultation process, to provide their points of view on this subject.

Final comment:

Inuit are starting to become educated about and aware of the hazards of nuclear waste. However, Inuit would like every community in Canada (with a special focus on Ontario—or on those who use electricity generated by nuclear power) to make a decision for themselves in terms of whether or not to continue with nuclear power; don't want to tell others what to do within their territory. A national education program and full consultations across Canada should take place as opposed to the current dialogue process.

4. NWMO Sponsored Community Feast / Participant Dinner

Kuujjuaq, Nunavik:

It was unfortunately not possible to organize a community feast in Kuujjuaq. This was in part due to the limited amount of time that was available to prepare the community feast, as well as the size of the community in question (pop. approximately 6000). The participant dinner, which took place instead of a community feast in the restaurant of the Kuujuak Inn, was a success and served to advance further discussion by the dialogue's participants on the subject of the Long-Term Management of Nuclear Fuel Waste. It further served as a means for the dialogue's participants to communicate amongst themselves their thoughts on the ongoing process.

Makkovik, Nunatsiavut:

In the case of the dialogue, which took place in Makkovik it was possible to organize a community feast. The feast took place in the gymnasium of the local school and was attended by well over 300 Makkovik community member, as well as the participants of the dialogue. This feast proved to be an excellent opportunity for ITK staff members, the NWMO representative, as well as the other expert presenters to communicate directly with the participants of the dialogue, as well as with local community members regarding the issue of the Long-Term Management of Nuclear Fuel Waste. This feast further served as a forum to answer any questions that were asked directly by interested community members.

5. National Inuit Youth Summit (Nain, Nunatsiavut);

An ITK staff member participated, presented on, acted as a resource person, and provided educational materials on the Long-Term Management of Nuclear Fuel Waste in Canada (including materials on the four Inuit-Specific Dialogues which had just been concluded) at the National Inuit Youth Summit. This summit, which was organized by the National Inuit Youth Council, took place from March 28 -30, 2005 in Nain, Nunatsiavut.

This summit represented an excellent opportunity for outreach on the subject of the Long-Term Management of Nuclear Fuel Waste in Canada with Inuit youth, as one of the goals at this summit was to have at least one youth member from each of the Inuit communities across the Canadian Arctic attend. In this manner ITK staff members were able to provide information to Inuit youth representatives from each of the communities within Nunavut, the Inuvialuit Settlement Region, Nunavik, and Nunatsiavut.

6. Review of Discussion Documents #1 and #2

ITK staff members, in coordination with an external consultant have now finalized the review process of Discussion Documents #1 and #2. For further information please see Appendix E for both documents.

7. Final Reports from the Inuit Landclaim Regions

The final reports from Nunavut, the Inuvialuit Settlement Region, Nunavik and Nunatsiavut can be found in Appendices A, B, C, and D. All four reports passed the following review process.

- Review of the respective reports by the meeting participants from the four Inuit Landclaim regions (immediately after the draft reports were completed);
- Secondary review of all four reports (including specific feedback, comments or changes) at the National Taskforce meeting, which took place in Ottawa on March 7-8, 2005;

- Final review via e-mail by the Taskforce meeting participants prior to submitting these documents to the NWMO via the fourth quarterly report.

In this manner it was ensured that all the information obtained throughout the Inuit-Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste in Canada was recorded in the most accurate manner possible.

8. Next Steps

The work that will be conducted in the upcoming quarter will include, but will not be limited to the following items:

- Preparation of the final report of the Inuit-Specific position on the Long-Term Management of Nuclear Fuel Waste in Canada for the upcoming ITK Annual General Meeting and Board of Directors meeting;
- Obtain final feedback from ITK's Board of Directors on the draft version of the final report on the Inuit-Specific position on the Long-Term Management of Nuclear Fuel Waste in Canada.

Appendix A (Final Nunavut Region Report):

Day 1: November 9, 2004

Participants

Soha Kneen, National Coordinator of the Inuit-Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste, ITK
Meeka Kilabuk, Board member, Nunavut Planning Commission (NPC)
Philippe Lavallée, NTI
PJ Akeeagok, Project Coordinator/Jr. Researcher, ITK
Luis Manzo, Director of Lands, Kivallik Inuit Association (KIA), Rankin Inlet
David Ningeongan, Lands Manager, KIA, Rankin Inlet
George Hakongak, Senior Advisor, NTI Lands
Stephanie Briscoe, Executive Director, Nunavut Impact Review Board (NIRB)
Karlette Tunaley, Technical Advisor, NIRB
Agnes Egotak, Kitikmeot Hunters and Trappers Association
Luke Suluk, Information Agent, Nunavut Planning Commission
Joe Amarualik, QIA Land Office
Matthew Akavak, Land Officer, QIA
Ian Rumbolt, Land Use Co-ordinator, Government of Nunavut

Welcome and Introductions

Soha Kneen, National Coordinator of the Inuit-Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste, ITK, introduced herself and PJ Akeeagok, Project Co-ordinator/Jr. Researcher, ITK. She invited participants to let her know if they would like any changes to the agenda.

Kneen said this was the first of four dialogues, with the others to take place in Inuvik the following week, Kuujjuaq in January, and Makkovik in early February. The goal is to inform the Inuit Landclaim regions on the issue of the Long-Term Management of Nuclear Fuel Waste and to collect statements and perspectives toward an Inuit position on this subject.

After introducing themselves, participants stated their expectations for the session. Most participants said they had come for the following information:

- Long-term effects of storage;
- Effects on Nunavut;
- Impacts on the environment;
- Impacts on wildlife;
- Degree of safety associated with storage;
- Proposed storage location(s);
- Proposed storage method(s);
- Existing plans;
- Storage of Nuclear Fuel Waste in light of current gold mining development;
- Locations where Nuclear Fuel Waste is currently stored;

- Existing research, including who conducted the research.

One participant said he was present to state that Inuit would not allow storage of Nuclear Fuel Waste on their land. Another participant pointed out that a 1999 NTI resolution strongly opposed storage and transport of Nuclear Fuel Waste in Nunavut. A representative from the Nunavut Planning Commission (NCP) noted that storage of Nuclear Fuel Waste comes under the aegis of NCP, with Article 11 of the 1993 treaty concerning land use. She expressed the NPC's interest in hearing about proposed sites, as well as perspectives of other countries and participants at this session, with a view to progressing toward a community consultation.

Kneen said ITK recognized that this was not a community consultation; rather, it was a dialogue. She introduced Joanne Facella, of the Nuclear Fuel Waste Management Organization (NWMO), as an expert who could fill in many of the information gaps. She also stated that Dr. Gordon Edwards and Robert Del Tredici also act as expert presenters who would present further information and visual details after Facella's presentation was concluded.

Kneen reiterated that ITK this was only one of four regional dialogues that would take place. She summed up the participants' expectations of the day's dialogue and invited them to add any that she had missed.

Participants read over the materials they had been given and provided comments.

A participant said the questions in the questionnaire were position-oriented. She queried the purpose, if this dialogue was not intended to result in a position paper. The role of most participants was to represent their organizations, not to give a personal opinion, she said. Participants would have to consult with their organizations before filling out the questionnaire. Kneen agreed that it would be inappropriate for participants to fill out the questionnaire.

Another participant suggested that the questionnaire might be a guide toward formulating a position. Another said it would be premature to fill out the questionnaire before participants were more conversant with the technical details of Nuclear Fuel Waste storage.

Kneen reminded participants that the goal of the process was a report containing the Nunavut specific position on what Canada should do with its Nuclear Fuel Waste. She said she would take direction from the participants and the report would reflect what took place at the meetings. Participants might decide to use the meetings to comment and state that they were not ready to take a position; however, that decision could be finalized the following day.

Update and General Information

Soha Kneen reiterated the group consensus that the meeting is for dialogue and information-sharing rather than development of an Inuit position on Nuclear Fuel Waste Management. She provided a brief overview of the *Nuclear Fuel Waste Act* (*NFW Act*) of 2002, including Section 12 (7). The *NFW Act* requires the management of Nuclear Fuel Waste over the long-term, in consultation with Aboriginal peoples. While the *NFW Act* was developed with public and stakeholder consultation, Aboriginal peoples and specifically Inuit were not included in

the process. In its 1998 response to the Seaborn Panel, the Government of Canada indicated that it would undertake a participation process for Aboriginal peoples to understand and assess Nuclear Fuel Waste issues. Furthermore, the consultation process would be designed and executed by Aboriginal peoples, to the extent possible, so that it was appropriate to their value system.

Kneen noted that ITK staff members have stressed to the NWMO and Natural Resources Canada (NRCan) the importance of Inuit involvement in the development of Nuclear Fuel Waste Management options. Inuit historically have been opposed to the Long-Term Management of Nuclear Fuel Waste in their territory, and their views deserve further exploration. A dialogue would allow Inuit to express themselves in a culturally appropriate manner. Issues such as the trans-boundary transportation of Nuclear Fuel Waste are of particular interest, Kneen explained. To address this need for Inuit engagement, ITK initiated a three-year process that will culminate in a comprehensive report on Inuit ethical, social, environmental, and economic considerations in regards to the storage or disposal of Nuclear Fuel Waste in Canada.

The objectives of the current dialogue include providing means and opportunities for Inuit to talk together and to share their opinions with the Government of Canada. The dialogue also creates a body of knowledge that relates Inuit views and opinions on Nuclear Fuel Waste and storage. The dialogue process is intended to build capacity and knowledge about Nuclear Fuel Waste Management amongst Inuit. Kneen noted that the dialogue is only related to the issue of Long-Term Management of Nuclear Fuel Waste and the dictates of the *NFW Act*. Within this scope, topics for discussion could include the current state of Long-Term Management, options proposed by the Act and the NWMO, and Traditional Knowledge in relation to Nuclear Fuel Waste Management.

In an overview of Nuclear Fuel Waste, Kneen described the nature and hazards of spent nuclear fuel bundles. Almost all Nuclear Fuel Waste is currently stored in the southern Ontario and Québec corridor, in places like Gentilly, Pickering, and Point Lepreau. Ontario Power Generation is responsible for approximately 90% of the 1.7 million spent nuclear fuel bundles. The long-term storage of this waste is necessary and perspectives on the issue must be solicited from various groups, including Inuit, she said.

Kneen noted that while no Inuit communities are currently located close to a nuclear power plant, some Inuit living in Nunavik (northern Québec) and Nunatsiavut (Labrador) are close to potential sites for long-term Nuclear Fuel Waste storage. A participant requested that Nunavut be added to this list since the Canadian Shield extends into the territory. Kneen added that, depending on the management approach chosen, communities may be affected either through the site or transportation of the waste. The Labrador Inuit Association has already confirmed its opposition to the storage of Nuclear Fuel Waste in its territories and those adjacent to it.

Kneen outlined the three methods of storage under consideration, including deep geological disposal in the Canadian Shield, storage at nuclear reactor sites, and centralized storage. The *NFW Act* directs the NWMO to examine these three options as well as other potential approaches. She briefly described the advantages and limitations of the three approaches in terms of community participation, long-term costs, administration, and security and safety issues. Kneen asked participants to consider questions that have guided the NWMO's work

to date, on topics such as the safety and well-being of communities, security issues, ethical considerations, environmental integrity, economic viability, and technical adequacy of the management approaches. For instance, does the management approach provide for deliberate and full public engagement through different phases of implementation? Have Aboriginal perspectives and insights informed the direction and influenced the development of the management approach? Kneen noted that while the NWMO considered many objectives in its management selection scenarios, none of the scenarios included Inuit communities.

PJ Akeeagok of ITK added that, as traditional hunters and gatherers, Inuit need to incorporate Traditional Knowledge in their thinking about the Nuclear Fuel Waste Management issue. Environmental change and its interaction with Traditional Knowledge are also important considerations.

One of the participants noted that any discussions around Nuclear Fuel Waste storage must recognize Inuit as distinct from First Nations and Métis, as dictated in the Final Agreement. Inuit cannot be lumped into the term "Aboriginal" and dialoguing with First Nations is not dialoguing with Inuit, the participant explained. Kneen agreed, recounting her efforts to clarify this distinction at a recent Traditional Knowledge workshop. "The term can't be Aboriginal or Native," she said. This was a major criticism of the NWMO documentation, Kneen said, noting that her presentation used their language.

Another participant noted that while Section 8 of the *NFW Act* calls for specific expertise in Traditional Knowledge and an advisory committee, the November 2005 deadline makes it difficult for such an advisory committee to do its work. "It is late in the day for issuing a statement," he said. Furthermore, no documentation has been received and proper consultations in a manner respectful to Inuit have not taken place. He asked if an advisory committee existed and if so, did it have any Inuit members? Kneen replied that there were no representatives from Inuit or other Aboriginal peoples on the advisory committee. This has been widely noted as a concern by First Nations and Métis organizations, as well as Inuit.

The next speaker raised a terminology concern. "There needs to be a proper definition of uranium," she said. Uranium is currently known as "the rock that kills," which may be an inappropriate term to those who consider nuclear power a clean technology and a potential fuel for the future. "Since it may be coming North, we need the proper translation for what we are discussing and the information we are trying to get across," she said.

Another participant asked about the process that would lead to the comprehensive report. Many people are not familiar with the legislation and need to know where to access the legislation in order to discuss it. Kneen answered that the process is limited due to the strict imposed timeline and to the lack of funding and time to reach all communities for proper consultations. In terms of the current meeting, Kneen added, the group should put forward what they feel is necessary. Other groups have been unhappy with the timeframe as well. It has been difficult to get the process even this far, she said.

One participant said the creation of Nunavut has proven that teamwork can accomplish a great deal in a remarkably short period of time. "If you give us the documents we need, it is possible to get a statement from our boards," she explained. It is neither too late to come up with an Inuit position nor too late to create an advisory committee, she argued. At the same time, respective boards must understand and approve any statements made.

Kneen asked if a statement could be made at a later date, if the appropriate information was provided to board members. It was generally agreed that this was possible.

Akeeagok noted an additional time pressure: needing to also dialogue with the regions, such as Labrador and northern Québec, before the delivery of the final report.

Another group member stated that appropriate consultations must be conducted in each community. Noting that the issue of Nuclear Fuel Waste and its band-aid solutions has been around for 30 years, the participant asked why Canadians cannot have another 30 years to conduct meaningful consultations and to arrive at a good solution. If this process of public participation is going ahead, then it should be done with entire communities and not just with some representatives.

Kneen called this an excellent point, stressing that this was only the beginning of the process. While the timeline demands four regional reports by March 2005 and a final report by June, a solution is not required. “We are not done,” she said.

One participant suggested the creation of a position paper with recommendations of appropriate timelines allowing for official and proper consultations beyond November 2005. She also recommended the establishment of an advisory committee for Nunavut that would help define the national Inuit perspective and position. She reminded the group that attendees were here to learn and not to make decisions. Agreeing, Kneen asked for further questions and noted that the afternoon’s presenters would be providing more information and opportunities for questions.

Presentations

Kneen introduced this segment by reiterating the purpose of the meeting, which is to provide all available information on the Long-Term Management of Nuclear Fuel Waste to the participants, as well as to take their feedback for inclusion in the report that will be submitted by the NWMO to the Minister on November 15, 2005. Kneen further emphasized that ITK does not endorse any one of the management options under consideration, but that ITK does want to ensure that Inuit are well informed on this subject and that they have a voice in the dialogue process that is taking place across Canada at this point in time.

Nuclear Fuel Waste Management Organization

Joanne Facella, Program Manager

Joanne Facella thanked ITK for the invitation and said she was honoured to attend. Unsure what information would be useful, Facella said she decided to bring a 14-minute video designed for people new to the issue, as well as an overview slide presentation designed for

all Canadians. Together the presentations would describe fuel bundles, their present storage, and methods of storage under consideration. However, technical difficulties prevented the showing of the video.

Facella said the slide presentation dealt with issues related to the development and release of NWMO's second discussion document, *Understanding the Choices*, which was intended to answer the following questions:

- What is used nuclear fuel? What is the issue?
- How should we compare options?
- What are the advantages and limitations of identified approaches to date?
- How should we go about selecting a management approach?

Facella reviewed the establishment of NWMO. As required by the 2002 *NFW Act*, NWMO was established by organizations that create used nuclear fuel. NWMO's first duty is a three-year study of options for long-term Nuclear Fuel Waste Management, with a final report due to NRCan by November 15, 2005. NWMO reports to NRCan, ensuring that the Federal Government and not NWMO will make the final decisions. Facella explained that when asked why this issue was left in the hands of the organizations that created the waste, NRCan responded that it wants to hold the polluters responsible.

While it can also look at other methods, the *NFW Act* requires NWMO to consider three specific methods of disposal: deep geological disposal in the Canadian Shield; storage at reactor sites; and centralized storage, above or below ground.

Facella explained that a panel chaired by Blair Seaborn determined that while the deep geological disposal method proposed by AECL (Atomic Energy of Canada Ltd.) looked technically feasible, the method might not be socially acceptable. Storage at production sites is an interim measure, designed to contain and isolate the material for only 50 years. While there are differing opinions from experts about how long Nuclear Fuel Waste remains a hazard, there is consensus that it is in the thousands of years. Whatever option is selected will have implications for many generations to come, Facella noted.

The *NFW Act* requires NWMO to include social, ethical, and economic considerations in its assessment. It also requires those creating the Nuclear Fuel Waste to set aside funds through segregated trust funds to take care of waste management.

In response to a question about the composition of the NWMO Advisory Council and how it considered Traditional Knowledge, Facella said the only criterion the *NFW Act* set for the Advisory Council was that it report at the end of the study. Instead, NWMO chose to involve the Advisory Council from the start. Facella said the composition of the Advisory Council will change over the process as it must represent those who are impacted by its decisions. Who will be impacted by the decisions cannot be determined until sites are selected, which will not happen until the next phase. Currently, NWMO is studying ideas on how to manage Nuclear Fuel Waste, which is a public policy issue that could affect all citizens.

Asked if the recommendation in November 2005 would include geographic areas, Facella stated that the NWMO is looking at the impact on different types of geographic regions in

Canada—for example, urban/rural, North/South, and traditional/agricultural/industrial use. The intention is not to even identify economic regions.

Facella stated that the mission of the NWMO is to develop collaboratively with Canadians a socially acceptable, technically sound, environmentally responsible, and economically feasible management approach for the long-term care of Canada's used nuclear fuel. For the last two years, the NWMO has tried to have an iterative process, hearing from people first so that the NWMO does not decide what ought to be asked and answered in the study. Then the NWMO will report back to people.

Facella provided some details on what she called the three "milestone documents" the NWMO has created as it builds toward the final report. The first discussion document, *Asking the Right Questions*, raises ten key questions surrounding institutions and governance, participation, Aboriginal values, ethics, continuous learning, human health, security, environmental integrity, economic viability, and technical adequacy. Facella directed participants to the detailed description of the ten questions on pages 51–57 of *Asking the Right Questions*.

Asked if the teams working on scenarios had Inuit members, Facella said there were two streams in the NWMO dialogue process. The stream engaging citizens may not have included Inuit, although there was Aboriginal representation. The second stream involved speaking with national organizations. The agreement was that organizations would hold dialogues with their membership in the way the organization deemed best. Facella said she was not aware of Inuit participation.

Another participant expressed sadness to hear that Inuit did not participate in the dialogue, noting that the deep geological disposal option must involve Inuit. She pointed out that Inuit are different from Aboriginal peoples—their land claims are in place—and asked that Inuit not be left out. Thanking the participant and assuring everyone that she did not wish to detract from the points raised, Facella said that the NWMO has tried from day one to have national organizations design their own process. It has taken longer than anyone would have liked. The study period is short for everything it has to do—there is not much time to meaningfully involve people in the process. Facella said she would be happy to follow through on suggestions for what the NWMO could do now to address the issue.

Facella then provided further information on the second NWMO document, *Understanding the Choices*. This document builds a draft assessment framework from the ten questions, reports back on dialogues and explorations of citizen values, describes options under study and next steps in the NWMO work plan, and invites further dialogue. Facella displayed a slide showing the various dialogues that surround the draft assessment framework.

A participant noted a problem with saying "this is what Canadians have told us" when this dialogue is the first time Inuit have been consulted. Facella responded that the document represents what NWMO has heard so far, and NWMO has yet to hear from Inuit. "Only the Inuit can tell us what their values are," she said. "At the moment we are missing those, as we are with other groups." Facella noted the work of an early workshop for the NWMO to understand how Traditional Knowledge would help form the study. The NWMO has tried to incorporate but not interpret Traditional Knowledge. Interpretation is more properly the role of the holders of Traditional Knowledge.

Asked the reason for the three-year deadline, Facella said the deadline is specified in the *NFW Act*. She said she could not speak for NRCan or the Government of Canada. There will be penalties if the report is not delivered by the November 2005 deadline, she explained. NWMO is doing its best—it took more than one and a half years to set up the process.

Returning to the presentation, Facella said the emerging framework for assessing the management approaches includes citizen values, ethical principles, and objectives.

The "citizen values" included in the *Understanding the Choices* document were developed from a dialogue with 462 randomly selected Canadians. Facella invited participants to identify values that might be missing. Values currently identified are safety from harm, responsibility, stewardship, knowledge, adaptability, accountability and transparency, and inclusion.

The "ethical principles" came from a roundtable of ethics experts. The principles are justice, fairness, and sensitivity to value differences, respect for future generations, respect for people and cultures, and respect for life.

The "objectives" are a reiteration of the ten questions, converted to a more concrete framework: fairness, security, public health and safety, worker health and safety, community well-being, environmental integrity, and adaptability.

Facella explained that the NWMO has come to appreciate the "envelope" of requirements that must be addressed in the choice Canadians are making amongst technical methods, including societal requirements, related infrastructure, and institutional and governance arrangements.

Facella then gave an overview of advantages and limitations of identified approaches to date, directing participants to the NWMO website (www.nwmo.ca) for further details.

Storage at reactor sites eliminates the need for transportation but requires active care. Currently, the seven reactor sites in Canada are licensed for 50-year storage, with oversight by the Canadian Nuclear Safety Commission. When spent nuclear fuel comes out of a reactor after 18 months of use, it is placed in water-filled pools for seven to ten years. There it cools, with the water acting as a shield. When taken out of the pools, the Nuclear Fuel Waste remains within the fence of the facility, in storage containers in buildings. For longer-term storage, facilities need to be more robust.

Centralized storage would bring all of Canada's spent nuclear fuel to one central site where it would be monitored and accessible. Centralize storage would require transportation of the waste and long-term maintenance of the facilities.

Deep geological disposal would store Nuclear Fuel Waste in specially constructed containers, 500 to 1000 metres underground, with no intention of recovery and with less facility maintenance required. While the Canadian Shield is often cited as a preference due to its stability, the NWMO is also considering other types of rock such as sedimentary rock in southern Ontario and Québec.

Asked if any of the methods included pre-treatment of the Nuclear Fuel Waste, Facella said they did not. She asked participants to express their opinion on the value of exploring this method. Recycling and reuse are not as simple as they are with non-hazardous materials, she explained, and involve aspects that people may not find acceptable. For example, reprocessing would involve dissolving the Nuclear Fuel Waste in a liquid—and liquids are more difficult to prevent from entering the environment. Canada would also have to become involved in creating a new industry, as separation would result in different waste streams. Furthermore, one of the bi-products of separation is plutonium, which can be used for nuclear weapons and would therefore have to be highly guarded. The NWMO understands that transmutation—changing the waste to something less hazardous—has not been proven to be feasible. However, these factors could change with future technological innovations.

"One thing is clear," Facella said. "No one method does everything that people say is important. Each has its strengths and weaknesses." A concern for security from terrorism would prioritize sealed underground storage, whereas a belief in the potential of new technology would lean toward above-ground storage. These are human issues, not technological, Facella explained. Even the nine members of the assessment team did not rate all methods the same against the same objectives. One of the reasons is that different people envision the future in different ways.

Asked whether more nuclear reactors will be built, Facella said she could not speak for the Government of Canada. She offered her impression that the Government of Canada is committed to an energy policy that includes nuclear energy. Acknowledging the difficulty of discussing Nuclear Fuel Waste storage without knowing the future quantities, Facella explained that the NWMO is not mandated to discuss fuel creation. Many people would like to have the debate the other way around, she said.

Facella presented some considerations Canadians told the NWMO, which must be included in an acceptable management approach:

- Begin now, but remain open to learning.
- Be adaptable to adjust direction.
- Take a staged approach that provides for reviews and adjustments.
- Provide opportunities for future generations to influence its implementation.
- Include monitoring of emerging options and research, at home and abroad.
- Involve transparent and accountable institutions.
- Ensure that citizens remain informed and have a voice.
- Understand concerns of affected regions and communities.
- Have strong and effective oversight institutions.

Asked whether people involved would be able to review the final report, Facella said all dialogues would go into the draft study report to be released in March 2005. While this draft would be the essence of the final report, there would be a period of time provided for people to comment. The draft study report will be on the NWMO website. After the report is submitted in November 2005, people can still comment to the Federal Government.

Asked whether there would be compensation for affected people, Facella said the NWMO is examining what would have to accompany any management approach. There is no proposal

on compensation at this point. She welcomed guidance, stressing that the NWMO is not the proponent of any approach but rather exists to facilitate a dialogue.

Facella invited participants to consider the diagrams outlining the influence of each objective, starting at page 57 of the *Understanding the Choices* document. She asked if the NWMO is looking at the right objectives, or whether there were objectives that have yet to be identified. "There may be things we missed because we didn't have breadth of input to this point," she said. "The Inuit voice would be quite helpful to everybody."

"The NWMO recognizes that this is a difficult public policy issue. Citizens have a right to comment. The decisions we make now may set a benchmark for other difficult decisions in the future, beyond Nuclear Fuel Waste," Facella continued.

A participant pointed out that Inuit are not represented by First Nations, Dene, or the Federal Government. Article 11 of the 1993 treaty assures Inuit participation on any issue related to land use in Canada, and yet the Federal Government continues to assume that the Inuit can be "lumped in" with Aboriginal voices. When the NWMO had its ethics roundtable and its Traditional Knowledge workshop, Inuit were not present. "We came up short because there is no time to include us before November 2005," she said. "It makes me realize that Inuit are not as important as First Nations, Métis, or the rest of Canadians. Inuit ideas and suggestions can outdo other races, like when we developed Nunavut."

"Please give us a window," she continued. "The hunters aren't here—they have input we don't have yet. A lot of our points are unique because of where we live and the size of our territory." She concluded by asking the NWMO to respect the legislation. "We have a right," she said.

"Thank you for telling me straight," Facella replied. "I will make sure my colleagues understand." She said the NWMO may have thought that asking organizations to design and implement their own processes, rather than forcing its own design, would have ensured Inuit input. Facella assured the group that the NWMO did not intend to be disrespectful.

Facella passed out the workbook *Understanding the Choices* for the information of participants in their own processes. She recommended the four-page overview of the issue. She asked participants to consider three questions:

- Are we looking at the right things?
- Can we have a bigger dialogue about the strengths and limitations?
- Are there specific elements that you feel must be built into an implementation plan?

Asked how the objectives would be weighed against each other, Facella stated that direction would come from the dialogues. The NWMO hopes people will share how they wrestle with these issues and what trade offs they are prepared to accept. The NWMO will reflect what Canadians can agree upon. Recommendations that come from this process will not meet all needs but will respond to what Canadians say is important. The NWMO might look at a combination of approaches, Facella said.

The session closed with a participant's expression of hope that Nunavut would not become a place that people might want to invade because of what is stored there.

Canadian Coalition for Nuclear Responsibility

Dr. Gordon Edwards and Robert Del Tredici

After introducing themselves as scientists and members of the Canadian Coalition for Nuclear Responsibility, the speakers provided participants with a photographic tour of issues around Nuclear Fuel Waste, nuclear power, and uranium.

Dr. Robert Del Tredici said he was attracted to the nuclear issue because of its complexity and invisibility. "We want to make it visible, culturally and literally," he explained. He cited the previous speaker's report as an example of a "high level" report that deals with the issue in principle but not in action. "Today we will show you what this issue looks like at the ground level," he said.

Dr. Gordon Edwards outlined the unusual and toxic properties of Nuclear Fuel Waste. No one knows how to render them harmless and therefore the emphasis is on containment rather than elimination, he explained. Showing an AECL diagram of how Nuclear Fuel Waste generates heat in underground repositories, he indicated that temperatures do not return to normal until sometime after 50,000 years. "The nuclear industry has not advertised these peculiar properties," he said, adding that the issue of Nuclear Fuel Waste storage has been presented as a public relations problem rather than a technical problem of how to safeguard the waste in the long term.

Noting that used nuclear fuel bundles are kept underwater to cool for seven to ten years prior to dry storage, Del Tredici and Edwards called cooling pools "the weak link" in otherwise safeguarded reactors. Also problematic are the "broken" pieces of uranium that remain highly radioactive. Del Tredici noted that nuclear technology was initially invented for the production of nuclear weapons. The difference between nuclear weapon and power production is that the energy obtained from splitting atoms is contained in the process of power production. Edwards added that a nuclear reactor cannot explode like a bomb since the reactor emits energy slowly and continuously. The waste material, however, is the same.

Looking at the dangers of radioactive waste, Del Tredici recounted the stories of victims of nuclear test exposure, many of who have died of cancer. Edwards noted that the consequences of radiation are well recognized: it has caused cancer and other diseases that may or may not be fatal. Nuclear bomb fall-out and its health effects represent the worst-case scenario but illustrate the danger of this potent material. The speakers indicated that an increasing number of people are speaking out about the health and environmental hazards of nuclear tests and power, urging governments to stop not only nuclear weapon but also nuclear power production. "They can't be used with safety," Del Tredici said. International treaties were designed to curb the production of nuclear weapons but not all countries are conforming, Edwards added.

Showing a map of Canada that located what he called "all nuclear things," Del Tredici clarified the two categories of Nuclear Fuel Waste: waste associated with uranium mining

and waste related to nuclear energy production. There are over 3 million fuel waste bundles and 200 million tonnes of waste from uranium mining tailings. In Canada, at the world's first uranium mine, Aboriginal people carried uranium ore on their backs in burlap sacks. Many of these miners died of cancer, Del Tredici said. One affected First Nations village came to be known as the Village of Widows. Available information on the harmful effects of uranium was not provided to First Nations peoples.

Edwards said that while Canada never developed atomic bombs and never suffered from nuclear fallout, populations close to uranium mining have comparably high rates of lung cancer. Citing examples of First Nations miners in Arizona who have suffered and are suffering from lung cancer, Edwards showed a slide of lung tissue illustrating the unique bursts of energy of embedded plutonium particles known as alpha radiation. While not as penetrating as X-rays, and theoretically stopped by a mere sheet of paper, alpha radiation is 20 times more dangerous than any other type of radiation. An understanding of alpha radiation underlines the danger of irradiated fuel bundles that give off alpha radiation for thousands of years, he explained. The toxicity of mine tailings is similar to that of spent nuclear fuel bundles.

Uranium mine tailings in northern Ontario can serve as an introduction to Nuclear Fuel Waste management. Essentially, there is no solution for this radioactive waste. "We just hope for the best," Del Tredici said, commenting on what he called "the track record" of Nuclear Fuel Waste Management. "We have had a poor experience in dealing with radioactive materials." Scientists have learned that, at the very least, Nuclear Fuel Waste must be well contained.

Del Tredici reiterated an earlier point about the fragility of wet storage. Dependent on a continually functioning cooling pump, the pool would be dry within 24 hours should the cooling pump fail, and fracture would result. Edwards added: "While the technical details of such an accident are unclear, it is undisputed that it would be a major disaster." Edwards noted that while the reactors were designed to run for 30 years, cooling pools were not designed to hold 30 years' worth of waste. Industry was confident they would find storage sites in a timely manner. "They were wrong," he stated.

Del Tredici showed photos of casks used for dry storage of spent fuel bundles, noting that these casks are now accumulating. Already in Québec, there are public hearings around the issue of storage enlargement. He urged people to keep in mind that NWMO only deals with Nuclear Fuel Waste despite other types of existing radioactive wastes.

Moving to the topic of the effects of radioactive fallout, Del Tredici gave the example of Chernobyl's impact on the reindeer of Sweden's Lappland. Freezers full of radioactive reindeer meat underline the concept of bio-magnification, he said. Edwards added: "We have known for some time that the fallout from Nevada affected Northern food chains much more than other food chains." The fragile nature of these Northern food chains means transmission to humans is much quicker.

Del Tredici indicated that one of the options under consideration for Nuclear Fuel Waste storage is underground burial in the Canadian Shield at Pinawa, Manitoba. The Canadian Shield is one of the most stable geological formations on Earth, he explained, but drilling in the rock may violate its integrity by creating millions of hairline fractures. "No one knows

the impact of that, especially once the rock is simultaneously heated up with spent nuclear fuel," he said.

Edwards noted that the potential for heat from Nuclear Fuel Waste to extend these hairline fractures has been discussed around the world. The California government spent considerable time and money investigating this kind of storage and found no proof that it is safe. "We don't know how to restore the rock to its original integrity," Edwards explained. While everyone acknowledges that these underground vaults will be filled with water, the question remains if this water may eventually come to the surface. "One has to ask if the deep burial method is a result of engineering euphoria or actual good science," Edwards suggested.

Turning to the centralized storage option, Del Tredici noted the risk of this approach leading to plutonium extraction. "Any place where there is recycling or reprocessing of spent nuclear fuel will become a place that people are interest in and thus, a major security risk, essentially a policed area," he explained.

Edwards pointed out that historically the nuclear industry has expressed little interest in permanently sealing Nuclear Fuel Waste repositories. This fact hints at an underlying attitude of unwillingness to lose the opportunity for plutonium extraction. He noted that the Ontario Power Generation has come out against centralized storage, expressing concern that it could lead to reprocessing and global security concerns.

Illustrating the hazard of plutonium, Del Tredici showed a slide depicting the measures a technician takes when handling plutonium to avoid the slightest exposure to alpha radiation. Edwards asked: "Why would AECL want to extract plutonium from spent nuclear fuel when Canada doesn't make nuclear bombs?" He then posited one possible answer: plutonium serves as an alternative fuel to uranium and therefore could extend the life of nuclear reactors should uranium sources become depleted from the proliferation of nuclear reactors around the world.

Del Tredici noted what he called the "many fatal flaws" within plutonium recovery. Nuclear fuel bundle recycling results in a highly corrosive liquid, essentially multiplying the amount of waste. Furthermore, the double-lined, double-walled tanks used to contain reprocessing waste have a relatively short life span. Edwards added information on problems associated with the continuous chemical reactions inside the storage tanks. Once sludge settles at the bottom of the tanks, despite stirring, it becomes a multi-million dollar project to move the sludge to another tank.

Del Tredici recounted the Russian experience of a nuclear fuel reprocessing facility releasing waste into a nearby river. Downstream illnesses were covered up and designated as vegetative syndrome. Much later and for the first time, locals found out just how much radiation was in the river—up to 2000 times higher than the normal background radiation. While industry would judge this amount as not particularly high, the level does not capture issues of cumulative exposure or radiation in sediment and vegetation. This experience and others point to the difficulty of tracking Nuclear Fuel Waste.

Edwards provided a brief account of history behind the establishment of the NWMO. More than 15 years ago, AECL was given $7 million to work on the concept of geological burial. This led to a ten-year-long environmental impact assessment under the Seaborn Panel that

received the input of many Canadians. The Seaborn Panel recommended the establishment of a Nuclear Fuel Waste management body that would be completely independent of but paid for by industry, controlled by those affected by Nuclear Fuel Waste, and with a mandate to look for solutions. The government's response to the Seaborn report indicated that the waste management organization should be industry-run, with recommendations made directly to Cabinet, a mandate to deal only with Nuclear Fuel Waste, and without the right to shut down nuclear reactors. Edwards noted that recommendations for a parallel public hearing on the future of nuclear energy in Canada were not implemented.

"I believe that the people at the NWMO have presented the issues more clearly than industry has done in the past and have better engaged the public; but they are hampered by the fact that they can't discuss not producing the waste," Edwards stated. Furthermore, the NWMO is limited to the three options—continued on-site storage, centralized storage, and underground geological disposal. Edwards indicated that AECL spent millions of dollars on the last option, even though each of the three options really point to the same result: there will eventually be a site with geological burial.

Edwards noted the existence of unmentioned options. Not producing the waste in the first place is one option that is rarely discussed. So too is the option of the Government of Canada passing a law to prohibit reprocessing; instead, the door to reprocessing is kept open, and so too is the door to plutonium accumulation. Edwards noted the security issues associated with plutonium accumulation. Plutonium is, after all, easy to steal, he explained.

Edwards concluded by noting the Government of Canada's lack of clarity on its direction with nuclear power. If it intends to continue with nuclear power production, the first two options—continued on-site storage and centralized storage—are hardly solutions. Other proposed approaches are similarly problematic. The geological burial option has a wait time of up to ten years and sealing Nuclear Fuel Waste repositories is illogical unless production is stopped. Halting nuclear power production is the key to a solution for Nuclear Fuel Waste storage, Edwards said. The NWMO's inability to address the production side of the Nuclear Fuel Waste issue is the reason the Canadian Coalition for Nuclear Responsibility and others have boycotted the NWMO process. A panel study of the ethical questions raised by this issue concluded that none of the options were good; a choice would be of the "least bad."

Del Tredici concluded by invoking the image of the giant World Peace Bell in the centre of the city of Hiroshima. With each ring, the bell symbolizes turning into prayer the power and harsh reality of the atom. One can be overwhelmed by the longevity of the atom and the industry, or one can fight back, he said.

Questions and comments

In response to requests for more information material, Edwards offered to send "nuclear" maps of Canada to those interested. For information booklets on uranium, plutonium, and Nuclear Fuel Waste, he referred to the web site of the Canadian Coalition for Nuclear Responsibility at www.ccnr.org.

One participant asked about the hazards of uranium by-products of gold mining. At what level do the by-products become significant and how is impact assessed? Edwards replied that it depended on the mine in question since each used a different type of uranium. Studies on South African gold mines and Calgary phosphate mines indicate that most of the uranium is left behind in the mining process. Mine-specific research is needed to determine if the amount of uranium left behind is hazardous.

In a follow-up comment, the participant said existing and even future prohibitions on uranium mining in Nunavut by NTI do not address the uranium by-product of gold mining. Edwards agreed that in gold mining there is potential to disturb a radioactive ore body. Once this uranium is exposed and finely ground, the radiation exposure increases 10,000 fold and it becomes a serious concern, he explained. The participant then asked how to develop guidelines and requirements that address the uranium issue for proponents of gold mines. Edwards said he could forward some information that may guide her in requesting information about uranium. A representative of NTI clarified that there is no current ban on uranium mining but a resolution to that effect "is in the works."

One attendee wondered if the North might be favoured for underground storage, given the potential impact of climate change and other environmental factors on underground storage in the South. Edwards expressed scepticism about the perceived advantages, calling Nuclear Fuel Waste an "unsolved human problem." "We have never truly gotten rid of any hazardous waste," he said. Radioactive atoms cannot be incinerated or combined in any fashion to be made less hazardous. There are no solutions. "We just have options that are unsatisfactory and we have to be honest about this," he said. Returning to the earlier question about uranium, Edwards drew attention to the information leaflet provided in the dialogue information kit.

Edwards added one more point. A great deal of the science involved in determining options for Nuclear Fuel Waste management could best be described as sophisticated guess work. Edwards acknowledged that mathematical models are better than nothing, but noted: "They may be dead wrong."

One group member asked if the government was spending any money on dissolving or rendering harmless Nuclear Fuel Waste and thus avoiding the issue of storage altogether. Edwards referred to the two processes mentioned earlier by Facella in her presentation. One of the processes under limited investigation, transmutation, may be feasible experimentally but not on commercial scale. Transmutation also has the potential to produce more waste than it started with. Another option focuses on tearing atoms into their basic building blocks of neutrons and protons, perhaps by rocketing Nuclear Fuel Waste into the sun. Concerns include the possibility of rocket malfunctions, explosions, and crashes, any of which might lead to nuclear fallout. The best option remains to stop Nuclear Fuel Waste production, Edwards reiterated.

The participant asked if the whole waste issue stemmed from the desire for a certain lifestyle that required a continuous supply of energy. Edwards disagreed, noting: "We don't need nuclear power for our lifestyles. There are other sources." On the positive side, many countries, such as Sweden, France, and Germany, are phasing out nuclear power and North America is at a standstill, not having ordered a new reactor since 1978.

In response to a concern about Iceland’s energy sources, Edwards replied that the country is blessed with geothermal energy that powers entire cities. With good deep drilling technology, geothermal energy could be feasible in Canada as well. However, these kinds of alternative and renewable energy sources have not been aggressively pursued since they lack the support of large corporations. Edwards called for public debate on renewable energy.

Day 2: November 10, 2004

Discussion of Options and Issues of Concern

Soha Kneen began the day by acknowledging a change in the agenda. She said the morning session would focus on Long-Term Management options, and asked participants how they would like to structure the discussion and what they would like to do with the questionnaire.

A participant responded that she wanted to take the questionnaire to her board for discussion which could then feed into ITK's final report.

Kneen agreed and clarified that the questions were just for feedback and not intended to be representative of Nunavut as a whole. She asked participants about a deadline for receipt of the answers to the questionnaire. She committed to sending the questionnaire, along with an information package to all meeting participants.

A participant asked whether it was appropriate to answer the questionnaire in light of the 1997 NTI resolution B97/08-24 opposing storage or transportation of nuclear goods in the Arctic. Most participants agreed that the resolution made it pointless to fill out the questionnaire.

Del Tredici suggested that participants should consider Nuclear Fuel Waste storage wherever it takes place, and not just the Arctic. Participants agreed that this was an opportunity to voice an Inuit opinion, having already been left behind in the process. One participant added that the North may start to generate Nuclear Fuel Waste in the future, so the issue may become more relevant.

A participant said the soonest her board could respond to the questionnaire would be January 31, 2005.

Facella reminded participants that the Nuclear Fuel Waste is already in existence, in storage. The NWMO is not asking whether people want Nuclear Fuel Waste in their communities but rather what Canadians think society can do about the problem. She said Inuit relationships with the environment and the resource industry means they have a unique expertise and insight. Inuit may see gaps in the framework, aspects not being considered. They may be able to give the NWMO a more complete assessment of what is appropriate for Canada. It is also a question of how all Canadians can exercise their responsibility to future generations.

Edwards drew attention to estimates of double the amount of Nuclear Fuel Waste in the near future due to continued production. The NWMO is looking at not just the current waste but also the waste that will be produced to the end of the reactors' life, he said. Edwards also clarified a point he had made the previous day when he said the ethics panel had determined that every option available was a bad option. In fact, the panel had made a distinction between current Nuclear Fuel Waste and the waste not yet produced. Many citizens were shocked that there was waste production in the first place. "Yes, we are stuck with the problem" he said, "But do we continue? You may have input on that."

Asked if the storage water on reactor sites prevents radiation from reaching people, Edwards said there are two types of radiation. The water does prevent exposure to one kind of radiation: the penetrating gamma rays from the bundles that can kill a person who is nearby. However, metals and other chemicals that come into contact with the gamma rays and become contaminated can leak. A site in Québec is about to take pipes out of a reactor and create a new waste site for them. These pipes will remain dangerous for thousands of years, but the NWMO is only considering used nuclear fuel.

A participant raised the issue of alternative energy sources in Canada. He suggested it would be best to recommend none of the three options, but instead recommend that Canada stop making Nuclear Fuel Waste.

Kneen suggested changing the questionnaire so that it has an all-Canada focus. The group could work toward having a Nunavut recommendation coming out of this meeting. This would be with the expressed understanding that this in an informal Nunavut response. It would not be part of an Inuit position, but would provide feedback as a region.

A participant said a changed questionnaire might be confusing. She said she wanted to express a Nunavut position. She suggested telling the Minister it would not be a good agreement if it did not include Inuit from Nunavut. It might not be vital to meet the NWMO deadline. As to whether this effort would constitute a position contrary to the NTI resolution, she expressed a wish to address national concerns and respect the interests of other Canadians. “We have to be Canadian and think of others,” she said. “If we don’t have a voice, we don’t count.”

Kneen read over the questionnaire. She promised to also develop a nationally-focused questionnaire. A participant pointed out that an expansion of question 8 might be all that is necessary for the nationally-focused version.

Another participant referred to mention of economic benefits in question 6. She said she had heard of a community that was interested in storage of Nuclear Fuel Waste for economic reasons. She said she was alarmed that the community did not understand the implications. Another participant replied that the community in question is Cambridge Bay, but the materials it was considering were merely garbage from a mining community—material that could be land-filled and land-farmed.

Discussion continued on how to fill out the questionnaire. Participants pointed out many places where they could raise the issue of not being consulted. However, it would still be possible to generate a report, while pointing out that it was not a formal position from Nunavut because there was no consultation.

A participant noted that the NWMO is stuck with the parameters dictated by the Federal Government. The NWMO may not be familiar with the difficulties in reaching all areas, but the Federal Government should be—perhaps it did not intend that a consultation happen. The level of consultation that would be required for the average uninformed person would be high. Another participant added that there may be an opportunity to lobby the Minister for an extension. It would require legislation, but the Inuit voice must be heard. They could try to meet the deadline, but the government should hear that it is unrealistic.

Kneen summarized the decisions for next steps as the following:

- Participants would respond to the questionnaire by January 31, 2005.
- ITK would provide a more nationally-focused questionnaire.
- ITK would bring forward the group's recommendations.

The group agreed to take a break and then move to making recommendations. Just before the break, Facella and Edwards made brief statements.

Facella said this three-year process is not the beginning or the end of the issue of Nuclear Fuel Waste storage. It is the beginning of a process that will continue long after the NWMO makes a recommendation. After the Federal Government makes a decision on a process for Canada, more public consultations will be required. A site will have to be identified, and then a process, environmental assessment, and licensing. Many phases of dialogue will follow.

Edwards said the important point is that the NWMO will make a recommendation, which will take other options out of the running. It is this three-year period that sets the choice of direction. He asked participants if they believed any of the choices were real solutions if waste continues to be manufactured. "The NWMO is mandated by law but citizens can say whatever they wish on the subject," he noted.

Discussion of Recommendations

Kneen read a preamble to the recommendations that she drafted during the earlier conversation:

These recommendations are provided with the understanding that they are informal submissions and are not the result of a consultation process that took place within the Nunavut territory.

Not enough time and funding were allocated in order to complete a formal consultation process that would be effective, meaningful, and culturally appropriate.

The meeting that has taken place from November 9 to 10, 2004, was a positive meeting, which has resulted in the provision of information and educational materials to those in attendance.

Representatives present at this meeting specified that they could not provide formal feedback that is representative of their organizations or communities as they have not yet been able to take the information provided back to their communities.

Participants added the following points:

- If the preamble includes that there was no time to consult communities, it sounds as though Inuit are taking upon themselves a full community consultation. "That should not be our burden." It should be the Federal Government and the NWMO who conduct official and meaningful community consultations.

- The phrase “Nunavut land claims area and its organizations” should be included.
- The meaning of “informal” and “official” is not clear.
- This type of process would represent a cultural and geographical approach for Inuit to take a formal and regional position on Nuclear Fuel Waste Management.
- To engage and deal with Inuit of Nunavut on Long-Term Management of Nuclear Fuel Waste with the NWMO before November 2005 is important. However, Inuit of Nunavut and others have been left out of the early dialogue.
- The NTI resolution regarding storage and transportation of nuclear material must be included.

Facella said there has been dialogue but not official consultation with citizens around their values and their choice of considerations to drive decision-making. There will have to be consultation at some point with the people who are affected, but the process is not yet at that stage. “We are not a formal hearings organization,” she said. “When we go to a community, we speak with citizens, not elected representatives, about values.”

A participant pointed out some differences between the North and the South—Southerners are more aware of nuclear issues because they have access to news. In Nunavut, it is not possible to drive to the next community; dialogue is a more prolonged process in the North. There are not necessarily informed opinions to take back to decision-makers at this point.

Facella stated that the NWMO has not asked for decisions from other people. The NWMO has been having an informed conversation, asking people about their values and priorities and how to apply them to this difficult issue. Not many people have had previous knowledge of the issue. The NWMO tries to give basic information and engage people in a conversation over a period of time. There is a two-day information session, followed up two weeks later by asking people the three questions from the discussion paper. Facella stressed that points on the last page of her presentation of the day before were not decisions but rather suggestions that people made in the course of the dialogues. “The NWMO is in no position to negotiate with government,” said Facella. “It is just a matter of surfacing the issues to help the Government of Canada make a decision.”

Facella commented further that the NWMO’s conversation with national organizations like ITK did not begin at this meeting. It has taken awhile to implement dialogue with national organizations. ITK owns and directs this process.

Referring to the fact that Inuit had been left out of the ethics and Traditional Knowledge meetings, a participant commented that more issues would come out of a meeting with Inuit than covered by the ten questions in the discussion document. Kneen clarified that ITK had been represented at the Traditional Knowledge workshop. She further stated that ITK developed this series of meetings hoping to come out with a formal Inuit position, but that there was insufficient time to conduct a comprehensive consultation, no matter who designed the process.

Del Tredici stated that Inuit are not often asked to comment on matters that apply to the rest of Canada. This is an opportunity to put forth the Inuit way. It is a dangerous thing to be asked to pick one of three options. Whatever is chosen, there will be more waste. He asked, “Where is the Inuit wisdom in this choice?” Inuit are entitled to make a statement about the whole problem, not just the technicalities.

At this point Facella, Edwards, and Del Tredici left, and participant discussed the storage issue.

Their comments included the following:

- There is an immediate problem, and this group should be proactive to assist decision-makers to make the best decision for the benefit of the country. Nunavut is 20% of Canada's land mass, and Canadians may consider it a good place for storage. But things like water, campsites, and traditional uses must be considered. This group must make sure that consultations happen not just in Iqaluit.

- The underground storage option contains too many unknowns. If bundles will fit into arena-sized pools, then why not just build five arenas?

- The scientists have not put forward a clear solution, indicating that do not have one. This leads the discussion to ethics, and the bottom line is health. The best thing for Inuit to do is to make sure more research is done before a decision is taken. If no strong recommendations are made, the Minister will have to make the choice. People must make sure the door is left open for future consultations as technology develops.

- Inuit recommendations should include the strong advice to find alternative sources of energy and stop making Nuclear Fuel Waste.

- Finding an alternative to the huge amounts of power that is generated by nuclear reactors may not be easy, may not even be possible. An Inuit recommendation should be for further extensive research.

- Scientists think with their heads, not their hearts, and they do not know the land. Inuit must provide this viewpoint.

- It seems wise to leave the door open to retrieving the waste in the hope that some scientific miracle could allow it to be destroyed forever. For that reason, an above-ground option would seem best.

- During the 1970s, Inuit took the Federal Government to court to stop uranium mining at Baker Lake. This fact should go into the preamble of the Inuit recommendations—that the nuclear issue is not new in Nunavut.

- Further to the point about storing waste where it can be retrieved at a future date, on-site storage at nuclear reactors should be extended, with precautionary measures. If it is buried, it will be there forever.

- The integrated solutions that Facella mentioned the previous day bear examination. For example, a central above-ground location would be good. That way it would be away from people but accessible in case there is a future solution.

- Another possibility is to lobby against one of the options—the underground option, for

example. That way, there would only be two options left on the table.

- It must not be forgotten that this is a human health issue.

- No matter what choice is made, there is a potential for the North to be affected to a greater extent than the rest of Canada because contaminants are passed through the air, to the lichen, to the caribou, and to people, for example.

- Recommendations should include something about monitoring.

- A transportation plan will be required for a deep geological disposal option. This should be discussed early in the process.

- It should be considered that Inuit people use the land much more than Southerners do.

- The Government of Canada and the NWMO should be told up front not to even consider the fact that the cold temperatures of Nunavut could counteract the heat of the Nuclear Fuel Waste.

- It has been recently proven that climate change is happening much faster in the North. This should be included.

- It should not be forgotten that a road to Nunavut will have its benefits. If a road is built for transportation of Nuclear Fuel Waste, and then a better solution is found, the road will still be there. (Another participant cautioned that this should not be mentioned.)

- An Inuit recommendation should be a position for the Arctic as a whole, not just Nunavut.

Kneen told participants that the report from the meeting would be circulated to participants before being more widely circulated.

The Dialogue Questionnaire and Key Summaries

Kneen summarized participant recommendations to this point, which included the following:

- Conducting more research before making a choice on a management approach;
- Taking the necessary steps to develop alternative energy;
- Stopping or reducing the production of Nuclear Fuel Waste;
- Considering a combination of storage methods in the Canadian Shield; and
- Deciding on which management approaches people could live with and which they could not.

One participant asked if these recommendations would be included in the NWMO report. Kneen said they would be submitted to the NWMO for inclusion in their recommendations to the Minister on November 15, 2005.

In response to a request for an Inuktitut version of the NWMO reports, Kneen offered to inquire with the NWMO if they could make the Inuktitut and other language versions available to participants. Another attendee argued that documentation should also be translated into the appropriate orthography (Inuktitut and Innuinaqtun) in order to appeal to board members.

One participant returned to an earlier point she had made: "I don't even want them to think about Nunavut as an option for storage," she said. Some discussion ensued to determine if this should be a recommendation. It was agreed that it should be part of the preamble and should read as follows: "Due to the uncertainties of climate and weather conditions, storage, disposal, or transportation of Nuclear Fuel Waste in Nunavut is not acceptable now or in the future."

Kneen reviewed the six specific recommendations so far agreed upon by the group and asked for any changes. She asked if "stopping the production of Nuclear Fuel Waste" should be kept as a recommendation. Attendees discussed the wording of this recommendation, suggesting that it could be modified to read "eventually decrease and eliminate nuclear energy."

A participant asked if there should be a separate recommendation requiring the government to spend money on research that renders harmless Nuclear Fuel Waste. Others suggested "research to find ways to destroy the atom or to reduce the half life" or "to mitigate the hazardous nature of the waste." Another participant said this recommendation should encompass the material such as pipes and tanks that become contaminated during the production and storage processes. Kneen restated this recommendation: "To conduct ongoing research to eliminate the hazardous nature of Nuclear Fuel Waste." One attendee said he doubted this was possible but noted that the United States Nuclear Regulatory Commission is mandated to conduct this type of research. There is a lot of money invested in research already, he said. He suggested money should instead be directed toward mitigation.

Kneen summarized the recommendations as follows:

1. Do more research before actually making a choice on the options for the Long-Term Management of Nuclear Fuel Waste;
2. Take necessary steps to conduct research to develop alternative energy sources in Canada with the goal in mind to eventually stop the production of Nuclear Fuel Waste;
3. To conduct ongoing research on methods of eliminating the hazardous nature of Nuclear Fuel Waste;
4. To use a combination of options (Canadian Shield, but place it higher up and keep it accessible—don't fully encapsulate it. The reason: may develop technologies to destroy the waste in the future);
5. Regardless of the option selected, proper consultation should take place across the country to inform the public of what the selected option means – a formal consultation should take place with the public;
6. Materials provided to the public should be released in the appropriate language (including Inuktitut and Innuinaqtun).

After participants agreed with the wording, Kneen asked about including a comments section. One attendee indicated that she would prefer to take the information and

questionnaires to her board before issuing comments. After some discussion, the group decided to include a preliminary comments section to which more could be added. One representative suggested that the section could include points about education, both existing and required levels, and Northern logistics. Everyone agreed that an explanation of the logistics Northerners face is key to understanding recommended timelines for consultations in the North. “You can’t think about getting around in Nunavut like you can about getting around in Toronto,” explained one participant. Weeks of planning are involved to set up a meeting such as the current one, and the expense is greater. Another attendee noted language and communication barriers, such as the fact that not everyone has e-mail. These points were not addressed in the NWMO documentation. “This underlines the ignorance of the process,” added a group member.

Education is a long-term process that cannot be done in one year, noted an attendee. He asked if the deadline could be extended. Akeeagok said an extension was possible and the penalty may be worth the opportunity to educate people in the North and the rest of Canada. The group was reminded that the daily penalty for contravening the November 15, 2005 deadline is $300,000. “We shouldn’t forget that the Federal Government has its share of responsibility in this since they set out the initial timeframe,” said one participant. The NWMO has no choice in this matter.

After Kneen briefly reviewed the comments with participants, an attendee requested the addition of a recommendation to include traditional land use in the NWMO’s community well-being objective. Another group member elaborated on this point. “Inuit Traditional Knowledge is important to the nature of human life, the wildlife, the sea – the ecosystem,” she explained. Inuit take every measure to protect their food source and their ecosystem. There remains a great need to educate people about the Inuit way of life, as evidenced by the considerable ignorance apparent in the morning’s discussion. Kneen agreed that the speaker had chosen his words poorly and that he had meant that no one, including Inuit, knows anything about Nuclear Fuel Waste storage.

Another participant noted that Section 12(7) of the NFW Act specifically refers to consultations. It is imperative that consultations occur to discuss each of the proposed approaches. Noting that Facella of the NWMO admitted that no consultations have taken place, only dialogues, the participant suggested adding this point to the comments section. Another participant agreed that there had been no engagement of the public to date. “You could go further and say that only one dialogue has taken place for 27,000 people,” said one attendee. While it would be unrealistic to consult with all communities, it is wholly inadequate to consult only with one. “No court of law would support this,” she said.

A representative of NTI indicated that the final NWMO report was required to suggest an economic region for the implementation of the selected Nuclear Fuel Waste Management approach. He suggested that the current report should include a section on the Nunavut Land Claims Agreement (NLCA), which would take precedence in a court of law over other legislation. Participants agreed that this point should be stated in the preamble as well as in the comments section.

A participant asked if the information gathered at this meeting would be distributed to their communities. Kneen clarified that participants were only expected to take the information back to their respective organizations, and ideally to facilitate their board’s response to the

questionnaire by January 31, 2005. Going out into the community with this issue is not expected, said Kneen. That is the responsibility of the government and the NWMO. “But if you want to provide information to your community members, by all means!” she added.

A discussion followed on ways to reach members of the different organizations represented at this meeting. Teleconferencing was ruled out because of language issues and the scope of required information. One attendee suggested leaving the decision-making at the executive level since there are no resources for extensive community consultations. “First we have to have the information, then it has to be translated and summarized and finally put into an entirely different model that community members can understand,” he said, adding that he doubted this was possible or feasible. The influence of the NLCA is thrown into doubt when the *NFW Act* does not even consider it. He expressed his observation that consultations are only triggered when the Minister chooses it as part of a management approach. At this point, the NWMO is only collecting data about the population’s general feelings on this issue to present to the Minister.

Another participant noted that his board members would require a considerable amount of information in Inuktitut before he could ask them to respond to the questionnaire. Kneen indicated that the main points surrounding the issue have already been translated in the kits provided to participants. It was agreed that as much information as possible should be made available in the appropriate language. The same participant asked who would provide funding for eventual consultations. Kneen indicated that, at present, there was only money for dialogues and none for formal consultations. Such funding would have to come from the NWMO and the government.

Addressing the earlier point of providing the information to board or association members, one attendee noted that she planned to bring it to a regularly scheduled meeting to avoid extra expense. Kneen added that it would be helpful if regular meeting schedules facilitated the January 31, 2005 deadline, but ITK would work around board schedules as best it could. A representative of NTI noted that he would not take the questionnaire to the board since they have already passed a resolution on the matter. Another group member said they were in a similar situation. Kneen responded that a simple statement to that effect would be sufficient. While filling out the questionnaires would be appreciated, it is not necessary. “We will take what you can give us,” Kneen said.

A participant asked if the recommendations and comments of the current meeting were meant to be national in scope. Kneen replied that they could be and with respect to the questionnaires, either or both (regional and national) could be filled out.

Summarizing points made from both the morning and afternoon discussions, Kneen started with the preamble and asked participants for agreement on all points. It was asked what was meant by “meaningful and culturally-appropriate consultations.” It was suggested that “meaningful” should be “time-sensitive.” Agreeing, another attendee indicated that in her organization, meetings are scheduled when few people are on the land. “Culturally appropriate” also implies properly translated materials in different presentation formats that are accessible to a range of people. “You can’t just give people handouts and show power point presentations at the beginning of a meeting and expect them to comment by the end of it,” she added. There is a need to absorb the information.

An attendee asked for clarification of who should lead the eventual consultations. The ensuing discussion resulted in agreement that both the government and the NWMO should conduct the consultations but under the direction of Inuit, similar to the process to date. Kneen continued reading the preamble and was asked to delete “engaging” from “engaging and dialoguing with Inuit of Nunavut” since engagement has not occurred. In the final section of the preamble, “recommendation by NTI” was changed to “resolution by NTI” and Kneen added the previously discussed phrase that precluded any storage, disposal, or transportation of Nuclear Fuel Waste disposal in Nunavut.

In final comments on the preamble, participants agreed to the phrase “it does not warrant the provisions of the Act, Section 12(7) given that proper consultations have not taken place to date.” Subsequent discussion revolved around the term “Aboriginal” and how Inuit have the potential to “get lost” within this word. Participants added “a consultation with Southern Aboriginal people cannot be understood as a consultation with Inuit.” Further, it was suggested and agreed that the preamble include a section on the NLCA.

Moving to the specific recommendations, Kneen was asked to add NRCan and the NWMO as the organizations that should be required to do more research and to take steps to develop alternative energy sources (Recommendations 1 and 2). One participant felt that the nature of the research in the first recommendations should be specified more clearly and particularly, should include risk assessments. After some discussion, “must do more research” was reworded to “must do more research/risk assessments.” Recommendation #4 was clarified by replacing “place it higher up” with “but more shallow.” The participants agreed with all other recommendations.

Before reviewing the comments, Kneen was asked to replace “representatives” with “attendees” in the preamble. The group reiterated the importance of inserting a section of the NLCA in the preamble as well as referring to it in the comments section. With the review of the preliminary report of the dialogue complete, Kneen provided some participants with a printed copy for any further comments. She reassured other participants that an electronic version would be forthcoming to all.

In closing, Kneen thanked everyone for coming to the dialogue and said she looked forward to their input at the end of January.

Draft Recommendations from the Nunavut Dialogue:

Preamble:

These recommendations are provided with the understanding that they are informal submissions and are not the result of a consultation process that took place within the Nunavut territory.

Not enough time and funding were allocated in order to conduct a formal consultation that would be effective, meaningful and culturally appropriate. In section 12(7) the Act states that they shall consult the general public and in particular Aboriginal people. The meeting that has taken place over the past couple of days cannot be considered a consultation under this act. It does not warrant the provisions under the Act. (see p. 5 of the act) Consultation with southern Aboriginal peoples cannot be understood as consultation with Inuit.

The meeting that has taken place during Nov. 9-10, 2004, was a positive meeting, which has resulted in the provision of information and educational materials to those in attendance.

Attendees present at this meeting specified that they could not provide formal feedback that is representative for their organizations or communities as they have not yet been able to take the information provided back to their constituents. (With the exception of NITI who already has a resolution in place on this matter)

Even if there was funding, it is not a matter for these organizations to take the lead in doing this. It should be the NWMO and NRCan, with the assistance of the Inuit Tapiriit Kanatami, who should conduct meaningful and formal community consultations within the Nunavut settlement area. The regions should not be expected to take the lead. The consultations should be initiated and organized by the NWMO and NRCan with Inuit directing the process. Formal consultations with Inuit should be initiated in addition to the current dialogue process. Meaningful consultations are defined as culturally appropriate, time sensitive, (look at provision of materials, providing them ahead of time, providing maps and pictures as opposed to just providing the info and asking for comments – look at methods that would be most useful and beneficial) – prior notification should be reasonable.

This type of process would represent a culturally and geographically appropriate initiative for Inuit to take a formal regional and national position on the matter of the Long-Term Management of Nuclear Fuel Waste in Canada.

Dialoguing with Inuit of Nunavut on the Long-Term Management of Nuclear Fuel Waste with the NWMO prior to November 15, 2005 is important. However, Inuit of Nunavut and other Nunavimiut are citizens of Canada too and have been left out of some of the NWMO processes (such as the Advisory panel, the Scenarios Team and the Ethics panel).

Inuit have values unlike others. Inuit know a lot about the land and the animals on the land. Inuit also have agreements and processes in place that require for Inuit to have a voice.

It should also be recognized that a resolution by NTI does already exist (please see Appendix A), but that it does not prevent the attendees of the Nunavut dialoguing commenting on the

L-T Management of Nuclear Fuel Waste in Canada as a whole. However, due to the uncertainties of climate and weather conditions, storage, disposal or transportation of Nuclear Fuel Waste in Nunavut is not acceptable now or in the future.

Specific Recommendations:

1. The NWMO and NRCan must do more research/risk assessments before actually making a choice on the options for the Long-Term Management of Nuclear Fuel Waste;
2. The NWMO and the Government of Canada must take the necessary steps conduct research to develop alternative energy sources in Canada with the goal in mind to eventually stop the production of Nuclear Fuel Waste;
3. To conduct ongoing research on methods of eliminating the hazardous nature of Nuclear Fuel Waste;
4. Use a combination of options (Canadian shield – but shallower in the ground and keep it accessible – don't fully encapsulate it – reason: may develop technologies to destroy the waste in the future);
5. Regardless of the option selected – proper consultation should take place across the country to inform the public of what the selected option means – a formal consultation should take place with the public;
6. All written materials provided to the general public should be released in the appropriate language (incl. Inuktitut and Inuinaktun).

Current comments:

- Increased education to the public including and especially in the North is necessary
- Getting into the logistics of language, education issues, transportation issues – as it applies to community relations/consultations/dialogues – outline difficulties and obstacles regarding the organization of these types of events in the North
- Guggestion of an extended deadline as there isn't enough time to properly educate the public on the issue of the Long-Term Management of Nuclear Fuel Waste
- Traditional land use should be included in the community well being objectives of the NWMO assessment
- Traditional Knowledge (IQ) are important to the nature of the value of human life, wild life, the land, the sea, our ecosystem – in the south food comes from a store – in the North the land is the food source/ecosystem/the land – Inuit will take every measure they can to protect it!
- Consultation regarding each of the proposed approaches has not taken place with Inuit. To date dialogues have taken place, but a consultation has not be initiated. In addition; one dialogue has taken place for 27,000 people. One dialogue in one community is not appropriate consultation in any court of law.
- The Nunavut landclaim secures the rights of Inuit. Consideration of any economic regions without Inuit approval, that fall within this area, is contrary to the NLCA that was negotiated and settled. The Nunavut Land Claims Agreement was passed in June 1993 (takes precedent over other legislation including the NFW Act).

Appendix A (NTI Resolution):

NUNAVUT TUNNGAVIK INCORPORATED

BOARD OF DIRECTORS

Arviat, N. W. T. August 26 to 28, 1997

Resolution No.: B97/08-24

Re: Storage of Nuclear Material In Greenland

Moved by: James Eetoolook
Seconded by: Larry Audlaluk

WHEREAS there are reports that the Premier of Greenland is giving serious consideration to a plan to store weapons grade nuclear waste and other nuclear material from Russia and the United States in Greenland;

AND WHEREAS Rand Unrestricted Draft Series data posted on the Internet as "A Concept for Strategic Material Accelerated Removal Talks {SMART} "Debat om Thule Air Base: "Atom-feenQsel" i Gn~nland" gives considerable detail on this nuclear proposal;

AND WHEREAS Rand estimates the material involved could be enough to manufacture about 100,000 nuclear warheads;

AND WHEREAS in addition to Greenland, other circumpolar locations including Canada, Iceland, and Northern Scandinavia could be under consideration;

AND WHEREAS the U.S. airbase at Thule, Greenland is cited as the most favorable location by the designers of the project proposal;

AND WHEREAS the transport of hazardous materials to or from the proposed Thule site could threaten people, lands or waters protected under the Nunavut Land Claims Agreement;

AND WHEREAS concern has been expressed to NTI by residents of Grise Fiord, N.W.T., a community which is relatively close to Thule;

AND WHEREAS; NTI is opposed to the storage of nuclear and other hazardous materials in the arctic;

NUNAVUT TUNNGAVIK INCORPORATED

BOARD OF DIRECTORS

Arviat, N.W.T. August 26 to 28, 1 ~97

AND WHEREAS NTI has already conveyed its strong concerns about this matter directly to the President of the Inuit Circumpolar Conference and requested that he convey tile matter to the Premier of Greenland;

THEREFORE BE IT RESOVED that NTI voice its opposition to any plans for the storage of nuclear goods, or the transportation of such goods in the Arctic.

AND BE IT FURTHER RESOLVED that NTI take steps to notify representatives of governments and organizations involved in any such planning of our strong opposition to such plans.

In favour: 9
Against: 0
Abstentions: 0

CARRIED Date of Vote: August 28, 1997

Source: Records from the 1997 NTI Annual General Meeting

Appendix B (1977 ICC Resolution):

ICC Resolution (June 1977):

RESOLUTION 77-11 (Concerning peaceful and safe uses of the Arctic Circumpolar Zone)

RECOGNIZING that it is in the interest of all circumpolar people that the Arctic shall continue forever to be used exclusively for peaceful and environmentally safe purposes and shall not become the scene or object of human conflict or discord; and

ACKNOWLEDGING the emphatic contributions to scientific knowledge resulting from a cooperative spirit in scientific investigations of the Arctic:

NOW, THEREFORE, BE IT RESOLVED:

(a) that the Arctic shall be used for peaceful and environmentally safe purposes only, and that there shall be prohibited any measure of a military nature such as the establishment of military bases and fortifications, the carrying out of military maneuvers, and the testing of any type of weapon, and/or the disposition of any type of chemical, biological or nuclear waste, and/or other waste. Further, present wastes be removed from the Arctic;

(b) that a moratorium be called on emplacement of nuclear weapons; and

(c) that all steps be taken to promote the objectives in the above mentioned.

Appendix B (Final Inuvialuit Settlement Region Report):

Day 1: November 17, 2004

Participants

Soha Kneen, National Coordinator of the Inuit-Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste, ITK
PJ Akeeagok, Project Co-ordinator/Jr. Researcher, ITK
Sadie Joss, Holman Island HTC (Hunters and Trappers Committee)
Jojo Arey, Inuvik HTC
Ron Gruben, Inuvik HTC
Ruben Ruben, Paulatuk HTC
Jo Thrasher, Inuvialuit Game Council
David Ruben, Paulatuk HTC
Darren Nasogaluak, Sachs Harbour HTC
Max Kotokak, Tuktoyaktuk HTC
Donald Aviugana, Aklavik HTC
Barb Armstrong, Inuvialuit Regional Corporation
Randall (Boogie) Pokiak, Tuktoyaktuk HTC
Peter Malgokak, Holman Island HTC

Welcome and Introductions

Soha Kneen introduced herself as the National Environment Co-ordinator of the Inuit-Specific Dialogues on the Long-Term Management of Nuclear Fuel Waste that is currently being conducted by ITK. She outlined the agenda for the next two days and invited participants to ask for changes. “This is your meeting, not mine,” she said.

Kneen defined the purpose of the meeting as an opportunity for ITK to seek Inuvialuit opinions and views on the Long-Term Management of Nuclear Fuel Waste and for ITK to provide information on the subject. She asked those who need to leave before the conclusion of the meeting to contribute their comments for the report by any means possible.

Kneen asked participants to introduce themselves and voice their expectations for the dialogue. After a quick round of introductions, a participant asked if representatives from Cabinet or Parliament were present. Kneen replied that these dialogues were only for Inuit representatives who were selected by regional members of an ITK taskforce.

Another participant asked why the Gwich’in were not at the table since they share many Northern lands and have an important perspective. Kneen said these are Inuit-specific dialogues organized by ITK; the Assembly of First Nations will hold dialogues with the Gwich’in. There are currently three dialogues, one for Métis, one for First Nations, and one for Inuit.

Tony Hodge, Nuclear Waste Management Organization (NWMO), said he would soon brief Norman Snow on this issue. “It may be best in any follow-up meetings that the Inuvialuit and the Gwich’in talk together,” he suggested.

In response to a question, Barb Armstrong said there was no link between the subject of this dialogue and oil and gas. She suggested the confusion could stem from the numerous oil and gas meetings being held concurrently in the community.

Kneen clarified that the subject of the current dialogue is the Long-Term Management of Nuclear Fuel Waste, which is currently stored onsite at nuclear power facilities. The Canadian government is trying to decide what to do with this waste.

Members of the group asked if there was a connection between DEW Line sites, nuclear submarines, and the Long-Term Management of Nuclear Fuel Waste. Armstrong stated that the Long-Term Management of Nuclear Fuel Waste is a stand-alone issue.

Hodge agreed that this process is distinct from DEW Line discussions, but could perhaps benefit from the lessons learned. DEW Line sites were abandoned and some terrible decisions were made, he said. Furthermore, while Canadian law only mandates the NWMO to deal with Nuclear Fuel Waste, it is certainly true that nuclear submarines do not last forever. Other countries are trying to decide what to do about nuclear submarines that have been abandoned in the sea. Canada does not have nuclear submarines and does not have to make these decisions, but countries involved are on the other side of the Arctic and there are definitely implications for Canada’s North, likely within 10 to 15 years. Having said this, Hodge reiterated that today’s discussion was focused only on waste from nuclear fuel reactors as outlined in the *Nuclear Fuel Waste (NFW) Act*. Agooalark added that the *NRW Act* has been included in the kits provided to the participants.

One participant said he had come to the meeting to learn about buried waste in the North. Buried waste in Greenland remained top secret for a long time. “What I want to know is—where was DEW Line waste buried? Was some of it nuclear?” He said he hoped to get such information from this meeting. Events in Greenland give the Inuvialuit and other Northerners a perspective on what could lie beneath. Without first having information, it is not possible to react to this issue.

Kneen agreed and noted that the intent of the current meetings is to add to information already provided so that participants have as much information as possible. Experts will discuss Nuclear Fuel Waste in detail in the afternoon session.

Returning to the issue of nuclear submarines, one participant noted that abandoned submarines are already leading to severe environmental damage in Russia. “Everything will end up in the North at some point,” he said.

Kneen stated that she did not want to imply that other Arctic and trans-national issues were not important and did not affect this community, but she further stated that this current dialogue was intended to focus on the Long-Term Management of Nuclear Fuel Waste in Canada.

Armstrong agreed that Inuvialuit and others living in North are all affected by what is happening in the North and not just what is happening in Canada.

Kneen indicated that all these comments would be included in the report.

Update and General Information: ITK Opens the Dialogue

Kneen presented background information on the Nuclear Fuel Waste issue. The 2002 *NRW Act* responded to the Seaborn Panel's recommendation that Canada engage Aboriginal peoples in the discussion of Nuclear Fuel Waste. In representing Canada's Inuit population, ITK sees the fundamental importance of Inuit input. ITK also believes it is essential that a dialogue take place in a relevant and culturally appropriate way. The current dialogue will allow Inuit to express opinions and will result in a comprehensive report reflecting areas of concern.

Kneen said the dialogue would address two questions:

- How do Inuit, as Canadians, think that Nuclear Fuel Waste should be managed?
- What management method is most acceptable?

A participant stated that he would like to say immediately that storage in the North is not acceptable. Kneen responded that it was not a question of storage in the North, but rather of participants' opinions as Canadians on what should be done with Canada's Nuclear Fuel Waste.

Tony Hodge clarified that NWMO did not come to the meeting thinking that the material would be stored in the Arctic. "NWMO is not interested in asking you that," he said.

Kneen said Nunavut has a resolution against storage and transportation of nuclear material. Hodge added that the Inuit Circumpolar Conference, of which Canada is a participant, has declared the nuclear-free status of the Arctic.

In response to a question about his background and position at the meeting, Hodge said he was an independent consultant on contract with NWMO as senior advisor. He stated that he spent time in Whitehorse working on environmental issues. His consulting work aims to bring sustainability from theory into practice and his role at the meeting is to represent NWMO.

Kneen clarified that she too was not suggesting Inuit should accept Nuclear Fuel Waste on their land.

A participant reiterated that it seemed they were being asked to store the material in the North, even though they have their own land settlement. Kneen said ITK's role is to provide Inuit with all the information and ask them to look at the issue in a regional and national context. She stressed that ITK is not endorsing any of the three storage options. ITK is currently conducting these dialogues to provide information to Inuit and to enable Inuit to have a voice in the national dialogues that are being conducting across the country at this point in time. The Inuit-specific dialogues will result in a final report that will be included in the NWMO submission to the Minister on November 15, 2005.

A participant stated that Northern municipalities should have been brought into the discussion, not just the hunter and trapper organizations. PJ Akeeagok responded that ITK had brought in as many people as it could, considering the need to include the four regions and the realities of budget. Responding to comments on the seriousness of the issue and the number of people who wanted to attend, Akeeagok said members would be sent an initial report for input before completion of the final report. The final report has a deadline of March 31, 2005. Kneen added that the decision with regard to the regional participants was made by the regional task force members (Joe Thrasher/Andy Carpenter) as it should be the region's decision as to who should represent them in this particular dialogue.

Returning to her presentation, Kneen stated that ITK is looking to outline the Inuit opinion in advance of NWMO's final recommendation, and develop communication between Inuit and the Government of Canada on the issue. Dialogues could include Traditional Knowledge on Nuclear Fuel Waste Management, treaty and other rights, and other relevant topics as they arise.

A participant said that Inuit have Traditional Knowledge on the environment and their way of life, but not on Nuclear Fuel Waste. Hodge responded that Traditional Knowledge may be "the flavour of the month" in Ottawa—the way to engage Aboriginal and Inuit communities. It would only be appropriate to think of applying Traditional Knowledge in considering building a facility in a particular place. However, there is wisdom is seeking Aboriginal insight in determining a way forward.

A brief discussion concluded that Traditional Knowledge is the appropriate term for Inuvialuit.

Another brief discussion ensued on language. Hodge said that, in other processes, NWMO had asked groups to write a report in their own language. Participants responded that it would be better to continue in English, given the many dialects and the lack of a traditional word for nuclear.

Kneen described Nuclear Fuel Waste as used uranium fuel from nuclear reactors, contained in bundles of approximately 20 kg. Because of its toxicity, it is dangerous to

human and environmental health. Kneen displayed a map of Canada's nuclear reactors where the waste is now temporarily stored, most of them in southern Ontario.

A participant stated that the waste producers of southern Ontario should look after the waste. "We don't use it," he pointed out.

Returning to her presentation Kneen described the initial storage of Nuclear Fuel Waste. The nuclear generating facilities have been in operation since the mid- to late-70s. Ontario Power Generation is responsible for about 90 per cent of the waste, with smaller contributions from New Brunswick Power, Hydro Québec, and Atomic Energy of Canada Limited (AECL).

Hodge stated that no further reactors are currently planned, but that could change—for example, the Saskatchewan opposition party favours the construction of a plant. There is also the matter of refurbishing current reactors. Of the existing 22 reactors in Canada, 17 are currently operating. The five that are not operating would need to be refurbished to go back into production. The site at Gentilly, Québec will soon have to shut down and retool, which will require an environmental assessment.

Kneen stated that approximately 1.7 million used nuclear fuel bundles have been produced and, at current production rates, the figure will rise to 3.6 million by 2033. The used nuclear fuel bundles will remain dangerous for hundreds of thousands of years.

A participant stated that it sounded as though the government wants to store Nuclear Fuel Waste in the North. He further stressed that the people of the North would not accept it, and Kneen said that point would be recorded.

A participant said the discussion should be held at a higher level in the North.

Another participant said the Inuvialuit Regional Corporation (IRC) has a "no nuclear here" position.

Another participant suggested the government may be planning to store the material on Crown land in the North. Northerners have already seen this practice with sumps.

"I can't decide for 5000 beneficiaries," said another participant.

Kneen stated that these points would most definitely be included in the report that would be resulting from this dialogue. Returning to her presentation she outlined the three methods of storage under consideration:

- Deep geological disposal in the Canadian Shield
- Storage at nuclear reactor sites
- Centralized storage (above or below ground)

Hodge confirmed that centralized storage would be for thousands of years, with refurbishment after 100 years.

Kneen summarized the waste management approaches, outlining the advantages and disadvantages of each. Hodge added that the assumption that deep geological storage requires no maintenance is currently under question.

Kneen concluded by listing the points identified by NWMO for consideration when considering long-term Nuclear Fuel Waste management options:

- fairness
- public health and safety
- worker health and safety
- community well-being
- security
- environmental integrity
- economic viability
- adaptability

Asked about "adaptability," Hodge stated that significant changes can occur over the centuries, citing the examples of climate change and societal change. The "adaptability" factor refers to the storage option's capability to adjust to changing conditions.

A participant reiterated that Northerners would never allow such storage. Another participant commented that there are no reactors in the North. Kneen assured the participants that these statements, as well as any recommendations, would most certainly be included in the Inuvialuit report resulting from this dialogue. She further stated that participants should also keep in mind that within this dialogue process Inuit were being asked to provide their opinions or voices as Canadians on this subject.

Hodge said he did not think the Nuclear Fuel Waste would be taken to the North. However, it was important to articulate the discomfort felt in the room. The people of the North have been invited to share their insight about a problem in the south—rather a turning of the tables. Because of events during the past 25 years, such as the Mackenzie Pipeline, it has been recognized that people of the North have wisdom in such issues. He stated that Northerners are on the leading edge in shared decision-making with the people. This co-management concept is not in place in the south.

Responding to the participant who said they could not speak for 5000 people, Kneen stated that ITK had decided to conduct dialogues as opposed to consultations, as all the communities in the region could not be involved due to time constraints and for fiscal reasons. As such it is ITK's intent to provide as much information as it can for people to take back to their communities on the subject of the Long-Term Management of Nuclear Fuel Waste in Canada.

Responding to Akeeagok's reading of the *NFW Act*, Section 7, that the NWMO consult the general public, particularly Aboriginal people, Hodge said that the legality is being hotly debated by lawyers, but their advice is that the NWMO should work with people across Canada. Kneen added that NRCan and the NWMO had provided the funding for the current process.

In order to ascertain the level of understanding of the current process within the room a participant asked others if they knew why they were asked to attend, and received the following responses:

- The government is asking to store nuclear waste in the North.
- The Act sounds as though a site with a large Aboriginal population has been chosen.
- This is reminiscent of past issues surrounding oil and gas.
- Nuclear makes people think of war.
- It does not seem a good idea to fill in the questionnaire.
- Having seen the results of industry, why would Northerners want something like this on their land?
- Is that how southerners regard the North—a place to dump garbage?
- The group should send a message that it does not want the waste in the North.

These responses were indicative of the fact that no information on the subject of the Long-Term Management of Nuclear Fuel Waste had been made available to the region generally speaking prior to the commencement of these dialogues. ITK had circulated educational information, but the region generally speaking had not been informed by either the Government of Canada or the NWMO.

Responding to a participant's comment on the clean reputation of nuclear power, Kneen stated that the reputation refers to emissions and not the production of Nuclear Fuel Waste. The public knows little about nuclear power generation and the resulting Nuclear Fuel Waste. That is why ITK is trying to provide information. She invited people to send in further comments to be included in ITK's report.

A participant suggested that while the current dialogue is not about bringing Nuclear Fuel Waste to the North, participants should address the issue anyway. The response should be what participants recommend, as Canadians.

Hodge clarified that NWMO has to make a recommendation to the Government of Canada on how to proceed with managing the waste, and it needs advice from Canadians. The recommendation should have three points:

- A suggestion for a technical method for Long-Term Nuclear Fuel Waste storage;
- An outline of pieces that must be in place to make the storage option work (for example, oversight, participation in ongoing decision-making, contingencies);
- A plan for timing.

Implementation will take decades and will provide an opportunity for more Canadians to be involved, said Hodge. The current dialogue is a first step, a wonderful opportunity for participants to say whatever they want. Even if a decision were made to leave the waste where it is currently being stored, the decision would trigger a 10-year federal environmental review process. For central or deep geological storage, the process would take at least 30 years.

Responding to a question, Hodge said nuclear energy has its own legislation and is not covered by the National Energy Board (NEB). There will be a standard government environmental review process by the Canadian Nuclear Safety Board.

Hodge noted that of the 30 countries producing nuclear waste, only Sweden and Finland have started constructing a deep geological waste depository. A few other countries have committed to this method of storage, but the rest have not determined how they will address the issue.

Presentations

Students from the Natural Resource Technology Program at Aurora College attended the afternoon presentations. PJ Akeeagok of ITK welcomed the first speaker of the afternoon, Tony Hodge.

Nuclear Waste Management Organization

Tony Hodge, Senior Advisor at the NWMO, noted that his presentation summarized information in NWMO discussion documents and other reports, which he would be happy to send to anyone requesting further information.

A participant suggested restating the purpose and origins of the current dialogue for the benefit of the students. Hodge stated that the NWMO is mandated to make recommendations to the Government of Canada on the issue of long-term storage of used nuclear reactor fuel. NWMO provided support to ITK and other Aboriginal groups to conduct dialogues with their membership.

Hodge explained that of the 22 commercial nuclear reactors in Canada, 20 are in Ontario. Waste associated with research facilities in Manitoba and Saskatchewan is not currently within the NWMO mandate, which is a point of some debate. Under current government policy, commercial reactors are destined to operate for another 20 years before their shutdown. Policy however can always change.

Hodge briefly described nuclear power generation. Energy harnessed from splitting uranium atoms generates heat, which boils water, and the resulting steam drives turbines that create electricity. Alluding to a question posed earlier in the day about pollution associated with nuclear facilities, Hodge stated that the heat that is discharged into nearby bodies of water could be considered pollution. A much greater concern is the potential contamination of water and ecosystems in the event of an accident. Nuclear reactors are located near large water bodies in order to release coolant water.

Currently, there are 1.8 million used nuclear fuel bundles in temporary storage in the country. Hodge noted that if the "polluter pays" principle was applied, 95% of the used fuel would remain in Ontario where the power was generated.

While Nuclear Fuel Waste does not present the volume problem of uranium mine tailings, Hodge noted that its "outrageously dangerous" nature makes long-term management extremely important. Nuclear fuel is comprised of many constituents that decay and disappear at different rates; some disappear quickly and others remain for thousands of years or more. The spent fuel bundles take 300 years to become cool enough to handle. For 300 years, the bundles have a capacity to protect themselves from terrorists, Hodge explained.

Recounting the origin of nuclear energy, Hodge stated that what started out as scientific inquiry into the nature of matter eventually resulted in a bomb being dropped on Hiroshima, Japan. This unleashed a great horror. Subsequent public pressure to make something positive out of it led to nuclear power generation. Canada has been a leader in non-proliferation of nuclear bombs with a pledge to use uranium peacefully.

A participant asked if people thought about the waste problems associated with nuclear power at that time. Hodge said they did not; the societal push was greater than any concern for waste issues. Currently, both long-term storage of Nuclear Fuel Waste and the future of nuclear energy are being questioned.

Used fuel bundles still have some uranium left in them. Reprocessing the bundles does result in refined plutonium for further energy use, but also yields extremely hazardous waste and "dirty" plutonium that is useful for military purposes. "Reprocessing is not a panacea; it just replaces one set of problems with another," said Hodge. Countries such as China, France, and Russia have engaged in reprocessing Nuclear Fuel Waste but more from a desire to recover weapons-grade plutonium than from a true interest in recycling.

Responding to a question about Sweden's and Finland's nuclear waste management/disposal approach, Hodge stated that they are moving ahead with deep geological repositories. Other countries have committed to this idea in policy but are far from implementation. Hodge provided some information about the U.S. situation. The Reagan administration assumed responsibility for Nuclear Fuel Waste Management but "lost" the money industry paid them to take the problem off their hands. The current U.S. government, in an effort to deal with the waste, overruled a Nevada state veto objecting to the waste being buried on federal lands within the state. In contrast, the Swedish and

Finnish legislatures passed laws that make it impossible for government to impose waste storage on communities that object. “This is on the table for NWMO,” said Hodge. If communities secure this right before storage options are implemented, doors are opened for other solutions.

One participant asked what communities receive in return for allowing Nuclear Fuel Waste to be stored on their lands. Hodge said communities get electricity although they pay for it in waste generation. The same participant asked if waste being sent to third world countries could be used for other purposes. Hodge explained that producers of Nuclear Fuel Waste are prohibited from exporting it through the rules and regulations laid out by the International Atomic Energy Association. “All international laws would be broken and the material is too heavy to be transported secretly,” he said. Countries have to assume responsibility for their used nuclear fuel.

On the question of dry storage, one participant asked if liquid or solid materials are put into the storage blocks. Hodge replied that used fuel bundles are lowered into the blocks, and then the air is removed and replaced with helium. A problem is that the containers have a design life of 50 years while the material needing storage remains severely hazardous for a long time. Whatever storage option is pursued, the material will have to be repackaged first. One of the students asked if the storage containers themselves wouldn’t become radioactive. Hodge agreed that this was yet another issue to consider.

Hodge reiterated his belief mentioned earlier in the day: moving Nuclear Fuel Waste to the North would be a huge effort that makes little sense given the effects of climate change on the Arctic.

Akeeagok noted that the Canadian Shield is under consideration and the Canadian Shield reaches into Nunavut.

Hodge stated that the Canadian Shield offers only a few areas with large stable plutons suitable for Nuclear Fuel Waste burial. Recent research suggests that sedimentary rock may also provide storage opportunities. If so, Southern Ontario could be a possibility.

Hodge noted that in the late 1970s, a three-month governmental review concluded that all efforts should focus on the option of deep geological burial. The subsequent Seaborn Panel, reviewing the same issue, indicated that while geological burial was technically possible, there was considerable discomfort with it amongst Canadians. This led to the creation of the NWMO.

Hodge reminded participants that used nuclear fuel does not exist in a vacuum. Nuclear Fuel Waste comes from nuclear energy which itself depends on uranium mining. Energy policy dictates how electricity is produced, and to date, both federal and provincial governments have refused to talk about energy policy, despite its centrality to the discussion of Nuclear Fuel Waste. The NWMO was given the mandate to deal with the waste, but not with energy policy or alternative energy. The *NFW Act* however does not

prohibit NWMO from comments in this regard. NWMO can "nudge the debate," Hodge stated.

Hodge provided some information on the financing of long-term storage. By law, Nuclear Fuel Waste owners are required to put money into a trust fund that will be used for long-term storage once government determines storage and location. The trust fund currently stands at nearly $1 billion. A rough estimate of the costs of any of the management options is in the range of $15–20 billion. Natural Resources Canada (NRCan) contributes by building the capacity of communities to respond to the issue. Hodge stated that the final report could include recommendations for programs to enable people to discuss the issue, for ways to further involve communities, and for the amount of money involved over the long-term.

Asked if funds designated for Nuclear Fuel Management could disappear in Canada as they did in the U.S., Hodge said that in Canada the fund must be reported on annually. This differs from the American process but perhaps it is not different enough, he said. There is no precedent for putting resources into a fund that is to last for thousands of years.

In answer to a question about the possibility of re-use or recharge of the waste, Hodge noted that recycling is impossible and reiterated that reprocessing Nuclear Fuel Waste is associated with weapons production and still results in hazardous waste. The same participant wondered why this form of energy production is still being used given all the problems associated with it. Hodge noted that this came back to the issue of energy policy and urged participants to comment on this point.

Another participant asked if the Canadian government could follow the U.S. example and just do what it wanted and dispose the waste in the North. Hodge agreed that this may be possible, but would call for a robust facility, less amenable to manipulation that requires effort to get at.

Hodge explained that the original intent of the Seaborn recommendations was for the NWMO to be at arms-length from industry. The government, however, felt that those who created the waste should also be responsible for its management. There are, however, mechanisms to address independence. A committee of non-industry members has the right to comment on anything with no interference from NWMO. An international group also participates, comprised of experts like Hans Blix, Thomas Berger, and Gus Speth.

In contrast to the Seaborn Panel, the NWMO is in this for the long term, given the long-term nature of the problem. Although the emphasis has been on the management approach, there will be many other recommendations in the report including principles that will guide implementation and financial surety.

One participant wondered how the current process differs from oil companies coming and going. Hodge said that according to the *NFW Act*, power companies do not have that

right. Some group members expressed skepticism. “Companies can dance around laws,” said one.

Hodge asked if a solution should be created that does not involve the government. Participants dismissed this idea, noting that problems associated with privatization could be worse.

A participant asked if the report would be circulated to the group prior to going to government. Hodge said yes, participants would have a chance to review the report in the spring.

Hodge provided further information on NWMO’s process. *Dialogue with Canadians* was based on a comprehensive assessment framework that included public attitude research, national citizen’s dialogues, and Aboriginal engagement and consultations. In NWMO’s second document, the three management approaches were compared. “My feeling is that none of the three approaches will be used in its pure form,” Hodge commented.

Akeeagok wondered if Canadians who had so far participated in the dialogues wanted the waste deposited in the North. Hodge replied that input has addressed assessment of the different approaches and the values needed to guide assessments. Hodge stated that a decade would pass before any action would take place for onsite storage, and action on deep burial would take three to four times that long. The financial implications of the timeframe are tremendous. Moving the waste to central storage or keeping it onsite passes the responsibility and costs to future generations. However, responsibility should be with the waste generators to deal with it as completely as possible. In any case, the financial resources must be there for future generations.

Hodge acknowledged that the NWMO’s Aboriginal dialogues have not talked to everyone. The NWMO wants to build a relationship with Inuit in order to better work together. “We are just beginning the dialogue,” he said.

One participant expressed his sense that that NWMO has already made up its mind. He said the specific mention of Aboriginal people in the documentation led him to believe that the storage site was going to be somewhere in the Canadian Shield. Hodge explained that the information was tailored to the current dialogues; neither an approach nor a site has been chosen. Dialogue goals are phrased differently in different communities.

Another participant took exception to the implication of building a long-term relationship with Inuit. “We don’t want any part of it,” he said. The problem is down there and it should stay down there. Hodge explained that he was not here to negotiate only to gain the Inuit perspective. Inuit may have some insight and decision-making processes that could be applied in the Nuclear Fuel Waste issue. “However, if you don’t want to be a part of this, that’s fine,” he said.

Another participant wondered if NWMO in its dialogues with various Aboriginal groups was hoping to find one that would say “yes” to storage. Hodge responded that his

organization is going all across the country with no intention to solicit anything other than what is important to Canadians.

A subsequent discussion revolved around last year's power black out in Ontario and nuclear reactor safety. A participant explained that no single factor was responsible; a wild swing in the system caused the reactors to shut down. A presenter scheduled to speak the following day, Gordon Edwards of the Canadian Coalition for Nuclear Responsibility, noted that nuclear reactors are actually quite safe from the employee perspective, whereas uranium mining is a different story.

One group member asked about Hodge's earlier mention of Nuclear Fuel Waste disappearing over time. Does it evaporate? Hodge offered a correction of his earlier statement, saying "disappearance" was the wrong word to use. Radioactivity diminishes very slowly over time, it is only the heat that disappears, he explained.

Another participant asked how long the dangers of Nuclear Fuel Waste have been recognized. Was there no environmental review process at the time of building nuclear reactors? Hodge stated that he suspected that the dangers were known but that public pressure to make something positive out of nuclear energy in the 1950s outweighed other aspects. Asked why they did not stop nuclear energy production, Hodge replied, "They chose not to."

Participants asked which management approaches were favoured to date by Canadians and the government. Hodge noted that no approach has been agreed upon to date. No permanent solution has been found and the used nuclear fuel remains monitored in temporary sheds onsite. "Finding the best possible approach is why the NWMO was created and that is what we are in the process of doing," said Hodge. He added that the current minority government may choose not to decide given the political costs of a decision. NWMO is required by the *NRW Act* to look at the three management options and determine which option is the best one, in consultation with Canadians.

One participant wondered if this process was new to the Canadian government. Hodge agreed that a process that sets out to determine what is important to all Canadians is new. The Seaborn Panel was not the same, it only reviewed one option.

A student asked if the cost of dealing with the waste produced is greater than the profits made from the energy produced. Where will the money come from to implement a solution with only one billion accrued to date? Will taxpayers pay the cost? Hodge stated that this once again raises the issue of energy policy in that the full costs of methods of energy production must be considered. In terms of the trust fund itself, the companies are required to contribute annually and the amount will accumulate over the next 30 to 40 years. However, a formula still needs to be written to determine how the additional funds will be raised. Hodge suggested that additional costs would likely be passed onto rate payers.

One participant asked what people living next to the reactors say on this issue. Do they want to get rid of it? Hodge elaborated by stating that he thought the communities that were asked to host the reactors were not prepared to "host" the waste for thousands of years to come. The community consultations for situating the nuclear reactors did not consider the waste factor. "Yet they must have been happy about the jobs created," suggested another participant.

"We need to get serious about not using this form of energy anymore. Only then will we get serious about solving the waste problem," commented one group member.

Kneen closed the question period indicating that there would be more time for questions and commentary the following day.

Canadian Coalition for Nuclear Responsibility/Atomic Photographers' Guild

Soha Kneen introduced herself again to the group, and then introduced the speakers. Speaking on behalf of the Canadian Coalition for Nuclear Responsibility was Dr. Gordon Edwards and Robert Del Tredici on behalf of the Atomic Photographer's Guild.

Gordon Edwards introduced himself as a teacher of mathematics at Vanier College in Montréal. He said he was shocked when he learned the problems associated with Nuclear Fuel waste. He joined the Canadian Coalition for Nuclear Responsibility in an attempt to demystify the subject and make information available to ordinary people in a language they could understand.

Robert Del Tredici introduced himself as a teacher of photography in Montréal. When he became aware that all aspects of the nuclear era are invisible, he embarked on a process to make them visible.

Edwards and Del Tredici's presentation took the form of a slide show of Del Tredici's photographs with commentary by both men.

Displaying a photograph of cement silos housing Nuclear Fuel Waste, Del Tredici stated that it would be hazardous for a half million years. "That is why you are here," he said. "You know it is a problem when the people producing it come to you and ask how to deal with it." Edwards added that it was 25 years before the industry acknowledged it was a problem. Initially even politicians were told there was no problem.

A spent fuel bundle is a group of rods with uranium pellets inside, said Del Tredici. Edwards added that there are now two million bundles and NWMO expects the number to double. Before the fuel is used, the bundles can be touched, but afterwards they become extremely radioactive. Responding to a question, Edwards said the bundles stay in the reactor for about three years. "Three years of energy and a half million years of

careful watching, in order to boil water," said Del Tredici. He displayed a slide showing where the fuel bundles fit in a CANDU reactor. There are 400 tubes and each contains 12 bundles.

Displaying a model of a uranium atom, Del Tredici stated that uranium is the heaviest naturally occurring element on earth. Although uranium is found in many places, it has many rare properties. Uranium is the only material that can be used in a nuclear reactor—its use was discovered in 1941. It is naturally radioactive, said Del Tredici, and its atom can be split. Bombarding it with neutrons liberates energy in the uranium atom and it falls apart. The broken pieces of the atom fall to the ground, giving birth to the term "fall out" for the leftovers of the splitting process.

"Man does this," said Edwards. The two halves are a new thing, not found in nature. The splitting produces hundreds of new dangerous materials that must be contained.

Splitting atoms all at once produces a nuclear explosion, said Del Tredici. Through testing and the use of the nuclear bomb, man realized how toxic these materials can be. The nuclear bomb is uncontrolled and violent; the nuclear reactor is the same process, but contained.

Del Tredici displayed a photograph of John Smitherman, a soldier tasked with washing the decks of a ship close to a test explosion. He got cancer and sued the government seven times—his wife only received compensation after he had died. Edwards added that hundreds of soldiers were encouraged to walk toward the mushroom cloud of nuclear bomb tests. Del Tredici described the town of St. George, Utah, just south of the Nevada test site. Residents regularly watched the coloured clouds from the tests and were never told that it could be dangerous. A woman named Irma Thomas noticed that people on her street were becoming ill, suffering stillbirths and miscarriages. She was the first to speak out and eventually won a lawsuit. Edwards added that the tests were done deliberately on days when the wind was blowing toward St. George, and away from Las Vegas where rich people lived.

Returning to the subject of Canadian Nuclear Fuel Waste, Del Tredici stated that Canada is one of the world's largest producers and exporters of uranium. Edwards added that sales of uranium for bombs were stopped in 1968 by the government of Lester Pearson. However, the waste continues.

Del Tredici displayed a map of the nuclear industry in Canada. Uranium is mined in the Northwest Territories and Saskatchewan. The reactors are in the south. Edwards said the Government of Canada was involved in the nuclear industry from the beginning, in secret at first because of the war. The first two mines were in Port Radium and Ray Rock, but mining is now concentrated in northern Saskatchewan. There was a time when Elliot Lake, Ontario, was the uranium capital of Canada.

Showing a photograph of a Dene man at Port Radium, Del Tredici explained that the Dene were hired to carry burlap sacks out and sail across Great Bear Lake with them. In

fact they often slept on the sacks. Even before it is used in nuclear reactors, uranium has a natural radioactive quality, and the town of Déline, where these men lived, became known as the “village of widows.”

Expanding on the dangers of uranium, Edwards explained that it is unstable and gives off little explosions at times. If inhaled into the body, rays scattered by the little explosions damage body cells. There are three types of rays:

- Alpha rays, which have little penetration power
- Gamma rays, which are very powerful
- Beta rays, which are not as powerful

The NWMO says that a single sheet of paper can stop alpha rays, but there is no protection once alpha rays are embedded in lung tissue. Over a half-life of 24,000 years, lungs would get a heavy dose. They showed a medical slide of lung tissue in apes infected with alpha rays.

A participant commented that uranium mining had been considered in Baker Lake a few years ago, but the project had not gone ahead.

Del Tredici stated that in 1931 there was a health advisory from the Government of Canada warning about the handling of uranium. However if was only distributed to workers in Ottawa who handled samples from the mines, not to the workers in the mines. “This is an indication of how the industry behaves itself with dangerous materials,” he said.

When uranium is milled, crushed, and the impurities are taken out, the left-overs (called mill tailings) are thrown away. The mill tailings contain about 85 per cent of the radioactivity. Through a series of little explosions, these tailings change into thorium or something else, and after about 12 steps, become lead.

The industry has made some improvements, said Edwards. It has covered waste material with a thin layer of water.

Asked what happened to the tailings from Port Radium, Del Tredici said many were dumped in one of the deepest parts of the lake, and the rest were dumped on land. It may be more dangerous to try to get them out of the lake than to leave them. Edwards added that the Serpent River runs toward Georgian Bay where there was a great increase in fish deaths in the 1970s.

Del Tredici pointed out a box on the map showing an inventory of radioactive materials in Canada. Edwards said that “used nuclear fuel” sounds better than “high level radioactive waste,” but they are the same thing. There is much less Nuclear Fuel Waste than tailings, but it has millions of times greater toxicity. Hundreds of new materials are

made through splitting the atom—that is what makes it different from anything man has had to deal with before.

Del Tredici displayed a photograph of the nuclear fuel chain. When the ore is crushed the purest uranium is saved as “yellow cake”, a bright fluffy yellow material. It is also called uranium concentrates.

The irradiated fuel is very hot. Unless water is kept circulating to cool the bundles, they can melt all by themselves and liberate toxic materials into the air. This is what happened at Chernobyl.

Displaying a photograph of a man holding a nuclear fuel pellet, with the caption, “Small wonder,” Edwards said Canadians were told that nuclear energy was clean, safe, cheap, and abundant.

The toxic waste released at Chernobyl spread worldwide, said Del Tredici. It contaminated the reindeer in Lapland. Reindeer eat lichen, and lichen was contaminated by the air and rain. The same could happen to caribou.

Showing a photograph of a spent fuel pool covered with a layer of water, Edwards stated that the water shields people from the fuel and circulates to cool it. This type of storage goes on for seven to ten years.

Asked how many parts per million is deemed a safe exposure, Edwards said the objective is total containment. Exposure to a single used fuel bundle for 20 seconds can kill. The uranium mining damage from the alpha rays happens over a period of time.

Turning to the three options that the NWMO asked participants to consider, Edwards said the problem with a centralized location is that Nuclear Fuel Waste cannot be moved to the central location until seven to ten years after it comes out of the reactor. All fuel therefore cannot be kept in a centralized location. The Royal Commission on Electric Power Planning in Ontario in the 1970s recommended against centralized storage.

Del Tredici told participants that spent fuel contains plutonium. There was only a handful of plutonium in the Nagasaki bomb and plutonium does not give off much radiation. A centralized location would be a security risk. “You would need a police state in that area to ward off all the people who might want it,” he warned.

Del Tredici further stated that the problem with deep geological storage is that the integrity of the rock would be destroyed when drilling down to deposit the material. Drilling would create millions of fissures. Edwards said the attraction of underground storage for industry is that they would not have to watch it forever. However, it is not possible to predict the geological future. Geology is not a predictive science—it cannot predict earthquakes or volcanoes. The other issue with deep geological storage is how to plug the hole.

Del Tredici noted that the Royal Commission on Electric Power Planning in Ontario during the 1970s not only recommended against centralized storage, it also opposed reprocessing of waste fuel. As a result, the Government of Canada could have passed a law against reprocessing, but it deliberately kept the option open.

Turning to Canada's role in the development of nuclear bombs, Del Tredici said plutonium for that purpose was produced in Chalk River, and spoke of the Zeep Reactor of 1945. "The real reason for building reactors was not electricity," he said. He added that the reactor at Chernobyl produced both energy and plutonium for nuclear weapons.

Plutonium is a temptation, said Del Tredici. A process for removing plutonium involves hot acid, and the tanks that hold the acid can only last 35 years. The word "recycle" sounds friendly, he said, but it creates a new level of toxic waste.

It is a sad fact, Edwards stated, that some waste has already leaked into the soil at Handford, near the Columbia River. The situation is being monitored, but there is no way to recover the leaked material.

Del Tredici showed a photograph of Russian women watching measurements being taken in a river near their home. Waste had been dumped into the river and people were becoming ill, but doctors were required to call the disease "vegetative syndrome" rather than radiation sickness. "That's what happens when this stuff gets out," he said.

"Nobody wants to see this stuff get out," said Edwards, "but accidents can happen. Therefore 100 per cent containment is a must—99 per cent isn't good enough."

The Hiroshima bomb exploded in the air half a mile above the city, said Del Tredici. He showed photographs of monuments in the Peace Park, and a large bell—the World Peace Bell. Every time the bell is struck with a log, it is a prayer to end the nuclear weapons culture. The atomic symbol is painted on the spot where the log strikes, so it is as though the first community to experience the bomb is striking back at the atom. They line up, hit the bell, and say a prayer.

Turning to the questions posed by the NWMO, Edwards stated that it looked overwhelmingly suspicious. "No, no," he mimicked. "It's not coming here, but we want to know what you think."

Del Tredici said that another option would be: none of the above. "Why not tell them to stop first?" he asked. "If they keep making the waste, it doesn't matter whether it's A, B, or C. You've got to say things that aren't on the agenda."

In conclusion, Edwards said it was important to understand the technology and the reason for consultations. "Not all the options are on the table," he said. "NWMO has orders from the government." NWMO was formed by the government for a reason. It is to report directly to the Cabinet, so there is no obligation for a public process afterwards—Cabinet can decide. "So why are they asking?" he asked. The clear indication is that they have no

solution—everyone acknowledges that none of these solutions seem good. As long as they keep the reactors in production, there will always be a large inventory of Nuclear Fuel Waste at the surface, because of the seven- to ten-year wait. A centralized solution creates an eighth site. “They have no intention of stopping,” he said. “They are looking for a way to say, ‘This is what the people of Canada want.’”

Edwards reviewed the historical facts of the nuclear industry. Waste was produced for 20 years before the problem was acknowledged. When the environmental assessment team for geological storage was appointed, they were told not to look at shutting down the industry. There were complaints at the time from the public and from politicians, so the government promised separate hearings into nuclear energy, separate from the waste problem. Blair Seaborn told people that they would have a chance to speak up, but the government just decided not to hold the nuclear energy hearings. The Seaborn report in 1998 said that geological disposal has not proven acceptably safe. The Seaborn report recommended the establishment of an agency independent of the nuclear industry, paid for by the nuclear industry, with citizens on its board of directors, including Aboriginal people. However, the government did just the opposite—it established NWMO, owned and run by the nuclear industry, with a short time frame and penalties for late reporting. “What is the agenda here?” he asked. Ontario wants to build more nuclear reactors and the industry wants to export. “It is an attempt to get people involved in the government’s public relations problem,” he said. The up side is that it is an opportunity to make a statement. The options are: 1, 2, 3, or none of the above, he said. “Until we stop producing waste, how can we begin to talk about any acceptable solution?”

Questions and comments

Asked about the contaminated cooling water, Edwards said there are pinholes and cracks in the metal cladding that produce small amounts of radioactivity. The filters themselves also become radioactive waste. He said the water itself should be relatively free of radioactivity, but he would check this fact. Hodge said the cooling water circulates, in an exchange process. About 15 years ago there was a change in standards because too much radioactivity was getting through, but a small amount still gets out of the system.

Asked to clarify what it is that expands over time, Hodge said it is the large tubes in the core, containing the bundles. The expansion is called “neuron creep.” Edwards added that the metal also blisters and cracks. This degeneration had not been anticipated, so not enough money may be budgeted and the industry may start cutting corners. Refurbishment often finds more to be done, he said. “How can you keep a machine running that you can’t take apart and look at?”

Asked if the Déline community deaths had been proven to be caused by radiation, Edwards stated that they had not. To prove it, there would have to be measurements of how much radiation people had been exposed to. The workers themselves were monitored, but it would be impossible to prove in a community of civilians.

Asked again about the water, Edwards said that tritium cannot be filtered out and hydrogen becomes radioactive. He was speaking of the water in the core of the reactor. He said he could not answer with regard to the water in the pools. Hodge promised to find out. Edwards said he believed that the amount of radiation in the water by the time it is finished would be small compared to the amount in the filters. The used fuel is much more of a problem. The NWMO is doing a good job of sensitizing people to the problem of nuclear waste, but it is not looking at tailings, filters, tubes for reactors, and so on. “It is only looking after one very specific type of waste—there must be a reason for that,” Edwards said.

Asked how to stop the government, Edwards said if people are aware that it does not sound like a good idea, they should say so. “You could have an impact,” he said. “And you aren’t the only ones.” There has never been a real debate on the role of nuclear energy in Canada. A participant said he was glad the government had shot itself in the foot—now the issue has become public.

Edwards stated that there has been no public debate because the people have been uninformed. The nuclear industry has been invisible.

Day 2: November 18, 2004

Questions to Speakers, Discussion of Options and Issues of Concern

Kneen asked participants if they wanted this session to be an open forum and whether it should be on or off the record. Everyone agreed that it should on the record.

Replying to a question about detecting uranium in the human body, Del Tredici said it was radiation—not uranium—that can be detected. Specifically, alpha rays can be detected; gamma rays, while they damage the human body, cannot. Large radiation doses will result in quick effects within anywhere from one week to one year, whereas damage from lower doses may not appear for 20 or more years. He gave the example of uranium miners who felt healthy during their working lives but died of lung cancer after retirement at a rate higher than average. It is widely accepted at a population level that mining is implicated in these high cancer rates but difficult to prove for individual miners whose death may be blamed on smoking or other factors, making it tough for their families to receive compensation.

A participant asked if the bodies could be dug up for analysis. Del Tredici said it was possible, but very expensive. The same participant added, “This is not about money but about lives.” Edwards said sometimes individual miners can win their fight for compensation. After about 20 years, the evidence of radiation may have disappeared if the body has been able to clean itself, but the damage remains.

Kneen noted that the current discussion was straying from the issue of Nuclear Fuel Waste and asked participants if they wanted to return to that topic or continue with more general information. Most agreed that they wanted to keep asking questions to inform themselves.

One group member asked why nuclear reactors are still being built despite the known dangers. Do decision-makers even understand how dangerous this is? Hodge stated that this point involves changing government energy policy, which the government has not addressed.

Edwards told the group of the 1978 Porter Commission which stated that if the Nuclear Fuel Waste problem could not be solved, nuclear reactor construction should stop. Edwards said a unique aspect of this issue is that government and industry are almost one and the same. The government wants to get a vote of confidence from Canadians on this issue in order to continue with nuclear power production. “If they were to shut down reactors now, it would be an admission of their incapability to deal with the problem,” he explained. Edwards suggested that the government has spent so much money on this issue that it wants to convince the public that the set of proposed long-term storage solutions is the best that can be done.

“Has the industry made money selling nuclear power?” asked one participant. Edwards replied that companies selling components for the reactors are making the real money.

Another participant asked if government really thought that burying Nuclear Fuel Waste in the Canadian Shield in the North was an answer. Del Tredici said the problem of rock fracturing made this approach questionable. Other options have been considered such as shooting the waste into the sun or burying it under tectonic plates. Edwards added that ocean dumping was also investigated until international law prohibited it. Another method, melting the waste into the Antarctic ice sheet, is dangerous due to corrosive salt pockets. Many ideas for Nuclear Fuel Waste disposal have been put forward but none have been demonstrated scientifically. “We have never disposed of anything – nature has its way of recycling,” Edwards said. The common scientific method of proving or disproving a hypothesis is not terribly useful in this situation. It would not be possible to test matter that had been buried and sealed. And if the storage site did not successfully contain the radiation, it would already be too late: ecosystems would be contaminated. Edwards said there are scientists of good faith on either side of this debate but neither side has proof to support their position.

“What is the problem with sending it into the sun?” a participant wondered. Del Tredici cited the lack of a good delivery vehicle. Edwards said there have been too many space shuttle and rocket explosions to consider this a safe option. He provided information about other options and their associated problems. Sending the Nuclear Fuel Waste to the centre of the earth is technically impossible. Transmutation, perhaps through melting the waste into lava, has not progressed enough to offer a realistic option. Edward suggested it would be important to keep the waste controlled and accessible in case of future scientific advancements that could help solve the long-term storage problem in a meaningful way.

A participant suggested that the government will only seriously look at the waste issue once nuclear power production is halted. Gordon said it would become a serious human problem rather than an industry public relations problem. Industry and government hope that people will not think about the waste if it is kept out of sight. “Why not bury it on Parliament Hill? They won’t forget about it there,” he said.

One group member voiced his concern about geological burial. Water might become contaminated and small animals might disturb the waste, and from there, contamination would work its way into predators and humans. Edwards and Del Tredici agreed that this ecosystem cycle seems obvious but noted that the issue has rarely been looked at from an ecological much less a social perspective.

Hodge stated that the NWMO faces the dilemma of balancing people’s demands against finding a solution for storage. Regardless of whether or not an acceptable solution can be found and regardless of future developments in society and government, something has to be done with the two million spent fuel bundles that already exist. With climate change and rising sea levels, onsite storage could have wide reaching environmental effects. Locations now considered remote may not be in 50 years, depending upon population

settlement. The only clear thing is that the generation who created the problem should take responsibility for it, he said.

A participant asked why the option of transportation has not been eliminated. He suggested the problem could be mitigated if the waste was left onsite where it would not involve other populations. Hodge stated that the NWMO could recommend onsite storage except that onsite storage has its problems. Onsite storage is the least secure option in terms of physical safety and the most technically-difficult. For reasons including the effect of climate change on coastal areas, the Nuclear Fuel Waste could eventually move off-site and into the ecosystem. A significant body of people has indicated that they do not want the waste onsite given the uncertainties around climate change and other unknowns. Asked what he meant by "significant body," Hodge said he was referring to people reached through the NWMO outreach processes.

Edwards stated that there are many opinions on the waste problem because it is unsolvable. "There are 360 degrees of opinion on what to do with it," he explained. Edwards suggested that "rolling stewardship" might help. One could package the waste safely for 100-200 years for the next generation who would then do the same. And perhaps at some point a real solution would be found. Hodge agreed that this concept, pegged on the seven-generation model, had potential. Edwards said that with rolling stewardship, one would fence off storage sites but still access the waste as needed.

There were questions about the rolling stewardship option. One participant asked about the limited lifespan of storage containers. Del Tredici and Edwards stated that containers could be made to last100 to 200 years. Hodge wondered what entity would assume responsibility for this stewardship now and into the future given the lack of public trust in government and industry on this issue. Del Tredici said people would choose the option of putting a fence around the waste rather than dropping it into a hole and putting a cork in it. "Putting a cork in the hole and permanently walking away is not on the table," Hodge said.

Hodge briefly reviewed the three management approaches that the NWMO must consider, adding that the organization is not limited to these options. "We will recommend none of the three in pure form," he predicted. Industry is looking at options in order to move forward.

Edwards observed that "moving forward" to the industry means keeping up production and making money.

"Can we trust society to leave the waste where it is, given societal changes?" Hodge asked. He suggested that onsite storage threw the responsibility for the waste to future generations more so than the other options.

One participant said he preferred the term "guardianship" to stewardship and disagreed that any option was less onerous for future generations. "It is guaranteed that we throw the responsibility to future generations," he said.

Another group member took exception to being included in the “we” responsible for the waste, saying that he had no part in its production. Another participant said everyone has consumed goods that may have been produced using nuclear energy and so everyone is affected in some way.

Edwards returned to the topic of stopping nuclear energy production. “If the subject is safety, why not stop?” he asked. How does transporting waste from Point A to Point B help if more waste is being created? He suggested the topic of Nuclear Fuel Waste storage options diverts attention away from the main question: How did we get into this in the first place? Industry and government will use people’s endorsement of a storage method as permission to spread nuclear energy production around the country. If industry and government are truly concerned for people’s health and safety, nuclear energy production should be stopped.

A participant suggested suing industry and government, similar to suits launched against the tobacco industry. “Suing the government is suing ourselves,” Edwards replied. He recommended the waste be kept in high-population areas. “They will have a personal stake in looking after it,” he said. If the waste is stored in a low-population area such as Northern Saskatchewan, who will protect the site when budgets are tight?

A participant suggested that the group make their own list of points and recommendations. The first could state that nothing comes onto ILA lands and the second could recommend that nuclear energy production should stop. Participants agreed to the points in the order given.

Edwards said each option actually supports the continued production of nuclear energy. Each is really only a step along the way to putting the waste in a hole and corking it.

One participant suggested that the NWMO should invite Inuvialuit representatives to see the reactors to get a real picture of what is being discussed. Hodge said one such tour had been organized in the past for Aboriginal representatives but it did not include Inuit. He suggested that such a tour might be possible in the future. Edwards and Del Tredici urged the group to make this tour a formal request.

Another participant wondered if scientists were working on solutions for the waste. Edwards said yes, but much of the science in this area is ruled by the nuclear industry. Despite the Seaborn Panel recommendation that research be independent and protected from industry interference, it is industry that collects and interprets the bits of science. “This is a conflict of interest,” he said. It shows considerable bad faith on the part of the government.

Edwards also noted that the final the NWMO report will be sent to the Minister and not to Parliament. He said it appeared to him that there will be no debate; the government just wants to make a decision. One participant asked if the government would review the report. Del Tredici said the government might review the report but is not required to by

law. He called it curious that the government gave the NWMO only three years to complete public outreach and write the final report.

Hodge encouraged the group to express their thoughts and concerns on the report. Del Tredici suggested that the NWMO could also express concern. Hodge replied that this is under discussion.

Forming the recommendations

As the group reconvened to form their recommendations, one participant said: “It is hard for us to trust industry and government, especially here in the North.” Despite a Game Council resolution to prohibit sumps, the community still has to fight against sumps. Kneen acknowledged this concern and clarified the intention of the dialogue. “I wanted to make sure you had as much information as possible on this issue,” she said.

One participant reiterated that nuclear energy production should be shut down until a way is found to dispose of the waste that already exists. “They will get more serious about dealing with the waste once they stop producing it,” he said.

Participants agreed that comments on the problems with the transport of Nuclear Fuel Waste could be interpreted as an endorsement of the onsite option. The onsite option is equally as troubling as a potential terrorism target. One participant said there simply is no solution. “When all is said and done, the consensus is rolling stewardship,” he said. Kneen reworded this idea as a recommendation.

Another group member asked if ITK had a committee dedicated to this issue. Kneen said no, but there is a taskforce with representatives from each of the four land claims regions who assisted with the coordination of the National Inuit-Specific Dialogue on the Long-Term Management of Nuclear Fuel Waste in Canada. She further stated that this dialogue was organized to obtain regional feedback and to provide information on the subject to the dialogue’s participants. “It is your feedback we want to send to the government, not ours,” she explained.

A participant asked if industry and government work with scientists in other countries facing Nuclear Fuel Waste issues. Kneen replied that the NWMO documents state that scientists in Canada have consulted with experts around the world and determined which options are more feasible than others. Referring to Edwards’ earlier comment about the industry selecting “bits of science,” one participant suggested a team of independent scientists be formed who could provide the whole story and not just “bits.”

The subsequent discussion raised the following points, concerns, and questions:

- The issue should be more publicly broadcast.
- Is there a guarantee that Nuclear Fuel Waste containers won’t fail in 100 years? What

then?
- Could there be more research on moving it into space?
- Participants are not limited to discussing the three main options.

Kneen reviewed the recommendations made so far and noted two additional points: The waste should not be stored in the Canadian Shield and the waste should stay on-site. She noted that concerns were also raised about the safety of deep geological disposal due to the potential for cracks in the rock and about who has the power to stop nuclear power production.

Kneen stated that ITK has contribution agreement with NRCan and the NWMO to provide Inuit with information on the issue and also to ensure that Inuit have a voice in this national dialogue process. ITK will submit the dialogue report in order to make sure that Inuit voices are heard. ITK will also issue separate press releases. She stressed that this dialogue was not about bringing Nuclear Fuel Waste into this community, but only to provide information. One participant said the wording that limited discussion to three options made it easy to think the issue was about bringing the waste into the North.

One participant suggested bringing someone from government to the dialogues. Kneen stated that this option was considered and then discarded under the assumption that presentations by NWMO and the government would be too similar. She offered to rethink this decision for the subsequent meetings. The next two dialogues will be held in Northern Québec at the end of January and the following week in Labrador.

A further recommendation was added calling for a tour of nuclear reactors by Inuit from each region. Kneen stated that one tour had taken place, but that it only included an ITK staff member, AFN staff members and representatives from the Métis National Council. Participants suggested Kneen approach the Game Council with information about Nuclear Fuel Waste and about a tour of the nuclear power reactors.

Preparation of Report and Recommendations

Kneen read aloud a draft preamble for the group's dialogue report and asked if it was what participants wanted. She agreed to a participant's suggestion to rewrite the last sentence as: "An in-depth and fully-funded consultation should take place."

A participant spoke of the number of communities not included in the dialogue. "We can't leave these people out," he said. Another participant agreed. Inuvialuit consist of more than the HTCs who look at the environmental situation; other organizations and municipalities should be included. "We are just one finger of the whole body," he said.

Kneen read back this addition to the preamble: "Those involved with the dialogue feel full consultation should involve not just members of the HTCs but also..." She asked the group if they would like to include mention of their land claim.

A participant noted that everything done on their land must have a project description, community consultation, HTC approval and recommendations, and a screening committee. Industry has to abide by these rules.

A participant stated that the Government of Canada broke the IFA with its gun legislation since Inuvialuit were never consulted. Another said the IFA acknowledges that Inuvialuit have the right to harvest any animals by any means.

Akeeagok expressed concern that if the report protested that the dialogue was too narrow, the NWMO would blame ITK. Participants told him not to worry—ITK had done what it could with the time and money provided to it.

Kneen read out the phrase, "should include all components of Inuit society..." and asked if anything else should be included in the preamble.

Asked about the report format, Kneen said there would be a preamble, then general recommendations, then comments on specific options. A participant suggested putting the group's most important point—that it did not want any Nuclear Fuel Waste on Inuit land—at the end of the preamble. Another participant stressed the group's other most important point—that no more reactors should be built until the waste problem is solved.

Another participant suggested putting "ISR" instead of "Inuit land" to include Crown land too, where nuclear waste disposal would also be unacceptable to the group. Another participant mentioned the morning's national news announcement of a BC decision that Aboriginal people have a say on what happens on Crown land. "With our lifestyle, we are like the animals: Borders don't count," a participant said.

Kneen reviewed the group's positions:

- Shut down existing reactors and stop production of Nuclear Fuel Waste
- Keep Nuclear Fuel Waste where it is produced
- Support the idea of rolling stewardship
- Hire independent scientists to look into the matter
- Research containment methods
- Inform the Canadian public, including those in the North
- Organize tours of nuclear facilities with participants from each Inuit land claims region

After a brief discussion of the number of people to be included in the tours, the group decided not to commit itself to a number.

Finished with the preamble, the discussion moved to the part of the report dealing with the storage options.

A participant suggested adding a point to the section on deep geological storage: climate change may affect conditions and pose problems.

A participant proposed that the section open with a statement that all three options are unacceptable and provide the reasons, and then say that onsite is the most acceptable. To leave the waste where it is avoids the problems of transportation and the unknowns of deep geological storage. Also, technical expertise would be onsite.

A participant added further rationale for this selection. If the waste were to remain where it was produced, the "out of sight, out of mind" tendency might be avoided. Transportation of radioactive waste poses greater danger than temporary or intermediate onsite storage using responsible methods. Transportation of nuclear waste spreads the risk across hundreds of miles and into communities across the country.

Kneen added that communities adjacent to current reactor sites are already familiar with nuclear issues.

Speaking further on the "out of sight, out of mind" concept, a participant said she did not want the issue to be a hidden one. "To ensure future guardianship, it should be in your face," she said.

A participant identified security as another concern. "We want to make sure no one walks away with it," he said. He asked about the current onsite security measures. A brief discussion ensued on screening of personnel at sites, security in the south versus the North, and responsibility for security.

Kneen asked the group what it wanted to say under "Guardianship."

A participant said nuclear guardianship must guide choices. Production and abandonment of material that might damage future generations must cease. "We must accept responsibility for nuclear production in our lifetime," she said. Future generations have a right to know and protect themselves from it.

Discussion ensued about the idea of accepting responsibility. A participant said the government and the people of the south made a choice for themselves and the next generations. The Northern concept of guardianship and stewardship is different from that of southerners. There is a vast gap between people in the south, many of whom came from other countries and placed themselves centrally, and Northerners who rely totally on the land. A participant said Northerners would not have accepted nuclear production in the first place and cannot say they accept responsibility for it now.

Another participant countered that while southerners did it, Canadians now have the problem. That must be articulated without sounding as though Northerners are taking responsibility. This is where the idea of rolling stewardship could be included.

A participant commented that Northern opinions were not sought when nuclear waste was found to be toxic. Another responded that it was not only Northerners who were kept in the dark.

Kneen clarified that the group could take responsibility as Canadians to say something about the issue. A participant agreed that an opinion should be voiced—"otherwise they'll think we don't care," he said.

Turning to the deep geological option, a short discussion ensued about cracks, abandoned wells, crushing the waste, and various options beyond the three main ones.

Kneen read the section of the draft report on guardianship and removed the sentence about accepting responsibility. She summarized that the group had said onsite storage was acceptable under certain circumstances.

A participant asked if the section could include the statement that nuclear reactors and nuclear weapons plants should be immediately and permanently closed. She said that point should be reiterated at every opportunity—that is, if the NWMO insists on feedback, the group will provide it, but the main point is that Northerners do not want nuclear waste.

Turning to the options of centralized storage and deep geological storage, Kneen asked if the group wanted to provide their reasons for rejecting these options or merely state the rejection. Participants agreed that it was an opportunity to reiterate the reasons why these options are not acceptable. Transportation would be dangerous. In the words of one participant, transportation would create "new sacrifice areas." Materials would still have to cool at sites for seven to ten years, and therefore both these options would create yet one more site. The unfeasibility of these options might be used as a bureaucratic stall to continue with production.

A participant suggested that perhaps the North is being considered for storage because of population density.

"How can we say 'don't bring it here' and at the same time suggest another site?" asked a participant. "It would make us hypocrites."

Concluding this session, Akeeagok obtained email addresses to send the draft report to participants and Kneen thanked participants for their hard work.

Final Recommendations from the Inuvialuit Dialogue:

Preamble:

The participants of the Inuit-Specific Dialogue, which took place in Inuvik, Inuvialuit Settlement Region (ISR), stated that they did not want Nuclear Fuel Waste in the ISR under any circumstances. They further emphasized that they also did not want to advocate for Nuclear Fuel Waste to be moved anywhere else within Canada either, but that these wastes should remain where they are currently being stored; at the currently existing nuclear reactor sites.

These recommendations are provided with the understanding that they are informal submissions and are not the result of a consultation process that took place within the Inuvialuit Settlement Region. These recommendations also do not represent a position taken by the Inuvialuit Regional Corporation, but are recommendations made by the individuals made at this dialogue.

Not enough time and funding were allocated in order to conduct a formal consultation that would be effective, meaningful and culturally appropriate. Section 12(7) the Nuclear Fuel Waste Act states that they shall consult the general public and in particular Aboriginal (Inuit, First Nations, Metis) people. The meeting that has taken place over the past couple of days cannot be considered a consultation under this act.

It is, however, the case that all present at this dialogue feel that an in depth and fully funded consultation consisting of all 6 communities in the Invialuit Settlement Region must/shall take place. Those involved in the current dialogue further feel that a full consultation should include all components of Inuvialuit society.

Further, all activities that affect the Inuvialuit Settlement Region must follow the processes outlined by the Inuvialuit Final Agreement prior to commencing.

Therefore, any activities that do not follow these processes are in contravention of the Landclaim and are therefore illegal in nature.

Regarding the subject of the Long-Term Management of Nuclear Fuel Waste, the attendees of this dialogue took the following positions.

- To shut down existing reactors, stop the production of Nuclear Fuel Waste, and stop any continued production of nuclear reactors until a way has been found to dispose of Nuclear Fuel Waste;
- To keep the Nuclear Fuel Waste at the existing reactor sites near the population centers;
- To support the idea of rolling stewardship (decide on the on-site option for the next 200 years and then revisit the issue of the management of Nuclear Fuel Waste at that time);

- To hire unaffiliated and independent scientists to conduct a study on a management approach for the Long-Term Management of Nuclear Fuel Waste;
- To increase research in the area of containment methods (e.g. dry storage containers);
- To increase the information provision on the subject of the Long-Term Management of Nuclear Fuel Waste to the Canadian public (including in the North);
- To organize a tour of a nuclear reactor in order to obtain all available information of the issue. Participants should include representatives from each of the Inuit Land Claims Region.

Option-Specific Recommendations:

All three options that were provided to the attendees of this dialogue were considered unacceptable as a method for the Long-Term Management of Nuclear Fuel Waste. However, the option of on-site storage was deemed the most workable at this point in time for the following reasons.

Transportation is not required:
Transportation represents unacceptable risks that are involved in transportation;

Generally as the fuels cool over the first few hundred years, the danger to the public decreases exponentially.

It is generally thought that the transport of radioactive waste poses a much greater danger to the public and the environment than temporary or intermediate on-site storage, using responsible methods.

Transportation of waste spreads the risk factor across thousands of miles and hundreds of communities across the country.

Location:
Attendees at this dialogue felt that the current location of the reactor sites and current storage sites (near population centers) is favourable as it ensures that this subject receives the attention that it requires. The removal of these materials to a remote location may not ensure a continued focus by the general public. A continued focus on a possible management method is required in order to decide on how to proceed in the short and long term.

Guardianship:
The nuclear guardianship ethic must guide our choices.

Until a solution is found only the rolling stewardship solution is deemed an acceptable approach.

Each generation has the responsibility to preserve the foundations of life and well-being for those who come after. To produce and abandon substances that damage following generations is morally unacceptable. Given extreme toxicity and longevity of radioactive materials, their production must cease.

As Canadians we have the responsibility to protect our environment and inform the future generations on this subject. Future generations have the right to know about the nuclear legacy bequeathed to them and to protect themselves from it.

Nuclear reactors and weapons productions facilities should be permanently closed.

The attendees of this dialogue further stated their opposition to the other two proposed options for the following reason:

These options would require:

- Transporting highly radioactive waste from the site of generation to create new sacrifice areas will not eliminate the problem;
- They are not feasible options as the general Canadian public (north and south, east and west) would not accept the moving of nuclear wastes to one central site (not to have it in their backyards);

It was further stated that the participants of this dialogue that they did not want Nuclear Fuel Waste in the ISR, as this would be in contravention of the Inuvialuit Final Agreement. The participants of this dialogue further elaborated that they also did not want to advocate for the materials to be moved anywhere else either, but that these wastes should remain where they are currently being stored; at the currently existing nuclear reactor sites.

Appendix: Acronyms

AECL	Atomic Energy of Canada Ltd.
HTC	Hunters and Trappers Committee
IRC	Inuvialuit Regional Corporation
ITK	Inuit Tapiriit Kanatami
NFW Act	*Nuclear Fuel Waste Act*
NRCan	Natural Resources Canada
NWMO	Nuclear Waste Management Organization

Appendix C (Final Nunavik Region Report):

Day 1: January 27, 2005

Participants

Soha Kneen, National Coordinator of the Inuit-specific Dialogues on the Long-Term Management of Nuclear Fuel Waste, Inuit Tapiriit Kanatami (ITK)
PJ Akeeagok, Junior Researcher/Project Co-ordinator, Inuit Tapiriit Kanatami
Eli Angiyou, Member of Kativik Environmental Advisory Committee
Johnny Arnaituk, Vice-President, Nunavik Hunters, Fishers and Trappers Association
Michael Barrett, Kativik Regional Government Representative
Emily Emudluk, CAVAC Kuujjuaq
Jimmy Johannes, Secretary, Nunavik Hunters, Fishers and Trappers Association
Nathalie Girard, Biologist, Executive Secretary for the Kativik Environmental Advisory Committee

Michael Gordon, Mayor of Kuujjuaq
Vallee Gordon, ITK
Alec Gordon, Kuujjuaq CBC Radio
Michael Kwan, Research Scientist, Nunavik Research Centre
Muncy Novalinga, Kativik Regional Government Representative
Adamie Padlayat, President, National Inuit Youth Council
Maggie Saunders, Kuujjuaq Municipal Councillor

Welcome and Introductions

Soha Kneen, National Coordinator of the Inuit-specific Dialogues on the Long-Term Management of Nuclear Fuel Waste, Inuit Tapiriit Kanatami (ITK), introduced herself. Kneen stated that this dialogue was intended to get the Nunavik Inuit perspective on the Long-Term Management of Nuclear Fuel Waste. Kneen asked participants to keep in mind the equally important national and regional perspectives and then invited introductions and expectations for the meeting.

One participant said his goal was to get more information on a potential regional environmental concern and his hope was that Inuit could have input. Other participants anticipated asking constructive questions, while gaining an understanding of the issue and providing recommendations.

Kneen explained that the purpose of the dialogue was to enable Inuit to have a voice on this national issue. “In no way is ITK saying that Nuclear Fuel Waste is coming to the North,” she said. ITK aims to provide Inuit with a voice and to receive feedback from the regional representatives attending this meeting. “We don’t know the outcome; there has been no final decision yet,” she said. This meeting is meant to provide information on all aspects of the Long-Term Management of Nuclear Fuel Waste and to answer any questions.

Update and General Information: ITK Opens the Dialogue

Kneen said the *Nuclear Fuel Waste (NFW) Act* was, according to information provided by the Nuclear Waste Management Organization (NWMO), developed on the foundations of extensive consultations with the public and stakeholders between 1996 and 1998. In its response to the Seaborn Panel, the Government of Canada indicated that subsequent public dialogues must be appropriate to different value systems. The NWMO has been in discussion with ITK, the Assembly of First Nations, and the Métis National Organization since 1998 to conduct these dialogues.

In its negotiations with both NRCan and the NWMO, ITK underlined the importance of Inuit involvement in considering options for the Long-Term Management of Nuclear Fuel Waste and in the subsequent recommendations to the federal Minister of Natural Resources. ITK was successful in using a culturally appropriate process in previous Inuit dialogues on this issue. While Inuit will continue to oppose the storage and/or disposal of Nuclear Fuel Waste in their territory, Inuit should still be informed on this issue. Kneen noted the additional risks of transboundary contamination and possible transportation of Nuclear Fuel Waste through Inuit territories.

In response to a question about the number and locations of previous Inuit dialogues, Kneen stated that ITK held one session in Iqaluit in November 2004 and another in the Inuvialuit Settlement Area. The fourth dialogue will be held in Makkovik, Labrador. She elaborated on the reasons and objectives of the dialogues, including the encouragement of Inuit dialogue on the issue, the production of a series of reports leading to the final report, capacity development at the local level, and Inuit acquisition of knowledge on this issue. The scope of this dialogue focuses strictly on long-term Nuclear Fuel Waste storage and how Traditional Knowledge (IQ) may apply. Kneen noted that the Minister will be apprised of the Inuit opinions, Traditional Knowledge (IQ), and recommendations on this issue of waste that is produced in the South. Information has yet to be released about the site or sites of storage.

Nuclear Fuel Waste requires management because it “multiplies many times over,” Kneen explained. Currently, Nuclear Fuel Waste is stored onsite where it is produced, in either wet or dry storage. The majority of Nuclear Fuel Waste is in Southern Ontario, with much smaller amounts at Chalk River and White Shell. Recalling her visit to the Pickering Nuclear Generating Station, Kneen described large dry storage containers and a facility that appeared safe and well-maintained. In response to a question, Kneen said the dry storage containers were steel-reinforced concrete vessels that were filled with Nuclear Fuel Waste and then welded shut. She suggested experts at this dialogue could better answer technical questions.

Kneen noted the complex nature of long-term storage. Nuclear Fuel Waste can only be held in dry storage after it spends seven to ten years in wet storage, making it unlikely that there could only be one storage site, especially when waste continues to be produced.

One participant asked if water in wet storage pools becomes radioactive and if it evaporates. “Wouldn’t there be a risk of contaminating the air?” he asked. Kneen said the water is in an internal continuous cycle within a completely sealed compression chamber. She added that the experts attending the dialogue could provide further information.

Kneen offered more details on the amount of Nuclear Fuel Waste in Canada. Ontario Power Generation produces 90% of Nuclear Fuel Waste in Canada, New Brunswick Power and Hydro-Québec each produce 4%, and other sources produce considerably less. In 2002, there were 1.7 million bundles of accumulated Nuclear Fuel Waste in Canada—enough to fill three hockey rinks in their entirety. At current levels of power production, this amount will double by 2033. One participant said it is important to understand who produces the waste.

Kneen stated that while nuclear reactors are not currently located in or close to Inuit communities, it is possible that nearby territories may be chosen for deep geological burial. She further elaborated on this by stating that the Labrador Inuit Association is opposed to storage and disposal of Nuclear Fuel Waste in its territory and adjacent territories. “We must also consider communities that may be along transportation routes,” Kneen advised.

Kneen outlined the methods of Nuclear Fuel Waste disposal and storage under consideration by the NWMO: deep geological disposal in the Canadian Shield, storage at the reactor site, and centralized storage (either above or below ground).

Deep geological disposal is intended to isolate Nuclear Fuel Waste from humanity and the environment and is attractive to those who want to be able to retrieve the waste if scientists discover a way to safely eliminate or reuse it. However deep geological disposal involves risky transportation and the initial years of wet and then dry storage.

One member of the group characterized this explanation as contradictory messages. How can there be assurance of permanent disposal amidst a discussion of possible retrieval of the waste? Geological burial involves many risks, including that of transportation.

Kneen responded by stating that although the NWMO has predictive models that take into account repository depth, location, and even significant geological change, there is no concrete proof of safety. Permanent disposal does, at this point, not seem to be favoured. “Most countries are considering a staged Nuclear Fuel Waste management approach that would allow the waste to still be retrieved,” she explained.

A participant asked if anyone had died from working at nuclear power generation facilities in Canada. Kneen said she did not have data to answer the question. She did, however, doubt that anyone had died given the safety measures evident at the nuclear reactor sites.

Another group member asked if there were any Canadian subsidiaries of international companies involved in this issue. Kneen said the power generation companies were

Canadian and added that the NWMO representative could better speak to these concerns. She apologized for her lack of scientific expertise in some areas, but encouraged all present to ask any questions they may have of the expert presenters that were to present later on in the afternoon.

Kneen continued by providing a brief overview of the second option under consideration, centralized storage. Above- or below-ground centralized storage is more expensive than deep geological burial because dry storage containers must be replaced every 50 years. One group member wondered if there were contamination issues associated with dry storage container replacement.

Kneen noted that shallow underground burial provides a degree of security from terrorism while still allowing access. A participant asked if the nuclear reactor sites were well-fortified or if security was lax. Kneen replied that facilities were very secure and that unauthorized entry would be difficult. Finishing her summary, Kneen said centralized storage does involve transportation and needed expertise and technology would be available onsite.

Kneen provided information on the third option being considered by the NWMO, reactor-site extended storage. Dialogue participants in the Inuvialuit Settlement Region said they would select this option if required, although their preference was not to choose at all. The CLAB facility in Sweden uses a centralized storage facility, storing Nuclear Fuel Waste in water 30 metres underground. France is also looking at long-term, interim storage options. One participant asked how a management option could be long-term and interim at the same time. Kneen agreed that this was contradictory and recommended that this question of "retrievable storage" be explored with the experts in the afternoon.

One participant asked if a community could intervene if chosen for Nuclear Fuel Waste storage or disposal. Kneen said it is not known if a site has been chosen, but stated that mechanisms to allow for community input would hopefully be implemented when the site selection process was completed. She further invited all present to ask this question of the NWMO presenter later on in the day.

Another participant asked if the NWMO was contemplating the transport of Nuclear Fuel Waste in the North. Kneen said this decision has yet to be made and will depend, in part, on the outcome of the national dialogues. If there is a national consensus to keep the waste at the site of the reactors, then transport will not be an issue. "If you have issues with the transport of Nuclear Fuel Waste, then you should voice them," she urged.

"They will most likely want to store it up North," a participant interjected. Kneen said deep geological burial depends on the conditions of the rock formation. First Nations are worried since the Canadian Shield in their territory may be deemed appropriate for deep geological burial. Kneen encouraged the participants to put these concerns in the recommendations while also maintaining a Canadian focus.

“There is absolutely no benefit to Nunavik from nuclear power generation. Only risks are generated. We don’t use that energy,” said one participant. Kneen agreed and asked participants to bring their questions and points to the experts in the afternoon and to the draft recommendations on the following day.

Participants discussed the funding required for deep geological burial and continued environmental monitoring.

Kneen finished her presentation with a summary of the limitations of the deep geological burial approach. “Advance proof of such a system is not possible,” she said. And yet deep geological burial remains the favoured approach.

Discussion and Concerns

“We live on the top part of the planet,” said one participant. He expressed concern for fellow Inuit on the Russian coastline exposed to contamination from abandoned and deteriorating nuclear-powered submarines. Has this contamination spread along the Northern coastline? Kneen agreed that this is a huge concern and said Dr. Gordon Edwards might have information on this topic. The same participant asked if ITK was aware of this environmental issue. Kneen stated that ITK was aware of this issue, but also stated that she would look into this issue further and forward any available information.

A group member noted that the Northern Contaminants Program looks at radionuclear and other forms of pollution. Monitoring has indicated that the Russian nuclear submarine situation has remained regional. “Long-range transport of this pollution is not significant,” he said.

In response to a question about beluga contamination from this radioactive source, the group member said belugas are far less radioactive than the animals in the region. Regional concern is focused on levels of organochlorine and other toxic compounds found in the whales.

Kneen agreed to include in the report the suggestion that ITK and the Inuit Circumpolar Conference address the problem of Russian nuclear submarines.

“The first and foremost recommendation is the rejection of Nuclear Fuel Waste coming to our territory,” a group member stated. Inuit want to protect their health and well-being. Kneen acknowledged this perspective, reminding the group to also think about this issue from a Canadian perspective. What would be the best management approach?

Another participant said no community wants Nuclear Fuel Waste at its doorstep. “If you benefit from it, then you should pay the price. There is no reason that we should take it.” Kneen suggested this point could go into the preamble if that is what the participants of this dialogue wished to do.

When asked about the wording of one of the paragraphs in her presentation, Kneen explained that there is no guarantee that Nuclear Fuel Waste will not travel through or be stored on Inuit territory. The Canadian Shield extends into Inuit territory. “You said ‘not over your dead body’ is the waste going to the North,” Kneen commented. The expression of this position effectively rules out Inuit support for deep geological burial.

One group member said decision-makers may choose the North for disposal because it is less populated. Another participant wondered if Nuclear Fuel Waste had already been dumped in the North. Kneen stated that there is no definitive answer on those questions and therefore it is important to have Nunavik’s voice and its opposition to the disposal/storage of Nuclear Fuel Waste in the report to be submitted on November 15, 2005.

Presentations

Nuclear Waste Management Organization

Michael Krizanc, Communications Manager, NWMO, began his presentation with a 17-minute video, the second produced by the NWMO. This video provided an overview of the issue, the proposed approaches, and the methods used by the NWMO in comparing and assessing the options.

Following the video, Krizanc gave a PowerPoint presentation, explaining that there are 22 nuclear reactors in Canada, five of which are currently in extended shut-down mode. One of the closed reactors in Pickering, Ontario is coming back into production, and two at the Bruce facility may be returning. He stated that an environmental assessment is underway at Gentilly, Québec, and a government decision will be made on whether to refurbish the reactor**.** The New Brunswick government will soon decide the future of the Point Lepreau plant. Atomic Energy of Canada Ltd. currently stores used fuel in Manitoba, Ontario, and Québec. Small amounts of used nuclear fuel are also stored at universities across the country.

The used fuel is contained in 1.8 million bundles at seven sites—Pinawa, Chalk River, Bruce, Pickering, Darlington, Gentilly, and Lepreau—as well as the small amounts at universities. The supply amounts to 60,000 tonnes and is half of the eventual total that will be amassed in the lives of the current nuclear reactors. Most of the waste is in Ontario. The first stage—wet storage—lasts seven to 10 years and is followed by a period of dry storage. The dry storage units are designed to last 50 years, although engineers say they could last up to 100 years.

A bundle is about the size of a fire log. It is used in the reactor for 12 to 18 months and during that time, produces power that would supply a household for 100 years.

Krizanc displayed photographs of storage pools and dry storage casks. He described outdoor concrete dry storage silos that are made of reinforced high density concrete, with steel liners and outer shells. Dry-storage silos house four modules, each containing 80 bundles. When full, they are filled with helium and welded shut.

The NFW Act of 2002 required the establishment of the NWMO and its advisory council, whose chair is David Crombie. The NWMO budget—provided by the nuclear industry on the polluter-pay principle—was initially $550 million and has been increased by $110 million each year since, for a total of $770 million by December 2003. The NWMO study must have a financial formula in its recommendations and is required to study three options but may also consider others. The NWMO report is due by November 15, 2005. The federal government must make the final decision based on the approaches studied by the NWMO.

The mission of the NWMO is to develop collaboratively with Canadians a socially acceptable, technically sound, environmentally responsible, and economically feasible management approach for the long-term care of Canada's used nuclear fuel.

The NWMO's recommended management approach must include more than a technical method. It must include an overarching management system with components such as governance, financial surety, monitoring and reporting, a public participation mechanism, dispute management, and research and development. It must also include an implementation strategy.

Krizanc outlined the NWMO milestones since its inception. In its conversations with approximately 300 Canadians, the NWMO heard that Canadians want an iterative approach with regular reports. As a result, the study has been divided into four sections. The NWMO produced its first discussion document in November 2003 outlining 10 key questions concerning the following:

- Institutions and governance
- Full public engagement and participation in decision-making
- Aboriginal values
- Ethical considerations
- Synthesis and continuous learning
- Human health, safety, and well-being
- Security
- Environmental integrity
- Economic viability
- Technical adequacy

The second discussion document was released in the summer of 2004. The third will be the draft report, to be released in the spring of 2005. And the last stage will be the release of the final report in November 2005.

The NWMO's second discussion document moves toward a framework for assessment of the options. Through the values derived from the citizen dialogues, an ethics panel, and information assembled from experts, the NWMO identified eight objectives for an acceptable management approach. Each of the storage options was scored against these eight objectives:

- Fairness
- Public health and safety
- Worker health and safety
- Community well-being
- Security
- Environmental integrity
- Economic viability
- Adaptability

Krizanc gave a brief overview of the three technological methods of managing Nuclear Fuel Waste, and their advantages and limitations. Storage at the current nuclear sites would eliminate the transportation element, but would require multiple administrations. Also, this option would not be particularly fair to the affected communities, who did not sign on to permanent involvement with nuclear waste. Deep geological storage, where nuclear waste would be encapsulated in rooms 500 to 1000 meters below ground, has been researched extensively—over $700 million has been spent on it.

Noting that the Canadian Shield encompasses Nunavik, a participant asked which area of the Shield is being considered. Krizanc responded that the study will not propose sites, just a management approach. The selection of a site can only occur after a method is chosen. Site selection will probably not be final for approximately 30 years after the method is chosen. While the legislation's description of deep geologic disposal is not limited to the Canadian Shield, the current process is not a site selection exercise.

The participant stated that he hoped the objective of fairness would be applied. Krizanc responded that involvement of citizens is very important. The DAD (decide, announce, and defend) process is no longer acceptable.

Asked what would happen if the community near a chosen site were to object, Krizanc said an increasingly important principle is a willing host community. "It would be reasonable to insist that this be part of the siting principle," he said.

Asked if the community would be paid for storing the waste, Krizanc said the issue would need to be discussed. There may be jobs associated with storage of Nuclear Fuel Waste, and at some point, Nuclear Fuel Waste may be considered a valuable resource. Alternatively, Nuclear Fuel Waste may cause damage, which would lever compensation.

Krizanc referred to a different but illustrative issue, the talk of financial arrangement for Kincardine, Ontario, with the re-establishment of the Bruce nuclear reactor. He noted that some people have another name for this kind of financial arrangement—a bribe. One other aspect for consideration is that there must be agreement between the owner of material and the community if a material is to be moved. However, the current report will not go that far.

Returning to his presentation, Krizanc said the remaining milestones are the draft report in the spring of 2005 and the final report by November 15, 2005. The final report will be made public at the same time it is delivered to the Minister of Natural Resources. The comments of the NWMO's advisory council will also be made public at that time. Since the owners of the Nuclear Fuel Waste are paying for the process and comprise the board of directors, an independent advisory council was established to balance and oversee the NWMO's work. The independent advisory council is providing ongoing comments and will make a final comment on whether the NWMO has done its job. The notes from this council's meetings are available regularly on the NWMO's website.

Krizanc said the NWMO is looking for ITK's thoughts on what to recommend to the government concerning the process, the three methods, the encompassing management system, the criteria to assess the options, and on who should have what responsibility.

Asked what the NWMO expects from the Minister of Natural Resources, Krizanc said that if the NWMO does not report on time, it will be fined $100,000 a day. However, it cannot give the government the same fine if it does not respond within a certain timeframe. Minority governments, changes of government, and perspectives of particular ministers will all affect the response of the government. Nuclear Fuel Waste must become an issue for the vast majority of Canadians to ensure the government will respond in a timely manner.

Asked how long Nuclear Fuel Waste remains dangerous, Krizanc said he did not know but that it would be many tens of thousands of years—"longer than recorded history." Kneen said the half-life is 710,000 years.

Krizanc added that it is difficult to answer questions about risk because of the diversity of views. The NWMO's work on the issue of risk includes an upcoming conference. "I am not here as an advocate for the nuclear companies," he said. "I know the benefits of nuclear and the seriousness of the waste issue."

A participant stated that it is difficult to select a method when there is little concrete information and disagreement about the information that does exist. Krizanc replied that the Seaborn Panel (officially called the *Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel*, it reported to the Government of Canada in 1998) concluded that deep geological disposal is feasible but that it is not necessarily socially acceptable. There is always uncertainty with something that has never been done before.

Responding to a comment that transportation is risky, Krizanc said nuclear material and other dangerous substances are transported frequently. The risk is not from the containers, but from traffic accidents.

A participant said it is common sense that to minimize transportation minimizes risk. As a result, onsite storage makes sense. With regard to fairness, the North does not benefit from nuclear power and should not have to store the waste. Krizanc replied that it would be costly to transport material as far as Nunavik. The participant reiterated that the benefit from nuclear power is all in the South. Krizanc agreed and added that communities on transportation routes would be included in the risk. He pointed out that British Columbia, Alberta, and Newfoundland also do not use nuclear energy.

Another participant commented that when containers are decommissioned after 50 years they become waste too. Krizanc agreed, adding that decommissioned nuclear plants become waste, but this kind of waste is not as dangerous as fuel waste. He said he had stood close to Pickering's decommissioned reactor and assured participants that these materials can be cleaned.

A participant offered some advice: the NWMO should carry its commitment to fairness, justice, openness, and transparency to the end. Krizanc replied that it is important for people to talk about what kinds of structures should be in place to ensure these principles are implemented. "A totalitarian government could overthrow the whole thing," he said. A government can only act to the extent that citizens demand.

Speaking of balancing benefit and risk, a participant said communities should know what they are getting into. There is still a lot of uncertainty in the science. The most likely method—deep geological disposal—has never been tried before. Krizanc said that even the Egyptian pyramids have lasted for a fraction of the life of used nuclear fuel bundles.

A participant enquired about the health of the nuclear workers in the photographs in Krizanc's presentation. Krizanc said the health of nuclear workers is better than that of the average Canadian, but reminded the group that these workers are well paid and have health plans.

Asked if homes are close to the existing nuclear plants, Krizanc said the Bruce and New Brunswick plants are in remote areas while the Pickering and Darlington plants are in built-up areas, but within an industrial area.

Returning to the previous discussion of the health of nuclear workers, a participant added that even though all Canadians are exposed to some level of radiation, exposures are cumulative and there is no minimum safe level. Krizanc referred participants to a paper on the NWMO website from a physicist who argues that some radiation is good for humans and serves as an inoculation to further exposure. Krizanc clarified that he does not advocate this position.

Canadian Coalition for Nuclear Responsibility/Atomic Photographers Guild

Robert Del Tredici told participants that the effects of radiation and other invisible phenomenon are in reality highly visible. “No technology casts a deeper shadow than nuclear technology,” he said, noting that it is time for transparency on the issue.

Dr. Gordon Edwards indicated that he and his colleague were present to explain this complicated technology in words that make sense.

Edwards suggested the first question participants should ask is: “Why are they coming to ask for our opinion?” One answer could be that government and industry do not know what to do with Nuclear Fuel Waste. Edwards said he had been very interested in nuclear technology when he first graduated. Given its reputation as a “clean” source of energy, he had been shocked to learn that nuclear energy produced radioactive waste. He asked why it has taken 30 years to start asking questions about Nuclear Fuel Waste management. “Why are Canadians being consulted now and not back then?” he asked.

Showing slides of enormous cement silos, the presenters described the process of containing spent nuclear fuel bundles. “Once these bundles come out of the reactor, they are lethal and can kill someone in 20 seconds,” said Del Tredici. Edwards underlined the danger of Nuclear Fuel Waste by relating the difficulty of maintenance work on the reactors. “At Pickering, some reactors have been shut down for seven years, both because of thousands of maintenance problems and the limited time workers can spend in the reactor,” he said.

Del Tredici described the uranium atom—the basic fuel for the fuel bundles—and pointed out its heavy nucleus. As this nucleus is bombarded, it splits and releases energy. When this process is repeated on millions of uranium atoms, a huge flux of energy is produced, resulting in either an explosion (a nuclear bomb) or the production of energy.

One of Del Tredici’s pictures showed a Russian monument dedicated to the splitting of the atom and the “father” of atomic energy. “This split results in new entities—literally the fall-out,” he said. Edwards noted that the term “fall-out” is used after a nuclear explosion but not for the process contained in a nuclear reactor even though the material is the same. It is essential that Nuclear Fuel Waste be kept safe and monitored at all times. Atom splitting results in at least 211 fission products, which are different every time. “These fission products are the waste,” he said. Del Tredici added that fall-out is still “coming down” from nuclear testing done by the United States, China, and Britain. “The fall-out of that testing is considered part of the natural background radiation,” Edwards explained.

The speakers turned to the human toll from radiation exposure. An American marine, who was exposed at close range to an underwater nuclear explosion, suffered from multiple cancers. Only after his death did the lawsuits he had repeatedly launched while alive succeed in modest compensation for his wife.

Edwards explained that exposure to low levels of radiation may take years to manifest. While some body cells will be immediately killed, others will be permanently damaged and perhaps lead to cancers and blood disease. In children, low levels of radiation exposure have been linked to mental retardation. “Some say some radiation is good for you but all scientific evidence points to the probable fact that there is no safe level,” Edwards said. However, the effects of radiation are difficult to prove without extremely expensive studies of an entire population.

Del Tredici said high rates of tumours, stillbirths, and other serious health problems in St. George, Utah were linked to the Nevada nuclear bomb test site, yet the suit against the United States government was overturned and no compensation was paid. Edwards underlined the common element in these cases: the government told the population not to worry. The problem, Edwards restated, is the time delay of up to 20 years. “Workers feel fine on the job but once they retire, health problems appear,” he said.

Canada is the biggest exporter of uranium and prior to the 1960s all of it went to the United States bomb program. “Here is the problem with the transparency of the nuclear industry,” Edwards said. There is no clear history of Canada’s nuclear involvement and the nuclear industry that could provide answers to such questions has failed to do so. “Did they know of the dangers and go ahead anyway?” Edwards asked. The Canadian Coalition for Nuclear Responsibility knows the answer to this question but the NWMO does not address these points.

Switching the focus to uranium mining, Edwards recounted the tragedy of the Dene mine workers at Port Radium who carried burlap sacks of crushed uranium ore on their backs, unknowingly breathing in radioactive particles. Deline, on the shores of Great Bear Lake (Sahtu), otherwise known as the “Village of Widows,” lost many of its men to cancers as a result. The mine workers were not told two key things: handling the crushed ore would be dangerous to their health and the uranium would be used to create bombs. The relationship between the nuclear industry and the military has led to the mystery and secrecy that still abound even though the dangers of radiation have been known since as early as 1931. The dangers to human health were relayed to government workers who assayed the uranium ore but not to the Dene miners.

Although alpha radiation is a very weak form of radiation easily stopped by a sheet of paper, its inhalation can seriously damage lung tissue cells. Referencing a picture of a radiograph, Edwards noted the pulses of radiation that are given off in affected lung tissue. Even though only a small number of cells are damaged, it is sufficient for the onset of cancer. In the U.S., the Surgeon General has identified home radiation (from radon) as the second most important cause of lung cancer. Edwards noted that the nuclear industry sometimes uses the argument of background radiation for justification to double exposure. “While it’s true that it’s natural, it doesn’t mean you should add to the risk,” he said.

Uranium mine tailings present another serious environmental and health concern. Although the original ore is gone, the same amount of radiation remains and is generally uncontained. This has been acknowledged by industry and a government committee that studied the issue, recommending that uranium mining be halted until a solution is found for high level wastes. Edwards noted that while radioactive tailings have not nearly been given the same attention as high level waste, it remains a serious concern for its ease of entering the food chain. “Why is the NWMO not dealing with all types of waste?” he asked.

In a subsequent overview of Canada’s inventory of radioactive waste, Del Tredici and Edwards wondered why discussions of Nuclear Fuel Waste management have not included the notion of stopping its production.

Edwards then turned to the options for Nuclear Fuel Waste management under discussion. He noted the difficulty of safeguarding dry storage containers in the context of radioactive half lives of thousands of years. “We have never safely disposed of anything,” he said. Even if an underground Nuclear Fuel Waste repository was built, complete with signs warning of the health and environmental dangers, there is no guarantee that the language would still be understood in a thousand or ten thousand years. The fundamental question remains: Why are we producing this stuff? “It’s a very complicated and dangerous way to boil water for the steam, which turns the turbines that produce electricity,” said Del Tredici.

Reactors are intended to operate for approximately 30 years. The high maintenance and renovation price tag begs the question: Are they worth refurbishing? Renovations are costly because of the radiation danger and unexpected problem, with renovations to Pickering Unit Four costing $1.4 billion. Despite the costs, the great attraction to nuclear production persists. Where else can one find such a tremendous concentration of energy in such a small pellet? Nuclear energy sounds like a good idea, so clean and well-safeguarded, but problem arise from its usage. “You have accepted an eternal commitment to look after the waste,” Edwards said. The nuclear industry has failed in its responsibility to inform the public by perceiving major technical problems as a public relations problem.

The contamination of the food chain in Lappland from the fall-out of the Chernobyl plant disaster has shown that long-range transport is a serious concern. This release is more important than the original explosion. In reply to a question about the monitoring of the Chernobyl reactor site, Edwards indicated that a sarcophagus protects the melted core. International financial aid is being sought to maintain this protective structure.

Displaying a picture of wet storage, Edwards indicated that 14 feet of water is needed to cool the radioactive bundles. “The heat generated by the spent fuel bundles needs to escape; if the waste was sealed it would be very dangerous,” he explained. Dry storage containers are necessarily large because the walls have to be thick enough to contain the radioactivity. Del Tredici noted that similar dry storage containers would be used for centralized storage. “Would this really be a simplification?” he asked.

The third option, underground storage, has problems as well. Del Tredici referred to a test shaft in Manitoba that runs one-quarter of a mile into ancient granite. No one can predict what would happen if Nuclear Fuel Waste was stored in rock containing millions of hairline fractures created by drilling the shaft. The concern is with the fracture zones. Furthermore, there is no doubt that such shafts would fill with water, which would then seep into fracture zones. “How can you restore the original integrity of the rock?” Edwards asked. There is no guarantee that this management option would work, and failure would be disastrous.

Reprocessing uranium brings its own dangers. Del Tredici noted that the amount of waste produced from reprocessing multiplies with the use of corrosive acids. The extracted plutonium is useful for only one thing: nuclear weapons production. Edwards suggested that plutonium is the reason countries want nuclear reactors. Canada’s gift of a nuclear reactor to India was never used to generate electricity but was used to produce India’s first nuclear bomb.

Edwards noted that the Government of Canada has never passed a law forbidding uranium reprocessing. “They have always kept that door open,” he said. The suggestion that Nuclear Fuel Waste is a valuable resource can only refer to its capacity to be reprocessed into plutonium. The very fact that plutonium gives off alpha radiation while still being relatively safe to handle creates a significant safety issue.

Del Tredici showed a picture of the Hanford nuclear reprocessing storage site in the United States. Millions of gallons of contaminated acid have leaked into the ground causing serious environmental problems. It is immensely difficult to manage this reprocessing waste and the plutonium produced.

A community that accepted Nuclear Fuel Waste in an underground repository or centralized storage would be faced with the possibility of future reprocessing for plutonium and further environmental and security problems. “Shouldn’t this be more overtly on the table?” asked Edwards.

Reprocessing of uranium has left its mark in Russia, said Del Tredici. For many years, radioactive liquid waste was dumped directly into a river upstream from Tartar villages. “They have been living with it unknowingly and now that they know about the contamination there is little they can do about it,” he said.

Edwards noted that the uncertainty of underground storage is the very problem. “The evidence will come when it’s too late,” he said.

The question of whether or not it is responsible to store Nuclear Fuel Waste in an irretrievable process remains controversial. “It is arrogant to think that we have a solution and can determine Nuclear Fuel Waste management for future generations,” Edwards said. There is no perfect solution and, furthermore, there is no known solution. “We are

being asked to choose one of three management options. Are these the only options?" asked Edwards.

Del Tredici showed a photo of the Hiroshima peace bell to suggest that Canadians should not simply be accepting this situation. There is at least one more option: stopping the production of Nuclear Fuel Waste in the first place. Only then can Canadians talk about securely storing the waste.

Edwards contrasted this dialogue process with Sweden's national debate on the issue. The Swedish government provided money to different citizen's groups to educate themselves on the Nuclear Fuel Waste issue. A subsequent referendum determined that nuclear power should be phased out. Similarly, Germany and Belgium are phasing out their nuclear reactors. The question of nuclear reactor phase-out in Canada clearly is not on the table and is not part of the NWMO's mandate. Edwards suggested the Government of Canada and the nuclear industry are determined to continue with nuclear power production.

Edwards questioned the validity of the three options being presented to Canadians. Onsite storage is not a long-term solution if Nuclear Fuel Waste is going to be produced indefinitely. Furthermore, all nuclear reactor sites are located near bodies of water, with the potential for serious environmental problems. Despite sounding like it implies one storage site for the country, centralized storage would actually involve at least eight sites—one centralized location plus the seven current and any new reactor sites. Another important question is if Canada's trade in nuclear reactors opens up the possibility of importing nuclear fuel waste.

Edwards suggested that any option Canadians choose will be interpreted as an endorsement to continue with nuclear production. "I believe that, eventually, they want to put Nuclear Fuel Waste underground and that the other options are just phases in that direction," said Edwards. The one positive thing about this dialoguing process is that for the first time people are hearing about Nuclear Fuel Waste and are being asked for their opinion. The NWMO has done a much better job of presenting the information than has the nuclear industry in the past.

In closing, Edwards clarified an earlier comment on the Seaborn Panel. Contrary to the claim that the Seaborn Panel said Nuclear Fuel Waste management options are safe but not publicly acceptable, the Panel said broad public support is required and safety is only one part of acceptability. Technical acceptability goes in hand with societal acceptability.

Discussion

One participant asked if there were any engineers working on Nuclear Fuel Waste management in the North. Edwards replied that while there was brief consideration of storing the waste in Antarctica, there is no serious research in this area.

Another group member wondered if there were any American industries interested in finding a management solution. Del Tredici indicated that the U.S. Department of Energy and the Government of Japan both contributed financially to the Manitoba test shaft. “Everyone has an interest in this,” he said. Many countries need to deal with the problem of Nuclear Fuel Waste but there is little that science can do because of the lack of predictive models for radioactivity decay. Edwards noted that an inquiry into the safety of Nuclear Fuel Waste storage in California concluded that there was no acceptable means of dealing with the waste and was doubtful there that ever would be any. “Claims about safety are based more on engineering euphoria than on scientific evidence,” he said.

“The Government of Canada and the nuclear industry are eager for this process to be concluded so they can get on with it,” Edwards concluded. Why else would the Canadian Government forbid the NWMO to ask the question of stopping nuclear power generation?

Day 2: January 28, 2005

Discussion of options, issues of concern, general questions

Kneen announced that the morning session would start with a question and answer session with Krizanc, Edwards, and Del Tredici. Following a mid-morning break, there would be a recommendations session, for participants only.

A participant asked whether there had been any deaths of employees on Canadian nuclear sites. Edwards responded that radiation is carefully measured and workers only exposed to permissible levels. However, even this can lead to deaths. Over the years, invisible accumulations can develop into cancer. Approximately 10 years ago, two employees at Atomic Energy of Canada Limited (AECL) died of cancer and their widows asked for compensation. It was proven that recommended levels were never exceeded, but even AECL believed the cancer was probably caused by radiation on the job. This is something that no one can prove.

Edwards told the story of Bjarnie Paulson, who came to the Canadian Coalition for Nuclear Responsibility (CCNR) with cancer all over his body. He had undergone more than 100 surgeries for it. He had done some work on a cleanup operation at Chalk River in 1958, after a fuel bundle had broken on removal from the reactor. A fire resulted, filling the building with radioactive smoke. Six hundred young military personnel were brought in to help with the cleanup. Medical experts agree that Paulson's condition looks like radiation damage. He went to court seven times and eventually the court determined that he demonstrated beyond a reasonable doubt that his condition was caused by his exposure to radiation at Chalk River. Throughout the process, no one in the nuclear industry was interested in Paulson. It is possible that he continued to be contaminated from particles that were left on his body and in his hair follicles when he removed his protective clothing.

Edwards noted that thousands of people have been killed from working in uranium mines. Workers there have two to four times the incidence of cancer as the average population, caused by the cumulative effect of small amounts of radiation year after year.

A participant expressed concern about leakage of contaminants into the environment and the food chain, and its effect on humans as it is taken into their systems. People get a false sense of security if they are not directly exposed. Edwards agreed, saying that the NWMO document *Assessing the Options* notes that alpha radiation can be stopped by a sheet of paper but does not say that it is 20 times more damaging than gamma radiation when inside the body.

A participant commented that the key is getting information to the public. Edwards handed out the Canada Department of Mines 1931 *Precautions for workers in the treating of radium ores.* It described the internal hazards of long-term ingestion of small

amounts of radioactive material. This means alpha radiation. When radiation gets into the food system it becomes internal radiation.

Del Tredici returned to the question of whether Canadian nuclear workers have died. He said that using death as the unit of measurement asks the wrong question. Radiation damages the immune system, causing a variety of illnesses not related to exposure. Even before the development of cancer, there are many compromises to health. However, this is difficult to prove.

Edwards referred to a document not provided in the NWMO information kit, containing excerpts from government reports about high-level radiation waste. According to this document, people can die from being close to Nuclear Fuel Waste within the first 500 years of its existence. From 500 to 1000 years, the external hazard is almost gone, but what is left is toxic, because of alpha radiation. People in the nuclear industry agree that alpha radiation is a potential cause of millions of cancers if released into the environment. Alpha radiation is not traceable. Many people say that nuclear is a good source of energy and is worth the risk. Others say Canada should discontinue production and that none of the options make sense. With the NWMO saying that the waste will double, Canadians should ask if this is inevitable.

Krizanc said the NWMO and the legislation do not ask Canadians to address that question, but he is hearing that people want the discussion. However, the waste already exists and the question is what to do with it. Discussion is underway on whether to continue at Gentilly, Point Lepreau, and Pickering, and governments and policy-makers need to hear people's points of view. The Government of Canada appears to favour nuclear energy, but it does not deliver energy—the provinces do. There are also opportunities to express an opinion when the plants' licences are renewed. Returning to the original question, Krizanc said there has never been a death attributed directly to radiation exposure in plants. Two of the most serious incidents in the Canadian nuclear program occurred in 1952 and 1958—both in Chalk River, Ontario. The 1958 accident was the biggest black mark on the Canadian nuclear program.

Del Tredici pointed out that Jimmy Carter, who was at that time a member of the U.S. Corps of Engineers, was present for a cleanup in 1952—and he is still living.

A participant commented that any nuclear accident would make sensational news. Industrial accidents are not uncommon.

Krizanc stated that, while he generally does not raise this point, news from China discloses 7000 deaths a year in its coal mining industry. All forms of energy have impact—for example, land must be flooded to construct dams for hydroelectricity.

A participant said he worries about the population's accumulated exposure to low doses of radiation over a long period of time.

Edwards said there is a difference between nuclear accidents and other industrial accidents. Nuclear accidents produce very long-lasting repercussions, such as the large areas of uninhabitable land near Chernobyl. He invited participants to consider the area that would be uninhabitable around Halifax if the 1917 explosion had been nuclear. The problem goes well beyond how many people are killed at the time.

A participant said it does not take a major accident to cause death. It would not be possible to clean up any leakage from deep geological disposal.

Edwards said the Seaborn Panel recommended an independent commission be established, not one run by the nuclear industry. He said Krizanc works for people committed to nuclear power. The 1978 report of the Royal Commission on Electrical Power Planning recommended an industry agency, but it is questionable whether this process can be fair and objective. He said he suspects that the first priority of the nuclear industry is not the health and safety of people, but rather that of the industry. He said he does agree that the polluter should pay.

Krizanc said the directors of the NWMO are representatives of the nuclear industry—they approve budgets and pay the bills, and have a right to a seat at the table. However, an independent advisory council comments on the NWMO's day-to-day work. Further, the NWMO will report to the Government of Canada, not industry.

Questioned by Del Tredici, Krizanc said a vote in Parliament would be necessary to enact any legislation resulting from the NWMO report. Edwards said the Government of Canada has been lobbied repeatedly to ask the people whether they want nuclear power, but it is not interested. It told the Seaborn Panel not to ask that question and promised a parallel set of hearings into whether or not Canadians want nuclear energy. When the government broke that promise, Blair Seaborn had to apologize to Canadians. Edwards asked how the government can represent the people when the nuclear question has not been asked. He said he worries that any choice among the disposal options will be interpreted as consent to nuclear power.

A participant commented that the previous spring his organization had indicated it was not interested in consultations that sounded like approval of nuclear power. He said he could not understand why there is still a nuclear reactor in Québec. Even though his organization has seen the damage from hydroelectric power in Québec, it still thinks there is no place in Québec or Canada for nuclear. Commenting on others' remarks that nuclear is not used in the North, making the question of waste inappropriate, he said that Northerners produce other waste—they are not good at conserving electricity. However, Northerners are not at all in favour of nuclear energy. Nonetheless, he congratulated the experts on the level and organization of their presentations.

A participant said that, as an Inuk, he finds the information scary. History tells Inuit that people holding power are not always fair and are sometimes arrogant and ignorant. It sounds as though people who hold the cards are using the government for their own

benefit, and expanding that power through the current consultations. He recommended saying “None of the above,” rather than choosing one of the presented options.

Edwards told participants of two opportunities for Québec citizens to express opinions on nuclear energy. Environmental hearings are being held over the expansion of waste sites at Gentilly II. The report is due in March, but it is not too late to send a letter. Other hearings are being held in Québec City with regard to Québec energy policy. CCNR has sent a brief to those hearings and any Québec citizen can have input. He offered to send Kneen the appropriate address. Politicians are elected by the people, but are usually advised by the industry on energy matters. Krizanc agreed that citizens have a responsibility to make their voices heard in these fora.

Asked the implications for the NWMO if Canadians voted for “none of the above,” Krizanc said the NWMO will give the report to the Minister and will probably also appear before a Parliamentary Committee. In fact, all Parliamentarians will be on the NWMO mailing list.

A participant asked that more information be brought to communities on nuclear issues. Citizens should be aware. Krizanc promised to leave the DVD presentation and send more copies. In response to a request to have it translated, he said translated information is included in the paper version.

Edwards noted that CCNR’s thanks for participation must go to ITK and not the NWMO because they were not invited to sessions in the South. Sessions in the South resulted in opinions from people who had not been fully informed. While the nuclear industry has a right to express its point of view, it is important to give Canadians a rounded picture.

“The nuclear industry is not here,” responded Krizanc. “This is an ITK dialogue, not an NWMO dialogue.” The 35 dialogues in Canada were well advertised—everyone was invited to attend.

Asked if people’s response of “none of the above” was reflected in the NWMO documents, Krizanc replied that this is not what he said. There were many different advocates, and people in many communities said there should be a discussion about the future of nuclear energy.

Kneen suggested that it should be an issue for the NWMO report that it has no mandate to discuss the future of the nuclear industry. Krizanc responded that this fact is not hidden. There is information on the NWMO website and there has been a national citizens’ dialogue about values.

Asked if the NWMO mandate includes waste from mining sites, Krizanc replied that it is just about used nuclear fuel. He mentioned the current intense discussion about Saskatchewan mining sites, but that it is not an NWMO issue.

Commenting that it is good to hear both sides of the picture, a participant suggested that Edwards should meet with the Inuit national leaders from Nunavut, Labrador, and the Northwest Territories. They would favour the phasing out of the nuclear industry, as it does not benefit the environment. “I would like to have kids some day,” he said.

A participant commented that he was impressed with the photographs of nuclear testing and by the information about the collection of baby teeth to demonstrate the level of fall-out and therefore the level of risk. “It shows we did risky things in the past when we didn’t know the results,” agreed another participant.

A participant said it is discouraging to see the basic question not asked. “We have to stop nuclear power first,” she said. “It will take time, but we have to speak up about the risks associated with the power.”

Likening the photograph of the plutonium ball to the theme of the *Lord of the Rings,* a participant envisioned the start of a new cold war. “Canadians should shut the whole darned thing down now,” he said.

In response to a suggestion to shoot the waste into the sun, Del Tredici said the technology does not exist. Edwards added that at one point the Select Committee on Ontario Hydro Affairs talked about disposal in “ice sheets,” but no one is considering that now. Sending the material to outer space is no longer being seriously considered because a rocket explosion would cause widespread damage. However, Canadians can have faith that if they do not make the problem worse, there may eventually be a real solution.

Krizanc said that many of the first 14 suggestions have been ruled out as impractical, despite a threatened lawsuit if the NWMO does not consider disposal in subduction zones—tectonic plates that would push the material toward the centre of the earth.

Edwards said the fundamental question is whether any of the solutions are real solutions. “Maybe some day there will be a solution,” he said, “but these are not.”

Krizanc said the NWMO has found Canadians hope that at some point the knowledge will be there for good management. Continued storage until that time is one of the options and perhaps is the answer for now.

Del Tredici said the key is in the title of one of the NWMO documents—*Asking the Right Questions.* “The right question hasn’t been asked,” he said. The three options are a huge distraction. The industry is still talking about doubling the waste. That renders this discussion useless. Edwards agreed that the main question was whether to continue—the others are just a footnote, or should be. “It is quite possible to stop nuclear now,” he said. “In fact, it will shut down unless $1 billion is spent on repairs.” The Québec nuclear industry is proposing to enlarge its waste site and make repairs. If citizens say “no” now, there will be no more nuclear power. Agreement to store waste on site might be taken as agreement to continue producing waste. “The process is spring-loaded to have you answer ‘yes,’” added Del Tredici.

Asked by Kneen about Tony Hodge's suggestion of a combination of solutions, Krizanc said it would be quite possible. The NWMO can study any option. Based on discussions at this point, he said it is clear that people will not accept deep geological disposal as proposed by AECL. However, there are also trade-offs. Disposal means security. But Canadians also want adaptability, because there may be a solution at some point. With 90–95 per cent of the energy remaining in the used fuel, perhaps a way can be found to use it. Edwards said the only way to get the energy from the used fuel is to extract plutonium and the NWMO will not admit that.

Krizanc replied that for the NWMO "adaptability" does not mean "reprocessing." The management approach should monitor achievements in science. Kneen noted that Japan and France reprocess fuel and extract plutonium but that Canada does not, due to international treaties. Edwards countered that the U.S. has made it illegal to separate plutonium, but Canada has not. The NWMO wants to keep the reprocessing option open. In 1978 the Royal Commission on Electrical Power Planning recommended against interim storage of Nuclear Fuel Waste, because of the likelihood it would result in extraction of plutonium.

Krizanc said weapons-grade plutonium is not the only use for Nuclear Fuel Waste. Different reactors use different grades of fuel. Edwards disagreed, arguing that enriched uranium cannot be extracted from used fuel. Krizanc started to mention processes in other countries, but Edwards said again that it was not true and suggested that Krizanc check his facts and send a letter. Kneen clarified that the group now understood that reprocessing meant the extraction of plutonium.

A participant suggested that, for now, the NWMO can make sure the fuel waste is secure. Krizanc said all the locations are secure.

Formulation of Recommendations

After a 10-minute break, Kneen reconvened the meeting and displayed a preamble that she had written, saying that it did not have to be used.

These recommendations are provided with the understanding that they are informal submissions resulting from a regional dialogue, which took place in Kuujjuaq, Nunavik, on January 27–28, 2005.

Not enough time and funding were allocated in order to conduct a formal consultation that would be effective, meaningful, and culturally appropriate. Section 12(7) of the Nuclear Fuel Waste Act states that they shall consult the general public and in particular Aboriginal (Inuit, First Nations, Métis) people. The meeting that has taken place over the past couple of days cannot be considered a consultation under this Act.

A participant suggested it would be worthwhile to send a letter to the Québec government hearings on the refurbishment of the Gentilly plant. ITK could send a letter of support to KRG in its request to abandon refurbishment of the reactor. Kneen responded that such a letter would have to be approved by the ITK Board of Directors. Another participant commented that since it is an issue in Québec, KRG could proceed. Kneen promised to coordinate with Adamie when she returned to Ottawa.

Another participant offered to get a resolution from the NHFTA in support of the letter.

Another participant pointed out that the Québec Minister of the Environment, Thomas Mulcair, would be visiting Kuujjuaq on March 1. There would be an opportunity to speak to him for an hour and a half. Kneen said she would have time to speak to the ITK Board of Directors before that time.

Kneen drew participant attention to the displayed preamble. She invited comments, which would lead to the formulation of recommendations.

A participant said, “Make sure no one can say, ‘They chose A, B, or C.’”

Kneen said that at the dialogue in Iqaluit, Nunavut Tunngavik Inc. (NTI) requested that it not be called a “consultation,” and this is stated in the preamble.

A participant suggested beginning by listing the organizations represented, then the points upon which they agreed.

Another participant said she did not understand why the group should respond to the question of storage of Nuclear Fuel Waste, because there is none in the North. However, since the Canadian Shield is in Nunavik, there is fear that the waste will come. Kneen suggested that they might be happy to respond as Canadians, and the participant agreed that it is an issue of concern.

A participant said the three options do not contribute to the long-term solution of the Nuclear Fuel Waste problem at the national level. He said he hesitated to use the word “trick,” but any decision on an option will be misrepresented as participants’ consent to further nuclear production. Another participant agreed with him and added, “Which we do not—not at all.”

Kneen clarified that the group was saying the generation of energy by the nuclear process should be stopped. A participant said the point was to discontinue nuclear as a source of energy and focus on the waste problem at hand instead of producing new waste.

Kneen suggested making a point about research into alternative sources of energy. Participants agreed and one specified that funds used to take care of Nuclear Fuel Waste should be redirected to alternative energy sources. “Cleaner energy,” added another participant. When it was pointed out that nuclear energy is thought to be “clean” because

it does not pollute the air when produced, participants suggested using the phrase “less risky.”

A participant suggested some kind of legislation specifying that Nunavik be nuclear free. Kneen asked if participants wanted to include the same wording as in the Labrador legislation, which specifies that adjacent areas be nuclear free too. Other participants suggested including the Northern Passage and other Northern routes.

Kneen read her notes from the dialogue so far:

- Possibly address the issue of the government not having a mandate after the national dialogues have been completed—answers could be seen as agreement to continue producing the waste.
- Possibly address the issue of whether nuclear energy should be used at all in Canada—why produce more waste when the government doesn’t know what to do with the waste that exists right now?
- Option of “None of the Above” is much better than the three options listed!
- Don’t want a disposal site in region or close to it
- Nuclear energy is not used in Nunavik
- No benefits if waste were to come to the region
- Edwards, Del Tredici, and someone from the NWMO should also meet with the national leaders on this subject—maybe presentations could take place at an ITK board of directors meeting?
- Basic question is not being asked—really have to stop nuclear power first and then try to find a solution to the waste issue
- There are too many risks from the mining process to the Nuclear Fuel Waste disposal/storage process
- Advocated the shutting down of the nuclear energy reactors—need to clean up selves first—could end up in disaster if the whole process isn’t considered (as opposed to stop-gap solutions of storage or disposal, but waste still continues to be produced)
- Talked about how the price tag for each approach is a major factor in the “selection process”
- Should address issue of whether or not Canada should continue to produce the waste and as a footnote an option could be dealt with
- Talked about possibly being unrealistic about shutting nuclear power down now
- Talked about the possibility of the NWMO recommending a combination of approaches
- Reprocessing will result in weapons grade plutonium
- Should take the time to figure out what to do with currently existing materials and not produce more

A participant suggested a message should be sent to the Québec Minister of the Environment that he should agree to shut down the Gentilly reactor. Another participant added that the Minister should be reminded he would have supporters in Kuujjuaq for that position.

A participant said it might be better not to mention the price of the options.

Kneen asked the group how they felt about a combination of options. A participant responded that an open public discussion of whether to continue use of nuclear energy should be held. Another participant pointed out that the group was not knowledgeable about possible option combinations. Kneen noted that early fact sheets listed options of limited interest that were no longer being considered. While that door is still open, she said she doubted these options will be considered.

A participant said she did not want to consider the option of reuse for fear the material would be used for a bomb. While it would be good if a way were found to diminish the radioactivity, it sounds too dangerous.

Another participant referred to the NWMO code of ethics. "They have to carry this to the end," he said. "The nuclear industry seems in history to have been ignorant, arrogant, and brutal in dealing with individuals. They seem to have no heart. This is scary," he said.

The government should keep its promise to have hearings on retaining nuclear power in Canada, said a participant. It would be interesting to see what, exactly, was promised.

Kneen promised to send participants the recommendations when they were written.

A participant commented that there should be an impartial organization—the NWMO is too close to the nuclear industry. He said he could see the point of making the industry responsible for its waste, but industry's top priority would be to keep the industry going in the best way possible. It "smells fishy" for the NWMO to be funded by the nuclear industry, a participant said. Another participant commented on the newness of the NWMO. It seems it is learning how to function while under pressure to produce.

A participant asked whether Inuit can get the government's attention. It seems to have already decided.

Kneen read the ideas that came out of the dialogue that could serve as part of the basis for recommendations:

- Attendees could not understand why the question of the disposal/management methods of Nuclear Fuel Waste was posed to this region, as the region neither consumes energy derived from Nuclear reactors nor produces Nuclear Fuel Waste as a result of the energy production process
- Nunavik should not, and cannot, shoulder the burden of dealing with the Nuclear Fuel Waste problem at the national level. Although attendees understood that this is an issue of concern to all Canadians, Nuclear Fuel is not used in the North.
- None of the options presented contribute to a long-term solution to the Nuclear Fuel Waste problem at the national level, and should all be rejected. Any decision on which option to pick would be misinterpreted as consent to the nuclear industry's activities on

this matter.

- Nuclear energy should cease to be produced so no further waste will accumulate. A clear message should be sent to the federal Minister of Natural Resources and to the province of Québec asking them to discontinue of the use of energy derived from Nuclear reactors.
- There should be a focus instead on solving the current issue of managing existing nuclear waste.
- Research on alternative and low risk energy sources should be funded extensively. This should include research into energy efficiency.
- Nuclear Fuel Waste should not be stored, disposed of, or transported through this territory. Theses materials should also not be stored, disposed of, or transported through territories near or adjacent to Nunavik. This includes transportation through the Northwest Passage and other Northern routes.
- The NWMO should consider options (such as the discontinuation of energy derived from nuclear reactors) within a public dialogue process, such as the Seaborn Panel proposed.
- The reprocessing of Nuclear Fuel Waste in Canada should be banned. There is danger that it could be used for weapons grade plutonium.
- The NWMO's code of ethics should always be adhered to and carried out in a meaningful manner to the end of this process. The government should maintain its promise to hold public hearings on the question of whether nuclear reactors should be shut down or not (as had been intended by Dr. Seaborn).
- Assuming that the nuclear industry does not shut down overnight, an impartial and independent organization (not funded by the industry) should direct and conduct a public hearings process on the issue of whether or not nuclear energy should be continued to be used in Canada.

Discussion of Rationale for the Nunavik Recommendations

No to Nuclear (and why):

- Participants at the Nunavik dialogue were against the production of nuclear power because of the waste issue. The waste, in turn, creates environmental concerns particularly with respect to deep disposal in the Canadian Shield. "No to nuclear" inherently means opposition to uranium mining. Furthermore, uranium mining also has its own environmental issues (for example, tailings). Finally, this theme includes the topic of the transport of Nuclear Fuel Waste, which is an environmental concern in itself and raises the issue of potential accidents.

The NWMO:

- Several concerns that arose from the draft regional report were raised concerning the NWMO. First, the consultations that had taken place were severely flawed. "One meeting per region is not sufficient to gather public opinion." Secondly, it was felt that the NWMO lacked independence and was too close to industry. That the NWMO had not provided a "no" option almost forces a tacit endorsement of nuclear energy on the part of dialogue participants. Finally, the group wanted to add that the NWMO should follow a code of ethics, which arose from a perception of arrogance on the part of the NWMO by the dialogue participants.

Alternative Energy:

- The recommendations from the Nunavik dialogue strongly endorsed the need for research and development into alternative forms of energy including hydro, wind, tidal, and solar.

Raising Public Awareness:

- The issue of NFW needs to be brought to the attention of Canadians more than it has been. "The general public should be better informed."

Discussion of Recommendations

Kneen gave participants the opportunity to review her summary (below) of the morning's discussion.

Preamble:

These recommendations are provided with the understanding that they are informal submissions resulting from a regional dialogue, which took place in Kuujjuaq, Nunavik on January 27–28, 2005.

Not enough time and funding were allocated in order to conduct a formal consultation that would be effective, meaningful, and culturally appropriate. Section 12(7) the *Nuclear Fuel Waste Act* states that they shall consult the general public and in particular Aboriginal (Inuit, First Nations, Métis) people. The meeting that has taken place over the past couple of days cannot be considered a consultation under this Act.

Attending at this meeting were representatives from the Kativik Environmental Advisory Committee, National Inuit Youth Council, Nunavik Hunters, Fishers and Trappers Association, Kativik Regional Government, Northern Village of Kuujjuaq, Makivik Corporation, and individual community members.

Attendees could not understand why the question of the disposal/management methods of Nuclear Fuel Waste was posed to this region, as the region neither consumes energy derived from Nuclear reactors nor produces Nuclear Fuel Waste as a result of the energy production process

At this meeting the following was agreed on by those present:

Draft Recommendations (working copy):

- Nunavik should not, and cannot, shoulder the burden of dealing with the Nuclear Fuel Waste problem at the national level. Although attendees understood that this is an issue of concern to all Canadians, Nuclear Fuel is not used in the North.
- None of the options presented contribute to a long-term solution to the Nuclear Fuel Waste problem at the national level, and should all be rejected. Any decision on which option to pick would be misinterpreted as consent to the nuclear industry's activities on this matter.
- Nuclear energy should cease to be produced so no further waste will accumulate. A clear message should be sent to the federal Minister of Natural Resources and to the province of Québec asking them to discontinue of the use of energy derived from Nuclear reactors.
- There should be a focus instead on solving the current issue of managing existing nuclear waste.
- Research on alternative and low risk energy sources should be funded extensively. This should include research into energy efficiency.
- Nuclear Fuel Waste should not be stored, disposed of, or transported through this territory. Theses materials should also not be stored, disposed of, or transported through territories near or adjacent to Nunavik. This includes transportation through the Northwest Passage and other Northern routes.
- The NWMO should consider options (such as the discontinuation of energy derived from nuclear reactors) within a public dialogue process, such as the Seaborn Panel proposed.
- The reprocessing of Nuclear Fuel Waste in Canada should be banned. There is danger that it could be used for weapons grade plutonium.
- The NWMO's code of ethics should always be adhered to and carried out in a meaningful manner to the end of this process. The government should maintain its promise to hold public hearings on the question of whether nuclear reactors should be shut down or not (as had been intended by Dr. Seaborn).
- Assuming that the nuclear industry does not shut down overnight, an impartial and independent organization (not funded by the industry) should direct and conduct a public hearings process on the issue of whether or not nuclear energy should be continued to be used in Canada.

Comments:

Kneen asked participants to comment or add anything to the draft preamble and recommendations. One participant expressed gladness for the existence of ITK and its role in providing Inuit with two points of view on the Nuclear Fuel Waste issue. It was agreed that this point should be added to the report.

Another group member wondered if the proposal for an independent inquiry on the phaseout of nuclear reactors had been included in Kneen's draft. Kneen assured the participant that the point had been included.

Asked about the first two dialogues conducted by ITK, Kneen said there were many similarities among all three sessions. She promised to send copies of the Iqaluit and Inuvik dialogue reports to participants at this meeting.

Another member of the group asked to include a recommendation about an educational process on nuclear energy and its problems. It was agreed that this type of education is necessary, particularly in the North. Kneen worded this into a recommendation: "Attendees recommended that an educational program on the broad issue of nuclear energy specifically designed for the North should be conducted across the country." One participant suggested changes to this wording whereby nuclear energy should include all aspects of the nuclear industry. Kneen added uranium mining, production of nuclear energy, and disposal/management of Nuclear Fuel Waste in brackets. A participant asked that environmental and health effects of Nuclear Fuel Waste be included in this recommendation as well.

"Science will solve the problem someday but not today," a participant said. He suggested there should be ongoing research on finding permanent safe solutions, not to reprocess Nuclear Fuel Waste but to find an acceptable use for it. One participant argued that the phrase "until the time that a satisfactory solution is found" could be interpreted to support the nuclear industry. He added that the amount of money put into the nuclear industry to date justifies the continued production of nuclear-generated power. Participants agreed that the wording of the last recommendation could be perceived to condone the industry.

Kneen underlined the importance of education on this issue, noting that these dialogues mark the first real dissemination of information on the Nuclear Fuel Waste issue to Inuit. While there have been a number of such information sessions in the South, two initial attempts in the North essentially failed due to a lack of funding, poor planning, and limited understanding of logistics of travel in the Arctic. Kneen suggested that the recommended education process be targeted at the entire country not only the North.

Kneen agreed to a suggestion that TV could be a very effective educational tool and refined the point to include multi-media. One participant noted that education was a powerful tool and as such, the message should be very carefully crafted in order to bring the appropriate message to the public. Group members discussed the need for a balanced education process. A group member suggested that balance is second to the need to bring forward the potential health and environmental effects. Kneen asked who should provide the education on this issue. Another participant said the format of the ITK dialogues with expert presenters was an excellent education means. "Efforts should be made to go to the community at large in such a fashion." ITK is in a good position to carry out such an educational campaign. Kneen added this point to the statement: "This type of educational program must be designed and conducted by external (to the government) independent agencies and /or national organizations."

Kneen noted that she and PJ Ageeagok had considerable work to do in the coming months with the preparation of the four regional reports by the end of March 2005. A task force meeting with the regional groups also had to be scheduled. The final regional reports are due at the end of June with the NWMO report going to the Minister by November 15, 2005. One participant asked when a draft of the NWMO report would be available. Kneen replied that ITK should have a copy by March or April, adding that while she had provided the NWMO with some information on the dialogues, she had not provided the details and would not until the regions had completed their review. “I want to ensure that the information that is included in the November report comes from the regions,” said Kneen.

Another participant wondered if results of the dialogues held with First Nations and Métis would be available for comparison. Kneen noted that while she had seen some of the reports from the Assembly of First Nations, she had not seen anything from the Métis organization. She would follow this up. Kneen noted that both of these groups had rejected the notion of consultations in favour of dialoguing, given the short timeframe.

One group member wondered if there were any plans to build new nuclear reactors in Canada. Kneen and others indicated that currently nuclear reactors are only being refurbished with no known plans for new reactors. “I don’t think they would tell us if there were,” added one participant. Another group member wondered if power shortages and blackout periods were on the increase in Southern Canada. He also asked if Southerners were using less energy. Kneen indicated that while she did not have any data, her impression was that consumption of energy in Southern Canada has not dropped and that there was more concern with climate change than energy consumption.

Asking if participants felt the draft recommendations captured their discussion, concerns, and comments, Kneen indicated that she would reword the document, circulate it to members of this group, and include important timelines. She thanked everyone for his or her participation, noting that she was happy to have been invited to provide them with information on this issue. In turn, members of the group thanked Kneen for coordinating the dialogue and for bringing the Nuclear Fuel Waste issue to their attention in what they hoped would be a continued education process.

Draft Recommendations for Review (final version):

Preamble:

These recommendations are provided with the understanding that they are informal submissions resulting from a regional dialogue, which took place in Kuujjuaq, Nunavik on January 27-28, 2005.

Not enough time and funding were allocated in order to conduct a formal consultation that would be effective, meaningful and culturally appropriate. Section 12(7) the Nuclear Fuel Waste Act states that they shall consult the general public and in particular Aboriginal (Inuit, First Nations, Métis) people. The meeting that has taken place over the past couple of days cannot be considered a consultation under this act.

Attending at this meeting were representatives from the Kativik Environmental Advisory Committee (KEAC); National Inuit Youth Council (NIYC); Nunavik Hunters, Fishers and Trappers Association; KRG; Northern Village of Kuujjuaq; Makivik Corporation; and individual community members.

Those present stated their appreciation that ITK had organized this workshop and that ITK staff had ensured that both sides of the issue had been made available to the regional participants of this meeting.

Draft Recommendations:

At this meeting the following was agreed on by those present:

- Attendees could not understand why the question of the disposal/management methods of Nuclear Fuel Waste was posed to this region, as the region neither consumes energy derived from Nuclear Reactors nor produces Nuclear Fuel Waste as a result of the energy production process;
- Although attendees understood that this is an issue of concern to all Canadians, they did not feel that the region should have to shoulder the burden of having to deal with the issue of Nuclear Fuel Waste in any manner;
- None of the options that were presented to attendees contribute to a long-term solution to the nuclear fuel waste problem at the national level. Any decision on which option to pick will be misinterpreted as consent to the nuclear industry's activities on this matter;
- Attendees further stated clearly that they did not want to choose any of the proposed options. Rather they stated that nuclear energy should cease to be produced (and the resulting Nuclear Fuel Waste should not continue to be accumulated) and that focus should be placed on solving the current issue of managing the existing Nuclear Fuel Waste;

- Attendees further stated that an emphasis should be placed on research that would examine alternative and low risk energy sources and that extensive funding should be directed into this area (including energy efficiency research - how to use more efficiently) ;
- Attendees wanted to further state clearly that they are in direct opposition to any Nuclear Fuel Waste to be stored, disposed of or transported through their territory. They further stated that these materials should also not be stored, disposed of or transported through territories near or adjacent to Nunavik (this includes transportation through the Northwest Passage and other northern routes);
- Attendees further wanted to send a clear message to the Minister (NRCan) and the province of Quebec that they are advocating the discontinuing of the use of energy derived from nuclear reactors (shutting down reactors);
- Attendees felt that the NWMO should be able to consider options (such as the discontinuation of energy derived from nuclear reactors) within a public dialogue process (such as what was proposed by Seaborn panel);
- Attendees are in direct opposition to the reprocessing of Nuclear Fuel Waste in Canada, as it will result in the possible extraction of plutonium;
- Attendees stated that the NWMO's code of ethics should always be kept in mind and to carry that code to the end of this process (in a meaningful manner);
- Attendees further stated that the Government of Canada should maintain its promise to hold public hearings on the question whether nuclear reactors should be shut down or not (as had been intended by Dr. Seaborn);
- Assuming that the nuclear industry doesn't shut down overnight – an impartial and independent organization (not funded by the industry) should direct and conduct a public hearings process on the issue of whether or not nuclear energy should be continued to be used in Canada;
- Attendees recommended that a balanced educational program (using multi-media) on the broad issue of Nuclear Energy (uranium mining, production of nuclear energy, disposal/management of NFW, Environmental and Health impacts of Nuclear Fuel Waste) should be specifically designed for the North and that this program should be initiated across northern Canada. This type of educational program must be designed and conducted by external (from the Gov't), independent agencies and/or National organization (Aboriginal or otherwise).

Attendees at this dialogue hoped that science would solve the problem of the disposal/management of Nuclear Fuel Waste some day. This is, however, not possible today. Until the time until there is a completely satisfactory solution to the problem of Nuclear Fuel Waste, nuclear reactors should be shut down and no more Nuclear Fuel Waste should be generated at this point in time.

Appendix D (Final Nunatsiavut Region Report):

Day One: February 9, 2005

Participants

Soha Kneen, National Coordinator, Inuit-specific Dialogues on the Long-Term Management of Nuclear Fuel Waste, Inuit Tapiriit Kanatami (ITK)

PJ Akeeagok, Junior Researcher/Project Co-ordinator, ITK
Kim Andersen, Labrador Inuit Health Commission
Tony Andersen, Vice-President, Labrador Inuit Association
Ataomie Blake, Labrador Inuit Association
Herb Jacque, Mayor of Makkovik
David Dyson, Town Manager, Makkovik
Allan McNeill, Labrador Inuit Association
Zippie Nochasak, Labrador Inuit Association

Welcome and Introductions

Soha Kneen, National Coordinator of the Inuit-specific Dialogues on the Long-Term Management of Nuclear Fuel Waste, ITK, introduced herself and outlined the agenda. The first day provides participants the opportunity to look over materials, to hear from the representative from the Nuclear Waste Management Organization (NWMO), and to enjoy an evening feast. The second day involves other experts until mid-morning and concludes with a session restricted to participants so they can talk freely.

Participants were invited to introduce themselves and share their expectations for the meeting.

A participant from the Labrador Inuit Association (LIA) said he did not know much about the issue and was interested in learning more because of potential uranium development in Labrador.

Another said he had renewed interest in the dialogues because he suspected they are actually about uranium mining rather than Nuclear Fuel Waste.

A third said his interest came from the point of view of exploration and of a worker at the local fish plant.

Another said she was interested because environmental health is one of her responsibilities.

Other participants said they were attending to learn as much as they could.

The Mayor of Makkovik welcomed participants and offered to help in any way. Another participant welcomed participants to Nunatsiavut.

Kneen noted that the dialogue is not addressing uranium mining, which she understood was an issue of immediate concern to this area. She further stated that this meeting was not intended to be a siting exercise. Instead, the dialogue seeks Inuit input on how Canada should dispose of Nuclear Fuel Waste, in parallel to sessions being held in the south. "We are not looking at 'where' but 'what you as Canadians think Canada should do with its Nuclear Fuel Waste,'" she explained. ITK developed the process, which was approved by its Board of Directors. Each land claims organization chose a representative, with Keith Chaulk representing Nunatsiavut, who in turn chose the current location and the list of participants. Kneen acknowledged that it is a difficult time of year for bringing people together; some people on the list were able to attend and some were not.

Update and General Information: ITK Opens the Dialogue

Kneen emphasized that ITK does not endorse any of the proposed approaches to Nuclear Fuel Waste management. Rather, this meeting is intended to provide Inuit in Nunatsiavut with information on the issue of the Long-Term Management of Nuclear Fuel Waste, as well as to ensure that Inuit can have a voice in the dialogue process, which is taking place within Canada (both in Canada's South and its North) at this point in time. She further stated that all suggestions made at this dialogue will be included in the resulting report and recommendations.

Kneen said that according to the available documentation, the *Nuclear Fuel Waste Act* of November 2002 represented a substantial achievement by Canada regarding responsibility for Nuclear Fuel Waste. The Act was founded on consultation with stakeholders, including several policy communications by the Government of Canada in 1996 and 1998, but had no significant consultation with Aboriginal people. In its 1998 response to the Seaborn Panel, the Government of Canada promised to undertake a particular process with Aboriginal people. This Inuit-specific dialogue is part of that commitment.

In discussions with the NWMO and Natural Resources Canada (NRCan) on how to include Inuit in this process, ITK suggested a comprehensive dialogue. ITK said it was important that Inuit express their opinions in a culturally meaningful way that takes into account the remoteness of communities as well as language needs. In the past, Inuit have opposed the storage or disposal of Nuclear Fuel Waste in the Arctic because of transboundary and other considerations. As part of the current Canada-wide dialogue process, ITK proposed a three-year Inuit-Specific National Dialogue, which is now nearing its end. This Inuit-Specific Dialogue will culminate in a comprehensive report that includes Inuit opinions on social, economic, environmental, and ethical considerations in the storage of Nuclear Fuel Waste. The report will be submitted to the

NWMO by June 30, 2005 and will be included in their recommendations to the Minister of NRCan on November 15, 2005.

Kneen elaborated on the objective of the current national dialogue process as one that focused on the provision of information to Inuit, as well as to enable Inuit in the four Inuit land claims regions to have a voice in the National Dialogue Process that was currently taking place regarding the issue of the Long-Term Management of Nuclear Fuel Waste in Canada. These dialogues, which have been taking place over the past four months were further intended to assist Inuit to strengthen organizational capacity, acquire knowledge on matters related to Nuclear Fuel Waste, and develop communications with the Government of Canada.

Kneen pointed out that the terminology has changed during the course of the dialogue process. Material initially referred to as "Nuclear Fuel Waste" is now more frequently called "used nuclear fuel." The two expressions refer to the same material—used fuel from nuclear reactors—although the latter expression does not sound as hazardous.

Kneen's presentation then proceeded into a basic explanation of what Nuclear Fuel Waste is. According to the materials she provided, Nuclear Fuel Waste is contained in rods, in bundles of approximately 20 kilograms, and is dangerous to human and environmental health. Kneen assured participants they would have the opportunity ask further questions regarding the radioactivity of these bundles later on during the day when the expert presenters would arrive to conduct their presentations. Kneen further stated that these presenters would be Michael Krizanc from the NWMO, Gordon Edwards from the Coalition for Nuclear Responsibility and Robert Del Tredici from the Atomic Photographers Guild. Participants would also be able to a view a video describing Nuclear Fuel Waste in detail, which was provided by the NWMO for the purpose of viewing at the Regional Inuit Dialogues.

Kneen proceeded by stating that Nuclear Fuel Waste is currently stored in wet and dry storage at reactor sites. Kneen displayed a map of storage locations and photographs of wet and dry storage containers. Nuclear Fuel Waste is initially stored in wet storage pools for a period of seven to ten years. At this stage, the Nuclear Fuel Waste is hot and highly radioactive. Kneen stated that people visiting the reactor sites are able to view the tanks through a window from a safe location. Dry storage containers are made of steel-reinforced concrete that has been welded shut. Kneen further stated that she had been in a room where dry storage containers are kept. While encased Nuclear Fuel Waste can be moved, it is currently being stored at the existing nuclear reactor sites.

Nuclear Fuel Waste has been produced in Canada since the mid- to late-1970s. Ontario Power Generation produces about 90% of the waste, New Brunswick Power 4%, Hydro-Québec 4% and Atomic Energy of Canada Limited 2%, with the remaining amounts coming from smaller producers like universities. As of 2002, there are 1.7 million bundles of Nuclear Fuel Waste, or 40,000 tonnes, or enough to fill three hockey rinks. By 2033, at the current rate of production, there will be 3.8 million bundles.

Kneen explained that the “half-life” of Nuclear Fuel Waste is currently estimated at 710,000 years. Asked for further explanation, Kneen suggested experts presenting later in the dialogue would be better able to provide further information. She offered a simple summary statement: it could be over 1,000,000 years before the material could be considered safe. However, this is not something that can be proven as this process has never been completed before.

While no Inuit community is close to a nuclear power plant, some Inuit hold traditional territory in places that could be considered for Nuclear Fuel Waste storage. The Canadian Shield contains rock that might be suitable for deep geological disposal of Nuclear Fuel Waste, but an option has yet to be chosen. The Canadian Shield does go through three Inuit territories, but this does not necessarily mean Inuit territory would be implicated. Even so, Nunavut Tunngavik Incorporated (NTI) and the Labrador Inuit Association (LIA) have opposed the storage or disposal within Inuit held lands in Nunavut and Nunatsiavut. Keith Chaulk from the LIA has previously stated his organizations’ opposition to storage on LIA territory or in areas adjacent to it, as well as along potential transportation routes.

At this point Kneen outlined the three methods of storage the *Nuclear Fuel Waste Act* directed the NWMO to examine: deep geological disposal, storage at reactor sites, and centralized storage. The NWMO has been mandated to look at other methods and may also propose a combination of approaches. Participants were invited comment on these and other matters for the recommendations.

Kneen proceeded by stating that according to the available information, deep geological disposal would isolate the material from human beings and from the environment and would involve transporting the material to a suitable site or sites. Many countries and agencies favour this method. Industry research has suggested that 324 bundles could be stored in a steel inner vessel surrounded by a copper outer shell. The NWMO discusses models that predict that the movement of radioactive and toxic contaminants would be greatly impeded by the combination of facility depth, type of rock, and the nature of the groundwater flow system. The site would have to withstand significant geological change and extreme events like storms, earthquakes, meteor impact, glaciations, and changes in temperature. Initially this option involved sealing the material so it could not be retrieved but some countries have postponed sealing so that the material can be retrieved should there become a way of using it. “At this point NWMO representatives have made statements alluding to their seeing Nuclear Fuel Waste as a resource,” said Kneen.

Another method under consideration, centralized storage, allows access to the Nuclear Fuel Waste under controlled conditions. Storage would either be above or below ground and would involve transportation. There are two choices for buildings used to store the Nuclear Fuel Waste: they would either need to be replaced after 100 years, or engineers would have to design more permanent structures that remain sealed for several thousand years. Either way, future generations would inherit the responsibility for safeguarding the material. Shallow burial would enhance security, but would still allow retrieval.

The third option under discussion, and the method currently used in Canada, is storage at reactor sites. While both above- and below-ground storage is used at the sites, the underground method is not widely developed. CLAB in Sweden stores the material 30 meters below the surface. An advantage to this method is that it eliminates the need for transportation. Given that the other two options can only be used after the Nuclear Fuel Waste had undergone the seven- to ten-year process of wet and dry stages at the nuclear reactor site, the centralized storage option means that more than one site will still be in operation.

Summarizing the three methods, Kneen outlined their advantages and limitations:

- **Storage at the reactor site** has the advantages of being situated in a community already accustomed to the presence of a nuclear facility, having the required science and technology at hand, and not requiring transportation. Its limitations are the need for continuing administrative controls and for storing the waste longer than the functioning of the nuclear power plants, the security issues posed by having sites near water, shifting the focus at these sites from the production of power, and that the reactor sites were not selected for storage considerations.

- **Centralized storage** has the advantages of allowing selection of sites solely on the basis of management, involving fewer security concerns, and having the required science and technology on site. Its limitations are that it requires the experience of and funding for effective and continual controls and administration, the potential contentiousness involved in the identification of a site, and the risks and costs associated with transportation.

- **Deep geological storage** has the advantages of possibly being a permanent solution and of not requiring continuing money and management. Its limitations are that it is not possible to prove that it works and that monitoring the site is more difficult.

Kneen interrupted her presentation to summarize the issue for a group of high school students who had arrived to sit in on the dialogue. She explained that ITK was in Makkovik to conduct the last dialogue on what Canada should do with its Nuclear Fuel Waste. She further explained the choice of Makkovik as the location for this dialogue by stating that a representative from the LIA chose the place and the participants. She also outlined that this discussion was not related to uranium mining and that the discussion of the Long-Term Management of Nuclear Fuel Waste within the four Inuit Land Claims Regions did not imply that Nuclear Fuel Waste would be brought to any Inuit owned lands. She elaborated by stating that ITK does not endorse any option—it is just ensuring that Inuit have a voice.

Discussion and Concerns

Asked about potential damage from the uranium mining proposed for the area, Kneen suggested that these questions be asked of the presenters during the afternoon session.

She told participants it was understood that such questions would arise during the process.

Asked what Nuclear Fuel Waste is, where it comes from, and why it requires disposal, Kneen responded that Nuclear Fuel Waste is created when energy is produced in nuclear reactors. Bundles of rods that contain nuclear fuel pellets create heat, which is used to produce energy. It is a quick way to create a lot of energy. She told participants that they would hear it called "clean" energy, and therefore represents a key method to meeting Canada's commitment under the Kyoto Accord. But Nuclear Fuel Waste has a reported half-life of 710,000 years before it is no longer dangerous—although the exact length is not known.

Asked if unpopulated locations were being considered for the centralized storage option, Kneen replied that no specific areas have been suggested. Currently, only the methods are being discussed; a siting exercise will follow. "People are worried about it, and rightly so," said Kneen. "Not just Inuit, but also First Nations."

In response to a specific question about the Canadian Shield, PJ Akeeagok referred participants to page 64 in the NWMO document *Asking the Right Questions*. Kneen added that a location in the Canadian Shield has not been determined should this be the method that is eventually chosen for the Long-Term Management of Nuclear Fuel Waste in Canada.

A participant asked whether the containers were tested to make sure there would be no leakage in years ahead. Kneen said the containers have a 50-year lifespan. These containers are currently replaced every 50 years and are said to be safe. The reactor sites are well managed, with appropriate security measures. She recommended that participants ask the experts such questions.

Asked about safety measures at storage facilities, Kneen stated that she had observed personnel at the Pickering Nuclear Reactor site were required to wear tags and protective clothing in specific areas of the nuclear reactor site.

In response to a question about the U.S. situation, Kneen stated that the U.S. is moving toward storage at a mountain in Nevada. All the experts have spoken against it, but the project seems to be going ahead. At this point Kneen refocused the current dialogue by stating that this dialogue is about the Long-Term Management of Nuclear Fuel Waste in Canada.

Asked whether expert groups like Greenpeace support any of the options, Kneen stated that the radical option proposed by some environmental groups is to stop nuclear fuel production. She indicated that she had, however, not heard from Greenpeace or the Sierra Club and that she was not sure whether or not they were included in the dialogue process the NWMO is currently engaged in. Her impression was, however, that the Sierra Club agrees with positions put forward by the Canadian Coalition for Nuclear Responsibility.

Kneen suggested participants pose these kinds of questions, such as how the materials would be transported, to the experts who would be presenting at this dialogue. She agreed that transportation is a serious issue.

A participant noted that in Nunatsiavut there are only two ways to transport material—by air and by boat. Another participant stated that any boats would travel along the shores of Nunatsiavut.

A participant likened the energy that is left in Nuclear Fuel Waste to a spent battery—it will not start his engine, but he still gets a shock from it. He suggested that the nuclear industry must be looking for ways to use nuclear fuel efficiently. Kneen agreed, advising him to check with the experts later on. While it is safe to stand beside the dry storage containers, there could be cumulative effects.

A participant stated that ITK is doing a good job in providing information. She asked if information kits could be provided to all schools, as this issue involves future generations. Kneen said the suggestion could be considered. The current process was intended to last three years, but the funding only became available the previous spring. There is not enough time or money to consult with each community. “Rather than have no voice, we initiated a dialogue process which would involve one dialogue in one community per Inuit Land Claim Region.

“Other communities have said this can’t be considered a consultation,” Kneen continued. “They said, ‘We need to talk to more people, but this is what we think.’” The people in Kuujjuaq said they did not want Nuclear Fuel Waste in their region. They worried that selecting an option could be perceived as an endorsement of nuclear power. Others stated that they did not want the waste, but felt it was constructive to recommend disposal methods. Across the board, Inuit have, however, been opposed to disposal or storage of Nuclear Fuel Waste in the Arctic or in areas adjacent to it. The current dialogue process has the potential for people to say what they want. “You can make a statement as strong as you like,” she said.

In response to a question about the amount of Nuclear Fuel Waste currently in storage, Kneen stated that there is enough waste to fill three hockey rinks (1.3 million used fuel bundles) and by 2033, six rinks (3.6 million used fuel bundles). The government is asking what Canadians think should be done about it. “Say what you want,” she stated. “It is important to say something and this is your opportunity to provide your opinion on this matter.”

A participant asked about areas near uranium mines, noting that stopping the production of nuclear energy would also mean that uranium development/mining would also not go ahead in the area.

Asked if a place in Northern Labrador is being considered for Nuclear Fuel Waste storage, Kneen stated that a site for storage/disposal has not yet been chosen. She repeated that the current dialogue process was strictly limited to the discussion of the

proposed storage/management options and that ITK is ensuring that Inuit have input in the ongoing national dialogue process. No sites are being considered at the moment, only approaches.

After a short break, Kneen reported to those present that NTI had previously passed a resolution declaring the Arctic a nuclear-free zone. In addition, the ITK Board of Directors has voiced its agreement and the Inuit Circumpolar Conference has a similar resolution.

Asked by one attendee if anyone could present the alternatives to nuclear power, Kneen stated that the expert presenters who would be present throughout the afternoon would be able to answer these types of questions. Discussion of energy alternatives was not the focus of this dialogue, but any resulting discussion of such alternatives would, of course be included in the resulting report.

In response to a request for more information about the results of the dialogues in the other Inuit regions, Kneen read the draft recommendations from Nunavik, Inuvialuit, and Nunavut.

When the meeting broke for lunch, Kneen stayed behind to make a presentation to a local Grade 6/7 class.

Presentations

Nuclear Waste Management Organization

Michael Krizanc, Communication Manager, Nuclear Waste Managment Organization (NWMO), thanked ITK and meeting participants for inviting the NWMO. He noted that the major Nuclear Fuel Waste owners established the NWMO in 2002 in order to meet their obligations under the *Nuclear Fuel Waste Act*.

Providing some background, Krizanc stated that three of Canada's provinces use nuclear power for generating electricity: Ontario with three generating stations (Pickering, Darlington, and Kincardine); New Brunswick with one generating station (Point Lepreau); and Québec with one generating station (Gentilly II).

Several of these reactors were shut down for refurbishing and maintenance until recently when two of the four reactors at the Darlington site and one at Pickering were brought back into operation. Krizanc stressed that while Nuclear Fuel Waste is extremely dangerous to humans and the environment and remains that way for a long time, it is very safely managed at all the nuclear power generating sites.

Explaining the process of wet and dry storage, Krizanc stated that each site has different types of dry storage containers all currently designed for a 50-year life span. "Engineers tell us that the containers could last 100 years before repackaging is necessary," he added.

While this suggests that long-term storage is not particularly urgent, Krizanc noted that Canada has no Long-Term Management plan for its Nuclear Fuel Waste.

The NWMO's goal with these dialogues is to determine Canadian opinion on an acceptable waste management approach. According to the *Nuclear Fuel Waste Act*, the NWMO is required to look at the following three options:

- Deep geological burial, which implies deep burial in the earth with the eventual plan to seal off the waste and no intention to retrieve it.
- Centralized storage, which could be above- or below-ground and may be situated anywhere in Canada.
- Reactor site storage, which means leaving the waste at the nuclear power generating facilities.

Krizanc noted that while the first approach implies disposal, the latter two are storage options. The NWMO can also investigate other Nuclear Fuel Waste management options, such as those outlined in the first NWMO discussion document. Deep sea burial, for example, has been considered and used to a limited extent prior to international conventions prohibiting this practice. The option of shooting waste into space is problematic given the enormous expense and the danger of rocket explosion as witnessed with the Challenger disaster.

"The NWMO is not asking people to come up with the science; scientists are doing this," said Krizanc. The NWMO is interested in what people think about the options. To date, Canadians have indicated that their priority is the safety and security of any chosen approach. The NWMO has adopted a multi-tiered dialogue process to determine Canadian opinion. One of these activities included a National Citizen's Dialogue that determined the values of about 500 people across the country on this issue.

Subsequently, the NWMO took the results to a Roundtable on Ethics, which devised an ethical and social framework to guide the assessment of the different Nuclear Fuel Waste management approaches. With this framework in mind, the NWMO asked a panel of experts to design a process transparent to the public that compares waste management approaches. An assessment team then used the panel recommendations to prepare an evaluation of the three approaches currently under consideration.

Krizanc noted that this assessment exercise allowed the different approaches to be measured against a set of performance measure objectives. He offered to further discuss details of the assessment with interested participants and referred everyone to the second NWMO discussion document *Understanding the Choices*.

Krizanc played a DVD prepared by the NWMO to provide additional background information on Nuclear Fuel Waste and on the NWMO Canada-wide dialogue process. He used a map to show that Ontario had the lion's share of commercial nuclear reactors in Canada. Ontario Power Generation is also the largest producer of radioactive materials used in medical applications and distributed around the world. Nuclear Fuel Waste

accumulated over the last 30 years would fill five hockey rinks from the ice surface to the top of the boards. Once the waste leaves reactors, it must be stored under 13–14 feet of water for 7 to 10 years to reduce the fatal level of radiation. However, even after 300 to 500 years, exposure of approximately 250 hours would still be lethal to humans.

In response to a question, Krizanc stated that nuclear fuel bundles could be used to produce energy for 12 to 18 months. Thousands of these bundles are stacked back to back in channels in each reactor. Krizanc estimated that an average reactor goes through 1800 bundles a year. An unused fuel bundle can be handled but once inside the reactor it becomes lethal.

Showing slides of wet and dry storage, Krizanc noted that dry storage containers are monitored 24 hours per day. “The exact location of each fuel bundle is known,” he said. The International Atomic Energy Association also has cameras inside the facilities. The reinforced concrete containers are steel-lined inside and outside and there is no measurable radiation outside the containers. In terms of security, Krizanc noted that “it would be difficult to get away with these storage containers since they are heavy and require specialized machinery to be moved.”

The *Nuclear Fuel Waste Act* requires waste owners to set aside funds for its management based on the Polluter Pays Principle, Krizanc explained. In essence, this means that those who consume electricity in the three provinces pay, as do all Canadians in a smaller way through the contribution of Atomic Energy of Canada Limited (AECL) to the Nuclear Fuel Waste management funds.

Krizanc further stated that in November 2005, the NWMO will make recommendations on the management options for Nuclear Fuel Waste but the government will make the final decision. “It won’t necessarily be the one we recommend,” said Krizanc. The NWMO will then implement the selected management option. The NWMO will take “ownership of the waste,” he explained.

“When we talk about a management approach, we don’t simply mean the technological aspect,” he continued. The NWMO is looking for an overall management system. For instance, if Canadians think that it is Canada’s responsibility to take Nuclear Fuel Waste from countries that purchased CANDU reactors, this could be incorporated in a management plan. Similarly, the plan could address a stated perception that the NWMO is run by the waste owners in a conflict of interest.

What has the NWMO learned from talking to Canadians? “They told us they didn’t want any surprises,” said Krizanc. As a result, two NWMO discussion documents reported back to Canadians on their dialogues and research. A draft report will be publicly released in late April/early May to provide Canadians with another opportunity to comment on whether or not the NWMO heard them correctly.

Krizanc explained the different steps that the NWMO has taken and is taking for the preparation of the draft report. “The NWMO has done its best to be transparent,” he said.

He noted the existence of “special engagement” with the communities currently hosting nuclear reactors since they have unique insight.

People with Aboriginal background were represented in all of the NWMO dialogue activities, though not on the assessment team. “There has been an Aboriginal voice above and beyond the National Aboriginal Dialogues,” he said. Kneen asked Krizanc if those representatives were specifically Inuit. Krizanc replied that these people did not specifically identify themselves as Inuit.

Krizanc noted that each Nuclear Fuel Waste management approach was measured against the eight objectives, including community well-being, economic viability, and adaptability. In a brief overview of the preferred approaches, he cautioned hat on-site storage actually involves multiple sites, each with its own security issues.

Deep geological disposal is the most studied method and the one preferred by several countries. He noted that Canada has invested heavily in this approach. Seven hundred million dollars have been spent on a test shaft as well as ten years on an environmental assessment of the concept of deep geological burial. Krizanc noted that while the Seaborn Panel acknowledged the technological feasibility of this approach, social acceptability had not been proven. Exploring this social aspect has been the basis of the current NWMO process.

Krizanc pointed out that while the NWMO will be fined $100,000 per day if it misses the November 15, 2005 deadline for its report, the government has not imposed any deadlines or fines on itself for making a decision.

In conclusion, Krizanc stated that he represented Tony Hodge for the National Aboriginal Dialogue whose goals included building a long-term relationship with Canada’s Aboriginal people on the issue of the Long-Term Management of Nuclear Fuel Waste.

Questions and Comments

One participant asked if scientists had considered the implications for underground storage of the earth’s shifts and movements. Krizanc noted that Yucca Mountain, Nevada, the American choice for their Nuclear Waste, lies on a fault line but that an earthquake would cause shifts on either side of the mountain but not underneath it. In Canada, storage is being considered in areas of the Canadian Shield where the rock has large plutons and has been stable for millions of years. Some residents in Northern Ontario fear that Nuclear Fuel Waste will be dumped in old mine shafts but this option has been rejected because of the many fissures in those shafts and the potential for resumed mineral exploration in the future. Stable areas of the Canadian Shield would be under consideration, but much of Ontario rock is full of holes due to mineral exploration. Krizanc noted that scientists have considered everything from the effects of another ice

age to the effects of climate change on deep geological burial. The problem is that no one has ever used this procedure.

The same participant asked if groundwater could seep into a geological Nuclear Fuel Waste repository. Krizanc explained that the water in these plutons has not moved for millions of years. He expressed his suspicion that a concern of earthquakes is at the root of most people's reservations over the deep geological burial approach.

Another group member asked if there are any indications from research that the radioactive waste could be "neutralized" in the future. Krizanc noted that one consideration in recommending an approach is its adaptability to new technologies. It appears that the public has some confidence that science will find a solution. Currently, there is limited research on transmutation but it is not yet a practical reality and may never be. Nevertheless, some people favour a step-by-step approach, whereby the Nuclear Fuel Waste is kept accessible.

Krizanc emphasized that transmutation is not the same as reprocessing Nuclear Fuel Waste, adding that Canada has never reprocessed any waste and produced plutonium as a result. Canadian Coalition for Nuclear Responsibility representative Dr. Gordon Edwards objected to the latter statement, stating that some reprocessing had taken place at Chalk River.

One participant wondered if air vapours or leakage from Nuclear Fuel Waste stored underground could be a concern. Krizanc replied that if this is a concern for the group, they may not want to consider the deep geological burial option. Kneen clarified that the participant was asking if there would be any external signs of leakage. Krizanc said radioactivity cannot be seen, smelled, or tasted but can easily be monitored and measured.

The same participant asked how easy it would be to monitor and measure at 500-1000 metres below ground. Krizanc said more accessible shallower storage would allow for easier monitoring.

The same participant then asked if disintegration of the containers could be detected. "If a container breaks down, there are still several shields to penetrate, backfill, a layer of bentonite clay, and then the surrounding geology," Krizanc answered. "There is a school of thought that thinks that is all that is needed." Others, however, believe leakage is inevitable and as such, there needs to be close monitoring. If scientist assurance of deep geological burial is insufficient, then another Nuclear Fuel Waste storage option is required until a satisfactory solution is found.

Another group member asked if there were specific sites in the Canadian Shield that were more favourable than others for Nuclear Fuel Waste storage. Krizanc said the second NWMO document considered areas outside the Canadian Shield and other types of geomedia have been studied elsewhere.

Edwards asked if the *Nuclear Fuel Waste Act* required that an economic region be identified in the final report. Krizanc noted that no specific region was to be named but rather the comments were going to be generalized. The report might note that an economic region with these characteristics would be affected in this way while another economic region would be affected differently. Krizanc explained that once the government selects an approach, a site selection exercise would be triggered. This would take at least ten years, followed by a ten-year environmental assessment and a further ten-year site planning and construction process.

In response to another question about the monitoring of buried Nuclear Fuel Waste, Krizanc agreed that if the repository were sealed, it would indeed be difficult to monitor. "Is the waste safe this way? What do you require for you to feel safe?" he asked. The NWMO is asking such questions of Canadians and while there is no right answer, all Canadians who are interested in this issue should have their say.

Another participant asked if there have been any safety problems at nuclear reactor sites. Krizanc assured participants that facilities in Canada and the waste stored on-site are very well monitored and safeguarded. Events such as Chernobyl and Three Mile Island were not associated with Nuclear Fuel Waste. "This waste is not explosive and the discussion here is not about atomic bomb production," Krizanc emphasized. In the early stages of the development of the nuclear industry, there was an accident at Chalk River but no fatalities were involved.

"Why would you want to tinker with something that is dangerous as it is?" a participant asked, referring to the current on-site storage of the Nuclear Fuel Waste. Krizanc stated that facilities would have to be refurbished and containers rebuilt. Perhaps today's society will not exist in the future, putting into jeopardy the repackaging of the waste. Krizanc asked if it was fair to pass on the responsibility to future generations in this way.

Another group member asked why this waste is continued to be produced. Krizanc stated that the next presenters would explore these fundamental questions. There is always impact, regardless of how energy is generated. He gave the example of the flooding that occurred with the damming of Churchill Falls for the production of hydroelectricity. In southern Ontario, coal-fired plants are being shut down in response to concern over air pollution. And although, in some ways, the footprint of nuclear power is small, the Nuclear Fuel Waste problem is huge. Nuclear Fuel Waste is likely being the world's most dangerous substance.

One participant noted that the inhabitants of Makkovik have accepted the risks associated with the energy they are consuming and asked if the people of Ontario have accepted theirs. He wondered what impact the power blackout in 2003 had on that population. Krizanc agreed, adding that it is a matter of determining what level of risk is tolerable. "You can't remove all risk from your life," Krizanc said.

A participant asked if underground storage in water was a consideration. Krizanc answered that this is the preferred method in Sweden.

A final question concerned the number of countries that have purchased Canadian nuclear reactors. Edwards replied that Argentina, Romania, Korea, Japan, and China are among the list, noting that the government sells its nuclear reactors quite aggressively. Canada also sells uranium to a large number of countries. Krizanc agreed with the final comment.

Canadian Coalition for Nuclear Responsibility/Atomic Photographers Guild

Gordon Edwards of the Canadian Coalition for Nuclear Responsibility thanked ITK for the invitation to participate in these dialogues. He directed participant attention to the Canadian Coalition for Nuclear Responsibility information kit. Participants might be wondering why they were being asked about Nuclear Fuel Waste when they had nothing to do with its production. He promised to cast light on the reasons and answer the question: What is Nuclear Fuel Waste and why is it dangerous?

Edwards, a teacher at Vanier College who trained in science, recalled that when he received his PhD in Mathematics and Applied Physics, he did not know that Nuclear Fuel Waste existed. He wondered how many other educated people did not know and how many simply did not raise the issue.

Roberta Del Tredici introduced himself as a teacher of photography and film at Vanier College. His interest in nuclear technology has resulted in the photographs displayed on the walls of the meeting room. He has photographed every step in the development of nuclear fuel, from the mine through to the waste. He said his presentation would not ignore the existence of nuclear bombs. He founded the Atomic Photographers Guild with the small group of photographers he had met at various nuclear-related sites, all committed to making these places visible. He said his presentation would fill out information on topics already discussed, including the track record of the people working with the technology.

Showing a photograph of cement silos containing Nuclear Fuel Waste, Del Tredici said, “This is what the fuss is all about.”

Del Tredici showed a picture of fuel bundles going into a CANDU reactor, 12 bundles to each tube. After they are used, about a year later, they are millions of times more radioactive. Edwards added that the purpose of the bundles is to boil water to produce steam, which generates electricity. Asked if electricity is required to start them, Edwards said starting them is just a matter of withdrawing controls.

Showing a model of an atom, Del Tredici said the process begins with uranium. In the middle of the atom is a heavy nucleus. Edwards said uranium is the only naturally occurring element whose atom can break apart and produce heat. Once started, it will continue.

Referring to Del Tredici's slide of a Russian monument to the splitting of the atom, Edwards said the splitting of the atom was being discussed just before World War II, and in the environment of war, the first application was a bomb. The fragments produced were radioactive waste.

Mushroom clouds from an atomic bomb are full of broken uranium atoms, with over 300 substances, including cesium, strontium, and iodine. When they settle, these substances are called fallout. Edwards added that fallout was the reason the testing of bombs was banned. Some materials are still coming down today. Furthermore, the split is unpredictable—it is never known what substance will be produced.

Del Tredici said the same process occurs in a reactor, but it is contained. The concern is how the containment can be maintained. He showed a photograph of a soldier, John Smitherman, who was forced to observe the tests at the Bikini Islands. He was sent to wash decks after an explosion, and noticed other people present in protective gear. Smitherman contracted a variety of cancers and both his legs had to be amputated. He sued the government seven times and was turned down each time. After he died, his wife was given some small compensation. Edwards added that it is hard for an individual to prove such cases because the consequences are invisible and do not happen immediately, although scientists know the trends in populations.

Del Tredici showed a picture of Irma Thomas, a civilian who lived in St. George, Nevada, 200 miles away from the Nevada test site. Scientists would not conduct tests until the wind was blowing away from Las Vegas, which meant toward St. George. Thomas noticed that people on her block were suffering from various cancers, miscarriages, and malformations, and wondered if they were related to the glowing pink clouds they all watched. She spoke out, others agreed, and they sued the U.S. government. The judge said while it was impossible to prove, it was probable, and granted them compensation, which was later turned over on the basis that the government cannot be sued. Edwards said these people were never told of the potential harm and in fact were encouraged to watch the tests. The authorities knew it was harmful and did not want to injure the rich people in Las Vegas.

Displaying a nuclear map of Canada, Del Tredici showed that most uranium comes from Saskatchewan and North. Canada is the world's biggest exporter of uranium, and in the 1950s, uranium was Canada's fourth most valuable export. At that time, it was all used for bombs, said Edwards. Before the discovery of fission that made the bombs possible, uranium was not useful; after fission, uranium became a high level secret operation. Del Tredici pointed out that the legend of the map distinguishes between mines that produce uranium for bombs and mines that produce uranium for nuclear reactors.

Canada had the first uranium mine in the world at Port Radium on Great Bear Lake. The Dene were hired to carry the crushed ore in burlap sacks. They took it in barges, sometimes sleeping on it for eight hours. They inhaled a lot of dust. Their town of Déline is known locally as the "Town of Widows." Edwards said uranium is naturally radioactive and has been on the earth forever, but it is not nearly as radioactive as

manufactured Nuclear Fuel Waste and fallout. However, uranium is very dangerous when inside the body—it can cause problems about 20 years after it is inhaled.

Showing a slide of two Dene men who worked in the uranium mines, Del Tredici said the marks in the picture show the uranium was destined for the Manhattan Project. However, workers of that era did not know the uranium would be used to make bombs nor did they know it was dangerous. A 1931 government directive to civil servants in Ottawa who examined uranium ore recommended the use of precautions even when handling products with low radioactivity. The report noted that ingestion leads to build-up. This document was given to scientists and technicians but never to the people working in mines and carrying sacks.

Del Tredici displayed a picture of alpha-emitting radioactive particles in the lung tissue of an ape. Despite being a non-penetrating form of radiation, alpha rays are thought to be 20 times more dangerous than gamma radiation when in the human body.

Canada is now the biggest producer of uranium in the world, Del Tredici said. It has stopped exporting uranium for bombs, but now exports it for power plants. Edwards added that mine workers in Northern Saskatchewan are still exposed to radiation and the only solution is to warn them. Del Tredici showed a photograph of a small sign at an open pit mine which tracks the low and high levels of radiation for the day depending upon the richness of the ore being excavated.

Edwards said all studies of uranium miners show cancer increased beyond the norm for the population. There is no such thing as a safe level. At lower exposures, fewer men get cancer, but those who get cancer get it just as badly.

“With nuclear technology, you’re always looking into the future,” said Del Tredici. The half-life of uranium is 4.5 billion years. Showing a photograph of grey-white sand at Elliot Lake, Del Tredici said, “You are staring at the future.” When the uranium goes through the mill, the uranium is leached out, leaving side products—radium, thorium—all radioactive, none useful.

Asked if Elliot Lake still looks like that today and if so why it is not cleaned up, Del Tredici said it is expensive to clean up. The area has been covered by a thin layer of water as a short-term solution. It is an unsolved problem with no solution, just like Nuclear Fuel Waste. The producers are leaving it because they do not know what to do with it—they take what they want and throw away the rest. The tailings contain 85 per cent of the radioactivity and, because they are in powder form, they can be seen blowing in the wind. The NWMO does not talk about this because it does not deal with all forms of nuclear waste.

“Now that we have the background, let’s focus on nuclear fuel,” said Del Tredici. He showed a photograph of a CANDU reactor. Uranium generates heat to turn the turbines. “In a short time it boils water, but we have to keep an eye on it for thousands of years,” he said. Edwards added that there are two problems: 200 million tonnes of tailings and

Nuclear Fuel Waste. Fuel coming out of the reactor is millions of times more radioactive than it was when it went in. It is the most radioactive thing on earth. It is a long time before it is approachable and even longer before it is safe. In fact, it is forever dangerous.

Edwards told participants that in 1955, the public and the government were told that nuclear energy was clean, safe, and abundant, so everyone assumed there were no problems. In 1977, the government acknowledged problems in the paper *Management of Canada's Nuclear Waste.* In 1978, the Royal Commission on Electric Power Planning called it a major unsolved problem and recommended stopping production. At that point the nuclear industry realized it had to get the problem out of the way, said Edwards. The nuclear industry said Nuclear Fuel Waste just needed to be put in a safe place, leading to the current process.

Del Tredici displayed a photograph of a freezer full of radioactive reindeer in Swedish Lapland. The accident at Chernobyl caused a cloud of radioactive particles to blow over the world. When it rained in Lapland, the particles were drawn into the lichen, the staple food of the reindeer. "This is what can happen when those particles escape," said Del Tredici. "We have never succeeded in containing anything for long."

Edwards said people think of an accident as something that happens to the machinery, but an accident can happen even after a reactor is shut down. A fire caused the Chernobyl accident. Only three per cent of the material at Chernobyl escaped—the rest is still there and must be guarded.

Del Tredici reviewed the options as set out by the NWMO. He showed a photograph of a wet storage pool before the water was put in. When placed in the wet storage pool, the fuel is radioactive and hot. It will be covered with 14 feet of water and left for 10 years. Edwards explained that the fuel will not cool down when the machine is shut off. There is too much radiating energy. If an accident stops the cooling process, the fuel would spontaneously melt.

Fuel transferred to dry storage it is still radioactive but people can approach the storage containers. Commenting on the photograph of a 70-ton dry storage cask at Pickering, Edwards said the 340 bundles it contains weigh less than 10 tons. Each container has its own cooling system. Without the casks, the fuel would be deadly.

Del Tredici introduced the second option, centralized storage. Edwards said it would involve routine transportation over highways and riverways. The material is heavy to ship and requires its own cooling system.

Turning to the third option, deep geological disposal, Del Tredici showed a photograph of a test facility, one-quarter of a mile underground, near Winnipeg. The Canadian Shield is stable but drilling creates fractures. "No one knows how this would play out over time," he said. Edwards added that when one reads that scientists have addressed all the questions, it does not mean satisfactorily answered. Scientists discovered fracture zones underground where water can travel more freely. In Manitoba they located a spot

between two fracture zones that could be used for storage, but it makes sense to assume that the repository shaft itself would become a possible escape route for toxic material. Scientists do not know how to reconstruct the integrity of the Shield.

Over 15 years, $700 million has been spent to prove that Nuclear Fuel Waste is not a problem. The Seaborn Panel spent ten years reviewing all the scientific research and found that deep geological disposal would not be acceptable to the Canadian public and that safety had not been proven. The Panel recommended the issue be examined from two points of view: the engineer's and society's. For the engineer, the options might be acceptably safe, while society is concerned about the consequences of not knowing about failure until it is too late, as with the Titanic and the Challenger. When scientists design something to be safe, it does not follow that it is. The Seaborn Panel recommended the establishment of a panel with no interest in promoting nuclear power, but the Chrétien government set up the NWMO, a creature of the nuclear industry. Edwards said he had spoken to nuclear scientists and they all say it would be a shame to bury the waste because there is something else they would rather do with it.

Del Tredici pointed out that there is plutonium in all spent fuel. India made its bomb by acquiring an early CANDU reactor for experimentation and extracting plutonium. A paperweight size of plutonium is all that is needed to make a bomb the size of the one dropped on Nagasaki. "When you hear about recycling, that means getting out the plutonium," he cautioned.

Del Tredici said Canada's origins in nuclear technology had to do with plutonium. He showed a photograph of the ZEEP reactor, which was made on the understanding that it would be part of the production of nuclear weapons. Edwards added that Britain, the U.S., and Canada cooperated to produce the first bombs. For many years Canada sold plutonium to the U.S. military to finance research. To correct an earlier impression that Canada had never done reprocessing, Edwards noted that Canada had extracted plutonium at Chalk River, to become part of Britain's first atomic bomb.

Del Tredici told of an area where radioactive waste is dumped into the Irish Sea, now the most contaminated body of water in the world. Reprocessing produces a liquid-acid bath. If Nuclear Fuel Waste were moved to a single centralized storage facility, it would be tempting to try to extract the plutonium, causing security concerns. Edwards added that the 1978 Royal Commission recommended against centralized storage because of the temptations of reprocessing. One year earlier, in 1977, AECL held a seminar for senior civil servants, outlining a plan for a reprocessing site on the Canadian Shield. He said that the NWMO document, if examined carefully, mentions that a centralized storage site would be suitable for reprocessing. A community that chooses to host a storage facility might actually be choosing a reprocessing facility.

Referring to a photograph of storage tanks at a Washington reprocessing plant, Edwards said a few million gallons leaked out and the operators do not know what to do. Asked if the plant had prepared a plan in case of such an accident, Del Tredici said they did not.

Displaying a photograph of some women in Russia, Del Tredici spoke of a community next to a reprocessing plant taking shortcuts in the race to catch up with the U.S. Liquid waste was dumped into a river, which turned black. People got sick, but scientists told doctors not to use the word “radiation” so the illness was termed “vegetative syndrome.”

As a result, the nuclear industry works hard to make sure waste does not escape, said Edwards. The plan is to contain the material forever, but many people do not believe anything man-made can last forever. “Accidents happen,” he said, “and once the damage is done, we can’t go back.”

Del Tredici’s final slide was of a bell at the Peace Park in Hiroshima. An atom is etched on the bell, and people strike it with a log while saying a prayer for peace. “We don’t have to just sit here and listen to the nuclear industry tell us the options,” he said. “There is another option: None of the above.” The industry is planning to double the amount of Nuclear Fuel Waste and none of the three options work if there is going to be more waste created. “You can say, ‘Shut down the industry and then we can talk,’” he suggested.

Questions and Comments

Reconvening after a short break, Edwards stated that the ITK had done a good job of letting people know of the problem; however, if people had known of the problems before the reactors were established, they would have objected. He further stated that Canada can still stop production. Not even politicians were told of the problem at first. When the issue became a public matter, $700 million was spent on it and an environmental assessment panel said it was still a problem. When Blair Seaborn was appointed to the environmental assessment panel he was forbidden to ask whether to continue to produce waste because the Government of Canada was selling nuclear reactors overseas and helping the industry at home. It simply wanted a solution to a public relations problem. Even the Canadian Minister of the Environment was not happy with the government.

Reviewing the options, Edwards asked how on-site storage is a solution when it is the current method. The main advantage of centralized storage is that consolidation is a better way to keep the material safe. But if production continues, this will just add one more site. The New Brunswick and Québec reactors are at the end of their lives and New Brunswick Power and Hydro-Québec are spending $1 billion each in an attempt to keep them operating. There have been no new nuclear reactors in Canada since 1978. The Government of Canada has spent a lot of money supporting the nuclear industry and wants the industry to proceed.

Edwards told participants that the *Nuclear Fuel Waste Act* stated that the NWMO must include a detailed technological description of each approach and specify an economic region. However, it was forbidden to raise the fundamental question. The first NWMO discussion paper is called *Asking the Right Questions* and yet it does not include the question of continuing production. However the NWMO does say it will listen to what

people say. The law says the government must choose one of the options studied by the NWMO. There is something dishonest about this process.

Turning to the third option, deep geological disposal, Edwards said that “disposal” is the wrong word. Humans have never succeeded in disposing of anything. Pointing to a graph that accompanied the 1978 Royal Commission report, he showed participants that the toxicity of nuclear waste decreases for the first several thousand years, but becomes more toxic after 100,000 years. The waste continues to produce new material. Another AECL graph showed that buried material was still hot after 70 years. After 4400 years the heat had spread to the surrounding rock, and after 8800 it had spread even farther. In an environmental impact statement, AECL said the material was still twice as hot after 50,000 years.

Edwards suggested that participants consider whether production should continue and whether to recommend any of the options. Recommending an option might be interpreted as wanting continued production. Other questions are whether the law governing the NWMO should be changed and whether an independent NWMO should be created, with representatives from ordinary citizenry and the Aboriginal population on the board of directors, and with costs still covered by the producers of the waste. Those concerned with the safety of humans—not of industry—could lead the initiative.

At this point some people who had recently arrived were introduced. Some were from a company exploring locally for uranium.

Asked what location he thought the government would decide upon, Edwards said the real question was what to do with the nuclear industry. There is no point in talking about Nuclear Fuel Waste until the government and the industry say they will stop producing it. They will take any vote for one of the three options as a vote of confidence in nuclear power and a mandate from the people.

Krizanc added that, while Edwards was correct in saying that the future of production is not one of the questions the NWMO was mandated to raise, groups have raised it and this has been reported by the NWMO. Based on recent sessions, it is likely that it will go into the NWMO’s final report. “While we don’t have that mandate, our study will report what we have heard,” he said. Gentilly and Point Lepreau are currently under review, and people can become involved in those discussions and Ontario is having the same discussions. There are forums for citizens.

Edwards countered that nuclear production is a federal responsibility and there are no discussions about continuing nuclear production at that level. No government ever ran on a platform of nuclear power. Nuclear power is not a subject of the federal democratic process.

Krizanc added that production has been discussed at the level of federal licensing, while Edwards responded by stating that the licensing bureau would say the question of whether to continue is not its job.

A participant commented that the demand for power increases every year and Ontario has shut down its coal-production plants. He asked how nuclear power compares with other sources of energy. Edwards promised to provide a website where participants could read about a study commissioned by the David Suzuki Foundation on how Canada could phase out nuclear power production. He said it is expensive to continue with nuclear power.

Asked about viable alternatives, Edwards replied that when energy options are listed in terms of production of greenhouse gases, nuclear comes almost last because of the time involved. When Canada tried to push nuclear power as part of the Kyoto Accord, the European countries voted it down. So nuclear power is not part of Canada's Kyoto strategy despite claims to the contrary. The arithmetic does not add up, and many other options reduce greenhouse gases faster than nuclear.

A participant commented that the group was small and could not represent a voice from its region. He said the group will consider the options and respect the presenters' positions. Edwards said his organization was interested in making the available information more comprehensible.

Day 2: February 10, 2005

Discussion of Options and Issues of Concern

Soha Kneen indicated that for the next hour, participants would have the opportunity to ask questions of Drs. Edwards and Del Tredici. The in-camera discussion would follow.

A participant asked if the renewed interest in uranium mining in Nunatsiavut meant the price had risen and if there were 300-year uranium reserves in the area. Edwards said he believed that the price of uranium was higher than it was a few years ago. The uranium reserves would last 300 years at current nuclear power production rates but would be depleted earlier if more reactors were built and used.

The same participant asked if Canada exports uranium for medical uses. Edwards noted that almost all of the uranium is destined for nuclear reactors, with only a small amount used for research reactors, the production of radioisotopes, and other uses. While Canada is a leader in medical isotopes, especially in Cobalt 60 used in radiation therapy devices, radioisotopes can be made without the use of uranium, in processes that involve substances like cyclotrons.

The participant asked if the only two uses for uranium are electricity and bombs. Edwards agreed, noting the existence of nuclear military reactors outside of Canada that only produce plutonium for weapons production. He summarized: uranium is used for research reactors, isotope production, military reactors, and power production. In response to the participant's query, Edwards said nuclear submarines have small reactors operating with highly enriched uranium.

Del Tredici clarified a point made about radioisotopes found in human bones. Natural isotopes exist and some, such as carbon 14, are used to age bones. These natural isotopes were used long before nuclear power and are distinctly different from the radioactive elements that are the fission products of uranium.

Another participant asked how long it took to contaminate the Irish Sea. Edwards explained that the contamination came from a uranium reprocessing plant in Northern England. During the Second World War, the British Government aspired to nuclear weapons production and Canada supplied the uranium. Reprocessing involves the dissolution of irradiated fuel in acid, leaving highly radioactive liquid waste, which, in England's case, was dumped in the Irish Sea via a long waste pipeline. Contrary to what scientists predicted, the waste washed up on shore, resulting in plutonium contamination. Clearly, scientific prediction has its limitations. "The difficulty with science is that it is not that powerful and advanced," Edwards said. Scientists are used to working in laboratories but not in natural complex systems.

Asked about continued monitoring for contamination in the Irish Sea, Del Tredici said there is no specific program. The negative health effects of radioactive contamination are often picked up in other ways. He gave the example of a Hiroshima bomb survivor living

in Northern England whose routine medical exam noted a significant jump in his strontium 90 levels. Edwards added that it is usually people outside the nuclear industry, such as doctors and dentists, who report the biological effects of radiation. Del Tredici spoke of the "barefoot epidemiologists," the concerned citizens who sense that something is wrong and gather information from their neighbours.

The same participant asked about radiation levels in sea life of the Irish Sea. Del Tredici said sea life is probably contaminated but radioactivity has been concentrated in seaweed. "This technology is full of surprises," he said. Asked about continuous monitoring of the effects of radiation on biological life, Edwards said industry only monitors when required by law.

One group member suggested that policies should be implemented that require companies to conduct monitoring prior to doing business. Edwards concurred, noting the Seaborn Panel's recommendation for the NWMO to be independent of nuclear power companies. This recommendation was not followed because the Government of Canada had already spent $17 billion on this industry and wanted the industry to continue. The Canadian Coalition for Nuclear Responsibility was founded in order to provide Canadians with more information than either the government or the companies are willing to provide on nuclear power and its resultant waste.

Asked for an explanation of one his photos, Del Tredici said the photographed woman "was swearing bloody murder" in a public meeting held after the Three Mile Island accident. The nuclear industry suggested to the community that slow venting into the atmosphere was the best option to eliminate the radioactive crypton gas from the damaged reactor. The woman at the meeting argued that what the industry called a clean-up of the reactor was the contamination of the environment.

Del Tredici noted that studies conducted by the nuclear industry into the health effects of radiation do not generally find a causal link between the two. A participant remarked that one does not hear much about this issue in the media. Edwards said for industry, no news is good news. The commendable NWMO dialogues with Canadians risk backfiring as the knowledge people gain leads them to ask difficult questions. Del Tredici noted that the NWMO representative said Nuclear Fuel Waste would have to be repackaged every 300 years but did not say how many 300-year cycles would be necessary.

Another participant asked if young people were interested in this issue. Edwards said an increasing number of scientifically trained young people feel a responsibility to demystify science, as he does himself. Del Tredici added that the average citizen also plays a key role in demystifying science as the holder of valuable local information.

The same participant thanked Edwards and Del Tredici for bringing the negative side of an issue to their community, noting they generally only hear the positive aspects from companies. Edwards suggested the Government of Canada should have a national inquiry on this issue and lay everything on the table. No one should blindly believe any point of view; questions should be asked in order to have a basis for decision-making.

Draft Recommendations and Comments

Kneen read a draft preamble clarifying that the current meeting was not a consultation. One participant suggested the wording should be stronger. As a result, Kneen changed this part of the preamble to *this is not recognized as a consultation process by those at this meeting.* After further discussion, this statement was modified to read: *It was formally stated by the participants of this meeting that this meeting was not recognized as a consultation*. Kneen said she would strengthen this statement in the final draft.

Another participant commented on the inadequate representation of the region at the meeting. Kneen replied that while many more people were invited, not all could attend. She asked if this comment was meant specifically for this meeting or if it applied more generally. The group agreed that a consultation should involve greater representation and go to all communities in Nunatsiavut. Kneen reflected this point in the draft document and added that *more funding should have been allocated in order to conduct what would be considered full community consultations*.

Kneen was asked to add that the current meeting was seen as an information session rather than a consultation. One participant asked if similar meetings have occurred with First Nations and Métis communities. Kneen noted that they had and similarly, they did not call the meetings consultations.

Several participants suggested the following points be included in the document:

- Nuclear waste production should be stopped until ways are found to reduce the toxicity of the waste.
- If waste production is continued, storage space will be used up.
- “We don’t want Nuclear Fuel Waste to be stored in Nunatsiavut, period!”
- There should be more emphasis on different means of generating electricity.

Another participant recommended that the waste should neither be stored in Nunatsiavut nor the rest of Canada. Noting that the waste has to be stored somewhere, Kneen suggested the group return later to this point. Several more comments came out of the discussion that ensued:

- More education is required on this issue, especially for younger generations.
- Canada should have the option of cancelling nuclear energy programs.
- All three Nuclear Fuel Waste options are extremely dangerous and more emphasis should be placed on safety.
- “We have to protect our industry and resources, our way of life—forestry and fisheries.”
- “Stop calling nuclear energy ‘clean’.”

After rephrasing these ideas in the draft document, Kneen reminded the group of its earlier concern with health monitoring. She added another comment: *The Nuclear industry should be required to conduct studies using external experts into what effects radiation has on human health and environment when exposure occurs*.

One participant asked if the points made so far are being called recommendations or comments. Kneen stated that she was referring to the points as comments until told otherwise by the group. Given that this meeting is not a consultation and leaves something to be desired in terms of representation, the same participant stated: "This body doesn't have the voice to give recommendations." Furthermore, uranium mining is a possibility in Nunatsiavut. "We can't assume that everyone is anti-nuclear," he said.

Another group member indicated her discomfort in making comments on behalf of LIA. Learning that points made at this meeting will not be strong recommendations, she felt encouraged to comment freely.

The group discussed stopping all nuclear power generation and the first step of stopping uranium mining.

"We should not be telling people in Ontario what to do, given that we in Nunatsiavut don't like being told what to do by others," a participant said. The Ontario population should be engaged in this dialogue just as Inuit are now. When they have information in-hand, Ontarians can make their own decision. The group agreed with this point. A participant noted that most of the group did not appreciate being told by Dr. Edwards which recommendations to make. Kneen assured the group that that comment came out of over-exuberance on the topic and was not intended to be patronizing.

One group member suggested that the Lands Claims Agreement means that Nuclear Fuel Waste could be stored in the territory. "We are considered part of Canada," he explained. The group revisited the point of not storing the waste anywhere in Canada. The following points arose from an attempt to determine where else the waste could be stored:

- Experts should focus their attention and their information session on the areas where the Nuclear Fuel Waste is currently being stored.
- Nuclear Fuel Waste should be stored where it is now, so no one will forget about it.
- The transportation issue is a major problem.
- The Government of Canada should pass a bill through the House of Commons that declares the Arctic a Nuclear-Free Zone.

The latter point was amended to include those lands that are recognized as Inuit homelands to address the fact that some of Labrador is south of 60^{o} and to include water as well as land.

Kneen read the comments back to the group, condensing those that were similar. Comments referring to Nuclear Fuel Waste being left onsite were grouped with the comment that *none of the options are considered safe*. Kneen added *but for the time*

being this seems the only option available and the comment on *the risks with transportation*. She made a note to add a comment on land use.

Further discussion among group members resulted in other points:

- Nuclear Fuel Waste is so dangerous that producers and consumers should be equally responsible for it. This would apply similarly with uranium mining waste—it would be irresponsible to send it South when Northerners have benefited from the jobs.
- "We have already seen enough damage to the environment; we don't want to add anymore."
- With all the billions spent on the Nuclear Industry, should there not exist a safer way to deal with the waste?
- "Could we ask the Government of Canada and Nuclear Power Producers to put resources into finding other ways to get rid of Nuclear Fuel Waste?"
- The NWMO should be independent of industry.

Kneen asked how to balance these points with earlier comments of stopping the production of nuclear power and its associated Nuclear Fuel Waste. Stopping nuclear power also has implications for potential uranium mining in the Labrador region. She asked the group if the comments relating to stopping nuclear power production should be deleted. The group agreed that these earlier comments would be dropped.

One participant stated that he found it difficult to make a decision on the long-term management of Nuclear Fuel Waste when he had no way to compare nuclear power production with other forms of power generation, their benefits, and their negative environmental effects. One cannot simply suggest removing 35% of Ontario's power production without offering good alternatives. Kneen added the first point as a comment, noting that dialogues in the South have only been conducted by the NWMO without the benefit of information from outside experts. "In the ITK dialogues we are presenting the whole picture," she said.

Discussion ensued about whether there was disagreement within the group. "I am not sure this is disagreement just because there are a few anti-nukes here; there is just not enough information to convince me," said one participant. The group agreed to call this a lack of consensus rather than disagreement. Kneen added the point to the draft document as a divider between the two sets of comments.

The group added the following comments:

- The pros and cons with respect to health and safety need to be placed before power production.
- "Whether or not we agree on this issue, the industry should have an opportunity to come into communities to explain why it is producing nuclear power." Industry should also provide information on the potential future consequences.

To the latter point Kneen added *via a consultation process to provide their points of view*.

She asked if the group wanted to comment on the possibility of uranium mining. Participants stated that their reason for deleting comments about stopping nuclear power production had little to do with uranium mining. “Don’t get the two mixed up; uranium mining is another issue that will be dealt with down the road,” one participant explained.

Reading the comments back to participants, Kneen replaced *elimination of production of Nuclear Fuel Waste* with of *production of Nuclear Fuel Waste* to reflect the group’s hope that a means to eliminate the waste will be found in the future. She modified the comment on Canada-wide consultations to reflect the group’s belief that it should be an educational process as opposed to the current dialogues. Kneen asked if participants were satisfied with the last comment: *more Inuit are becoming educated about and aware of the hazards of Nuclear Fuel Waste*. It was suggested that this be moved to the beginning of a previous comment and be reworded to *starting to become more educated*.

One participant asked if the Nuclear Fuel Waste issue had ever been part of a provincial election campaign. Kneen noted that politicians stay away from the issue, adding that the dialogue process itself is random with only selected people invited. “It is not an open process, with the majority of Canadians still unaware of the issue,” she said. The same participant concluded that most people probably think nuclear fuel is only dangerous in the reactors, likening it to a used battery.

The morning discussion ended with a draft document, with the understanding that the comments distinguishing this meeting from a consultation would be strengthened.

Review of Comments and Closing Remarks

When the meeting reconvened after lunch, the group had agreed to change the title of the draft document to “Draft Comments.”

Kneen explained that the interpreter ITK had booked for the session had not shown up and apologized for the resulting lack of interpretation at this meeting. She further asked what procedure participants would like to follow as they reviewed the document they had put together in the morning. They agreed that she should read it aloud, which she did.

In the first paragraph under *Final Comment*, a participant suggested that the word “Ontario” be changed to Canada. This was the only substantive change. The document now read as follows:

Preamble:

These recommendations are provided with the understanding that they are informal submissions resulting from a regional Inuit dialogue, which took place in Makkovik, Nunatsiavut (Labrador) on February 9–10, 2005.

It was formally stated by the participants of this meeting that it is not recognized as a consultation process, but as an information session. The reasoning for this is that not enough time and funding was allocated to conduct a formal consultation that would be effective, meaningful, and culturally appropriate. Section 12(7) of the Nuclear Fuel Waste Act states that they shall consult the general public and in particular Aboriginal (Inuit, First Nations, Métis) people. The meeting that has taken place over the past couple of days cannot be considered a consultation under this act.

In order for this to be considered a consultation, more time and funding should have been allocated in order to conduct full community consultations in each community in Nunatsiavut.

Some present also stated that it would be very difficult to have recommendations resulting from this dialogue, as there are not enough people present from the region to have a valid set of recommendations as a result. It is not representative.

Comments:

- All present were in opposition to the storage/disposal of Nuclear Fuel Waste in Nunatsiavut and the Canadian Arctic;
- Nuclear Fuel Waste should remain on-site as opposed to moving it into an unpopulated or remote area.
- All present came to agreement that all three of the nuclear waste management options are extremely dangerous (list options here). More emphasis should be placed on safety and elimination Nuclear Fuel Waste; however, for the time being this seems the only option available;
- Participants were concerned about the possible risks involved during transport;
- The Government of Canada should in the House of Commons declare that the Arctic is a Nuclear Free Zone; Inuit in Nunatsiavut will be encouraged to contact their MPs to raise the issue in Parliament;
- In addition any lands recognized as Inuit home lands should be included as a Nuclear Free Zone;
- Landuse/use of sea or other environs should be included in a point here!!!
- Statement emerged that both the producers and the consumers should be responsible for the safe storage/disposal of nuclear fuel waste;
- Problems with contaminants already in the system—don't want to add any more;
- Ask the Government of Canada and the producers of waste to put a lot more funding into finding ways of getting rid of the Nuclear Fuel Waste;
- The government should look into the development of alternative energy options;

- More education needs to take place in general as well as within the public school system on the issue of nuclear power and the resulting Nuclear Fuel Waste;
- Need to protect already existing industry and resources that are already present (land, water, animals, environment);
- Those present agreed that the Government should stop calling nuclear energy a clean energy as it results in the production of Nuclear Fuel Waste;
- The nuclear industry should be required to conduct studies using external experts in order to conduct scientific studies into what effects radiation has on human health and the environment when exposure occurs;
- The NWMO should be an independent body—and not led by industry (as outlined by the Seaborn Panel);
- For amount of nuclear waste produced and the amount of electricity produced—what levels/amounts of energy are produced by the use of other energy sources (use of fossil fuel, etc.)—also questioned safety of these approaches (incl. emissions and pollution as a result); comparison studies need to be presented to the public.

Around this table there wasn't consensus as some felt that the nuclear industry should be shut down, whereas others did not feel this way. Their comments were as follows:

- Nuclear Industry should be shut down and should put more emphasis on the Canadian Government and industry to get rid of the tailings and waste;
- Health and safety should be considered before production;
- It was stated that representatives of the nuclear industry should be brought into communities via consultation process, to provide their points of view on this subject.

Final comment:

Inuit are starting to become educated about and aware of the hazards of nuclear waste. However, Inuit would like every community in Canada (with a special focus on Ontario—or on those who use electricity generated by nuclear power) to make a decision for themselves in terms of whether or not to continue with nuclear power; don't want to tell others what to do within their territory. A national education program and full consultations across Canada should take place as opposed to the current dialogue process.

A participant asked about the country-wide information sessions mentioned in the NWMO document *Understanding the Choices*. Kneen said these were not open sessions but rather involved just a few communities and participants selected by the NWMO. The participant suggested this process might seem to be a "fix." Kneen said that statement would not be included.

Akeeagok, who was not present during the initial discussion of the Draft Comments, asked participants if they would like to include something about lobbying Members of Parliament (MPs). He asked if they thought lobbying would help reduce the possibility of Nuclear Fuel Waste being dumped in Nunatsiavut. A participant suggested the point be included with the earlier comment about MPs being contacted to declare the Arctic a nuclear-free zone. Akeeagok suggested MPs could influence the Minister of Natural

Resources in his decision about the disposal of Nuclear Fuel Waste. Kneen stated that this point could be added to the document, but that the recommendations or comments produced in this meeting and the calling of MPs would be separate processes. Akeeagok elaborated by stating that the LIA could lobby MPs. A participant suggested that the educational part could be done through politicians during the spring by-election.

Kneen asked participants if they were ready for her to take the document for revision and send it back to them the next week. She outlined the time frame leading up to the ITK Board of Directors meeting in March where the full report would be considered. This document will be an appendix to the larger report, since there is no single Inuit position. She said she would e-mail the document to participants.

On behalf of the town of Makkovik and the LIA, participants thanked ITK for the process, which they called interesting, educational, and informative.

A participant said he still had his copy of the TIME magazine story of Three Mile Island. There has not been much advancement in terms of health and safety since then. It is good that ITK is examining this issue on behalf of Inuit, who are a small group of people in a large amount of land and might have other Canadians forcing things on them.

Kneen asked participants to send her sections of their land claim that might have bearing on the Nuclear Fuel Waste issue.

A participant commented that this was the first time he had met real “anti-nuke” people.

Kneen gave details of the three meetings that would take place in Ottawa in the week of March 7.

Just as the meeting was adjourning, Ted Andersen arrived. He expressed his interest in radiation-related issues and was given information by ITK and several other participants.

Appendix E (ITK Reviews of DD #1 and DD#2):

Discussion Document # 1: Asking the Right Questions?

Comments prepared by:

Inuit Tapiriit Kanatami

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INUIT TAPIRIIT KANATAMI

March 2005

Introduction

Inuit Tapiriit Kanatami represents Canada's Inuit on matters of national concern. There are approximately 50,000 Inuit living in 53 communities. The Inuit territory of Canada is divided into four main regions: The Nunavut region (further divided into the Kitikmeot, Kivalliq and Qikiqtaaluk regions), the Inuvialuit region (the western Arctic), Nunavut (northern Quebec) and Nunatsiavut (Labrador).

ITK is the national voice of the Inuit of Canada and addresses issues of vital importance to the preservation of Inuit identity, culture and way of life. One of the most important responsibilities of ITK is to promote Inuit rights and to ensure that Inuit are properly informed about issues and events that affect their lives, and that processes purporting to address Inuit interests are properly informed by Inuit knowledge, perspectives and vision.

The ITK Department of Environment has the responsibility of protecting and advancing the place of Canada's Inuit in the use and management of the Arctic environment. It acts on this responsibility in close cooperation with Inuit regional organizations.

ITK's comments on NWMO's Discussion Paper #1 are intended as a supplement to the on-going dialogue with Inuit that has been initiated on the long-term management of nuclear fuel waste in Canada.

Background

Canada's Inuit have a long history of exposure to radionuclides. This history is thoroughly documented in the Canadian Arctic Contaminants Assessment Reports (I & II). Historically, anthropogenic radionuclides in the Canadian north originated from atmospheric testing of nuclear and thermonuclear weapons between 1955 and 1963 and the radioactive fallout from the Chernobyl accident in 1986.

Cesium levels in Arctic biota have generally declined since 1963 and fallout from Chernobyl has imbedded itself in soil and lake sediment. Other possible, yet small, sources include the burning-up of nuclear powered satellites upon re-entry to the atmosphere, discharges from nuclear power plants and reprocessing plants, and nuclear waste dumping directly into the Arctic Ocean. The impact of ocean disposal remains unmeasured.[1]

A large portion of the homeland of Canada's Inuit is situated in the Canadian Shield. As a backdrop to ITK's comments is the concern that location, remoteness of communities and small populations, make Inuit and their lands vulnerable as a choice for the siting of nuclear waste disposal facilities. Canada's north is also experiencing a mining boom and

[1] Chris M. Furgal and Robbie Keith, Canadian Arctic Contaminants Assessment Report: Overview and Summary, Northern Perspectives V25 no.2, Winter 1998.

a renewed interest in exploring and developing the north's mineral potential, including uranium, increasing the overall sense of vulnerability.

The preliminary results from the Inuit Dialogues draw attention to a fundamental difference in approach to nuclear issues generally – one that has its origins in mandate of the NWMO. ITK understands that the NWMO was not instructed to take a position on the future role of nuclear energy in Canada, but rather to examine options for managing existing and future waste.

However, when seeking to involve and better understand the views of Inuit in this process it is important to know that representatives of the Inuit regions to the Dialogues share the common position that the ultimate goal of any nuclear debate in Canada should be focused on reduction and eventual elimination. Further they agree that Canada's northern region should not be an option for any form of nuclear waste facility, transport or production. Indeed, the Board of Directors of Nunavut Tunngavik Incorporated, the organization created pursuant to the 1993 Nunavut Land Claims Agreement to represent all Inuit beneficiaries in Nunavut, adopted a resolution in 1997 stating its objection to any storage of nuclear or other hazardous materials in the arctic.[2] ITK has verified that this resolution continues to stand today.

Further, as early as 1977, the Inuit Circumpolar Conference, an organization representing Inuit of the circumpolar region, adopted a resolution concerning peaceful and safe uses of the Arctic Circumpolar Zone, including a prohibition on the disposition of any type of nuclear waste.[3]

Asking the Right Questions?

ITK has thought long and carefully about how the role of Aboriginal peoples in the NWMO process has been characterized and constructed. This is the starting point for understanding if the right questions have been asked, from an Inuit perspective. The *Nuclear Fuel Waste Act* requires that Aboriginal peoples be consulted in the process for establishing a long-term approach for the management of used nuclear fuel. The NWMO has further refined this instruction by seeking to consider the traditional knowledge and understanding of Aboriginal peoples.

In developing the ten questions set out in this Discussion Paper, the NWMO sought the views of Canadians through a variety of techniques. These included:

- **Early Conversations**: We note that the Far North was explicitly excluded from the consultation effort (see report on Discussion Findings, January 2003)

- **Envisioning the Future**: No Inuit involvement in the Scenarios Team. Report by the

[2] Nunavut Tunngavik Inc., Resolution No. B97/08-24, Arviat
[3] Inuit Circumpolar Conference, Resolution 77-11

Global Business Network, November 2003 (we note First Nation involvement)

- **Exploring Concepts**: No Inuit involvement?

- **Alternative Perspectives**: A traditional knowledge workshop was held in September 2003 with Inuit involvement. The purpose of the workshop was to provide Aboriginal peoples with an opportunity to participate in developing guidelines for the management of nuclear waste in Canada.

From ITK's perspective, one of the most important discussions during the Traditional Knowledge Workshop led to the statement: "Recognize that a people's 'world view' can determine sustainable use or environmental degradation'." (pg.9)

Given this, ITK was pleased to see Q-3 as an overarching question. By this, ITK assumes that Inuit (and other aboriginal) perspectives and insights will be sought and will inform consideration of the social, environmental, economic and technical aspects. Having said this, ITK is concerned by the absence of a specific reference to knowledge and information in the question itself. Inuit have far more to offer the process than simply their 'perspectives' and 'insights'. Inuit have detailed information, broad knowledge, and understanding of northern ecosystems. If ever, storage in Canada's northern regions were considered, Inuit would have to be directly involved in assessing the viability of such an option.

ITK does have some concern, however, that Inuit (and other Aboriginal peoples) may be 'compartmentalized' by having identified a separate question attempting to create inclusion. Ideally, one would equally read in 'aboriginal' in all of the other questions. From ITK's perspective, when exploring the other questions, efforts must be made to involve Inuit.

Next, from the perspective of establishing an appropriate context for involving Inuit, the NWMO should also make explicit in this Discussion Paper (and others) that all of the Inuit regions in Canada are covered by land claims agreements protected by Section 35 of the *Constitution Act, 1982*. Each of these agreements set out the rights of Inuit, rules for accessing lands owned by Inuit and the powers and authorities of management institutions for lands, waters and wildlife. Any decision-making process contemplated by the NWMO for these regions must take into account the particularities of each land claim agreement. These agreements are:

1975	The James Bay and Northern Quebec Agreement (Inuit of Nunavik)[4]
1984	The Inuvialuit Final Agreement
1993	The Nunavut Land Claims Agreement
2004	The Labrador Inuit Land Claims Agreement

[4] Negotiations are currently underway to recognize and affirm Nunavik Inuit rights in the offshore areas of Quebec and Labrador and in northern Labrador.

Inuit are not a special interest group. They are the owners of very large tracts of northern lands and are an Aboriginal people with constitutionally protected treaty rights. This sets up a series of requirements and obligations for involvement that go beyond the principles of good public policy.

Finally, very legitimately and importantly, the NWMO is situating its work in the context of other international processes. The rights, roles and authorities of indigenous peoples are also very much part of international processes. For the Inuit of Canada, this has special significance as they have actively participated in various international processes that have application to setting standards how northern lands and resources are used and developed. Of particular note is the work of the Inuit Circumpolar Conference, the Arctic Environmental Protection Strategy, the Arctic Council and the Northern Dimension of Canada's Foreign Policy. ITK urges that the NWMO consider these processes, and the role that Inuit play in each, as it moves forward.

Discussion Document # 2: Understanding the Choices

Comments prepared by:

Inuit Tapiriit Kanatami

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INUIT TAPIRIIT KANATAMI

March 2005

Introduction

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The ITK Department of Environment has the responsibility of protecting and advancing the place of Canada's Inuit in the use and management of the Arctic environment. It acts on this responsibility in close cooperation with Inuit regional organizations.

ITK's comments on NWMO's Discussion Paper #2 are intended as a supplement to the on-going dialogue with Inuit that has been initiated on the long-term management of nuclear fuel waste in Canada. In commenting on Discussion Paper # 2 it is also important to note that, at this time, ITK is not purporting to present the Inuit view point on the process set out to select the assessment methodology nor its application to the disposal options. ITK is facilitating the Inuit Dialogues, but cannot report on behalf of the Inuit regions in advance of the final results from this process. These comments, therefore, are necessarily limited to the implications of the NWMO having proceeded to the stage of selecting and applying a methodology in the absence of more detailed Inuit input.

Background

Canada's Inuit have a long history of exposure to radionuclides. This history is thoroughly documented in the Canadian Arctic Contaminants Assessment Reports (I & II). Historically, anthropogenic radionuclides in the Canadian north originated from atmospheric testing of nuclear and thermonuclear weapons between 1955 and 1963 and the radioactive fallout from the Chernobyl accident in 1986. Cesium levels in Arctic biota have generally declined since 1963 and fallout from Chernobyl has imbedded itself in soil and lake sediment. Other possible, yet small, sources include the burning-up of nuclear powered satellites upon re-entry to the atmosphere, discharges from nuclear power plants and reprocessing plants, and nuclear waste dumping directly into the Arctic Ocean. The impact of ocean disposal remains unmeasured.[5]

[5] Chris M. Furgal and Robbie Keith, Canadian Arctic Contaminants Assessment Report: Overview and Summary, Northern Perspectives V25 no.2, Winter 1998.

A large portion of the homeland of Canada's Inuit is part of the Canadian Shield. As a backdrop to ITK's comments is the concern that location, remoteness of communities and small populations, make Inuit and their lands vulnerable as a choice for the siting of nuclear waste disposal facilities. Canada's north is also experiencing a mining boom and a renewed interest in exploring and developing the north's mineral potential, including uranium, increasing the overall sense of vulnerability.

The preliminary results from the Inuit dialogues draw attention to a fundamental difference in approach to nuclear issues generally – one that has its origins in mandate of the NWMO. ITK understands that the NWMO was not instructed to take a position on the future role of nuclear energy in Canada, but rather to examine options for managing existing and future waste.

However, when seeking to involve and better understand the views of Inuit in this process it is important to know that representatives of the Inuit regions to the Dialogues share the common position that the ultimate goal of any nuclear debate in Canada should be focused on reduction and eventual elimination. Further they agree that Canada's northern region should not be an option for any form of nuclear waste facility, transport or production. Indeed, the Board of Directors of Nunavut Tunngavik Incorporated, the organization created pursuant to the 1993 Nunavut Land Claims Agreement to represent all Inuit beneficiaries in Nunavut, adopted a resolution in 1997 stating its objection to any storage of nuclear or other hazardous materials in the arctic.[6] ITK has verified that this resolution continues to stand today.

Further, as early as 1977, the Inuit Circumpolar Conference, an organization representing Inuit of the circumpolar region, adopted a resolution concerning peaceful and safe uses of the Arctic Circumpolar Zone, including a prohibition on the disposition of any type of nuclear waste.[7]

It is also important to recall, as was discussed in ITK's comments on Discussion Document # 1, that all the Inuit regions are now governed by constitutionally protected land claims. The subject of 'consultation' is an important feature of these treaties. Consultation with Inuit (and other Aboriginal peoples) has been litigated in Canada and legal jurisprudence now exists. We make this point because a very large portion of Canada's Arctic region is covered by Inuit land claims, including large tracts of land owned by Inuit. These treaties create legal obligations and processes that must be respected.

For example, in the Labrador Inuit Land Claims Agreement, the most recent of Inuit treaties, consult is a defined term:

"Consult" means to provide:

[6] Nunavut Tunngavik Inc., Resolution No. B97/08-24, Arviat
[7] Inuit Circumpolar Conference, Resolution 77-11

(a) to the Person being consulted, notice of a matter to be decided in sufficient form and detail to allow that Person to prepare its views on the matter;
(b) a reasonable period of time in which the Person being consulted may prepare its views on the matter, and an opportunity to present its views to the Person obliged to consults; and
(c) full and fair consideration by the Person obliged to consult of any views presented.[8]

Understanding the Choices

In reviewing Discussion Document # 2, as well as the Assessment Team's report, ITK is particularly concerned that the NWMO process is moving forward ahead of the parallel process established to engage Inuit.

While the *Nuclear Fuel Waste Act* sets out a requirement for the NWMO to consult separately with Aboriginal peoples, there remains the question of how the results of these consultations are being incorporated into the broader values being assigned by NWMO to Canadians at large. Discussion Document # 2 sets out six core values, drawn from the National Citizens' Dialogue, that direct the long-term management of used nuclear fuel.

- **Responsibility** – we need to live up to our responsibilities and deal with the problems we create

- **Adaptability** – continuous improvement based on new knowledge

- **Stewardship** – we have a duty to use all resources with care, leaving a sound legacy for future generations

- **Accountability and Transparency** – to rebuild trust

- **Knowledge** – a public good for better decisions now and in the future

- **Inclusion** – the best decisions reflect broad engagement and many perspectives; we all have a role to play

The preliminary results of the dialogues with Aboriginal peoples, however, appear to be limited to how traditional knowledge will be included in the development of a long term management approach and to be "responsive to their emphasis on planning within very long time horizons". There is further engagement that "to the extent that the NWMO is able, these principles [of Aboriginal Traditional Knowledge] will be carried forward as part of the values foundations on which the study will proceed". These are set as:

[8] Labrador Inuit Land Claims Agreement, initialled on August 29th, 2005 by the Inuit, the Government of Canada and the Government of Newfoundland and Labrador, signifying their intent to recommend this agreement for ratification.

- **Honour**: the wisdom that can be garnered from speaking to elders in both the aboriginal and non-aboriginal communities

- **Respec**t: the opinions and suggestions of all who take the time to provide insight into this process

- **Conservation**: particularly as it applies to the consumption of electricity, must be a major part of the solution, not just a footnote in the NWMO process

- **Transparency**: is essential to the process when NWMO (the producer of the problem) has to suggest the solution

- **Accountability**: must be part of the fabric of any solution so that those responsible (whether for the concept or the delivery) are held to high account by the public for their actions, given the nature of the problem.

As discussed in ITK's comments on Discussion Document # 1, there is a risk of isolating Inuit and their values from mainstream Canadian values. This identified risk appears now to have evolved into reality. Discussion Document # 2 makes it clear that the six core values articulated through the National Citizens' Dialogue, (where recall there was no Inuit involvement) will direct the long-term management of used nuclear fuel.

ITK is currently facilitating Inuit-specific Dialogues and a final report will soon be available. Through this process, Inuit are developing their own policy framework for addressing the management of nuclear fuel waste. It is essential that the NWMO await the results of this process before committing to an option.

Discussion Paper # 2 goes on then to describe the development of a methodology for assessing the various disposal methods based on a set of criteria constructed in the absence of results from the Inuit (and other Aboriginal) Dialogues. It would appear that the NWMO process is moving faster than the parallel processes established for Aboriginal peoples. Nowhere in Discussion Document # 2 is it made clear if and then how these processes will converge.

The Assessment Team that was assembled to select and apply a methodology for rating the selected options did not include any Inuit representation. Nor from our reading of the "Assessing the Options: Future Management of Used Nuclear Fuel in Canada" were Inuit referred to other than acknowledging that they, as Aboriginal peoples, have a particular role to play in setting establishing public acceptance by providing input into the decision-making process.

From ITK's perspective, it is important to note the following statements in the Assessment Report, as this report formed the basis for the views presented in Discussion Document #2:

> *A key characteristic of multi-attribute utility analysis [the selected methodology] is its emphasis on the judgments of the decision-making team that the analysis is intended to serve. This is sometimes interpreted as a weakness, in the sense that applications may appear overly subjective. (pg.21)*
>
> *To take advantage of all inputs as the foundation for its work, the Assessment Team developed a synthesis of Canadian values drawing from all available inputs including early insights from the Dialogue and the Roundtable on Ethics. (pg.64)*

These clarifications on the foundations for the Assessment Report compound our concern over the timing of the parallel processes and if there can be a serious opportunity for the results of the Inuit-specific Dialogues to meaningfully influence the decision-making process.

Later in the Assessment Report, the Objectives Hierarchy developed by the Assessment Team is plotted against the original ten questions from Discussion Document #1. The Assessment Team concluded that Question 3 concerning Aboriginal Values was a generic question that would inform all the objectives. While this is laudable, once again, we are concerned about timing. The only input that the Assessment Team had to work with was the report on the Traditional Knowledge Workshop. While this is a valuable product, from ITK's perspective it cannot be considered as capturing the full scope for how Inuit should be involved in the decision-making process.

We move on in the Assessment Report to Section 5.6 where the eight objectives are described in more detail. We note with some alarm a statement in Objective 4: Community Well-being:

> *… Many groups may feel that their shared interests are affected regardless of whether they live physically close to used nuclear fuel management facilities. Depending on the sites that eventually are proposed for consideration, Canada's Aboriginal peoples may have a particularly significant stake… (pg.71)*

As reported in ITK's comments on Discussion Document # 1, Inuit have made it clear they do not want to see nuclear waste disposal facilities in their regions.

The Assessment Report then goes on to describe, in detail, how the assessment methodology was applied and summarizes the results.

> *Within the limits of the analysis, not only did the deep geological repository generally score better than the other alternatives, but it also generally scored at a level that suggests it will perform well in meeting the eight objectives not only in comparison to the others but also on its own merits, particularly over the long term. The favourable results for the*

> *deep geological repository derive largely from advantages realized over the long time period during which any management approach must perform. (pg.105)*

Finally, the Assessment Report sets out an implementation scenario "in the event that the Government of Canada agrees with and accepts the deep geological repository as the preferred technical approach."

Our intent in highlighting the Assessment Report is not to critique the report itself. We leave that to others with expertise in assessment and valuation methodologies. Our point is that a group of credible experts was established as an Assessment Team to select and apply an assessment methodology to the three disposal options without the benefit of any formal Inuit input other than ITK's participation in the Traditional Knowledge Workshop.

Discussion Document #2 then goes on to say that the Assessment Team "agreed that the geological repository would create the least adverse community impact. No significant long-term operations are required under a geological repository, <u>making it likely that the facility would be largely forgotten in the long term</u>. (emphasis added). From an Inuit perspective, this is a huge value judgment indicating an absence of sensitivity and understanding for how Inuit value their lands and environment.

Discussion Document #2 then acknowledges that …

> *"While the importance of factoring in and addressing the concerns of Aboriginal peoples is recognized in general, and specifically concerning [community well-being], the Assessment Team did not feel capable of anticipating the perspectives of Aboriginal peoples. The perspective of Aboriginal peoples will need to be understood and brought into the assessment in regard to assessment the methods on community well-being, as well as on each of the other objectives identified in this assessment". (pg.64)*

The question remains: When and how?

ITK has worked very efficiently, given the shortened timeframe for the Inuit Dialogues. In conducting the Inuit-specific Dialogues, ITK is operating under the assumption that the results will be timely and able to influence adjustments to the framework developed by the Assessment Team. ITK seeks assurance from the NWMO that this will be the case. Otherwise, the commitment to involving Inuit will become a sidebar to decisions already taken.