NWMO Citizen Panels Report, Phase II: Panel Two

NWMO SR-2008-03 March 2008

Navigator Ltd.

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
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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.

NWMO Citizen Panel Report
Montreal, Quebec

NUCLEAR WASTE MANAGEMENT ORGANIZATION
MONTREAL, QUEBEC 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 Montreal, Quebec 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 Montreal, Quebec Phase Two Citizen Panel was held on January 23, 2008 at Leger Marketing, a neutral third party facility in Montreal.

The Panel was held over three hours from 6PM – 9PM with 17 Panelists in attendance. Daniel Meloche, a Leger Marketing 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 Montreal Panelists by Panelist identifier code:

 **Panelist: M-1A**	City: Montreal Age: 55-64 Gender: Male Occupation: Self-employed, information
 **Panelist: M-4A**	City: Montreal Age: 45-54 Gender: Female Occupation: Employed, secretary
 **Panelist: M-7A**	City: Montreal Age: 45-54 Gender: Female Occupation: Unemployed
 **Panelist: M-10A**	City: Montreal Age: N/A Gender: Male Occupation: N/A
 **Panelist: M-12A**	City: Montreal Age: 55-64 Gender: Female Occupation: Employed, work security commission
 **Panelist: M-14A**	City: Montreal Age: 35-44 Gender: Male Occupation: Employed, information analyst
 **Panelist: M-16A**	City: Montreal Age: 65+ Gender: Male Occupation: Self-employed, artist
 **Panelist: M-19A**	City: Montreal Age: 45-54 Gender: Male Occupation: Employed, entertainer
 **Panelist: M-2A**	City: Montreal Age: 55-64 Gender: Female Occupation: Employed, psychologist

 **Panelist: M-3A**	City: Montreal Age: 45-54 Gender: Female Occupation: Employed, placement counsellor
 **Panelist: M-6A**	City: Montreal Age: 35-44 Gender: Male Occupation: Employed, architect
 **Panelist: M-8A**	City: Montreal Age: 45-54 Gender: Female Occupation: Self-employed
 **Panelist: M-11A**	City: Montreal Age: 65+ Gender: Female Occupation: Retired
 **Panelist: M-13A**	City: Montreal Age: 18-24 Gender: Male Occupation: Employed, financial analyst
 **Panelist: M-15A**	City: Montreal Age: Female Gender: 45-54 Occupation: Employed, homeopath
 **Panelist: M-17A**	City: Montreal Age: 35-44 Gender: Female Occupation: N/A
 **Panelist: M-20A**	City: Montreal Age: N/A Gender: Female Occupation: N/A

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 come 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 Montreal and stands alone as a record of the Citizen Panel discussion on January 23, 2008. A larger Aggregate Report on this wave of Panel discussions, including the Panels in Kingston, Toronto, 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.

b. Panel Notes

Report of the Montreal NWMO Citizen Panel
Second Meeting
23 January 2008
Panel Notes

General Discussion

[Discussion Leader]: I'm wondering if you thought more about the NWMO after our last session. Is there anything that came up or that you've thought of since then?

M-10A — I recently heard that they're talking about closing the plant in Gentilly. I heard that on TV. They're starting to talk about it now, but I think there are no plans for it yet until 2011.

M-11A — I've heard a lot about the Bouchard-Taylor Commission and reasonable accommodation. There's a lot of talk about that.

M-2A — I've been reading a lot in the paper and I've also seen on TV a lot about a new movement in Europe – I think in London, specifically – to build 20 new nuclear energy stations. But, not only that, they're looking more closely at the issue of waste management and what to do with the nuclear waste that would come from these new stations. And they're saying they want to accomplish plans by the year 2020. I've also been hearing discussion about shutting down one of the nuclear energy stations in Ontario, but Ottawa was arguing that it's very important for the station to remain open because of the production of isotopes used to treat cancer patients.

[Discussion Leader]: Has anyone else heard about this debate about the nuclear station in Ontario?

M-1A — Yes, and I thought it was actually a very important news piece because it shows us how important nuclear energy really can be. I'm pretty sure a lot of us still don't realize just how many people out there are dependent on nuclear production.

M-16A — Yes, and it was that same week of our last meeting – after January 8 – that at least 5-6 news reports came out on that very topic, the last of which announced the firing of Linda Keen, nuclear safety commissioner. And it was interesting because we had just been speaking about transparency.

[Discussion Leader]: Can anyone else tell me a little bit more about that and your reaction to the news?

M-15A — Well, it's funny… Last time, we were talking about deep geological isolation of nuclear waste for safety purposes and, in fact, this woman believed that safety is a greater priority than the isotope shortage and yet she lost her job because of it. So, it raises questions about what the priority should be: safety or nuclear production. And it seems, in light of this event, that they are favouring production over safety issues.

M-7A — Well, one thing's for sure and that's that they make money from the sale of isotopes. So, in my opinion, they've chosen profit over safety.

M-1A — But they also help treat sick people – don't forget that. Ultimately, though, that woman's biggest mistake was that she misjudged the risk factor. I mean, is it better to let 5000 people die today because there's a risk of danger but where that risk has only as much chance of happening as you have at winning the lottery? So, you have to be able to weigh the risks and benefits and her problem was that she lacked good judgement. She just didn't weigh the potential risks and consequences very well. But, of course, this never should have happened to begin with and, in my opinion, the politicians or the people running this government failed miserably at their jobs because this situation never should have come to this in the first place. They simply did not meet their obligations and the parliament had to intervene because people were dying in hospital waiting for cancer treatments.

[Discussion Leader]: OK, is there anything else? Did anyone hear of anything else?

M-6A — I wasn't here at the last discussion and I'm sure you all discussed it at length, but I just found it quite extraordinary, this whole event, not because of the political aspect, but just because of the fact that this is the first time the word "nuclear" has come to light in the media in a new way. That is, I think it made everyone realize that "nuclear" doesn't just have to do with energy, but it also plays an important role in medicine, for instance, in cancer treatments among other things. So, I for one saw it in a new way, just by virtue of following this one news event.

M-1A — I agree. And, in fact, I think they should have capitalized on the positive a little more because people generally tend to have a very negative view of nuclear: they see the word "nuclear" and right away they think "nuclear bomb." But since the beginning of nuclear energy production, the number of human lives that have been saved far outnumber the victims of nuclear energy.

M-7A — Alright, fine. There's the debate of "pro" or "con" for nuclear energy – that's clear. But regardless of your position, there's still the issue of what to do with the waste. In other words, like it or not, nuclear energy exists and we still have to find a solution to the problem of nuclear waste disposal.

M-3A — Well, I actually requested a copy of the final report of this organization, the one they submitted to the government – I went onto their website and requested a copy. And, admittedly, I haven't read through it completely, but from what I saw of it I found their study to have been well done.

Choosing a Way Forward Exercise

[Discussion Leader]: Actually, I have here a copy of a document called *Choosing a Way Forward*, which is a summary of the key findings from a three-year study conducted by the NWMO at the request of the Government of Canada. I'd like you to review it much like you did last time with the document entitled *Moving Forward Together*.

Also, I'd like to ask you to use the green and red pens to mark the document as you did last time. However, unlike last time when I asked you to mark the things you agreed and/or disagreed with, this time I'd like you to review the document for clarity, marking

in red the things you find unclear or confusing and in green the things you find helpful and informative.

So, did you find this document informative? Clear?

M-12A Yes, in general.

M-1A A little repetitive, but it's good overall.

M-15A I agree. It's a bit redundant. It's a good summary, but it's a bit redundant.

[Discussion Leader]: OK, but it's clear and easy to understand?

M-12A I think it's a good use of common language at an appropriate level such that it's accessible to the average person. Aside from the odd term or phrase, I think it's easily accessible to the average person. I myself am a layperson and have no background in any of this and I was still able to understand it.

M-1A It's just little things like when they say, for example, "safely and securely" [Page 2]. I mean, if it's safe, then of course it's secure. So, it's just little things like that that make it redundant and I think they could stand to cut some of the fat a bit. Other than that, I'd say it's good on the whole. However, the one thing that I find is missing is an explanation of transportation. That's a very important aspect of waste disposal – how they transport it – because it's during transportation that there's the greatest risk of accidents and yet they don't really talk about it here.

[Discussion Leader]: So, you feel the issue of transportation is missing…

M-1A Yes, not only transportation, but also preparation – how they prepare the waste to be transported – because no matter what, there's always a risk of an accident. However, should an accident happen, good preparation can greatly minimize the damage.

M-19A They do mention transportation a little at the beginning…

M-1A Yes, but they don't explicitly say "The waste is prepared in such-and-such a manner, etc…." and they don't talk about minimizing risk by taking precautions in advance of the transportation stage.

M-2A And there's something else too: this document is a little out of date. First of all, there's the question of what happens in the first 30 years, then after 60 years and then after 300 years and these are topics that are set to be discussed with world governments – London, Japan and all that – in April of this year. So, that's the first thing. The other thing is with regard to transportation. It has already been decided that because transportation of nuclear waste is too dangerous because it affects communities that they're going to build a repository in Chalk River next to the power station and there's no way they're going to transport the waste to anywhere else – it's just too dangerous. Likewise, in the U.S. it was decided that they would deposit nuclear waste in the state of Utah in the Nevada Mountains, but they're still discussing some of the repercussions of that because there's questions about the nuclear waste getting into the water and how it's going to affect water supplies. So, when I look at this [document], it's clear that it's not quite up to date.

M-13A Well, it's from 2005 – it says it right here.

[Discussion Leader]: Was there anything else in the document that wasn't clear?

M-16A Yes, the whole part about the three phases. I think there's a problem with the design because they've got some lines in bold and then they have bullet points outlined underneath and they've just got a whole bunch of words going down the page whereas it seems to me it would be a lot clearer if they had just made a chart clearly outlining each of the three points: "Here are the three stages – 1, 2, 3."

M-1A Right, they're describing three separate methods, but they're mixing them all up. I mean, I got to the end and I just thought to myself "It seems like they still don't know what they're doing!" And then we get to the end where they make their recommendations and they say "Centralized containment and isolation of the used fuel in a deep geological repository, etc." and "Flexibility in the pace and manner, etc." and then they backtrack and say they want "an optional step in the implementation of the process." So, to me it just sounds like they're not yet clear on what the steps are and where they're going.

M-6A It's because they're trying to highlight the all the *options*.

M-20A And they're still in the consultative phase of the process. / That's right, so "Here are the options."

M-1A I understand, but they need to do a better job of isolating the options and clearly outlining them for us because here it's all mixed up.

M-4A Maybe it's just a question of design and presentation. For example, on Page 3 where they say "[…] we compared the benefits, risks and costs of the three technical methods: deep geological disposal in the Canadian Shield; centralized storage, etc." they could simply enumerate the three methods in order to make them stand out more clearly. For instance, it could read "We compared the benefits, risks and costs of the three technical methods: 1) deep geological disposal, etc.; 2) centralized storage, etc.; 3) storage at nuclear reactor sites. It's just a small point of precision, but it already makes the three methods stand out more distinctly from one another, just by enumerating: 1, 2, 3.

M-10A Right, I agree. As a matter of fact, I tried to see what they meant by three methods and I was looking for them, but they didn't really talk about methods 2 and 3, just option #1.

M-1A Indeed. They sort of mention the other too in passing, but it's not well organized.

M-14A I thought the last page [Page 8] was better and I understood the three steps there a little better, especially where they indicate "Provision for an optional step in the implementation process, etc." – that was clearer and so I understood the three steps. But in the body of the document where it was a lengthier explanation, it wasn't clear.

[Discussion Leader]: Is there anything in this document that you were hoping to see, but that was missing?

M-2A No, I just think they are, once again, giving the wrong information and it makes me angry. For example, they say [Page 3] "[…] deep geological disposal in the Canadian Shield, etc." and, well, that's the Canadian Arctic, but there's a document that was published this year – 2008! – by the Sierra Club of Canada and they are recommending against deep geological disposal in the Canadian Shield because of the risks and dangers to the polar bear and its

natural habitat. Also, did they consult with First Nations people about this? After all, we're talking about their land. So, I just read this document and think this is a lot of misinformation. I mean, I keep current with all these issues and what I read on the computer and what's happening in 2008 is not reflective of what I'm reading here – this is an outdated document.

M-4A One thing I wondered about too was what consultations were there with Aboriginal communities. If they really want to deposit nuclear waste in the Canadian Shield, that's their land, isn't it?

M-20A Yes, the Canadian Shield is in the Arctic.

M-16A No, it's not in the Artic. The Canadian Shield runs from Lake Ontario all the way to Gaspésie.

M-20A No, they want to dump it where the polar bears live, in the Arctic. I saw it on the news on TV.

[Discussion Leader]: OK, is there anything else in this document that's missing, but that you would like to see?

M-16A I would like them to make a clearer timeline because they talk about 30 years, 60 years and all that, but where are we now on that timeline? It sounds like they're still in the hypothetical and theoretical stages of the project, which means I'll be dead by the time the first phase comes around in 30 years, but maybe I'm wrong.

[Discussion Leader]: Was there anything from the previous document you reviewed at the last session [Moving Forward Together] that you would have liked to see in this one?

M-1A Yes, actually. In the previous document they talked about the Scandinavian countries and how much more advanced they were in terms of nuclear technology, as well as disposal of nuclear waste, and how we were working together with those countries in order to draw for their expertise. They don't talk about that here, but it seems to me that this would be an important point to highlight. It might be in the full-length report, but it's not in this summary and I think it would be a worthwhile point to bring up because it still doesn't seem to me like we're entirely clear about what we're doing or the direction in which we're headed.

M-10A That's a good point.

M-1A I just find there are a lot of redundancies and qualifiers and things sprinkled throughout the document that make it so we have absolutely no idea what they're trying to say. For example, "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" [Page 7]. I mean, what exactly do they mean? What do they want to say? Why don't they spare us from having to read all these kinds of things that mean practically nothing. Or why don't they just come out and say what they want to say? You know what I mean? It's a bit heavy.

M-10A That's true. It is a bit heavy.

M-1A Or when they say something like "in an *appropriate* Geological formation" [Page 4] and they don't explain what they mean by "appropriate," it renders that qualifier, basically, useless. And if this isn't the time or the place to explain "appropriate," then just don't use the term because it raises questions about what might be "inappropriate." Basically, I just find that the document has all sorts of little things like that all throughout that make it a bit strange.

M-15A Another example that's almost as bad is "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" [Page 4] – what the hell does all that mean?!

M-1A Yes, it's very wordy.

[Discussion Leader]: Now I'd like us to go to Page 6 where they talk about citizen engagement. In this section of the Summary, the NWMO commits to continue to involve a broad range of citizens and experts alike in key decisions in the implementation of Adaptive Phased Management.

M-1A Who would be important for NWMO to involve? Who do you see being involved in this?

M-20A Well, us!

M-14A I think in order to arrive at something optimal and fair, they should involve a number of different people including experts in nuclear energy, as well as regular citizens with

no background knowledge. So, they should try to consolidate the advice and opinions of all these people in an attempt to gain as wide a spectrum of insight as possible.

M-10A But there's a danger in involving people from the general population in an area in which they have no expertise and that's because people with even the best of intentions sometimes end up making the worst decisions simply because they don't know any better.

M-19A Yes, but I think it's worthwhile having people like us who are not experts to give our insight as outsiders looking in. Perhaps that, in addition to the input from experts as insiders looking out, is what's needed for a greater balance of opinions.

[Discussion Leader]: And when you say "experts," who exactly do you mean? What experts do you see being involved?

M-1A Experts in nuclear energy and technology.

M-6A Environmental experts.

M-1A Yeah, environmentalists.

M-20A But those people are against nuclear energy, so I don't see them being involved. They're too biased.

M-1A So what? They should still have their say. We should all have our say. Even if we're not the ones making the final decisions, I think we all have something to bring to the table and our opinions should be heard and taken into consideration.

M-8A Academics, university researchers.

M-6A Engineers, PhDs, university professors because a lot of this is very high-level, technical stuff and we can't expect regular people to know about these things.

M-10A Special interest groups and/or NGOs, particularly in the area of safety standards, either at the national or international level.

M-6A Honestly, I'm all for democracy, but I just think it would be best to get a group of experts together first – people who know all about these issues – and then have the experts

explain it to the rest of us. And instead of creating a brochure like the ones we've been asked to review here, they should put together a DVD, something simple and informative to explain it to the general population.

M-13A I would add to all those who should be involved all the people who live in and close by to the areas, all the people who will be directly affected should anything happen.

M-1A Maybe then we should also add citizens' rights groups or pressure groups.

M-15A But let's not get carried away with citizens' rights and pressure groups and things of that nature that are completely opposed to nuclear energy because that's not the issue here. Like it or not, nuclear energy exists and there is a need for it – that's not what we're arguing. The issue here is that nuclear waste is a by-product of the production of nuclear power and we have to find a way to safely dispose of it. That being said, I don't think anyone has any bad intentions with regard to nuclear waste disposal and I for one am glad to see that an organization like this exists and that we're even being consulted at all because we all know that in at least half the world's countries, if not more, people don't even get the chance to be heard.

[Discussion Leader]: OK, that's a good way to bring me to my next question: how might we judge whether the NWMO has lived up to its commitment? As citizens, how can we evaluate the job that they're doing?

M-20A See, that I don't know about. I don't mind being consulted in the "before" phase where they present me with the possibilities and ask "What do you think?" – I have no problem with that and I even think it's very interesting and very important – but I think it's going a bit far when I'm asked to evaluate the organization and how they're doing. I mean, come on. I could just as well say "Great job" and I have no idea what I'm talking about, you know what I mean?

[Discussion Leader]: But when I talk about evaluating them I mean evaluating the job they're doing in terms of getting the right people involved and ensuring they remain on board, not having people drop out along the way and then replacing them with others…

M-20A Just be transparent.

M-19A Right. I've been to their website and it's incredible the amount of information that's there – all the consultative meetings they've had so far and with whom and so on. And, of course, you can accuse them of going overboard with all these consultations and all, but you could never accuse them of not doing enough. So, that being said, it's still a good thing that they're being upfront and open about what they're doing because you can never reproach them for being secretive and trying to hide something. I mean, I was astonished at the number of consultative meetings that this organization has held so far. I don't remember the exact numbers, but it was very impressive.

M-17A But I find that for a problem that is so serious, it's worrisome that we're here discussing a document that was written in 2005 – I find we're going too slowly. What has happened in the meanwhile since this document was written? I feel like we're moving too slowly.

M-19A Yes, perhaps there is such a thing as over-consulting and at some point you have to be able to take at least 80% of what you've learned through the consultation process and be able to start to apply it.

M-20A Or at least keep up with things and keep the documentation current, adding what has happening in the meanwhile. For instance, this document should at least contain some new developments since 2007.

M-17A Yes, for instance, what about the whole issue of recycling nuclear waste for other uses? There are some countries who are already doing it and that's nowhere to be found in this document – they don't mention it at all.

M-19A Actually, that's exactly what they're referring to in the Adaptive Phased Management process when they say they want to allow for the possibility for future generations to be able to retrieve the waste. So, deep geological isolation doesn't mean it's permanently disposed of into the ground, buried and forgotten. And, in fact, they say they're looking at ways of doing it so as to make it easier for future generations to retrieve the waste once further technological advances have been made and to allow them to make their own decisions about what to do with the waste, other alternatives.

M-15A But is it possible to retrieve the waste once it's disposed of through deep geological isolation? That's not clear in the document.

M-15A It's clear in the final report.

M-12A OK, but the final report is a 600-page document. Basically, it's not clear here in the summary. And it gets especially confusing when they talk about "Ensuring safety and security for material that will remain hazardous for longer than recorded history, etc." [Page 2].

M-1A Joking aside, I think we've stumbled onto something very important here and that's that we here around the table are a good example, I think, of the Canadian population at large because only one of us here has even bothered to read the final report.

M-16A I skimmed over it.

M-14A Even so, you are telling us that things are made clearer in the final report and yet we've never read it, but the point is it's not clear from what we have read in the summary. So, why is the information not clear in the executive summary? That's the question. If we all agree that the point about retrievability after deep geological isolation is very important, then why is it clear only in the full report and not in the summary as well? Clearly, they've missed something there. A summary is supposed to contain the most essential points and yet they don't talk about the point of retrievability. However, they do add superfluous, meaningless phrases like "for longer than recorded history." Overall, there are a lot of unimportant things in this summary that have been added and a lot of seemingly important things that have been left out.

M-2A I think it may be the result of a bad translation because the original document was written in English and that's what I read on the computer and I had found it to be a much better piece of information than what I got from this document in French here tonight.

M-14A So, it's the translator's fault!

M-2A There must be a few things that were missed.

M-6A Well, I actually have a question along those lines… If this document was translated from English, who was it originally intended for? The reason I'm asking is because they sort of lump all the nuclear energy producers together – Ontario, New Brunswick, Quebec – and yet we only have one nuclear power station here in Quebec. And energy being a provincial jurisdiction, the Quebec government actually favours investing in hydroelectric power over nuclear. So, in other words, there's a difference between the provinces' positions and I find it a somewhat delicate matter and it would be interesting to see some comparative statistics on the production levels of each province. The reason for this is because I'd like to know to what extent this all pertains to us as Quebecois and as a province that has a particular vision about energy production. Ultimately, having only one nuclear power station in our province, imagine if they decided one day to choose a site in Quebec where they would dispose of the nuclear waste produced by Ontario and its greater number of nuclear stations?

M-1A That's why they're looking at a more neutral area: the Canadian Shield!

M-6A What I'm concluding out of all of this is that at the beginning everything was clear and easy to understand, but the more we look at it and talk about it, nothing's clear! In the end, we all interpreted things a little differently. So, really, can we say it was clear? I don't think so.

M-1A It was a bad translation.

[Discussion Leader]: If I remember correctly, the last time you had similar comments about the brochure we looked at, that it seemed like a bad translation taken directly from English. So, what is it in this document that makes it seem like a bad translation form English? Is it the vocabulary? What?

M-20A Sometimes there are words that don't quite go together and it just seems bizarre.

M-19A In some places, there are even quite serious French-language mistakes.

M-1A Perhaps, but I think we'd have to see the English version first to determine if what you're claiming is true or not.

M-19A No, sometimes you just know. Intuitively, by reading, you know it's not natural. For example: "*Il pourrait y avoir*

nécessité de conteneurs de transport et d'installations pour charger le combustible dans les conteneurs de transport, etc." [Page 5]. In my opinion, that's simply a poorly-constructed French sentence. The vocabulary is off, there's no French tonality…it just doesn't feel like proper French.

[Discussion Leader]: I'd like us to turn now to the section of the document that deals with Adaptive Phased Management – Page 4.

M-14A — What I find strange is that they're telling us there are three options, which they then go on to explain, but finally they come up with this fourth option that's sort of a "best of all worlds" alternative.

M-7A — No, what's strange is that they don't even explain all three options. They explain only the first one and then they go on to talk about the fourth one. So, what happened to the two other options? It's not logical.

M-14A — Well, they've come up with this Adaptive Phased Management method that draws a little bit from all the other options.

[Discussion Leader]: So, how does an organization like this one avoid the pitfalls of focusing too much on one method that it loses sight of new developments that arise in the meanwhile?

M-16A — Well, they can just do what they're doing here – say a whole lot of nothing and wait and see what turns out.

M-14A — I think the important thing is to remain open to what's happening elsewhere in the world, in Europe, in Japan or wherever. And we know there are new developments taking place in other parts of the world, yet nowhere in this document do they mention it, nor do they mention that we're working with other countries to find a solution. And, honestly, I'd much rather see consultations happening with experts around the world than with people like me. I'm happy to give my input, but there are most certainly experts in Japan or in Europe that have much more to offer on the subject. So, what's missing in this document is more focus on exchanges between experts in the field on an international level – I'd like to see that.

M-4A — Yes, that would be a worthwhile initiative.

M-2A Well, in April of this year there's supposed to be an international conference – I forget where exactly – including delegates from Australia, the United States and Japan and they're supposed to put forth some regulations and controls.

M-7A Is Canada a participating country?

M-2A I'm not sure.

M-1A But it's never easy because they're damned if they do, damned if they don't. That is, if they follow too closely in "foreign footsteps," if you will, then people will criticize and say "Hey, we should be able to come up with a Canadian solution, one of our own." So, it's not always an easy task to just say "OK, we're going to follow in the American's footsteps" or "Let's just do what the French are doing." Besides, I think they have already consulted quite extensively with leading international experts.

M-14A Then they should remind us because it's not a point that stands out, especially not in this document. It's all nice and good that they keep saying they're consulting with citizens and engaging the civic population, but they need to remind us that there are experts both at the national and international level who are being consulted as well. All it takes is one sentence or even just the word "international" to give us that dimension and I haven't seen it anywhere in here.

M-13A It's funny that at the beginning everyone was saying how this document was clear and easily readable, etc. and now everyone is totally against it, up in arms! Personally, I think you have to remember that this is just a summary and it's very difficult to get everything across in a 7-page summary of a 600-page document. The only constructive criticism I would offer, however, is that it may have been a good idea to use diagrams to, perhaps, better explain some of the concepts and whatnot. Otherwise, I think they've done a fair job of summarizing the main points and popularizing the concepts using fairly simple language and making it accessible for laypeople.

M-20A To answer M-1A's original question on how to avoid the pitfall of tunnel vision… Actually, I think this document is sort of reassuring in the sense that it's not absolute and doesn't seem to offer any definite answers. So, in that

sense, it's actually living up to its name [*Adaptive* Phased Management] because it seems it is flexible enough to adapt to changing realities. It seems there is an innate flexibility in this plan that will allow for adaptation as new developments come along over time. Besides, no decision will ever be the perfect solution, but the intention is to try and find the most appropriate way of managing a real problem that exists and that we're facing. So, that being said, I think there is merit in continued consultations and the more they consult with different groups of people, the closer we'll get to where we need to go. But I think where the citizenry will really be instrumental in the decision-making process is when it comes time to choose a site – I'm sure people will really have something to say then.

M-15A

One concern I have with international consultations is this: what if through consultations with other countries Canada decides to reach an agreement with other world governments to use the Canadian Shield as an international dumping ground? Canada being an enormous territory that is largely unpopulated, what if they start to sell off the Canadian Shield to other countries for the purposes of deep geological isolation for their nuclear waste? I mean, it's not implausible to use it as a source of income for the country…

M-1A

I don't really have any real concerns about that. My biggest concern is that there are increasing numbers of nuclear power stations being built around the world – that's what makes me nervous. And because of that, I don't think any country should be responsible for the disposal of their nuclear waste because of the risks and dangers associated with it. There should be an international organization solely responsible for taking possession of nuclear waste and managing it for the entire world. Countries like Canada are not so much a problem because we have the resources and know-how to dispose of nuclear waste in a responsible and intelligent manner, but not all countries do and that's the problem.

[Discussion Leader]: What must an organization like the NWMO do to gain your trust and for you to continue to have confidence in its implementation plans or process?

M-4A

They got to have a system of checks and balances and be transparent.

[Discussion Leader]: How? In what way, exactly?

M-14A Well, first by the way they select their members. There must be a set of established criteria and based on merit, not just token appointments based on political allegiance. For instance, if there is a change in government tomorrow, I don't want to see all the members of that organization be replaced by "friends" of the new administration.

M-17A Publish an annual report outlining their progress.

M-20A Focus groups like this are a good idea, but maybe there's another way to have larger, open forums where larger numbers of citizens can express themselves.

M-1A I think they have a discussion forum on their website and even a Q&A section where you can ask questions and they reply to you with an answer.

M-14A I've used it and they're actually very good, very quick – I got an answer within two days.

M-1A And what if tomorrow you went back and asked another question and it took them three weeks to answer this time? The question put to us was "What can cause us to have confidence" but there's also the other side of it: what can cause us to lose confidence? Well, inconsistencies like not receiving a prompt response all the time or getting outdated information like this summary that dates back to November 2005, these are all things that can cause us to lose confidence. I know they can't always update everything every week, but we're a focus group here and they couldn't even give us anything more recent than 2005.

M-1A When I first went to their website, my initial reaction to it was actually very negative. And it put me off for the littlest detail: at the top of the welcome page where you normally have the menu with a tab that says "*Français*" where you click for the French version of the page, they have a little ribbon-like thing that says "*Afficher ce document en français*." Well, when I saw that I said "What's that? I mean, it doesn't follow the standard form you normally see nowadays on most websites, so it's sort of like they're out of sync with what's going on out there in the world. However, once you take the time you go through the website, it's very good. It's just the packaging that's a little

off. I don't understand why they don't hire a designer to take care of these things – there are standards to follow.

M-6A

I think it might be worthwhile to take the time and do some advertising or public awareness campaigning to increase people's positive awareness of nuclear energy. Right now, I think most people have a spontaneous reaction to the word "nuclear" that's fairly negative – they think "nuclear" and right away they think "atomic bomb" – and yet we know there are many positive benefits to nuclear power. But it's difficult, I understand because a lot of people are against it.

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

Parking Lot questions from Montreal Phase Two Citizen Panelists were the following:

- In the 50-year history of nuclear development in Canada, what have we done to manage the waste?
- Does the NWMO have a current project to manage the current problem?
- What is the security during transportation (of the waste)?

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

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Choosing a Way Forward

The Future Management of Canada's Used Nuclear Fuel

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 safety 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	A staged management approach with three phases of implementation: • Phase 1: Preparing for Central Used Fuel Management • Phase 2: Central Storage and Technology Demonstration • Phase 3: Long-term Containment, Isolation and Monitoring Phase 1 (approximately the first 30 years): Preparing for central used fuel management would comprise the following activities: • 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 *Canadian Environmental Assessment Act*. • 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	
Concept (cont'd)	Phase 2 (approximately the next 30 years): Central storage and technology demonstration would comprise the following activities: • 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. 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. Phase 3 (beyond approximately 60 years): Long-term containment, isolation and monitoring would comprise the following activities: • 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. 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. 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.

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 through transportation, 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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