Department
of Energy &
Climate Change

Call for Evidence

Please use this form to answer questions on the Call for Evidence on Managing Radioactive Waste Safely: Review of the Siting Process for a Geological Disposal Facility.

The closing date for the submission of responses is **10 June 2013**.

Responses can be returned by email (preferable) or post.

Email address: radioactivewaste@decc.gsi.gov.uk

Or by post to: The Managing Radioactive Waste Safely team
Department of Energy and Climate Change
55 Whitehall
London
SW1A 2EY

In order to help us analyse responses, please provide details of your organisation.

When the call for evidence ends, we may publish or make public the evidence submitted. Also, members of the public may ask for a copy of responses under freedom of information legislation.

If you do not want your response - including your name, contact details and any other personal information – to be publicly available, please say so clearly in writing when you send your response to the call for evidence. Please note, if your computer automatically includes a confidentiality disclaimer, that will not count as a confidentiality request.

Please explain why you need to keep details confidential. We will take your reasons into account if someone asks for this information under freedom of information legislation. But, because of the law, we cannot promise that we will always be able to keep those details confidential.

The responses to this Call for Evidence will inform a public consultation that will follow in the autumn.

We would like to keep stakeholders who are interested in the MRWS process up to date on developments. If you would like to be kept up to date please sign up at the end of the form.

Introduction

1. The UK Government's policy for the long-term management of higher-activity radioactive waste is geological disposal[1]. In 2008 the Managing Radioactive Waste Safely (MRWS) White Paper[2] was published which outlined a framework for implementing geological disposal based on the principles of voluntarism and partnership.

2. Three local authorities formally expressed an interest in the MRWS programme: Copeland and Allerdale Borough Councils, and Cumbria County Council. In January 2013, the three local authorities voted on whether to proceed to stage 4 of the process. The two boroughs voted in favour, but the county voted against. The Government had in 2011 given a specific undertaking that the existing site-selection process would only continue in west Cumbria if there was agreement at both borough and county level. The county's decision therefore ended the existing site selection process in west Cumbria.

3. Shepway District Council in Kent had also taken soundings from local residents, but subsequently decided against making a formal expression of interest in the current MRWS process.

4. The Government remains firmly committed to geological disposal as the right policy for the long-term safe and secure management of higher-activity radioactive waste. The Government also continues to hold the view that the best means of selecting a site for a geological disposal facility (GDF) is an approach based on voluntarism and partnership.

5. Evidence from abroad shows that this approach can work, with similar waste disposal programmes based on these key principles making good progress in countries like Canada, Finland, France and Sweden.

6. The fact that two local authorities in west Cumbria voted in favour of continuing the search for a potential site for a GDF demonstrates that communities recognise the substantial benefits that are associated with hosting such a facility – both in terms of job creation and the wider benefits associated with its development.

Purpose of the call for evidence

7. In line with the Secretary of State's written Ministerial statement of 31 January 2013[3], Government has been considering what lessons can be learned from the experiences of the MRWS programme in west Cumbria and elsewhere. We are now inviting views on the

[1] Radioactive waste disposal is a devolved matter. The Scottish Government has a separate policy and supports long-term interim storage and an on-going programme of research and development. The Welsh Government has reserved its position on geological disposal of radioactive waste while continuing to play an active part in the MRWS process. The Department of the Environment in Northern Ireland supports the MRWS programme.

[2] Managing Radioactive Waste Safely: A Framework for Implementing Geological Disposal https://www.gov.uk/government/publications/managing-radioactive-waste-safely-a-framework-for-implementing-geological-disposal

[3] See https://www.gov.uk/government/speeches/written-ministerial-statement-by-edward-davey-on-the-management-of-radioactive-waste

site selection aspects of the ongoing MRWS programme in this call for evidence, particularly from those who have been engaged in (or have been interested observers of) the MRWS process to date. The responses to this call for evidence will inform a consultation that will follow later in the year.

Background

8. Higher-activity radioactive wastes are produced as a result of the generation of electricity in nuclear power stations, from the associated production and processing of the nuclear fuel, from the use of radioactive materials in industry, medicine and research, and from military nuclear programmes.

9. As one of the pioneers of nuclear technology, the UK has accumulated a substantial legacy of higher activity radioactive materials. Some of it has already been processed and placed in safe and secure interim storage on nuclear sites. However, most will only become waste over the next century or so as existing facilities reach the end of their lifetime and are decommissioned and cleaned up safely and securely.

10. These higher-activity wastes can remain radioactive, and thus potentially harmful, for hundreds of thousands of years. Modern, safe and secure interim storage can contain all this material – but this method of storage requires on-going human intervention to monitor the material and to ensure that it does not pose any risk to human or environmental health. While the Govemment believes that safe and secure interim storage is an effective method of managing waste in the short to medium term, the Government is committed to delivering a permanent disposal solution.

11. In October 2006, following recommendations made by the independent Committee on Radioactive Waste Management, the Government announced its policy of geological disposal, preceded by safe and secure interim storage. The Government subsequently announced that it would pursue a policy of geological disposal with site selection on voluntarism and partnership. This remains Government policy.

Geological disposal

12. Geological disposal involves isolating radioactive waste in an engineered facility deep inside a suitable rock formation to ensure that no harmful quantities of radioactivity ever reach the surface environment. It is a multi-barrier approach, based on placing packaged wastes in engineered tunnels at a depth of between 200 and 1000m underground, protected from disruption by man-made or natural events.

13. Geological disposal is internationally recognised as the preferred approach for the long-term management of higher-activity radioactive waste. It provides a long-term, safe solution to radioactive waste management that does not depend on on-going human intervention.

Response form

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Organisation / Company	The Immobilisation Science Laboratory, The University of Sheffield
Organisation Size (no. of employees)	REDACTEDREDACTEDREDACTED
Organisation Type	REDACTEDREDACTEDREDACTED
Job Title	REDACTEDREDACTEDREDACTED REDACTEDREDACTEDREDACTED REDACTEDREDACTEDREDACTED
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Would you like to be kept informed of developments with the MRWS programme?	Yes
Would you like your response to be kept confidential? If yes please give a reason	No

The Government is interested in your views on the geological disposal facility site selection process outlined in the 2008 Managing Radioactive Waste Safely (MRWS) White Paper. To assist us you may wish to consider the following issues in your response:

- **What aspects of the site selection process in the MRWS White Paper do you think could be improved and how?**
- **What do you think could be done to attract communities into the MRWS site selection process?**
- **What information do you think would help communities engage with the MRWS site selection process?**

We believe that the Managing Radioactive Waste Safely (MRWS) process represents a credible approach to long term management of the UK inventory of radioactive waste. We see no reason to abandon the community site selection aspect of the MRWS process, but there are a number of essential improvements in three key areas, which should be considered. These focus on: building a more robust post-closure safety case, principally by addressing issues of conservatism; increased community engagement, specifically pertaining to the safety case and economic benefits; and streamlining of the MRWS decision making process. We detail these issues below.

1. Scientific Case

The key reason cited by the Cumbria County Council for withdrawing from the MRWS programme was the question over the suitability of West Cumbria's geology for siting a nuclear waste repository.

Disposal in crystalline rock, such as the Borrowdale Volcanic Group in Cumbria, has been identified as a suitable geology, similar to potential repository locations in Sweden and Finland. As such, the Nuclear Decommissioning Agency (NDA) have outlined an environmental safety case[1] detailing the design of multiple engineered barriers (including wasteform, canisters and backfill) to retard radionuclide migration. However, the NDA state that it is not possible to choose the repository scenario and engineered barrier design until the site has been selected, and hence the geology is known. Indeed, detailed studies of the repository engineered barrier system are not planned until stages 5 and 6 of the MRWS process, when the repository site will be investigated through a borehole programme and subsequently excavated.

In our opinion, the lack of an upfront detailed scientific case for the performance of engineered barrier systems is a key failing of the MRWS process. In order for communities to have confidence in the MRWS process, building the safety case cannot be left until late in the process, and should become a key feature of the earlier stages. Acknowledging that a full repository safety case does rely on local geology, the early case should emphasise the design of safe engineered barriers, supported by a rigorous programme of scientific experimentation to predict with confidence their safety functions, and how they will behave with time. This will be crucial in engaging communities in the MRWS process, as even at an early stage, confidence in the post-closure safety of the repository is central. We believe that this scientific knowledge is currently absent, but is essential to enhance the post-closure safety case and therefore in improving public confidence.

Owing to the lack of this detailed case, the other principle scientific failing of MRWS has been a set of conservative assumptions about the performance of potential engineered barrier systems, which have been unsuccessful in convincing communities of the safety of a potential repository. Indeed, this conservative approach was noted in a previous failure of the UK authorities to site a Rock Characterisation Facility in Cumbria; the planning inspector commented that the "*lack of adverse, as distinct from a conservative, interpretation... [was] an unfortunate omission from the emerging safety case*"[2], when specifically considering the engineered backfill material considered for use in the intermediate level waste repository (known as NRVB).

Therefore, it is our recommendation that developing a detailed understanding of the behaviour and performance of engineered barriers, to be presented to the volunteer local authorities, should be brought to an earlier stage of the MRWS process. We believe this will boost public confidence in the post-closure safety case for the disposal of radioactive waste in an underground repository, and encourage engagement in the site selection process. Understanding a range of engineered barrier designs, suitable for a variety of host geologies, will be a sound investment for the MRWS process; potentially enhancing public confidence in the disposal concept in other (i.e. non-Cumbrian) areas of the UK with potentially suitable host geology.

[1] Cumbria County Council, 1996. RCF Planning appeal by Nirex, pp 241-242
[2] Geological Disposal: Generic Environmental Safety Case main report. Nuclear Decommissioning Authority Report, NDA/RWMD/021, December 2010.

Community Engagement

If the current approach of volunteering and partnership is retained, which we believe the government was right to reaffirm, it will be necessary to comprehensively re-evaluate engagement with potential host communities.

In the early stages, greater engagement will be required with communities which hold potentially suitable geologies, to encourage entry into the site selection process. In order to attract communities, this must include a more detailed disposal design and scientific case to demonstrate repository safety, as discussed above. A greater emphasis on developing generic engineered safety systems suitable for potential host geologies will strengthen the GDF siting case, and be an important tool in demonstrating to interested communities that we can predict and control the migration of radionuclides to ensure repository safety. The effective communication of a robust

scientific safety case will be important in engaging members of interested communities to proceed with the MRWS process.

One of the key aspects of the MRWS programme is investment in the form of a community benefits package, although government has not given a decision on the details. This lack of detail is a failing of the MRWS process, eroding community confidence in the ability and willingness of government to deliver a benefits package commensurate with hosting a facility of the national importance of a radioactive waste GDF. Although government is right to suggest that *"any Benefits Package should be developed jointly between communities and, the government ... taking into account local needs, and issues of affordability and value for money*[3]*"*, the ambiguity surrounding these benefits in the early stages of the MRWS process harms community engagement. The detail of the nature and extent of community benefits should, therefore, be addressed early on in the MRWS process, and encourage investment in long term, sustainable improvements which address local needs. Additionally, necessary infrastructure improvements required by the GDF need to be emphasised to the community as an additional benefit, alongside the extensive and guaranteed investment in the local area which will form the community benefit package.

[3] https://www.gov.uk/managing-radioactive-waste-safely-a-guide-for-communities#why-should-local-communities-be-interested

MRWS Process

As noted above, the current MRWS process leaves building a detailed science case for the performance of the repository until the later stages (5 and 6). We recommend that in order to retain the support of communities throughout, there is a need to build confidence in the safety of the GDF earlier on. This should be combined with simplification of the process to include fewer stages, with a more substantial evidence gathering process at each. In accordance with the issues we raise above about the scientific basis for a robust post-closure safety case, we note that one of the failings of the process in Cumbria was a lack of data to support GDF feasibility, making it difficult to provide evidential arguments against groups that proposed the geology was flawed.

Another reason for Cumbria county council's concern was a lack of legislation to protect their right of withdrawal later in the process, particularly once the detailed evidence stages had been completed. Although communities are free to withdraw from the volunteer process whenever they choose, these fears may be tempered if legislation could protect the right to withdraw. Acknowledging and protecting the right to withdraw is an essential part of strengthening community confidence that the MRWS process will be administered fairly and transparently.

There will be a natural cooling-off period following the decision of Cumbria county council to withdraw from the MRWS process. We believe that this time is an ideal opportunity to invest in research, development and design activities with the objective of developing a more robust engineering safety case for the disposal of radioactive waste in a geological facility. This will be key to engaging and retaining interested communities in the MRWS process, and building public confidence in the safe disposal of UK radioactive waste.

Please note that the opinions expressed here are those of the contributors and do not necessarily reflect those of our employer or research sponsors.