

Meeting:	NuLeAF Steering Group, 20 th March 2019
Agenda Item:	5
Subject:	Update on the 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;
- RWM Update;
- GMF Update; and
- CoRWM Update.

Recommendation:

That Steering Group approve the revised Policy Statement 3 on Geological Disposal.

Background information

The UK Government's policy on **Working with Communities – implementing geological disposal** was published in December 2018¹, with the equivalent policy for Wales published in January 2019². The National Policy Statement, governing the planning aspects of the GDF, is expected to be published in spring 2019. This paper provides an update on progress on GDF related activities.

1. NuLeAF Policy Statement on Geological Disposal

1.1 At the June 2018 Steering Group a discussion was held on NuLeAF's Policy on the Disposal of Higher Activity Wastes. At that meeting it was agreed that NuLeAF's Policy Statement 3 on Geological Disposal, published in 2007, should be reviewed once the final Working With Communities policy was available.

A revised version of Policy Statement 3 has now been prepared – the draft is attached as Annex A. The paper draws on the 2006 CoRWM report on **Managing Radioactive Waste Safely**³, which still underpins UK and Welsh

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>

³ <https://www.gov.uk/government/publications/managing-our-radioactive-waste-safely-corwm-doc-700>

Government policy. It also references a range of position papers on geological disposal published by CoRWM in late 2018 and early 2019⁴.

The new Policy Statement covers a number of questions, namely:

- 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 with a proposed NuLeAF Policy on Geological Disposal. This draws heavily on the Policy approved by members in 2007, while making some alterations and additions.

Members are asked to approve the Policy Statement, subject to any amendments that they wish to agree.

2. GDF Siting Process

2.1 The **Working with Communities** policy for the Geological Disposal Facility (GDF) siting process in England and Northern Ireland was published on the 19th December 2018, with the Welsh policy launched on the 16th January 2019. The publication of the final policies enables RWM to engage directly with any local authority or community that is considering entering the siting process.

The final policies give a clear and prominent role to local government. The policy in England states that:

- Local authorities can instigate discussions with the delivery body (RWM). If an approach to RWM is instigated by another body, then all relevant principal local authorities (districts/boroughs and counties) must be informed at an early stage.
- As a next step a **Working Group** would be formed to identify the Search Area within which potential sites would be considered. All relevant principal local authorities must be invited to join the Working Group, but if they choose not to participate, the Working Group can still proceed.
- The next stage would be to form a **Community Partnership** which will enable the community to share information and find answers to questions they have on the GDF. The Partnership should contain a range of interests but at least one principal local authority must be

⁴ <https://www.gov.uk/government/organisations/committee-on-radioactive-waste-management>
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involved, as must RWM. The Partnership will sign an agreement with RWM setting out the principles of how it will work. From this stage on annual **Community Investment Funding** of £1million will be available, rising to £2.5 million for communities that proceed to the borehole drilling phase.

- Communities and RWM have a **Right of Withdrawal (RoW)** from the process up to the final Test of Support. The community RoW can only be triggered by the local authorities on the Community Partnership. If there is more than one local authority on the Partnership, the all councils involved must agree before the area can withdraw.
- Councils will also have the say on when the final **Test of Support** must take place. The Test will determine whether the community as a whole is willing to proceed with the development of a GDF.

Welsh policy is similar in many ways, though it sets out a slightly different role for local government – if a local authority decides not to join the Community Partnership then its area is automatically excluded from the Search Area. It also gives a more prominent role to community councils and addresses the requirements of the different Welsh policy environment.

NuLeAF plans to publish an updated **Briefing Paper on Geological Disposal**, explaining the final English and Welsh policies, in the coming weeks. This will sit alongside the new Policy Statement on Geological Disposal, once that is agreed by Steering Group.

3. RWM Update

3.1 A consultation has been launched on proposals for the process of **Site Evaluation (SE)** in England⁵ and Wales⁶. This proposes the methodology and range of criteria that will be used in assessing the relative merits of different possible GDF sites. RWM hosted a series of public engagement events on the consultation across England and Wales between the 7th February and the 7th March. The Executive Director and some NuLeAF members participated in these workshops.

The consultation will run until the 31st March (England) and 14th April (Wales). NuLeAF has drafted a response to each, drawing on discussions with RWM at the December 2018 Steering Group meeting and January 2019 Radioactive Waste Planning Group (RWPG) meeting.

3.2 Confusion over the GDF siting process has caused a negative reaction in Wales and Northern Ireland. In both cases this has been linked to the

⁵https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/766912/RWM_SiteEvaluation_ENGLAND.pdf

⁶https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/771116/Site_Evaluation_Consultation_For_Wales.pdf

publication by RWM of online resources on **geology**⁷, which includes information on each of the 13 geological regions that cover England, Wales and Northern Ireland.

In both Northern Ireland and Wales statements on the geological attributes of certain areas have been misinterpreted, leading to the perception that an area is being actively considered as the site for the repository.

In Northern Ireland local MPs and Newry and Mourne Council have made clear their opposition⁸. In south Wales RWM had to cancel their planned Site Evaluation event and replace it with an online discussion due to opposition from Swansea Council⁹ who complained that they had received no prior contact to inform them of the planned event. RWM has since amended the web resources to make clear the voluntarist nature of the siting process.

3.3 RWM has published the **inventory for disposal**¹⁰ and the Environment Agency (EA) and the Office of Nuclear Regulation (ONR) have published a **Joint Regulators Assessment of the 2016 generic Disposal System Safety Case**¹¹. The assessment can only be generic at this stage, as no site has been identified, and the aim is to provide advice and comment to RWM on regulatory matters. It covers a range of issues including transport, operational and environmental safety along with retrievability and the inventory for disposal.

The EA and ONR conclude that they have not identified any fundamental regulatory issues that would prevent RWM developing a safety case that met regulatory requirements. However, they note that *'there is a significant amount of work for RWM to do to develop a comprehensive, site-specific safety case'* and that *'many aspects can only be evaluated when a site is selected.'* Among the recommendations are that RWM clarify the approach to retrievability. Also, it suggests they should continue to revise the inventory for disposal taking into account new developments that might affect assumptions regarding waste volumes and types destined for disposal.

4. GMF Update

NuLeAF is undertaking research on behalf of the Group of Municipalities with Nuclear Facilities (GMF), seeking views on how to best take forward the work of the **European local Network of radioactive Waste Dialogue** (ENWD). The ENWD is the GMF's forum for discussion of issues around geological disposal and it is felt that the network is in need of reinvigoration.

⁷ <https://www.gov.uk/guidance/about-national-geological-screening-nqs#the-13-regions>

⁸ <https://www.independent.ie/regionals/argus/news/concerns-over-possible-nuclear-waste-dump-across-the-border-37803867.html>

⁹ <https://www.walesonline.co.uk/news/politics/two-areas-wales-chosen-consultation-15785868>

¹⁰ <https://www.gov.uk/government/publications/2016-inventory-for-geological-disposal>

¹¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/756205/Joint_regulators_assessment_of_the_2016_generic_Disposal_System_Safety_Case.pdf

NuLeAF's Executive Director will report the findings of the research to a special meeting of the GMF in Brussels on the 21st March. This meeting will discuss future objectives for the GMF and ENWD. Current General Secretary Mariano Vila d'Abadal has indicated he will step down this spring and so it is felt to be an opportune time to consider how to further invigorate the network.

5. CoRWM update

CoRWM has published a paper on the retrievability considerations for geological disposal¹². This completes a set of 5 new papers which restate the Committee's support for geological disposal and their view on issues such as transport and safety. All the CoRWM papers have been reviewed in preparing NuLeAF's revised Policy Statement on Geological Disposal.

NuLeAF's Executive Director met with Sir Nigel Thrift, the Chair of CoRWM, in London on the 5th of February. The Director briefed Sir Nigel on NuLeAF's work and role in the GDF siting process, and discussed CoRWM's future plans.

¹² <https://www.gov.uk/government/publications/retrievability-considerations-for-geological-disposal-corwm-position-paper>

Policy Statement 3
March 2019

1. Background

NuLeAF's Steering Group published a Policy Statement in 2007 explaining the concept of geological disposal and why the UK and Welsh Government, informed by the Committee on Radioactive Waste Management (CoRWM), believed it was the best solution to the long-term management of the UK's Higher Activity Radioactive Wastes (HAW). The Policy Statement set out NuLeAF's support for geological disposal, with certain caveats and while recognising that not all member local authorities shared that view. Following the launch of a new Geological Disposal Facility (GDF) siting process in 2018, this Policy Statement has been revised and updated. It was endorsed by NuLeAF's Steering Group in March 2019 (note: this paper is subject to member review and amendment at that meeting) and is supported by **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.

This paper draws on the 2006 CoRWM report on **Managing Radioactive Waste Safely**¹³, which still underpins UK and Welsh Government policy. It also references a range of position papers on geological disposal published by CoRWM in late 2018 and early 2019¹⁴. These do not amend their position on geological disposal, 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.*¹⁵ A fuller insight into CoRWM's current thinking can be provided by reviewing these papers, and the original 2006 report.

2. What this Statement covers

This paper covers the following questions:

- *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 view and setting out NuLeAF's policy on geological disposal.

¹³ <https://www.gov.uk/government/publications/managing-our-radioactive-waste-safely-corwm-doc-700>

¹⁴ <https://www.gov.uk/government/organisations/committee-on-radioactive-waste-management>

¹⁵ CoRWM Position Paper: Why Geological Disposal? November 2018, p1
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3. What is Geological Disposal?

CoRWM's 2006 report to Government¹⁶ 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.

4. 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.

¹⁶ 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, citizen's 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)'*¹⁷.

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 stores¹⁸.

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.

5. 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.'*¹⁹

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

¹⁷ Managing our Radioactive Waste Safely, CoRWM's Recommendations to Government, CoRWM Doc. 700, July 2006

¹⁸ <file:///C:/Users/phili/Desktop/New%20GDF%20paper/corwm-position-paper-why-geological-disposal.pdf>

¹⁹ file:///C:/Users/phili/Desktop/New%20GDF%20paper/3470_O_Safety_Requirements.pdf
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In their 2018 paper **GDF should only Target Best Geology**²⁰, 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.

7. 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.*'

8. 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 some argue for the option of waste retrieval vary. Some believe it might be

²⁰ file:///C:/Users/phili/Desktop/New%20GDF%20paper/3468_O_Best_Geology.pdf
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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.'*²¹

9. 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. 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]

'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.'

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

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).

10. NuLeAF's Policy on Geological Disposal

CoRWM's perspectives 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.

On that basis, as an organisation we support their general conclusions. We:

- Believe that Geological Disposal is the best available approach in the current state of knowledge but that this must be subject to regular review and that the Government must be open to the possibility of other practical alternatives.
- Wish to see a strong commitment to undertake R&D to reduce uncertainties about long-term safety.
- Wish to see an effective GDF siting process, where, at a local level, communities are able to discuss and learn about all aspects of the proposals, and also to question and challenge.
- Will support, on an impartial basis, any local authority in England and Wales that makes a decision to enter the GDF siting process. We will continue to make the wider case to Government and RWM for the best economic, social and environmental outcomes to all communities involved.
- Note that significant quantities of HAW are currently stored at Sellafield and on other sites across the UK and that this situation will continue for many decades. We believe that the service to the nation performed by these host communities should be recognised and fully reflected in socio-economic support.
- Recognise that there is a spectrum of views among our member authorities on the degree of confidence that can be placed on the long-term safety of geological disposal. We will therefore continue to use our meetings as a forum for debate and discussion on all aspects of geological disposal and alternative management options.

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