Meeting:	NuLeAF Steering Group, 12th June 2019
Agenda Item:	5
Subject:	Update on the Geological Disposal Facility (GDF) siting process
Author:	Philip Matthews
Purpose:	To report on recent developments related to the proposed Geological Disposal Facility

Introduction:

This report provides an update on recent developments related to the process for identifying a Geological Disposal Facility. It covers:

- NuLeAF Policy Statement on Geological Disposal;
- GDF siting process; and
- International Update.

Recommendation:

That members approve the final **Policy Statement 3 on Geological Disposal** (Annex A) and the proposed **Briefing Paper 19: Guidance on Geological Disposal from the Committee on Radioactive Waste Management** (Annex B).

Background information

The UK Government's policy on **Working with Communities – implementing geological disposal** was published in December 2018[1], with the equivalent policy for Wales published in January 2019[2]. The National Policy Statement, governing the planning aspects of the GDF, is expected to be published later in 2019. This paper provides an update on progress on GDF related activities.

1. NuLeAF Policy Statement on Geological Disposal

A draft revised Policy Statement on Geological Disposal (Policy Statement 3) was presented to the March 2019 Steering Group meeting and discussed with members.

Following that discussion and the comments made, a decision has been taken to separate the earlier document into two distinct papers:

- A concise **Policy Statement** setting out NuLeAF's perspective of Geological Disposal. This has taken on board the comments made at the last Steering Group meeting and is intended to reflect fairly the broad range of views that our members have. (Annex A)

[1] https://www.gov.uk/government/publications/implementing-geological-disposal-working-with-communities-long-term-management-of-higher-activity-radioactive-waste
[2] https://gov.wales/docs/desh/publications/190116-geological-disposal-of-higher-activity-radioactive-waste-working-with-communities-en.pdf

- A proposed new **Briefing Paper 19: Guidance on Geological Disposal from the Committee on Radioactive Waste Management (Annex B).** This sets out the views from CoRWM on geological disposal in general, based on their 2006 report and recent statements on aspects of the overall proposals.

The Policy Statement will help guide our future engagement with geological disposal at a national and local level. It also sets out our views on the associated areas of long-term storage and near surface disposal, the latter being something that the NDA is currently considering as an option for some of the Intermediate Level Waste (ILW) inventory.

The proposed new Briefing Paper 19 is intended to help members understand the views of CoRWM on the various aspects of geological disposal, given their primary role in shaping government policy. It will sit alongside an updated **Briefing Paper on Geological Disposal**, explaining the final English and Welsh policies, which will be published in the coming weeks.

2. GDF Siting Process

2.1 Consultations on the approach to **Site Evaluation (SE)** have now closed. NuLeAF submitted responses to both the English and Welsh proposals[3] as did a number of local authorities. The final documents, which will set out the methodology for assessing the relative merits of different potential GDF sites, will be published later this year.

3. International update

3.1 NuLeAF's Executive Director attended a special meeting of the Group of Municipalities with Nuclear Facilities (GMF) in Brussels on the 21st March. The meeting discussed future objectives for the GMF and ENWD.

Current General Secretary Mariano Vila d'Abadal has indicated he will step down later this year and so it is felt an opportune time to consider how to further invigorate the network. The meeting heard a presentation from NuLeAF on research into member views on the **European local Network of radioactive Waste Dialogue** (ENWD), the GMF's forum for discussion of issues around geological disposal. Drawing on the research and discussions in Brussels, papers will be prepared for a meeting later in the year where the future direction of the network will be agreed.

3.2 At the Brussels meeting it was also announced that Meritxell Martell, an independent consultant with a long involvement in the network, will be taking over as Co-ordinator of the GMF following Mariano's departure.

[3] http://www.nuleaf.org.uk/document-library/consultation-responses/consultation-responses-2019

3.3 GMF meetings for 2019/20 have also been announced:

- Today (12th June) there is a one-day visit to the Bure facility in France, which is conducting ongoing research into geological disposal in clay. More information on the French GDF process is available on a new English language website[4].
- A visit to the Olkiluoto facility in Finland, where the world's first deep geological repository is under construction in granitic rocks, is planned for October.

These visits are open to any NuLeAF member authority. It is recognised that the cost of participation is a significant barrier, given current financial constraints. While it was not possible to secure support for the Bure visit, NuLeAF will continue to seek funding to enable councils to attend future events.

[4] https://international.andra.fr/

Annex A

GEOLOGICAL DISPOSAL

Policy Statement 3

June 2019

1. Background

The UK and Welsh Government believe that Geological Disposal is the best solution to the long-term management of the UK's Higher Activity Radioactive Wastes (HAW). Their position is informed to a significant degree by the 2006 **Managing Radioactive Waste Safely**[5] report of the Committee on Radioactive Waste Management (CoRWM), the key elements of which were reaffirmed by CoRWM in a series of position papers on geological disposal published in late 2018 and early 2019[6].

Government accepted CoRWM's view that any siting process for a Geological Disposal Facility (GDF) cannot be imposed on a community: instead communities must be able to choose whether to enter the siting process, and then offer their consent based on a good understanding of what is proposed and its implications. It has also been acknowledged that local authorities, as democratically elected bodies with clear roles and responsibilities in land use planning, economic development, transportation, waste planning, community engagement and environmental protection, must be involved.

Following the unsuccessful conclusion of the previous Managing Radioactive Waste Safely (MRWS) process, a White Paper on Geological Disposal was published in 2014 leading to the launch of a new GDF siting process at the end of 2018.

NuLeAF and our member local authorities have been actively involved in shaping the current process. We:

- NuLeAF's Director sat, in a personal capacity, on the Community Representation Working Group (CRWG) established by Government to develop the approach to **Working with Communities**.
- Provided detailed responses to all relevant consultations and used our Steering Group and Radioactive Waste Planning Group (RWPG) as a forum to engage with and advise Government.
- Provided written and oral evidence to the BEIS Select Committee on the **National Policy Statement (NPS)** on geological disposal.

The GDF siting process gives a clear and significant role to local government. NuLeAF will engage with the siting process as it progresses, representing the view of local authorities to RWM, the UK and Welsh Governments, regulators and other interested parties.

[5] https://www.gov.uk/government/publications/managing-our-radioactive-waste-safely-corwm-doc-700
[6] https://www.gov.uk/government/organisations/committee-on-radioactive-waste-management

To help guide our work we have developed a Policy Statement on Geological Disposal, set out in Section 2. This statement has been developed through discussion with our members and was formally approved by NuLeAF's Steering Group in June 2019.

Further information on the issues that underpin this Policy Statement can be found in:

- **Briefing Paper 17: Geological Disposal Facility (GDF) Siting Process** which explains current policy on geological disposal in England and Wales, and the role within that for local authorities and communities.
- **Briefing Paper 19: Guidance on Geological Disposal from the Committee on Radioactive Waste Management (CoRWM)** which explains the Committee's appraisal of the various options for disposal of Higher Activity Waste (HAW) and the considerations that a GDF siting process must address.

2. NuLeAF's Policy Statement on Geological Disposal

NuLeAF believes that any successful siting process for a Geological Disposal Facility (GDF) must place local authorities, and the communities they represent, at its heart.

As the Local Government Association's representative body, we will continue to engage with the UK and Welsh Government, GDF developer (RWM) and the regulators to advocate our members' interests; and to build the capacity of our members to engage in the siting process if they wish. We will:

- Support impartially any local authority in England and Wales that, on whatever basis enters, or is impacted by, the GDF siting process.
- Continue to make the wider case to Government and RWM for the best economic, social and environmental outcomes to all communities involved.
- Support and advocate effective and inclusive local siting processes, where communities are able to discuss and learn about all aspects of the proposals, and also to question and challenge.
- Press Government and RWM to recognise the significant concerns that communities have regarding the long-term storage of HAW at Sellafield and other sites across the UK. These communities will host wastes for many decades to come and their role must be acknowledged within the siting process. Community benefits and investment should be provided on the basis of their service to the nation.
- Encourage Government and RWM to engage with and listen to communities on the issue of retrievability of waste.
- Advocate to Government and RWM the need for the transportation impacts of the GDF siting process to be fully recognised and addressed.
- Engage with and represent local government and community interests in any parallel process for the management of HAW through Near Surface Disposal (NSD). NuLeAF believes that any siting process for NSD facilities must be based on voluntarism and community consent.

Our engagement will reflect the diversity of views within our membership and our central role as a supporter of local government. Our meetings will be a forum for open debate and discussion on all aspects of geological disposal. All perspectives will be presented, including the views of those who advocate alternative solutions to the long-term management of Higher Activity Wastes (HAW).

We believe that government should undertake regular reviews of policy to consider alternatives, informed by both physical and social science research, and practical learning from the UK and across the globe. A strong commitment should be made to undertake R&D to reduce uncertainties about long-term safety.

Annex B: BRIEFING PAPER 19: GUIDANCE ON GEOLOGICAL DISPOSAL FROM THE COMMITTEE ON RADIOACTIVE WASTE MANAGEMENT (CoRWM).

1. Introduction

The **Committee on Radioactive Waste Management (CoRWM),** is the independent advisory body to the UK and Devolved Governments on the management of Higher Activity Radioactive Waste (HAW).

In 2002 CoRWM was tasked by Government with undertaking an in-depth review to determine the best options for the long-term management of the UK's Higher Activity Wastes. Following an extensive process of engagement and consultation, involving NuLeAF, their conclusions were published in the **Managing Radioactive Waste Safely**[7] report, published in 2006. Their view was, that with a number of caveats, geological disposal was the best option for the long-term management of the UK's HAW inventory.

This view was reaffirmed by CoRWM in a series of position papers on geological disposal published in late 2018 and early 2019[8]. These more recent papers did not re-open their deliberations but instead *'provide an overview of CoRWM's work 2003-2006 providing a traceable outline of the path that led CoRWM to recommend geological disposal'.*[9]

Current UK and Welsh Government policy is supportive of Geological Disposal and is guided to a significant degree by the views of CoRWM. Given its importance to current policy in England and Wales, this Briefing Paper explains CoRWM's view on the key questions surrounding geological disposal.

It covers the following:

- What is geological disposal?
- Why choose geological disposal over other options?
- Can we be sure a GDF is safe?
- Should a GDF only target the best geology?
- What are the transport considerations?
- Should we be able to retrieve wastes?

It concludes by summarising CoRWM's overall conclusions.

[7] https://www.gov.uk/government/publications/managing-our-radioactive-waste-safely-corwm-doc-700
[8] https://www.gov.uk/government/organisations/committee-on-radioactive-waste-management
[9] CoRWM Position Paper: Why Geological Disposal? November 2018, p1

2. What is Geological Disposal?

CoRWM's 2006 report to Government[10] states that '*Geological disposal is based on the concept of the retention of radioactive wastes by a combination of engineered containment within a geological barrier. Concepts for geological disposal are based on an extremely long period of containment of the waste during which time its level of radioactivity will diminish through the process of radioactive decay. It is acknowledged that at some point in the very far future radioactivity will eventually make its way into the biosphere, but at levels expected to be insignificant in terms of impact on health and the environment'.*

Current policy in England and Wales thus envisages the burial of wastes deep underground (200m to 1,000m) within an engineered facility, in which multiple barriers contain radioactive wastes for very long periods of time. Through decay, this should ensure that future human populations and the surface environment are not exposed to significant levels of harm at any point.

More information on the concept and potential design of a GDF is provided in NuLeAF's Briefing Paper 17.

3. Why choose Geological Disposal over other options?

In the early 2000s, the Committee on Radioactive Waste Management (CoRWM) was tasked by Government with evaluating the range of possible options for the management or disposal of the UK's Higher Activity radioactive Wastes (HAW). This review took 4 years and involved engagement with a wide range of stakeholders.

CoRWM considered six waste streams (High level waste; Spent Nuclear Fuel; Plutonium; Uranium (highly enriched, depleted, natural and low enriched); Intermediate and low-level waste not suitable for the Low-Level Waste Repository (LLWR); and Reactor decommissioning waste.)

For each of the waste streams, 15 possible management options were considered (Appendix 1). A process of shortlisting was then undertaken with options eliminated if they couldn't be implemented in the reasonably foreseeable future. This led to the exclusion of most options with only four taken forward for further study:

- Long term interim storage
- Near surface disposal of short-lived wastes (near surface disposal is not considered suitable for long lived wastes)
- Deep geological disposal
- Phased deep geological disposal.

[10] Committee on Radioactive Waste Management, 'CoRWM's Recommendations to Government', July 2006, Chapter 15.

These options were assessed using a weighted scoring system by experts in relevant fields, citizens' panels and stakeholder groups. Based on this, CoRWM's overall conclusions was that *'disposal options performed significantly better than storage options'* and that *'Phased geological disposal ranked slightly higher than geological disposal'.* CoRWM stated that `*the key discriminators between geological disposal and storage options were burdens on future generations and public safety (up to 300 years)*[11].

This outcome was consistent regardless of the different weightings that the various stakeholders placed on the assessment criteria. The weighting applied by Non-Governmental Organisations (NGOs), which gave much more emphasis on environment, amenity, flexibility and implementability still ranked geological disposal highest though it was followed extremely closely by underground local stores[12].

On this basis, CoRWM concluded in that geological disposal was the best approach to take. CoRWM also noted the adoption of geological disposal by many countries world-wide and that is it the subject of studies and recommendations by the International Atomic Energy Agency (IAEA) and European Union.

4. Can we be sure a GDF is safe?

CoRWM's paper on **Safety Requirements of Geological Disposal** states that *'a safe GDF should be deliverable.'*

Their evaluation of options concluded that geological disposal was preferable, in safety terms, to indefinite storage and that the robust regulatory regime in the UK should mean that a GDF couldn't be built unless it was safe.

Radioactive Waste Management (RWM) has published a generic Disposal System Safety Case (gDSSC) which will form the basis of a specific safety case as and when a site for a GDF is selected. CoRWM believes that *'any aspects which make the GDF unsafe, would be picked up by the regulators who would not license the facility or allow it to be constructed until these matters were resolved*.[13]'

5. Should a GDF only target the best geology?

The surrounding geology within which a GDF is developed is an important barrier that will, along with the nature of the waste being disposed, the waste containers, and the engineering of the repository, prevent radioactivity making it into the surface environment in dangerous concentrations. This has

[11] Managing our Radioactive Waste Safely, CoRWM's Recommendations to Government, CoRWM Doc. 700, July 2006

[12] file:///C:/Users/phili/Desktop/New%20GDF%20paper/corwm-position-paper-why-geological-disposal.pdf

[13] file:///C:/Users/phili/Desktop/New%20GDF%20paper/3470_O_Safety_Requirements.pdf

led some to propose that a GDF siting process should be led by a search for the 'best' geology, with other considerations being secondary.

In their 2018 paper **GDF should only Target Best Geology**[14], CoRWM considers this. They note that the option of only considering the best geology was not raised during the stakeholder engagement that informed its 2006 Recommendations to Government.

Their view is that any move towards *'choosing the best geology'* is not justified on technical grounds as each geological setting has various advantages and disadvantages. It is also the case that current knowledge of sub-surface geology is limited and thus any 'screening' on the basis of geology would, they argue, be arbitrary.

6. What are the transport considerations?

In their 2006 report CoRWM recognised that many stakeholders and members of the public had concerns about the transport of radioactive and nuclear materials and it was thus a material consideration in any GDF siting process. Issues raised by the public include nuclear and conventional accidents, the risk that material could get into the hands of terrorists, and the impact on the environment.

CoRWM has undertaken a recent review of the transport issue taking into account recent developments. Their **Transport Considerations** paper concludes that the *'standards and regulations applied to radioactive material transport have been adequate to ensure an operation where any detriment suffered is very largely due to the conventional risks of transport'* and that a GDF does not present additional security challenges.

At the same time CoRWM does recognise that *'transport is an activity which should be minimised'* though this needs to be considered alongside other factors in determining the overall impacts of any radioactive waste management scheme.

CoRWM also states that the *'double movement' of radioactive wastes should be avoided as far as possible. This is the movement of radioactive wastes to centralised interim stores, followed by a second phase of transport to disposal facilities at a later date.'*

7. Should we be able to retrieve wastes?

CoRWM's paper on **Retrievability Considerations for Geological Disposal** recognises that *'the issue of retrievability will be a significant concern for communities involved in the siting process'* and that *'it is inevitable that stakeholders will raise…questions of retrievability, and it would be prudent to design these considerations into the process.'* The reasons why

[14] file:///C:/Users/phili/Desktop/New%20GDF%20paper/3468_O_Best_Geology.pdf

some argue for the option of waste retrieval vary. Some believe it might be necessary due to issues identified with the repository and its safety; others that the material being emplaced may have a value at some future date. CoRWM's 2006 report defined 3 levels of retrieval:

> **Reversibility** – designed into the option to facilitate the recovery of material by reversing the original emplacement process.
> **Retrievability** – designed into the option to facilitate the physical retrieval of waste through means other than reversing the process, such as ensuring access to the waste and having (or being able to have) the retrieval mechanism in place.
> **Recoverability** – addressing the retrievability issue by demonstrating that the waste is technically recoverable through mining or other means.

CoRWM identified a range of practical challenges and drawbacks in designing a repository for retrieval and, in their 2006 report set out their view that *'disposal in a GDF meant burial underground (200-1,000 m) of radioactive waste in a purpose-built facility with no intention to retrieve waste once the facility is closed.'* They do however note that there may be some scope to retrieve wastes during the operational phase and that the approach must be '*consistent with developing and maintaining public and stakeholder confidence.'*

The UK and Welsh Policy on Working with Communities recognises that, during the operational phase, *'wastes that has been placed into a GDF could be retrieved if there was a compelling case to do so'* but that permanently closing a GDF after operations have ceased *'provides for greater safety, greater security, and minimises the burden on future generations.*[15]*'*

8. CoRWM's overall conclusions

CoRWM's 2006 Report includes a number of recommendations that are formulated in a way that takes into account the existence of varying levels of confidence in the long-term safety of geological disposal. These recommendations are broadly consistent with comments submitted to CoRWM by NuLeAF during the Committee's public and stakeholder engagement programme in the lead up to the 2006 Report.

They are expressed in the 2006 Report in the following terms:

> *'Within the present state of knowledge, CoRWM considers geological disposal to be the best available approach for … long term management ... when compared with the risks associated with other methods of management.'* [Recommendation 1]

15 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/766643/Implementing_Geological_Disposal_-_Working_with_Communities.pdf

'The aim should be to progress to disposal as soon as practicable, consistent with developing and maintaining public and stakeholder confidence.' [Recommendation 1]

'There should be a commitment to an intensified programme of research and development into the long-term safety of geological disposal aimed at reducing uncertainties at generic and site-specific levels ...' [Recommendation 4]

The commitment to ensuring flexibility in decision making should leave open the possibility that other long-term management options (for example, borehole disposal) could emerge as practical alternatives. Developments in alternative management options should be actively pursued through monitoring of and/or participation in national or international R&D programmes.' [Recommendation 5]

CoRWM also recognises that a robust programme of interim storage must play an integral part in long-term management strategy and recommend that this must be *'robust against the risk of delay or failure in the repository programme.'* (Recommendation 2).

APPENDICES

Appendix 1

Options considered by CoRWM for management of HAW. A full explanation of what each option involved can be found in the 2006 CoRWM report:

1. Storage
2. Near surface disposal
3. Deep disposal
4. Phased deep disposal
5. Direct injection
6. Disposal at sea
7. Sub-seabed disposal
8. Disposal in ice sheets
9. Disposal in subduction zones
10. Disposal in space
11. Dilute and disperse
12. Partitioning and transmutation
13. Burning in reactors
14. Melting of metals
15. Incineration.

Appendix 2

Criteria against which options were appraised. Number 1 was weighted as most important by experts and stakeholders, number 11 the least important.

1. Public safety – Individual, short term (up to 300 years)
2. Public safety, Individual – long term (longer than 300 years)
3. Worker Safety
4. Security
5. Environment
6. Socio-economic
7. Amenity
8. Burden on future generations
9. Implementability
10. Flexibility
11. Costs