

## International Panel

The President invited three individuals with international stature and experience to provide advice and counsel throughout the course of the study.

- **Justice Thomas Berger**  
From 1974 to 1977 Thomas Berger served as the Commissioner of the Mackenzie Valley Pipeline Inquiry, recommending a ten year moratorium on building a pipeline so that native land claims could be settled. He represented Vancouver – Burrard as a Member of Parliament in 1962-63 and was later an MLA and leader of the British Columbia New Democratic Party. Mr Berger served as a Justice of the Supreme Court of British Columbia from 1973 to 1983. He now practices law in Vancouver.
- **Dr. Hans Blix**  
Hans Blix was Director General of the International Atomic Energy Agency from 1981 to 1997 and was a member of Sweden's delegation to the United Nations from 1961 to 1981. In 2000 he was appointed Executive Director of the United Nations Monitoring, Verification, and Inspection Commission, supervising international inspections for weapons of mass destruction in Iraq until the inspections were suspended in 2003. A Swedish citizen, Dr. Blix has written several books on subjects associated with international and constitutional law.
- **Dr. Gustav Speth**  
James Gustav Speth is Dean of the School of Forestry and Environmental Studies at Yale University. He founded and was president of the World Resources Institute, co-founded the Natural Resources Defense Council, served as advisor on environmental issues for U.S. Presidents Carter and Clinton, and was Chief Executive Officer of the United Nations Development Program. In 2002, for his role in bringing the global warming issue to wide public attention, Dr. Speth was awarded the international environmental Blue Planet Prize.

These individuals were asked about the NWMO's overall approach to its study, and its assessment of approaches for the long term management of used nuclear fuel. We sought advice on how the NWMO might best apply a broadly integrative approach to the study. We did not ask that they be technical reviewers, although their insights in that domain were also welcomed.

Through telephone calls, face-to-face meetings and correspondence, comment was provided at each stage of the study, with the focus being around each of the NWMO's three major public documents. The following issues were considered.

### **Discussion Document 1 – *Asking the Right Questions?***

This document presented our mandate, background information about the problem and the options, and posed the elements of an analytical framework (10 key questions).

- Following validation of the 10 key questions in public dialogue, there is an opportunity to refine our assessment and consider factors we may have missed.
  - Have we identified in an enlightened way, and at a high level, the nature of the problem with which we are faced and communicated it well?

- Viewed from the broader societal and global context, have we missed important issues which should be included in the study?
- Going forward, should adjustments be made to the process?

### **Discussion Document 2 – *Understanding the Choices?***

This document reported on our engagement work, including our attempts to understand Canadian values and presented the preliminary assessment of the options.

- In the further articulation of the framework presented in this document, have we appropriately integrated (*from a substantive perspective*) technical, social and ethical considerations?
  - Have we addressed important cross-cutting considerations - such as precautionary approach, treatment of uncertainty, value of continuous learning, importance of institutions and governance – in an appropriate way?
  - Which arguments and/or discussion in the document need further articulation and/or refinement?
  - Have we missed important issues which should be addressed at this point in the study as we refine our assessment?
- As we continue to articulate the framework and move further along the assessment process, are we engaging citizens and communities of interest in an appropriate way (*from a process perspective*)?
  - Going forward, should adjustments be made to the process?

### **Discussion Document 3 – *Choosing a Way Forward – Draft Study Report***

This document is the draft final report which elaborated the recommendations and posed an implementation plan.

- Is the rationale for NWMO's recommendation, contained in this document, coherent and consistent with the thinking as it has evolved and been outlined through the two previous discussion documents?
- Has NWMO described the rationale for its recommendation in a clear manner, responsive to technical, social and ethical considerations?
- Do we communicate a carefully considered and convincing path forward?
- In the design of implementation plans for each of the three technical approaches examined in the study, has NWMO included consideration of the full range of systems, activities, and social and political institutions (both domestic and international) which may be required to effectively manage the used nuclear fuel over the period required?
- Have we overlooked new thinking or developments concerning effective governance and accountability mechanisms that would further public confidence?
- In making this recommendation, is NWMO leaving important issues unresolved? If so, what might NWMO do to either effectively respond to these issues in its

recommendation or help pave the way for the government of Canada to effectively address these issues?

- Is the level of detail appropriate to support a decision?
- Does our recommendation provide for a pragmatic course of action, incorporating best practices, evolving knowledge and acknowledging remaining uncertainties?
- Is there an opportunity to contribute to the international dialogue on this issue which has not been exploited well in either the recommendation or the document overall?

Excerpts from the written comments of the three panel members on the Draft Study Report *Choosing A Way Forward* are provided below.

## **Justice Thomas Berger**

### ***COMMENTS ON DRAFT STUDY REPORT, “Choosing a Way Forward”***

*Thomas R Berger  
July 6, 2005*

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#### *THE APPROACH*

*I think centralized containment in a deep geological repository is a sound approach, together with interim shallow underground storage at the same central site prior to final placement in the deep repository.*

*This allows for continuous monitoring, with a potential for irretrievability, and will permit future generations to decide whether and, if so, when there should be final, irretrievable closure.*

#### *THE WORK OF NWMO*

*I believe the process that Parliament created is flawed. The Seaborn Commission proposed that NWMO be established at arm's length from the nuclear industry. Instead, Parliament mandated the establishment of NWMO as a wholly-owned subsidiary of the nuclear industry.*

*I want to say, however, that NWMO's draft study report is an excellent document.*

*NWMO, in accordance with its mandate, has consulted the technical experts, engaged the citizenry and elicited the views and values of Canadians, to inform the search for a preferred approach to the disposal of nuclear waste.*

*It is obvious that NWMO has operated independently of the industry.*

*The very act of releasing a draft of the final report months in advance so that there can be full public discussion exemplifies NWMO's determination to act independently.*

*The independence of NWMO should be clear as it moves towards selection of a site.*

*NWMO has been dealing so far with the issue of deciding how to dispose of nuclear waste. At the next stage NWMO will be determining where to dispose of nuclear waste. The issue will no longer be an abstract one, but one that will affect those in the vicinity of the site. At that stage the need for NWMO to be and be seen to be independent of the industry will be crucial.*

### *CHOOSING A SITE*

*I support what is said in the Draft Study Report about the process for choosing a site. The Draft Study Report says, at p. 24-25:*

*“Engagement will need to become increasingly a local dialogue. We must understand concerns of regions and communities that are affected directly and indirectly. These communities will become active players and problem solvers. Communities must be informed and equipped to participate in discussion and decision-making. Their participation must be based on an understanding of potential risks and the means to manage them, including those from transportation. Communities in the vicinity of any future facility must have opportunities for genuine involvement. They should be informed of issues and participate in decision-making, as well as monitoring. Effective engagement is based on principles of openness, transparency, integrity and mutual respect and involves a shared responsibility. We will build on the relationships that we have established. Through a diverse engagement program we have sought to come to know and develop an ongoing dialogue with many communities of interest. This has laid the foundation for a longer-term relationship that will be essential as Canada moves through the phases of decision-making and implementation. The dialogue we have begun will continue and grow in the years to come. Our engagement with the Canadian public and with Aboriginal Peoples is just beginning”*

*Moreover, the procedure proposed for consultation in determining the process for selecting a site and then for consultation with those actually affected once the site is chosen, will ensure that those most affected are heard.*

*This is all the more important in that NWMO will be considering one site that will include the laboratory, shallow underground storage and the repository for deep burial. In other words, once the site for the laboratory is chosen, that will be the site for shallow underground storage and the deep repository.*

*The choice of a site is not likely to be uncontroversial. You need only look to the controversy over the choice of the Yucca Mountain site in the United States as the deep repository for that country's nuclear waste.*

*I realize that NWMO intends to seek a volunteer community. This may be difficult. No community may volunteer. Moreover, if the community volunteers, it may nevertheless be divided, that is, a city council may volunteer, but a substantial part of the community may object. Then there are the quite distinct rights of Aboriginal people in the vicinity of any volunteer community that may have to be considered.*

*The recommendation that site selection be limited to the four provinces of Ontario, Quebec, New Brunswick and Saskatchewan is appropriate. It also offers (except in the case of Saskatchewan) the possibility of choosing the shortest route for transporting waste from reactor sites to the central facility.*

### TIME LINE

*Civilization has never had to consider an issue like this. No generation has had consciously to consider how its activities may produce waste that could be lethal to those living decades or even centuries from now. Civilization itself goes back perhaps no more than 5000 years (as Ronald Wright has written, only 70 lifetimes).*

*The idea of planning for such a lengthy period is subject to innumerable contingencies.*

*But by choosing adaptive phased management, with the three phases of implementation as stated at the Draft Study Report, p. 15, and a 175-year schedule before final closure of the repository, NWMO is looking to a time horizon which it can be assumed will be, in terms of its values and its politics, similar to our own.*

*From the point of view of our obligations to future generations, I think NWMO has, by establishing its timeline, allowed for technological advance and at the same time kept open options that may be addressed by future generations.*

*The time line of 30 years to choose the site (and 30 more years to proceed with shallow underground storage, and after that to develop the deep repository) is not out of keeping with the gestation period of major industrial projects in the 20<sup>th</sup> and 21<sup>st</sup> centuries.*

*The Mackenzie Valley gas pipeline project has been in various stages of planning for more than 30 years. The Sardar Sarovar Projects in India were first proposed when Jawarhalal Nehru was Prime Minister; they are under way now but by no means*

complete. Similarly, the Three Gorges Project was under consideration in the days of Chairman Mao.

### REPROCESSING

Uranium is abundant in Canada, so there is no apparent economic advantage in reprocessing spent fuel rods. This does not alter the fact that reprocessing the spent fuel rods would reduce the absolute volume of nuclear waste. It may be that, for foreign policy reasons, Canada does not wish to countenance reprocessing. I appreciate that there may be good reasons to oppose reprocessing of spent fuel rods by any nation. But I think the issue should be raised. In the United States the National Academy of Sciences takes the view that spent fuel from nuclear plants poses a security risk, not so much because terrorists might use the fuel to create a dirty bomb (it would be very difficult to do that) but because an attack could cause the fuel to ignite, releasing radiation into the environment. Reducing the volume of nuclear waste would reduce the hazard.

### ABORIGINAL CONCERNS

My concern about hearing from the “people affected” has an additional dimension in the case of Aboriginal people.

As long ago as 1987 the Brundtland Commission said that in the case of tribal people, “they must be given a decisive voice in the formulation of resource policy in their areas.”

Deep geological burial in the Canadian Shield or in Ordovician sedimentary rock is bound to include traditional territory of First Nations. They are the Canadians who mainly live on a permanent basis on these rocky and windswept frontiers. And they have a deep sense that their ancient tribal territories, no matter how inhospitable other Canadians may think them, are the true dwelling place of generations.

First Nations have a view of the passage of time occurring in a single place that many can't altogether comprehend. A First Nation whose traditional territory includes a site under consideration will almost certainly believe that descendants of their blood may well be living there thousands of years from now.

In an earlier comment\* I set out the developing law regarding the legal duty of consultation owed to First Nations in Haida Nation v. B.C. 2004 S.C.C. 73, Taku River Tlingit v. B.C., 2004 SCC 74, the Supreme Court gave some indication of the measures required to comply with the duty of consultation.

It should also be noted that the duty is one of consultation and, if necessary, accommodation, that is, it may be necessary to modify a particular development if it impinges substantially on the rights of First Nations.

These cases (Haida Nation and Taku) arose in British Columbia, a largely non-treaty area of Canada. In Mikesew Cree v. Heritage Canada, heard in the Supreme Court of

*Canada on March 14, 2005 the same reasoning may be applied to lands covered by treaty.*

### RENAISSANCE OF NUCLEAR POWER

*Nuclear power may be making a comeback. The contention is that, given the impact on climate change of continued burning of fossil fuels, there is reason to believe that there will be a renaissance of nuclear power.*

*Parliament has said that NWMO is to proceed on the footing that we will continue to rely on nuclear power and will therefore continue to produce nuclear waste. But NWMO is not to consider the nuclear cycle.*

*Both the NWMO's Roundtable on Ethics and the Advisory Council have adverted to this same question.*

*It is indisputable that a decision by Canada to authorize new nuclear plants will lead ultimately to a larger volume of nuclear waste than can now be assumed. If such a decision were taken, it would mean that the measures NWMO has proposed might have to be modified. Plans might have to be made for a second site.*

*Under its mandate, NWMO is to proceed on the footing that Canada will continue to rely on nuclear power and will therefore continue to produce nuclear waste. Our current nuclear plants will generate, if they run to the end of their projected lives, another 3.6 million bundles of used nuclear fuel.*

*This is not to say that NWMO's current recommendations are incomplete, but to say that it would be appropriate to remind the industry and Parliament that the issue will have to be revisited if we decide to proceed with new nuclear plants.*

### TRANSPARENCY

*The National Citizens' Dialogue raised the issue of transparency.*

*It was put this way, at p. 9:*

*“People must be told the truth. There must be greater transparency in decision making and monitoring by both government and industry. They want to know why decisions are made and how they are being implemented. They want to know if standards are being met or not. They want full disclosure of financial and management information.”*

*Given the desire for transparency it is unfortunate that NWMO, though carrying out a public mandate, is not currently on the list of organizations subject to Canada's Access to Information Act, R.S. 1985, c.A-1.*

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*\*Earlier comment January 14, 2005*

*... the case of Delgamuukw v. B.C. [1997] 3 S.C.R. 1010 (which) set out the legal duty of consultation owed to First Nations.*

*In Haida Nation v. B.C. 2004 S.C.C. 73, handed down on November 18, 2004, Chief Justice McLachlin, writing for the Supreme Court, held that the legal duty of the Crown to consult with Aboriginal people is part of a process of fair dealing and reconciliation flowing from the Crown's duty of honourable dealing with Aboriginal people. On the same day, in Taku River Tlingit v. B.C., 2004 SCC 74, the Supreme Court gave some indication of the measures required to comply with the duty of consultation.*

*In Haida Nation, Chief Justice McLachlin, said, at para 35:*

*“that duty [of consultation and accommodation] arises when the Crown has knowledge of “the potential existence of the Aboriginal right or title and contemplates conduct which might adversely affect it.”*

*It seems to me that at the stage when a region is designated NWMO may be obliged to consult with the Aboriginal people of the region.*

*It should also be noted that the duty is one of consultation and, if necessary, accommodation, that is, it may be necessary to modify a particular development if it impinges substantially on the rights of First Nations.*

*These cases (Haida Nation and Taku) arose in British Columbia, a largely non-treaty area of Canada, but I expect that in Mikesew Cree v. Heritage Canada, to be heard in the Supreme Court on March 14, 2005, the same reasoning will be applied to lands covered by treaty. To the extent NWMO opts for centralized storage or deep geological burial in Ontario, it will be dealing with treaty land.*

*In treaty areas the rights of First Nations are defined. Apart from Indian reserves themselves they include rights of hunting, gathering fishing and trapping as well as rights to travel and to establish cabins for these purposes and to carry on traditional activities over treaty lands, i.e., over the whole area of land obtained by the Crown under treaty. I should think this covers the whole of northern Ontario.*

*The obligation appertains to what are Aboriginal and treaty rights protected under s. 35 of the Constitution Act, 1982. These are entrenched constitutional rights, not dependent on the goodwill of the Crown or the good offices of NWMO.*

*I appreciate that NWMO is not the Crown or an agent of the Crown, but a private corporation, and therefore has no duty of consultation with Aboriginal people. However, in Haida Nation, Chief Justice McLachlin, noted, at para. 53:*

*“The Crown alone remains legally responsible for the consequences of its actions and interactions with third parties that affect Aboriginal interests. The Crown may delegate procedural aspects of consultation to industry proponents seeking a particular development; this is not infrequently done in environmental assessments.”*

*I think Parliament has in part delegated to NWMO the task of consultation. In s.12(7) of the Act, NWMO is required to “consult the general public, and in particular aboriginal peoples, on each of the proposed approaches.”*

*I do appreciate that NWMO has been at pains to fulfill its obligation generally to consult Aboriginal people. But the Supreme Court has said that the duty of consultation applies to the people affected.*

*So the duty arises when the Crown (or its delegate, in this case NWMO) is aware that there may be an adverse effect on treaty rights. Such rights do not exist in the abstract. They belong to First Nations. At the stage then when the Crown knows of the existence of treaty rights likely to be affected, it must consult with the First Nations that are entitled to exercise those rights.*

## **Dr. Hans Blix**

### ***Comments on CHOOSING a WAY FORWARD***

*Dr. Hans Blix*

*Date*

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*Like the earlier documents prepared by the NWMO this study provides a very patient and dispassionate examination of issues, which are highly technical but which also on some points provoke strong feelings. It is valuable that the study explicitly discusses these points. The proposal to be submitted to the Canadian Government must be not only technically but also socially acceptable.*

*The NMWO has taken great care to consult a very broad spectrum of Canadians. Some people were found whose strong views regarding the disposal of spent nuclear fuel were linked to strong views for or against the use of nuclear power. The study wisely and consistently avoids discussing the use issue as being outside its mandate and takes its point of departure in the simple and undeniable fact that spent nuclear fuel and nuclear waste exist and must be taken responsibly care of at some point.*

*Nevertheless, as the Advisory Council remarks [concerning the Draft Study Report] (p. 237), the NWMO will have to address the matter of capacity and therefore of quantity. The Council would be critical, it says, of an approach that aimed at the management of greater quantities than the present generating plants are expected to create unless such approach were linked to a statement about the need for a broad public discussion on Canadian energy policy. Perhaps an additional difficult phase of this kind can be avoided. The study found that most Canadians are against delays and want a decision on the waste issue now, albeit one that allows future adjustments in the light of new research.*

*The NWMO is assuming that the quantities of spent fuel to be taken care of are for an expected reactor life time of 40 years. While this assumption is no doubt made for good reasons one must be aware that there is a wide tendency in the world to-day to accept a life after 40 for nuclear reactors. Against that background it would not seem out of place to look for disposal arrangements and sites which would provide some flexibility as regards capacity. This would neither preclude a political decision on an early phase out of nuclear power, nor one on expansion.*

*Interestingly, the study found that while some people consulted had strong views on the issue of disposal of spent nuclear fuel most people knew little about it and seemed to have little interest in becoming personally involved in the study (p. 30). One should not, however, conclude that those who now seem indifferent might not become engaged, when it comes to selecting sites for the storing or disposal of spent nuclear fuel. The study is right in proposing that the procedures for such selection should be carefully worked out to enable all interested people to participate.*

*The NWMO study sees the time dimension as a unique feature in the issue of disposal of spent nuclear fuel. This is understandable. Systems are designed to last for periods longer than recorded history (p. 11). There may be only limited consolation in the reflection made (p. 42) that the body of knowledge existing on this issue is very large compared to other social decisions, which we make with relative ease. Indeed, in our burning of fossil fuels we release vast quantities of wastes – like heavy metals – which remain toxic forever. While the nuclear waste problem must be and is the focus of earnest discussions it is justified to see it in perspective. It would also be justified clearly to indicate that the radioactivity of spent nuclear fuel, although remaining for an extremely long period of time, decreases drastically in intensity in the period immediately after the fuel is removed from the power reactors. The chart provided toward the end of the study (on page 241) would deserve to be brought forward.*

*The NWMO study provides convincing reasons for combining some of the options examined for the disposal of spent nuclear fuel. Its conclusions are similar to those reached by some other countries with advanced nuclear power sectors, like Finland and Sweden: keeping the spent fuel for a period at the reactor sites, then transporting it to shallow underground facilities for a further period of cooling and eventually placing it in deep underground facilities. The process envisages use of underground laboratories,*

*monitoring for an extended period, and the possibility of learning and adjustment. While we should not allow ourselves to benefit from fission power and leaving a residue of problems to our children and grand-children, we should as much as possible avoid arrangements, which prevent them from exploiting and benefiting from new scientific and technical knowledge. Reprocessing and transmutation are hardly economic today (p. 130) but it is not excluded that these and other procedures might become of interest in the future.*

## **Dean Gustave Speth**

### *Comments on **Choosing A Way Forward***

*Dean Gus Speth*  
*July 27, 2005*

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*I suppose this may be my final comment on the work of NWMO, so let me begin both by thanking you for this opportunity to participate and by saying how enormously impressed I am by the procedures you have followed and the values you and your team have embodied in the exercise throughout. While I am sure that close-up you see more than a few imperfections, from my perspective I believe you have carried out a model public policy review - open, transparent, principled, thorough, and impressively participatory. I congratulate you.*

*My November 22 letter to you said much of what I wish to say, and I would like to attach it here as part of these final comments.\* In particular, I am pleased to see that you are recommending a fourth option, Adaptive Phased Management, with special emphasis on a system for adaptive management proceeding in phases and leading in the end to a technical solution - isolation of the spent fuel deep underground in suitable rock formations in Canada. I think you have laid out well one of the principal paths forward. while presenting the option to depart from it at various times and in various ways should the public interest require.*

*With your approach Canadians will be taking responsibility to deal as safely as possible with the highly dangerous residuals of its own use of nuclear power. There are no guarantees in this business once these wastes have been generated -no risk free approach -but given that the wastes exist, I believe you have recommended a wise course, and I, for one, cannot think of a wiser one. Moreover you have documented it thoroughly -it is there for all to see.*

*The "draft study report" of Choosing A Way Forward asks an important question on page 180: should the Board of Directors of N\WMO be expanded to include independent directors. I believe the answer to this question is a very clear yes. The more controversial and difficult stages of NWMO's life lie in the future and its credibility and hence its*

*success depend critically on independence (even if the industry could provide all the expertise needed on the board, which itself is doubtful). Indeed, I would urge that a very significant component of the board be independent "(outside" directors.*

*The two final comments I would offer has to do with nuclear power's future and with ensured financing. The two are related. Part of the adaptive management envisioned by NWMO should be to maintain robustness in its implementation regardless of whether nuclear power declines, stays static or grows considerably. That is simple common sense. Also, fundamental fairness to future generations requires that the full costs of all phases of implementation and all unexpected contingencies be unambiguously paid for by the industry up front. I gather from Chapter 18 that this is the legislated intention. If so, I would only suggest that all estimates and calculations be prepared with the greatest care.*

*\* Attached Excerpts from letter  
Dean Gus Speth  
November 22, 2004*

*I'd urge you to look at your challenge in the context of two options: a stagnant nuclear power industry and a revitalized one. I'd urge also that you factor the possibility of very serious climate change into your considerations as well as the threat of terrorists attacks at various points in the process of handling, shipping and storing/disposing of the waste. Finally, you should examine "worst case" scenarios so that the most serious possibilities of harm will be identified.*

*I was pleased to see how much effort you and your team have put into learning what other countries are doing to meet the nuclear waste challenge.*

*I also benefited from our discussion of the Nuclear Fuel Waste Act and was pleased to understand better that it leaves you the option of looking not only at the three main options but also at other methods. I am not at all suggesting that you reopen your decision on options such as disposal at sea or in space. Rather, I am pleased that you can look at options that involve one or more of the three primary options – deep geological disposal, storage at reactor sites, and centralized storage above or below ground – but involve them in a less-than-permanent way. In particular, I would urge you to include in your review the option of interim below-ground retrievable central storage (to be followed one day by permanent disposal). The goal here would be have one or more hardened, safe sites for the storage of nuclear waste where the waste could be kept for a period of, say, 100-200 years. The principal argument in favor of this option is that Canadians and others will know a great deal more about how best to safely dispose of the waste permanently 100-200 years from now than we know now. A secondary option is that the waste, so some of it, may turn out to have value to future generations.*

*One can envision two variants of this option. In one, the site of this central storage is selected without worrying at this point about suitable permanent geological*

*disposal sites. In the other, one tries to find a site that offers good prospects for permanent geological disposal but the site is used in a way that allows long-term access to and retrievability of the waste. At the extreme, this second variant requires that the selected site meet all the criteria for both central storage and geological disposal, but one need not go to this extreme.*

*If one allows this type of flexibility and adaptive management, then the Assessment Team's work has to be viewed in a different light. Its work proceeded on the premise, for example, that the central storage facility would have to last for "thousands of years," whereas in the option I would urge you to consider, this length of time would not be required. As a result, some type of interim central storage might look a lot more attractive to the Team.*