

NWMO Citizen Panels Report, Phase II: Panel Eight

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Navigator Ltd.

nwmo

NUCLEAR WASTE
MANAGEMENT
ORGANIZATION

SOCIÉTÉ DE GESTION
DES DÉCHETS
NUCLÉAIRES



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Nuclear Waste Management Organization

The Nuclear Waste Management Organization (NWMO) was established in 2002 by Ontario Power Generation Inc., Hydro- Québec and New Brunswick Power Corporation in accordance with the *Nuclear Fuel Waste Act (NFWA)* to assume responsibility for the long-term management of Canada's used nuclear fuel.

NWMO's first mandate was to study options for the long-term management of used nuclear fuel. On June 14, 2007, the Government of Canada selected the NWMO's recommendation for Adaptive Phased Management (APM). The NWMO now has the mandate to implement the Government's decision.

Technically, Adaptive Phased Management (APM) has as its end-point the isolation and containment of used nuclear fuel in a deep repository constructed in a suitable rock formation. Collaboration, continuous learning and adaptability will underpin our implementation of the plan which will unfold over many decades, subject to extensive oversight and regulatory approvals.

NWMO Social Research

The objective of the social research program is to assist the NWMO, and interested citizens and organizations, in exploring and understanding the social issues and concerns associated with the implementation of Adaptive Phased Management. The program is also intended to support the adoption of appropriate processes and techniques to engage potentially affected citizens in decision-making.

The social research program is intended to be a support to NWMO's ongoing dialogue and collaboration activities, including work to engage potentially affected citizens in near term visioning of the implementation process going forward, long term visioning and the development of decision-making processes to be used into the future. The program includes work to learn from the experience of others through examination of case studies and conversation with those involved in similar processes both in Canada and abroad. NWMO's social research is expected to engage a wide variety of specialists and explore a variety of perspectives on key issues of concern. The nature and conduct of this work is expected to change over time, as best practices evolve and as interested citizens and organizations identify the issues of most interest and concern throughout the implementation of Adaptive Phased Management.

Disclaimer:

This report does not necessarily reflect the views or position of the Nuclear Waste Management Organization, its directors, officers, employees and agents (the "NWMO") and unless otherwise specifically stated, is made available to the public by the NWMO for information only. The contents of this report reflect the views of the author(s) who are solely responsible for the text and its conclusions as well as the accuracy of any data used in its creation. The NWMO does not make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information disclosed, or represent that the use of any information would not infringe privately owned rights. Any reference to a specific commercial product, process or service by trade name, trademark, manufacturer, or otherwise, does not constitute or imply its endorsement, recommendation, or preference by NWMO.



NAVIGATOR

NWMO Citizen Panel Report Toronto, Ontario

NUCLEAR WASTE MANAGEMENT ORGANIZATION
TORONTO, ONTARIO CITIZEN PANEL REPORT
MARCH 2008

WHAT ARE CITIZEN PANELS?

Building on previous qualitative research studies, the NWMO contracted Navigator to initiate Citizen Panels in 8 cities across Canada. The goal of the Citizen Panel project was to further explore the feelings, attitudes and perceptions of Canadians toward the long-term storage of Canada's used nuclear fuel.

The Citizen Panel project is markedly different than the qualitative research projects that have preceded it. The intent of the Citizen Panel format used in this project is to allow for the discussion to be formed and driven by the views of the individual Panelists. These Panelists have completed Phase One of the Citizen Panel project where they were introduced to the NWMO and are aware of rudimentary facts surrounding Canada's used nuclear fuel such that an informed discussion can occur.

Phase Two of the Citizen Panel project occurred in Toronto, Ontario in January 2008.

WHAT IS NAVIGATOR?

Navigator is a research-based public affairs firm that works with companies, organizations and governments involved in the public policy field.

Navigator has grown to become a diverse firm with consultants from a variety of backgrounds who have excelled in the fields of journalism, public opinion research, politics, marketing and law.

Our strategic approach can be summed up as: *"Research. Strategy. Results."*

PANEL REPORT OUTLINE

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1. NWMO CITIZEN PANEL BACKGROUND

a. Citizen Panel

The Toronto, Ontario Phase Two Citizen Panel was held on January 21, 2008 at Research House, a neutral third party facility in Toronto.

The Panel was held over three hours from 6PM – 9PM with 18 Panelists in attendance. Jaime Watt, a Navigator research professional, acted as Discussion Leader.

A general outline of discussion objectives, as well as a discussion document intended to guide the work of the Panel were prepared in advance of the Citizen Panel. Reproductions of the document shown to the Panel can be found at the end of this report as appendices.



















b. Panelist Profile

In order to ensure that Panelists speak openly and freely over the course of this research, the individual identities of Panelists will remain protected and not revealed to the NWMO at any point of the project. Contact with Panelists is managed exclusively by a dedicated Panel Manager and each Panelist has been given an identifier code to ensure anonymity in all accessible Panel documents. All personal information and contact reports are stored separately and controlled by the Panel Manager.

While verbatim comments are used through this report, the identification will be only by Panel or by unique Panelist identifier code, but never by name.

Panelists have agreed to offer additional information, including their gender and one additional fact about their lives to make the Panel reporting richer for the reader.

Below are the profiles of the Toronto Panelists by Panelist identifier code:

	City: Toronto Age: 25-34 Gender: Male Occupation: Student		City: Toronto Age: 25-34 Gender: Male Occupation: Employed, construction
Panelist: T-1A		Panelist: T-2A	
	City: Toronto Age: 55-64 Gender: Male Occupation: Self-employed, semi-retired		City: Toronto Age: 55-64 Gender: Male Occupation: Unemployed
Panelist: T-3A		Panelist: T-4A	
	City: Toronto Age: 45-54 Gender: Female Occupation: Employed, ODSP employee		City: Toronto Age: 25-34 Gender: Female Occupation: Employed, accountant
Panelist: T-5A		Panelist: T-6A	
	City: Toronto Age: 45-54 Gender: Male Occupation: Employed, translator		City: Toronto Age: 55-64 Gender: Female Occupation: Retired
Panelist: T-8A		Panelist: T-9A	
	City: Toronto Age: 45-54 Gender: Female Occupation: Employed, business analyst		City: Toronto Age: 55-64 Gender: Female Occupation: Employed, project manager
Panelist: T-10A		Panelist: T-11A	
	City: Toronto Age: 35-44 Gender: Female Occupation: Employed, social worker		City: Toronto Age: 35-44 Gender: Male Occupation: Unemployed
Panelist: T-12A		Panelist: T-13A	
	City: Toronto Age: 25-34 Gender: Female Occupation: Employed part-time, admin assistant		City: Toronto Age: 25-34 Gender: Female Occupation: Unemployed
Panelist: T-14A		Panelist: T-15A	
	City: Toronto Age: 45-54 Gender: Female Occupation: Employed, financial consultant		City: Toronto Age: 65+ Gender: Female Occupation: Employed, support worker
Panelist: T-16A		Panelist: T-17A	
	City: Toronto Age: 45-54 Gender: Female Occupation: Self-employed, psychotherapist		City: Toronto Age: 35-44 Gender: Male Occupation: Employed, engineering instructor
Panelist: T-18A		Panelist: T-19A	

c. Panel Methodology

These Citizen Panels have been designed, as much as possible, as collaborative discussions facilitated by a Discussion Leader. They are separate and apart from focus groups in that they empower individual Panelists to raise questions and introduce new topics. The role of the Discussion Leader, in this format, is merely to introduce new topics of discussion and lead the Panel through a number of discussion exercises.

As well, additional measures were incorporated into this Citizen Panel format to empower individual Panelists. Each Panelist was made aware of their independence and responsibilities to both contribute to, and lead, the Panel discussion. A transcriber, traditionally taking contemporaneous notes behind one-way glass or in another room, was, in this case, placed inside the discussion room. Panelists were empowered to direct him or her to take special note of elements of the Panel discussion they felt were important, or ask him or her to recap any part of the discussion upon request. A commitment was made by the Discussion Leader that the notes taken would be sent to Panelists for review, possible revision and approval, to help Panelists have faith they are in control of the proceedings and ensure their contribution is reflected accurately.

Potential Panelists were originally selected through random digit dialling among a general population sample in the wide area in which each Panel was held. Individuals called underwent a standard research screening survey in which they indicated that they were interested and able to participate in a discussion about a general public policy issue with no advance notice of the specific topic. Individuals were screened to include community-engaged opinion leaders in at least one of these topics: community, environment, and/or public/social issues. Those that passed the screening process were asked to participate in a traditional focus group on the perceived trust and credibility of the NWMO, which allowed an introduction to the topic of used nuclear fuel and topics such as Adaptive Phased Management. The discussions were neutral in tone and did not presuppose any outcome on issues such as nuclear power generation and siting for used nuclear fuel.

At the end of this research study, participants were asked if they would be willing to continue in discussions on the topic of used nuclear fuel. Those that expressed interest were placed on a “short list” of potential Panelists for the four-phased Citizen Panel project. Research professionals at Navigator subsequently used this pool to select Panelists that would ensure a diversity of age, gender and experience in the Panels. Only participants who demonstrated both a willingness and ability to contribute to group discussion and complete exercises were included in the pool. The content of each participant’s contribution in the focus groups was not reviewed by Navigator professionals. Rather, the only qualifiers were that individuals could speak clearly and were able to grasp concepts introduced to them at a basic level.

A target Panel population of 18 was determined for each location in the interest of ensuring the long-term viability of each Panel over the course of four discussions.

Phase One Citizen Panels occurred in late Fall 2007. Although successful in terms of the richness of data collected in all 8 Panel locations, it was clear upon completion of the Panels that it would be necessary to hold Supplementary Citizen Panels in four locations (Toronto, Montreal, Regina and Sault Ste. Marie) due to smaller than expected Panel populations, as well as a difficulty experienced by some Panelists to honour their commitment to attend, as was confirmed on the day of the Panel.

Supplementary Citizen Panels occurred in early January 2008 and consisted of 6 new recruits, selected by random digit dialling, to replicate the experience by which all other Panelists had been selected. New recruits were sent a reading package in advance and then had a one hour “lobby” session immediately prior to the Supplementary Citizen Panel. This session replicated a condensed version of the Preparatory Phase research and allowed for any questions Panelists might have had about the NWMO. Following the “lobby” session, the Supplementary Citizen Panel continued, adding Panelists who had confirmed but, for a myriad of reasons, could not participate in the Phase One Citizen Panels.

Following the completion of the Supplementary Citizen Panels, those that demonstrated a willingness and ability to continue were added to the pool for Phase Two Citizen Panels.

Phase Two Panels occurred in mid to late January 2008. The Panel discussion began with the Discussion Leader asking Panelists if they had thought any more about the NWMO since the last Panel, or if they had just gone back to their daily routines and not given the organization much additional thought. The Discussion Leader then distributed a document for discussion, the Executive Summary of the NWMO’s study *Choosing a Way Forward: The Future Management of Canada’s Used Nuclear Fuel*. The document was given both individual consideration, as well as collective consideration. Individually, Panelists were asked to mark the documents with red and green pens, green indicating they felt a certain point was helpful to their understanding and red indicating that they did not find the point helpful. The intent of the individual document review was to serve as a launching point for further collective consideration and discussion of the more complex strategic objectives of the NWMO. The Panel discussion concluded with Panelists reviewing the answers provided by the NWMO to the questions Panelists had posted in the Parking Lot in Phase One.

Again, Panels were successful in the richness of the data gathered. Furthermore, Panelists have begun to demonstrate a higher degree of ownership in the process with impressive attendance, commitment to the discussion and, in some cases, engaging in extra work, such as assembling their thoughts on paper and seeking out additional information.

This Panel Report is, to the best of Navigator’s abilities, a faithful rendering of the discussion held in Toronto and stands alone as a record of the Citizen Panel discussion on January 21, 2008. A larger Aggregate Report on this wave of Panel discussions, including the Panels in Montreal, Kingston, Sault Ste. Marie, Scarborough, Saint John, Saskatoon, and Regina has also been submitted to the NWMO.

2. PANEL NOTES

a. Disclaimer

The attached are contemporaneous notes taken by a transcriber positioned in the room with the Panelists. The transcriber was taking direction from the Citizen Panel on specific points of interest. The following is not an official transcript, but a best effort to capture the sense of discussion with some granularity.

Panel notes will be reviewed by all Panelists, with each having an opportunity to revise (add or subtract) their individual contributions such that it the notes then stand as a clearer rendering of the Panel discussion.

The transcriber for this panel was Courtney Glen, a Navigator research professional.

b. Panel Notes

Report of the Toronto NWMO Citizen Panel
Second Meeting
21 January 2008

General Discussion

[Discussion Leader]: I'm wondering if after the last group. Did you think any more about the NWMO or did you just go back to everyday life?

T-14A Candu (name of our reactor) became "Candon't." We had the most positive approach to Candu. With the isotope problem at Chalk River occurred...I'm waiting for them to get sued for

[Discussion Leader]: What implications does that have for what we've been talking about?

T-14A We didn't have anything bad to say about you because nothing bad has ever happened but now we have a concrete example. It wasn't anything too bad but it was a concrete example.

T-16A I talked to my former boss who lived in Pickering. He was very interested to hear that someday all the waste beside the plant will be moved. I don't think that he realized that those who have the nuclear plants would not be responsible for storing the waste.

T-18A One of the things that has really struck me has been around the issue of Linda Keane, that she had concerns around

safety issues but the way it's often been presented in the press has been more around the medical aspects and lack of isotopes. To me it's more of a financial loss, it's a medical issue but everything becomes centered on her and her big secret. It's so political and you don't really know.

T-3A What this has to do with nuclear waste management is not fulfilling contracts. But still, no one has heard of this organization. I have talked to many people and no one has heard of it. I don't know if the profile of this organization is as forward as it should be. I don't know if it has to do with Chalk River but it's something I would be looking at if I were part of your group. Either no one cares about nuclear waste or there isn't enough information. For lots of people it's like flushing the toilet. Out of sight, out of mind.

T-11A I talked to lots of people and they were fascinated. I had a visitor from Britain and she had no idea that they had a similar group and initiative in Britain and she reads more news than anyone. My understanding is that this will be released to the public for people's information so they would be aware of the initiative.

T-16A I think they should have had television ads about this.

[Discussion Leader]: Did any questions occur to you? Did you wish you brought something up?

T-4A The question of what to do with these rods, I brought it up at a band rehearsal and we spent about 45 minutes trying to figure it out and it all came down to science, that was the only field we could actually put trust into. All kinds of suggestions came up but it really is like a big question mark.

T-12A I talked to people at work and friends and people were saying "where it is now and where is it stored and how much longer is it safely stored?" I didn't know for how long. People were like "oh yes, it does exist"

T-10A I had a friend who lived in Ajax for 40 or 50 years and she is really concerned about safety. Not everyone has been affected but no one can prove that's because of nuclear.

T-1A People assume there is an organization somewhere. It's iffy whether it's under control.

T-19A I had a strange comment at work. One of my colleagues said “oh, so they last as long as a plastic bag.” There are a lot of things that people just don’t think about. That’s the direction the conversation went instead of just nuclear.

T-17A I have a friend who said “I wonder if it’s really safe. I’d love to sit in on that Panel because I have a lot to say. If they’re putting it under ground, what if there’s a leakage underground?” I said it was safe and can be moved and it will be moved to a safe place. She said “keep on hoping.”

[Discussion Leader]: Your thoughts on the brochure were very helpful. The next version we share with you will look very different and that is because your comments. I made a presentation to the NMWO executive. They were very responsive to your comments and were very interested in the process and had tons of questions for me. If you wonder if it’s worth coming and making a contribution, I can tell you very sincerely it was.

As the organization is transitioning from being a study organization to an implementing organization, they are very interested in hearing from Canadians with our ideas on what that plan should look like, what kind of attributes it should have. To help form that discussion, I thought I would share this document with you tonight.

Choosing a Way Forward Executive Summary Exercise

T-5A I found it just gave me a lot more questions. There was at the beginning, it said the waste would be safely contained by engineered barriers and geology. I wanted more clarification, which I found on the next page but it’s still vague to me. I realize this is not something that is supposed to give a lot of detail but I’d like some more clarification.

T-11A I was surprised because up until now I hadn’t, or don’t remember, hearing about a temporary shallow underground repository. That’s news to me. I don’t remember hearing that. The other part that I found surprising was timing. I found that seemed it’s being rolled out a lot more slowly. I hadn’t realized that it was so staggered.

T-1A Last brochure seemed a bit more optimistic. Parts of this sounds like things are being projected forward.

T-5A This was an earlier one, early in the process.

T-19A I have questions after this. They talk about the facilities being around for another 40 years and they’re going to pay for the storage of this. When these facilities close, where

does the money come from when it's half life is much longer.

T-3A That's mentioned in here in a broad sense. But what is the financial formula and how will the financial surety be provided.

[Discussion Leader]: Did you find the brochure helped you understand the topics we've been talking about?

T-3A This brochure streamlined the site.

T-13A It's an easier read. The word Aboriginal keeps coming up and I don't understand why.

T-4A To prove that they are really on the case.

T-16A I think the sites will be in an Aboriginal area.

T-4A It sounds to me that that's where they want to dump it and they're making sure they have their approval.

[Discussion Leader]: Just to clarify, they've not yet embarked upon that process of siting.

T-14A I like this better than the one we saw last time. It's so well presented and so clearly done. I really like all the active words they include on page 4.

[Discussion Leader]: Did this clarify your understanding of the work they're doing? What about it helped you get that clarity?

T-14A Yes. The pictures in the last one could divert your attention. They didn't have a chart, the last time they had a chart. I didn't like use of the word fairness. It's so incredibly interpretative. I don't think they should use the word fair.

[Discussion Leader]: Do you not think they can move forward in a fair way? Do you have a suggestion for another word?

T-14A Acceptable. I think acceptable is better than fair. Fair there is too high an expectation. When there's acceptable, it's more of a working solution. You may not always get what you want but you'll get a compromise.

T-18A I like this brochure a lot better than the other. I like that "choosing" is really highlighted, the "future management"

is so clear, that there's a summary. There are a few small criticisms. Who is this geared for? If it's geared for the general public, it will be too difficult to understand. For me it worked really well. On page 2, "we are convinced it's time to act decisively" was not necessary. I don't like use of the word Canadians, I like the use of the word citizens better. When you use Canadians, it sounds like every Canadian has been consulted. They also use the word oversight a few times. I think that word conjures up a different meaning in other people's minds.

T-16A Oversight is more of an American thing – more of an error. Overseeing is better. In the States, they tend to mean it in a positive way.

T-18A The cultural effects are not clear in what they're talking about here. Intellectual capacity also, something about it just doesn't fit. In that paragraph there's nothing that really looks at intellectual capacity so I don't think that's really important. Underneath (on page 7) in recommendations, would prefer the use of citizens rather than Canadians because it's not all Canadians. On the last page, "security of humans and environment," there's something about that that seems weird.

T-16A People seem better than humans?

T-9A I found it better than the last one because I had less questions than the last one.

T-16A Why the hell does it take so long? Why should it take 30 years to look around for a site and then another 30 years to decide whether you need temporary storage then another 60 years to hollow out rock? This is beyond bizarre – no where is this explained.

T-9A But they haven't made a lot of decisions like storage containers and transportation and that takes a long time.

T-1A Given that this was before the last brochure, it seems like they've actually accomplished quite a bit.

[Discussion Leader]: People just ask "why can't they dig faster?" What I'm told is that even if they went as fast as they possibly good, it takes that long because they have to go through testing, approval processes.

- T-16A That's crazy. All you do is pick a site, get approval, black a hole in the site and shove the stuff down!
- T-10A Why does it need centralized storage? Is it because of a limitation of the facility or another reason? I would like to see some list or facts about how other countries with nuclear generators deal with nuclear waste. You could give many examples and explain why we chose this method. It's very good writing but what is the criteria for saying environmental responsible, technically feasible, etc. I don't like the use of the word fair. There's no answer for fair.
- T-19A One thing I missed here is the last brochure it gave you the website, I knew there was somewhere to go but here it didn't give you that information. The questions I had afterwards, I'd like to have something standing out saying "if you want more information..."
- T-11A I think you have to come at it from what that brochure was for, to give people a heads up, to give them a simple way of understanding it.
- T-16A Brochure was a little too busy but had a lot more visual interest.
- T-2A In general, I found it helpful but two things I was not certain about. But questions about some things that are going to happen that they cannot predict – but what are those things?
- [Discussion Leader]:** Do you give them marks for being honest?
- T-2A It also means that maybe they know but they're not telling us everything.
- T-4A They don't know who they are going to be over the long term so that's uncertain. I realize because I do know a little bit about this now so I was skimming it. If I were someone who didn't know anything about it at all, this is very good. You come away with a decent picture.
- T-12A I thought it did a very good job of describing ethics, methods, etc. Only think I criticized is I would like them to use the hockey rink analogy – I do not understand the one they use in here.

[Discussion Leader]: NWMO is genuinely committed to the engagement of people

like ourselves because they believe that as they move forward with implementing APM, it has to be technically sound but also acceptable to Canadians. I'm interested in, from reading the brochure, as you think about the importance that they are putting on citizen engagement, how would you judge that they are actually delivering on that? Who should they involve? What might that engagement look like? What should they do? How would you know they did live up to their commitment?

- T-1A The only think I was curious about was when they were talking about how monitoring would be done. Were they talking about more professional citizens? I would have thought someone from that industry rather than someone off the street.
- T-11A The website.
- T-9A But no one's heard of the website.
- T-16A You know how you see people on TV, that's what they need to do.
- T-15A W5 should do a story on it. I don't remember hearing anything about this before the last focus group. When you were asking people who they talked to, I talked to my father who is a very educated man but he didn't know anything about it. A news crew should go out and do a full story so people start asking more questions.
- T-17A What I was thinking is that you want to get out there so people hear more about it. Like little pamphlets on the train so riding along you can read. Get it out there so people know.

[Discussion Leader]: Do you see engaging Canadians as being the same thing as informing them or going a step beyond?

- T-12A I think that the Organization does want to engage and ask questions, and the fact that they talk all the time about a willing site. It does seem they want to engage more than other organizations. It does seem like it's an important part of who they are.
- T-11A Town hall meetings. It's engaging.
- T-9A Is it necessary for all this engaging? If they engage people who already know about the subject, wouldn't that be more useful than engaging us? Then people who know about the subject already can tell us.

- T-10A Good to have a panel of professionals or something and also some people from the social side. If they can have a kind of debate, not like we ask the questions because we don't know scientifically. If they have that kind of session the people prepare the panel, they are professionals, they know what to ask.
- T-8A I liked the other brochure, there was interesting information in it. They said what they did in other countries.
- [Discussion Leader]:** Any ideas on how the NWMO could demonstrate that they are engaging Canadians?
- T-18A I think it's something that's difficult because it's something we obviously really need but it's also very controversial. Engaging the public is a fine line so when I'm thinking of the idea of televisions, there are a couple of shows like Peter Mansbridge who have really good panel like shows so that would be a good way of bringing it to the public's attention as objectively as one could be.
- T-1A Old ways of engaging people, televisions are really only one way. On the internet you can have dialogue, it can be really interactive, discussing things with other users, guidance from experts.
- T-19A It would be a great thing if they ran a commercial and said "we want to hear from you" and put up the website.
- T-14A Catchy slogan. Advertising works.
- T-4A If you put ads on the TV, the people will react to them, it's like they're trying to sell us something.
- T-13A Bruce Power, that's what comes to mind. They have a whole bunch of other groups connected with them and they're on TV advertising. I don't know if you could go along those same lines. They say they're looking towards nuclear power safety.
- T-16A The people that live in the communities where the nuclear plants are, they were promised that if they put the plant in their town they would not have to store the fuel are one stakeholder, the other are people are people who live in the communities or regions where they are proposing to store it. The people that live on the transportation route is the

third stake holder. Then you get the NIMBY syndrome where people don't want it. That's the sticky part. The rest is basically public relations.

T-11A I disagree with that. I think everyone is involved, whether we'd like to believe it or not. I think that everyone should have an equal...

[Discussion Leader]: Central to the recommendation that the NWMO made to the government is that the process be adaptive. As we move forward, there has to be an ability to recognize and respond to any changes that take place. I'm wondering how, in your perspective, how can the NWMO best respond to those changes and incorporate them? How do you know that they're getting it right? What would they need to do so that you have confidence that they're adaptive in their planning?

T-5A Continue having focus groups every once in a while. They could send out little information booklets and questionnaire surveys. Reporting with questionnaire and survey so they can get feedback.

[Discussion Leader]: How would you even know what the changes were?

T-9A They do have an independent advisory council, I'd imagine they'd monitor the situation. I don't think Canadians have to be informed every time they turn around. I'm not interested in what every single organization is doing as long as they have competent people and I have confidence that they are doing it right. It makes me feel better if competent people are running it.

T-15A There hasn't been a disaster yet, they're obviously doing something right. The only thing I brought up before was what happened in Port Hope.

T-3A They found radioactivity outside the fence. You can go anywhere in Port Hope and it will be radioactive from before when they used to take soil out of the old facility [El Dorado] - CLARIFY.

T-15A There was an increase in cancer in that town.

T-11A It's been there since before World War Two.

T-1A Not only is the advisory board a good idea, but there is really a way to be even more interactive – get feedback.

T-18A It seems like you're talking about accountability.

[Discussion Leader]: What I'm asking is a bit different than accountability. Part of the Organization's implementation plan is a plan to be adaptive. You could hold them accountable for implementing their plan, but they also have to be scouting the horizon for recognizing that things have changed and then responding to that. How would you know they were honoring their commitment to be adaptive?

T-18A This is really abstract and I don't know how they would do it but it's an issue of trust and somehow there has to be some sort of public trust of what they're doing and that has to be communicated. They could take out ads in the paper but that doesn't mean that everyone is going to read it.

T-11A Do you mean all Canadians or people with interest?

T-12A When they mention that the rods are retrievable, that means to me that they can go get them if something better comes along. To prove to me that they are looking into other areas, do they have a research and development arm? They could communicate that they have a research and development arm.

T-5A We are talking about the future and they should report things on the website and engage a watchdog like Greenpeace. Have the website built up so it can work for someone who only wants a little bit of information or get more details for people who have a better idea and want to know. If they update the website regularly.

T-19A It says they were associated with other groups in other countries. On the website, they could not just have the R&D people but links to other organizations to show this is what's going on in France, etc. It shows that they are looking at other options, people are doing other things but we've decided to go with this way because it's the best way to go.

T-10A A third part could be like a different team with a lot of questions, can approve their thinking, their methods of being adaptive.

[Discussion Leader]: A couple people mentioned the same thing. Let's talk about research. What in your mind would be important for the NWMO to undertake in terms of both technical and social research. What would that program look like?

T-9A Agreements with universities.

- T-14A Give research to the Canadians army to do. Look how many things have come out of the military. A lot of good things come out of military applications.
- T-5A Because there's a lot in here about adaptability, it's going to have to be forward looking. Are there going to be changes both socially and technically?
- T-1A Faster methods of disposal, new uses, recycling, instead of aiming at just disposing the stuff.
- T-16A Transportation, researching the safest way. How they would react in an accident.
- T-3A The one aspect that's not even mentioned are activist groups and that's free research, these groups are out there and are recognizable and reputable and do their own research and they could participate.
- T-18A One of the things about a research program is the broadness of it and who's going to fund the research. There are implications that come from who's going to fund the research. Facilities like universities that are looking for new uses, people that aren't personally invested in it.
- T-9A If universities were involved, they could train future employees.
- T-11A I think because it's global, one of the first things they could do would be align themselves with France, Sweden and have a close dialogue, come up with a global council.

[Discussion Leader]: We've talked a lot about technical research. The organization is also committed to moving forward and being socially acceptable to Canadians. A lot of people feel they a social research program, will meet with representatives from other organizations, people of interest. I'm wondering what else you think they should be doing on that social research side so they do have a program that honours their robust commitment to moving forward in a way aligned with Canadians values.

- T-4A Town hall meetings. You invite professionals and average people.
- T-15A I think high school students, not necessarily grades 4 and 5 but they might be able to come up with creative ideas, more so than adults.

- T-12A They should do research to see how much money it would take to pull a northern community out of poverty and then pay that community that much to take this.
- T-9A They tried to transport garbage up north but that didn't work.
- T-18A I have more of a question, but I would be curious to hear from them what they are thinking.
- T-19A Sarah said she was talking about school students together. What about putting together a course that you can hand out to school systems so they are more aware of what their social responsibilities should be.

[Discussion Leader]: We've got this organization doing what they say is their best. I guess one of the things we talked about is thing changing over time, we talked a lot about it as something better coming a long. Another way to look at the need to be adaptive is if something changes. For example, the plan is based on certain assumptions that things might change. Are there certain things that would call into question the plan.

T-5A I think that any change would require a reassessment. Changes in the amount, changes in the type of energy we use, changes in how people think would all cause people to reassess.

T-6A Are we where we thought we would be in the past? Where are we from where they wanted us to be?

T-12A I feel like in the past they didn't think that much about the future and one of the things I like about how this organization presents itself is that it will be adaptive to the future.

T-1A Way back we didn't even think that radiation was that bad for people. Our knowledge of radiation is growing. They may have to upgrade things if there are new reactors put in. Each new situation requires us to adapt.

[Discussion Leader]: Another way to look at the adaptive part of it is the extent to which we have confidence in the technology the NWMO is recommending. They're saying that there is a lot of confidence in the technology that they're proposing and they feel very confident that if they were to go ahead, today's best technology supports their decision. How much do you think we have to accept that as true as opposed to how many resources we need to put into finding better technology?

T-18A It has to do with the mandate of the organization. Is the mandate primarily to dispose or is it to be a research organization. The sense that I get from this is that it's really disposal based on the best technology. I think it would be an allocation of funds, where they get their funds from, how much they allocate toward research. Once the facility is built, does it just become a facility that adapts to new technologies as they come out or do they continue to be proactive with a very strong research wing? It seems to me that they will adapt to new technologies rather than be proactive.

T-11A I'd like them to look to the future for adaptability but would like to make sure that the lions share of that is taking good care of the stuff while we find a new place. I know they [producers] all have to be contributing on a regular basis to the funds but I think this is a huge budget already but how much money do we have to dedicate to find bigger and better ways...

[Discussion Leader]: If I look at how far science has advanced in my lifetime, I don't think we should settle for putting it in the ground. What does this group think of that?

T-19A If you always look that way, when you actually act on something...you have to start somewhere and you have to do something or you never will.

T-18A In Toronto we have the University Health Network, money comes from different places for different programs. I think they should broaden and find funding from different places.

T-1A They should never spend any less than is necessary to keep the management as safe as possible.

T-9A We are assuming that nuclear energy is going to expand. What if they find other sources and the costs of nuclear goes down rather up, they might not have an escalating budget.

T-16A We are lucky compared to those European countries. Think of how densely populated they are, they don't have the option of burying this in a sparsely populated area.

[Discussion Leader]: What signs would you look for so you know that you could actually depend on that group?

- T-3A The group would have to have some conflicting personalities – hard core activists, nuclear energy people – so there would be checks within the actual panel.
- T-15A I think there should be people from different generations because the older generation seems to stick to their own views.
- T-19A Where do you find the information on other people in this group? I'd like to know more about them. I would like to see some credentials for these people. Trust is earned and part of this is being open.

Parking Lot Question and Answers Discussion

[Discussion Leader]: What's your general take?

- T-15A It's pretty clear. Question 20, it just lists off names and what they do.
- T-16A I love question 36, it's my favourite.

[Discussion Leader]: What about question 25?

- T-12A I thought it was a good answer. Very clear. I couldn't believe someone actually asked question 18.
- T-3A I don't even think it answers or addresses the question.
- T-18A It doesn't say how many are on the board and it doesn't break them down.
- T-4A Question 1 doesn't get answered either.
- T-12A I agree, that's politics talk. The others I find very clear but not that one, it was surprising.
- T-5A I thought 4 and 7 were unclear also.
- T-17A Some of it I have to read 2 times to get something from it. It's pretty straightforward though.

3. PARKING LOT QUESTIONS

Again in Phase Two, Panelists were empowered to outline any questions they might have that was outside of the current discussion, about a specific matter the Discussion Leader could not address or simply brought up for future consideration on a Post-it note provided and post their question in the “Parking Lot.”

Answers to the Parking Lot questions posted in Phase One Citizen Panels were provided to Panelists in each Phase Two Citizen Panel. Questions asked ranged in terms of quality and appropriateness, but were all answered to the best of the NWMO’s ability.

Again, Panelists were informed that all questions put in the Parking Lot would be answered by the NWMO and provided to Panelists at a future session. The intention of the Parking Lot exercise is to continually empower and encourage Panelists to think of their contributions longitudinally over the life of the Panel.

a. Phase Two Parking Lot questions

The Toronto Phase Two Citizen Panel did not have any Parking Lot questions.

APPENDICES

- i. Personnel
- ii. Discussion Leader's Guide
- iii. Discussion document: Executive Summary

I. PERSONNEL

JAMES STEWART WATT, SENIOR DISCUSSION LEADER

Jaime Watt is Chair of Navigator, a Toronto-based research consulting firm that specializes in public opinion research, strategy and public policy development.

Prior to relocating to Toronto, he was, for ten years, Chair of Thomas Watt Advertising, a leading regional advertising agency and communications consulting firm based in London, Ontario.

A specialist in complex communications issues, Jaime has served clients in the corporate, professional services, not-for-profit and government sectors and has worked in every province in Canada, the United States, the United Kingdom, France, Central America, Korea and Kosovo.

He currently serves as Chair of Casey House, Canada's pioneer AIDS hospice, as well as Casey House Foundation and is a Vice President of the Albany Club. He is a director of the Dominion Institute, Woodrow Wilson Center's Canada Institute, TD Canada Trust's Private Giving Foundation, The Canadian Club of Toronto and The Clean Water Foundation. As well, he is a member of the President's Advisory Council for the Canadian Red Cross and is a member of the Executive Committee of Canadians for Equal Marriage. He was a founding Trustee and Co-chair of the Canadian Human Rights Trust and the Canadian Human Rights Campaign.

CHAD A. ROGERS, SUPPORTING DISCUSSION LEADER

Chad Rogers is a Consultant at Navigator providing strategic planning and public opinion research advice to government, corporate and not-for-profit clients.

He has recently returned to Canada after working abroad with the Washington, DC based National Democratic Institute as director of their programs in Kosovo and Armenia respectively. Chad oversaw multi-million dollar democracy and governance assistance programs directed at political parties, parliaments and civil society organizations in newly democratic nations. He conducted high-level training with the political leadership of Armenia, Bosnia Herzegovina, Iraq, Kyrgyzstan, Macedonia, Moldova and Serbia.

Having previously worked on Parliament Hill as both a legislative and communications

assistant to Members of Parliament and Senators, he has an in-depth knowledge of Canada's Parliament and its committees, caucuses and procedures.

He is a board member of the Kosova Democratic Institute and is a member in good standing of the Public Affairs Association of Canada (PAAC) and the Market Research & Intelligence Association (MRIA). Chad has trained at the RIVA Qualitative Research Training Institute.

COURTNEY GLEN, PROJECT MANAGER

Courtney Glen is a Consultant at Navigator assisting in public opinion research, strategic planning and public policy advice for government, corporate and not-for-profit clients.

Courtney most recently worked at the Fraser Institute as a junior policy analyst in health and pharmaceutical policy. In her time at the Institute, Courtney co-authored a major pharmaceutical policy paper and contributed to their monthly policy journal, *The Fraser Forum*.

Prior to that, Courtney worked as a researcher for the Scottish Labour Party in Edinburgh, Scotland, conducting an audit of the Parliament's Cross Party Group on International Development.

Courtney has a Masters in International and European Politics from the University of Edinburgh in Scotland and a Bachelor of Arts Honours degree in Political Science from the University of Guelph.

JOSEPH LAVOIE, PANEL MANAGER (FRANCOPHONE)

Prior to joining Navigator, Joseph Lavoie worked at Citigroup Global Transaction Services where he improved communications within the Transfer Agency Systems department. Joseph achieved this objective via Web 2.0 technologies, which he previously leveraged in developing Santa's Journal, a successful viral marketing campaign that introduced Santa Claus to the world of blogging and podcasting.

Joseph has been active in numerous provincial and federal election campaigns; has provided political commentary for various websites and television/radio programs; and has served as the recruitment director for the Ontario Progressive Conservative Youth Association. In March 2007, Joseph was selected *Canada's Next Great Prime Minister* by Canadians as part of a scholarship program sponsored by Magna International, the Dominion Institute, and the Canada-US Fulbright Program. He currently serves on the Public Affairs/Marketing Team for the Toronto Symphony Volunteer Committee.

STEPHEN LEONARD, PANEL MANAGER (ANGLOPHONE)

Prior to joining Navigator, Stephen attended the University of Guelph where he graduated with a Bachelor of Arts Honours degree in History. Throughout his undergraduate career, Stephen was an active member of the Canadian Forces Army Reserve in Toronto, which he left in June due to medical reasons as a Corporal.

Stephen is head Panel Manager and plays a vital role in the management and organization of the Citizen Panel project.

II. DISCUSSION LEADERS GUIDE

PHASE TWO CITIZEN PANELS

DISCUSSION LEADER'S GUIDE

1. OPENING OF PANEL SESSION (0:00 – 0:10)

- Welcome back
- Reminder: Explanation of Panel methodology
- Confidentiality of session
- Explanation of NWMO disclosure of proceedings
 - Re-cap of Panel notes distribution and amendment
 - Feedback from Panel on process of reviewing notes
- Re-introduction of Transcriber
- Re-introduction of Parking lot

2. RE-INTRODUCTIONS (0:10 – 0:20)

- Very brief re-introductions

3. AGENDA & EXPECTATIONS (0:20 – 0:30)

- Reminder: Role of Discussion Leader
- Introduction of Panel Managers

4. GENERAL DISCUSSION (0:30 – 1:00)

- I am wondering if you thought more about the NWMO after our last session, as many people tell me that, despite their best intentions, they just go back to their daily routines without giving it another thought.
- Did any questions you would like to ask come to mind?
- Has anyone read, seen or heard anything about NWMO in the media since our last discussion?

5. CHOOSING A WAY FORWARD (1:00 – 1:45)

- You will remember from our last discussion that we looked at the NWMO brochure *Moving Forward Together*. This time, I'd like to share with you an NWMO document which summarizes the key findings from a three year study the NWMO conducted at the request of the Government of Canada called *Choosing a Way Forward*.
- I would like everyone to take a few moments to review the document.
- Did you find this document informative? Clear? Does it include information that you find helpful?

6. EXPLORING THE OBJECTIVES OF THE NWMO (1:45 – 2:30)

- On pages 6 and 7 of the Executive Summary, you will see a series of objectives of the NWMO.

Citizen Engagement

- In the Summary, under the section *Citizen engagement*, NWMO commits to continue to involve a broad range of citizens and experts alike in key decisions in the implementation of Adaptive Phased Management.
 - What do you think a collaborative process between the NWMO and citizens might look like?

Adaptability

- Adaptive Phased Management is built in part around the concept of adaptability – being able to recognize and respond to changes in society and in our environment more generally.
 - How can NWMO best respond to changes and incorporate new developments into its planning?

Social and Technical Research

- What, in your mind, might it be important for the technical and social research program to include?

Trust and Credibility of NWMO's Implementation Plans and Process

- As implementation proceeds, what might cause you to have confidence, and/or lose confidence in the work of the NWMO and its implementation plans or process?

7. PARKING LOT QUESTIONS AND ANSWERS (2:30 – 2:50)

- We committed after the last discussion to get you answers to the questions placed on our parking lot.
- We have done so and are sharing with you not just the answers to your questions, but also from your fellow Panelists in the other 7 Panels.
- Do these answers meet with your expectations?
- Do any other questions come to mind? If so, please jot them down on one of the Post-it notes in front of you and put it in the parking lot.

8. WRAP-UP (2:50 – 2:55)

- As we end our session does anyone have any remaining issues to discuss or questions to raise?
- Panel Management issues

9. NEXT SESSION (2:55 – 3:00)

- Approximate date of next meeting(s)
- Adjourn

III. DISCUSSION DOCUMENT: EXECUTIVE SUMMARY



Choosing

a Way

The Future Management
of Canada's Used
Nuclear Fuel

Forward

A Summary

Summary

Three years ago, the Nuclear Waste Management Organization (NWMO) launched a mission of developing collaboratively with Canadians a management approach for the long-term care of Canada's used nuclear fuel. We envisaged an approach that would be socially acceptable, technically sound, environmentally responsible and economically feasible. We are convinced that it is time to act decisively.

Canadians believe that our generation must assume responsibility now for the long-term management of the nuclear waste that is produced to supply our energy needs. This is an ethical obligation. Canadians want to be assured that they and their environment will be safe. And, they want a flexible approach that can accommodate new knowledge. The NWMO's assessment of the options, based on the best science and technology at home and around the world, gives us confidence that we have the necessary knowledge to meet these expectations.

The NWMO is recommending that Canada proceed in a deliberate and collaborative way to isolate the used fuel in a deep underground repository. The waste would be safely and securely contained by engineered barriers and the surrounding geology. It would be monitored and remain retrievable over time. Our recommendation recognizes that how the technical method is implemented is crucial. We intend to seek an informed willing host community. The process will be phased and transparent with explicit decision points where citizens are provided with genuine opportunities to influence progress and outcomes. We call our recommendation Adaptive Phased Management.

The Challenge of Nuclear Waste

For decades Canadians have been using electricity generated by nuclear power reactors in Ontario, Quebec and New Brunswick. We have produced almost 2 million used fuel bundles – about 36,000 metric tonnes of uranium – a number which will double if our 22 existing reactors operate for an average of 40 years each. When used nuclear fuel is removed from a reactor, it is considered a waste product, is radioactive and requires careful management. Although the radioactivity decreases with time, chemical toxicity persists and the used fuel will remain a potential health risk for a very long time.

Ensuring safety and security for material that will remain hazardous for longer than recorded history is a significant challenge – technically and socially. Any decision taken today will be implemented over many decades. Undoubtedly the program will encounter major changes in science and technology, institutions, values and political perspectives, and economic and financial conditions.

Canada's used fuel is now safely stored on a temporary basis at licensed facilities located where the waste is produced. Like many other countries with nuclear power programs, Canada has yet to decide what to do with this used fuel over the long term. That is why the Government of Canada passed a law requiring the owners of used nuclear fuel to create the NWMO. Consistent with the *Nuclear Fuel Waste Act (NFWA)* we engaged interested citizens including specialists, stakeholders and Aboriginal peoples in research and dialogue to assess the options for long-term management.

Listening to Canadians

Our study was built on a firm foundation – a mission statement integrating the elements of sustainable development; a pre-eminent focus on safety and security; a perspective that takes a long view; a framework of ethics and values; and recognition of the requirement for citizen engagement.

Canadians expect that the best scientific and technical knowledge will be used to understand the risks and identify the technical methods appropriate for used fuel management. However, scientific and technical evidence and analysis, while essential, cannot be the sole basis of our choice. While science can speak to the probability of an occurrence of an event, science cannot speak to social tolerance for its occurrence. The views of Canadian society in judging benefits or risks, and assessing the social implications of various approaches are critical to the development of a socially acceptable recommendation.

Our study was a dynamic and interactive dialogue with thousands of fellow citizens and specialists. Each phase of our analysis was shaped by those conversations and reported in public documents. Through a wide variety of techniques we sought to understand the values of Canadians, have a dialogue with Aboriginal peoples, explore future scenarios, and continually test what we were hearing.

There was common ground. Two important requirements became evident: **the approach must be safe and secure** – for people, communities and the environment; and **it must be fair** – both to current and future generations.

We came to understand that these requirements of safety and fairness have important implications. They mean:

- Our generation needs to take active responsibility to achieve a safe, long-term response to our waste problem – it is imprudent and unfair to wait any longer;
- The plan needs to have a definitive outcome, but also needs to provide flexibility along the way for future generations to make their own decisions;
- We, and future generations, need to be able to monitor the waste to ensure continued safety and be able to access it if safety is compromised or science provides better advice.

Citizens also made their views known about energy policy. The NWMO did not examine or make a judgement about the appropriate role of nuclear power generation in Canada. We suggest that those future decisions should be the subject of their own assessment and public process. Used fuel exists today and will continue to be produced to the end of the lives of Canada's existing nuclear facilities. The focus of our study was to recommend a responsible path forward for addressing its long-term management. Our study process and evaluation of options were intended

neither to promote nor penalize Canada's decisions regarding the future of nuclear power.

Assessing the Options

As required by the *NFWA* we compared the benefits, risks and costs of three technical methods: deep geological disposal in the Canadian Shield; centralized storage above or below ground; and storage at nuclear reactor sites. We benefited from the vast base of research conducted in Canada and around the world over more than 50 years.

The framework for our comparison of options emerged from the objectives that Canadians believe to be important: fairness, public health and safety, worker health and safety, community well-being, security, environmental integrity, economic viability and adaptability. It was also informed by the knowledge and expertise of specialists. Our ethical framework resulted in social and technical aspects of safety and risk being treated in a holistic and integrated way throughout the assessment.

Our analysis concluded that while each of the approaches had distinct advantages, no one perfectly addressed all of the objectives which citizens said were important.

The storage options were expected to perform well over the near term; however, existing reactor sites were not chosen for their technical suitability as permanent storage sites. Furthermore, the communities hosting the nuclear reactors have an expectation that used nuclear fuel will eventually be moved. The NWMO believes that the risks and uncertainties concerning the performance of these approaches over the long term are substantial in the areas of public health and safety, environmental integrity, security, economic viability and fairness. A key contributing factor is the extent to which storage approaches rely on strong institutions and active management to ensure safe and effective performance. The NWMO expects that these capacities will be strong over the foreseeable future but uncertain over the very long term.

The deep geological disposal option was judged to perform well against the objectives in the very long term because of the combination of engineered and natural barriers to isolate the fuel. The key weakness, however, is its lack of adaptability, which is an important objective in the minds of citizens. Over the short term, the approach was judged to be less flexible in responding to changing knowledge or circumstances. There is some uncertainty about how the system will perform over the very long term because we cannot obtain advance proof of actual

performance over thousands of years. This approach also provides comparatively little opportunity for future generations to influence the way in which the used fuel is managed. Its lack of adaptability is a weakness that may affect the performance of the system over time on other objectives such as public health and safety and environmental integrity.

This examination led us to develop another approach that incorporates the most significant advantages of the options assessed and is supported by a phased decision-making process designed to actively and collaboratively manage risk and uncertainty.

Adaptive Phased Management

The NWMO recommends an alternative approach – Adaptive Phased Management. It consists of both a technical method and a management system. Its key attributes are:

- Ultimate centralized containment and isolation of used nuclear fuel in an appropriate Geological formation;
- Phased and adaptive decision-making;
- Optional shallow storage at the central site as a contingency;
- Continuous monitoring;
- Provision for retrievability; and
- Citizen engagement.

The table that follows describes the concept in greater detail.

Representative Conceptual Design Activities for Adaptive Phased Management

Concept	
	<p>A staged management approach with three phases of implementation:</p> <ul style="list-style-type: none"> • Phase 1: Preparing for Central Used Fuel Management • Phase 2: Central Storage and Technology Demonstration • Phase 3: Long-term Containment, Isolation and Monitoring <p>Phase 1 (approximately the first 30 years): Preparing for central used fuel management would comprise the following activities:</p> <ul style="list-style-type: none"> • Maintain storage and monitoring of used fuel at nuclear reactor sites. • Develop with citizens an engagement program for activities such as design of the process for choosing a site, development of technology and key decisions during implementation. • Continued engagement with regulatory authorities to ensure pre-licensing work would be suitable for the subsequent licensing processes. • Select a central site that has rock formations suitable for shallow underground storage, an underground characterization facility and a deep geological repository. • Continue research into technology improvements for used fuel management. • Initiate the licensing process, which triggers the environmental assessment process under the <i>Canadian Environmental Assessment Act</i>. • Undertake site characterization, safety analyses and an environmental assessment for the shallow underground storage facility, underground characterization facility and deep geological repository at the central site, and to transport used fuel from the reactor sites. • Obtain a licence to prepare the site. • Develop and certify transportation containers and used fuel handling capabilities. • Obtain a licence to construct the underground characterization facility at the central site. • Decide whether or not to proceed with construction of a shallow underground storage facility and to transport used fuel to the central site for storage. • If a decision is made to construct the shallow underground storage facility, obtain a construction licence and then an operating licence for the storage facility.

Representative Conceptual Design Activities for Adaptive Phased Management	
<p>Concept (cont'd)</p>	<p>Phase 2 (approximately the next 30 years): Central storage and technology demonstration would comprise the following activities:</p> <ul style="list-style-type: none"> • If a decision is made to construct shallow underground storage, begin transport of used fuel from the reactor sites to the central site for extended storage. • If a decision is made not to construct shallow underground storage, continue storage of used fuel at reactor sites until the deep repository is available at the central site. • Conduct research and testing at the underground characterization facility to demonstrate and confirm the suitability of the site and the deep repository technology. • Engage citizens in the process of assessing the site, the technology and the timing for placement of used fuel in the deep repository. • Decide when to construct the deep repository at the central site for long-term containment and isolation. • Complete the final design and safety analyses to obtain the required operating licence for the deep repository and associated surface handling facilities. <p>There may be a need for transportation containers and facilities to produce them; processing facilities to load the fuel into transportation containers; production facilities for storage containers; and processing facilities to transfer the fuel from transportation to storage containers.</p> <p>Phase 3 (beyond approximately 60 years): Long-term containment, isolation and monitoring would comprise the following activities:</p> <ul style="list-style-type: none"> • If used fuel is stored at a central shallow underground facility, retrieve and repackage used fuel into long-lived containers. • If used fuel is stored at reactor sites, transport used fuel to the central facility for repackaging. • Place the used fuel containers into the deep geological repository for final containment and isolation. • Decommission the shallow underground storage facility. • Continue monitoring and maintain access to the deep repository for an extended period of time to assess the performance of the repository system and to allow retrieval of used fuel, if required. • Engage citizens in on-going monitoring of the facility. • A future generation would decide when to decommission the underground characterization facility and any remaining long-term experiments or demonstrations of technology, and when to close the repository, decommission the surface handling facilities and the nature of any postclosure monitoring of the system. <p>There may be a need for production facilities for used fuel containers; processing facilities to transfer the fuel from storage to the deep repository; and production facilities for sealing materials.</p> <p>The current owners of used fuel would continue to be responsible for its interim management at the reactor sites. The NWMO would assume management responsibility of the used fuel when it is transported from the reactor sites to the central facility for long-term management.</p>

Implementation

The NWMO will be responsible for implementing the approach chosen. The insights gained and relationships established during our study phase will provide a firm foundation for implementation. Our vision and values will continue to guide us as we strive to gain the confidence of Canadians. Canada has an extensive system of oversight. At a minimum the NWMO will meet all applicable regulatory and licensing requirements; our goal is to exceed them. We must ensure that our security provisions and safeguards are compliant with Canada's nuclear non-proliferation policy and international agreements.

Citizen engagement

Detailed implementation plans will be designed through dialogue with the many communities of interest who will have important roles to play. We expect to hear a diversity of voices as we seek advice and receive direction on the design of the process and the issues to be explored. In a democratic society, the inclusiveness and the integrity of the process by which decisions are taken are key.

The NWMO will be required to apply for licences to prepare a site, construct, operate, modify, and decommission a nuclear fuel waste facility. We will be required to demonstrate compliance throughout. At each step, there will be opportunity for further public scrutiny.

Financing

Financial surety means determining what costs can reasonably be expected to be incurred over the lifetime of the project, along with some contingency for unexpected events, and putting in place the financial mechanisms to ensure the necessary money will be available when it is required. The NWMO has an ongoing obligation to assess the accuracy of the cost estimates for the selected management approach and the sufficiency of contributions to cover cash flow obligations for the life of the project.

The *NFWA* sets out requirements for the establishment of trust funds to finance the long-term management of Canada's nuclear fuel waste. A total of \$770 million has been deposited by the waste owners to date. The legislation incorporates explicit provisions that these trust funds will be maintained securely, reported on and used only for the intended purpose.

Choosing a Location

Although the NWMO is not proceeding with site selection as part of this study, there has been intense interest in the considerations and principles that might influence the process. The NWMO intends to seek an informed, willing community to host the central facilities.

In the interest of fairness, we intend to focus within the provinces that are directly involved in the nuclear fuel cycle – Ontario, New Brunswick, Quebec and Saskatchewan. Communities in other regions and provinces may express an interest and should be considered. The NWMO will respect Aboriginal rights, treaties and land claims.

We propose that the siting process be open, inclusive and fair to all parties, giving everyone with an interest in the matter an opportunity to have their views heard and taken into account. The process will ensure that groups most likely to be affected by the facility, including those who are provided with the forms of assistance they require to present their case effectively.

Placing all of Canada's used nuclear fuel in a single central location will require moving it from current decentralized locations. We will need to demonstrate the safety of any transportation system to the satisfaction of citizens. On the basis of the work which the NWMO has conducted, including commissioning background papers, discussions with nuclear waste management organizations in other countries, and our understanding of regulatory requirements, we are confident that used fuel can be transported safely. The design and development of transportation plans, the mode of transport, routes, security and safety measures and emergency preparedness will require the collaborative efforts of many communities of interest.

Addressing Social, Economic and Cultural Effects

Implementation presents a significant opportunity to recognize and support a host community's vision for its social, cultural and economic aspirations. There will also be a broader set of interests beyond the immediate host community. Reactor site communities will figure prominently. All potentially affected parties must be afforded fair and equitable treatment in assessing and managing potential significant socio-economic effects.

It will be important to design implementation in such a way as to avoid or minimize disruptive impacts on the many affected communities. Where adverse impacts cannot be avoided, implementation must recognize the

contributions and costs borne by the community through appropriately designed mitigation measures. Risks can be mitigated not only by a variety of physical design features, but through institutional, informational and social measures. That will require developing the capacity for community oversight and empowering the communities to have influence in the process.

Research and Intellectual Capacity

As the NWMO implements the Adaptive Phased Management Approach, we will be committed to integrating continuous learning and adapting the plan to new ideas and technology. To do this, there needs to be a vibrant and robust research and development effort during the development and execution of the program.

The Recommendation

Adaptive Phased Management tries to find an optimal balance of competing objectives. It embraces the precautionary principle and adaptive management. Societal goals and objectives and successful technology demonstration will determine the pace of implementation. We believe Adaptive Phased Management is the strongest possible foundation for managing the risks and uncertainties that are inherent in the very long time frames over which used nuclear fuel must be managed with care.

- It commits this generation of Canadians to take the first steps now to manage the used nuclear fuel we have created.
- It recognizes that over the long term, it would be imprudent to rely on a human management system alone with its changing forms of institutions and governance.
- It will meet rigorous safety and security standards through its design and process.
- It allows sequential and collaborative decision-making, providing the flexibility to adapt to experience and societal change.

- It provides genuine choice by taking a financially conservative approach, and providing for capacity to be transferred from one generation to the next.
- It promotes continuous learning, allowing for improvements in operations and design that would enhance performance and reduce uncertainties.
- It builds confidence in the technology and supporting systems before the final phase is implemented.
- It provides a viable, safe and secure long-term storage capability, with the potential for retrievability of used fuel which can be exercised until future generations have confidence to close the facility.
- It provides for continuous monitoring and contingency against unforeseen events, either natural or man-made.
- It is rooted in values and ethics, and engages citizens allowing for societal judgements as to whether there is sufficient certainty to proceed with each step.

On the following page is the NWMO's recommendation to the Government of Canada. With a decision about the basic approach the NWMO will then be able to move forward to meet the objective of safely managing Canada's used nuclear fuel for the long term.

The path we propose, built on sound science and technology, is responsible and responsive. Nuclear waste is not a legacy issue we wish to leave to future generations. A decision to act must not be postponed.

November, 2005

NWMO's Recommendation

Our recommendation for the long-term management of used nuclear fuel in Canada has as its primary objectives safety – the protection of humans and the environment – and fairness to this and future generations.

Therefore we recommend to the Government of Canada Adaptive Phased Management, a risk management approach with the following characteristics:

- Centralized containment and isolation of the used fuel in a deep geological repository in a suitable rock formation, such as the crystalline rock of the Canadian Shield or Ordovician sedimentary rock;
- Flexibility in the pace and manner of implementation through a phased decision-making process, supported by a program of continuous learning, research and development;
- Provision for an optional step in the implementation process in the form of shallow underground storage of used fuel at the central site, prior to final placement in a deep repository;
- Continuous monitoring of the used fuel to support data collection and confirmation of the safety and performance of the repository; and
- Potential for retrievability of the used fuel for an extended period, until such time as a future society makes a determination on the final closure, and the appropriate form and duration of postclosure monitoring.

The Nuclear Waste Management Organization would implement this comprehensive approach, in compliance with the *Nuclear Fuel Waste Act (NFWA)* of 2002, and would:

- Meet or exceed all applicable regulatory standards and requirements for protecting the health, safety and security of humans and the environment;
- Provide financial surety through funding by the nuclear energy corporations (currently Ontario Power Generation Inc., Hydro-Québec and NB Power Nuclear) and Atomic Energy of Canada Limited, according to a financial formula as required by the *NFWA*;
- Seek an informed, willing community to host the central facilities. The site must meet the scientific and technical criteria chosen to ensure that multiple engineered and natural barriers will protect human beings, other life forms and the biosphere. Implementation of the approach will respect the social, cultural and economic aspirations of the affected communities;
- Focus site selection for the facilities on those provinces that are directly involved in the nuclear fuel cycle;
- Sustain the engagement of people and communities throughout the phased process of decision and implementation; and
- Be responsive to advances in technology, natural and social science research, Aboriginal Traditional Knowledge, and societal values and expectations.

The NWMO invites all interested individuals and organizations to review our public engagement activities, discussion documents, reports and research on our website at www.nwmo.ca.

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