Nuclear Decommissioning Authority

Health Impact Assessment for UK Geological Disposal of Radioactive Wastes

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Abstract

Geological disposal is the United Kingdom Government's policy for the long term management of higher-activity radioactive wastes. The process of 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. The Nuclear Decommissioning Authority has been tasked by the UK Government with planning and delivering a geological disposal facility through the Managing Radioactive Waste Safely (MRWS) process. The Radioactive Waste Management Directorate has been established within the Nuclear Decommissioning Authority to achieve this.

The process of selecting a site for geological disposal is based on the principles of voluntarism and partnership. This means that communities volunteer to participate in the process that will ultimately provide a site for a geological disposal facility. The Radioactive Waste Management Directorate will work in partnership with volunteer communities to identify and assess potential candidate sites. The Radioactive Waste Management Directorate will undertake a Strategic Environmental Assessment (SEA) of proposals for implementing geological disposal in each participating community and a Health Impact Assessment (HIA), integrated with the SEA will consider the effects on health and well-being issues. This paper describes the high level proposed approach to HIA as developed by RWMD.

Introduction

In June 2008, the UK Government and Devolved Administrations for Wales and Northern Ireland[2] published 'Managing Radioactive Waste Safely - A Framework for Implementing Geological Disposal' (the MRWS White Paper) [1]. As stated in this White Paper, 'Geological disposal is internationally recognised as the preferred approach for the long-term management of higher activity waste'. As of 2006 at least 39 countries (including the UK) had significant arisings of radioactive waste. Of those countries, 25 have taken final decisions on a long-term policy and all had opted for geological disposal. These include Belgium, Canada, Finland, France, Germany, USA and Sweden [1, 2]. The MRWS White Paper outlined a six-stage site selection process through which a preferred site for a geological disposal facility would be identified and developed, illustrated in Figure 1.

Under the process of voluntarism and partnership, communities are asked to volunteer to participate in the process that will ultimately identify a site for a geological disposal facility. Once a

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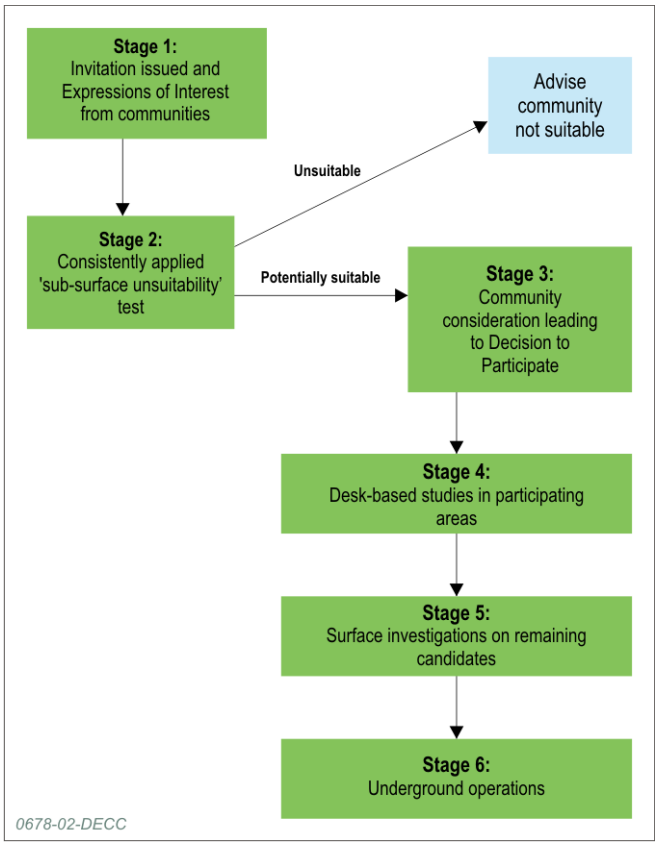
[2] UK Government in this context means the Department for Environment, Food and Rural Affairs (Defra), the Department for Business, Enterprise and Regulatory Reform (BERR). The Devolved Administrations are the Welsh Assembly Government and the Department of the Environment Northern Ireland. The Scottish Government supports long-term interim storage of higher activity wastes and an ongoing programme of research and development and therefore did not sponsor the MRWS White Paper. Some elements of Defra and BERR have been brought together in the Department of Energy and Climate Change (DECC).

community/ies have entered into the MRWS process the Radioactive Waste Management Directorate will work in partnership with these communities to identify and select a suitable site and develop the Geological Disposal Implementation Plan (GDIP)[3].

Figure 1 Stages in the MRWS site selection process



If a community makes a decision to participate then Stage 4 of the MRWS site selection process would involve desk based studies of the candidate community areas initially leading to the identification of Potential Candidate Sites[4]. Where the community or communities wish to continue to participate in the site selection process, Stage 5 would involve surface based investigation works (and then later the drilling of boreholes to various depths to investigate the geology in more detail) and Stage 6 would involve long-term underground operations. Participation up until quite late in the process (just before Stage 6), when underground operations are due to begin, is without commitment to further stages.

The UK Government is committed to ensuring that the geological disposal programme fully assesses and accounts for environmental impacts and sustainability issues through the application of SEA, Sustainability Appraisal (SA) and Environmental Impact Assessment as laid out in the MRWS White paper [1]. In 2009, RWMD published its Strategy for Sustainability Appraisal and Environmental Assessment [3]. This proposes that during Stage 4 of the MRWS process (Desk Based Studies),

[3] The Geological Disposal Implementation Plan is part of the overall geological disposal programme and focuses on the implementation phases. The draft plan will be the subject of the SEA.
[4] A Potential Candidate Site will be a combination of a volume of rock for the underground facility and a surface site for the surface facility.

RWMD will undertake a Strategic Environmental Assessment (SEA) of its Geological Disposal Implementation Plan (GDIP). The SEA will be compliant with the SEA Directive 2001/42/EC [4], will inform key decisions by RWMD and decision making bodies during Stage 4 and will assess the social, economic and environmental impacts of implementing the GDIP. The Strategy also states that health effects will be considered as part of the assessment work, in line with the requirements of the Directive and with reference to Department of Health guidance on the consideration of health issues in SEA [5].

Human health is one of a wide range of proposed assessment topics for the SEA and is often assumed to be covered by a focus on biophysical criteria such as, for example, water quality, air quality and noise. The Radioactive Waste Management Directorate's proposed approach to Health Impact Assessment considers how integrating HIA within SEA could achieve a more sustainable outcome for the geological disposal programme and address a wider set of stakeholder concerns.

Proposed approach

The HIA will be baseline led[5] to be consistent with the proposed approach for the SEA and informed by qualitative and quantitative information from the candidate area(s) and Potential Candidate Site(s). Therefore, rather than being based on generic high-level objectives and indicators, the HIA will be based on the actual and predicted situation in the candidate area(s) and Potential Candidate Site(s).

The proposed approach suggested by the Radioactive Waste Management Directorate is for a high level methodology that will integrate the HIA with the human health assessments that are undertaken as part of the SEA for implementing a geological disposal facility. Figure 2 provides an overview of the six MRWS site selection stages showing when assessments (including SEA, Environmental Impact Assessment and HIA) would be undertaken.

It is anticipated that a more defined methodology would be developed in collaboration with the specific communities participating in the MRWS process as part of the SEA scope at the beginning of MRWS Stage 4, but also throughout the SEA process and then throughout MRWS Stage 5 becoming increasingly focused and detailed with standalone assessment reports at key decision points.

As described in Figure 2, it is anticipated that the HIA will evolve through several versions during the site selection process, for example;

- Before a decision to participate is made – high level proposed approach to HIA;
- During MRWS Stage 4 – 'plan level' HIA to be developed in consultation with any community/ies in the process;
- At the beginning of Stage 5 – localised site investigation HIAs;
- At the end of Stage 5 – preferred site specific HIA; and,
- At the end of Stage 6 – final site HIA.

When a community/ies make a Decision to Participate, it is planned that a Community Siting Partnership[6] will be formed [1]. The Radioactive Waste Management Directorate proposes that the

[5] The collation of a body of information on participating communities that allows the prediction of likely effects on key receptors. An objectives led approach would have focused the assessment on performance of the geological disposal implementation plan against pre-determined sustainability criteria.

[6] Following a decision to participate the site selection process and in particular the development of the facility will require considerable engagement with communities. The UK Government favours a partnership approach to this, as followed in other countries.

partnership should be used to consult on the HIA scoping (as part of the SEA scoping). Through this engagement the scope of the HIA can be developed to include, where appropriate, the more detailed comments and views of stakeholders.

The HIA will consider the wide range of factors that can influence health and well-being from a geological disposal facility including, for example;

- the transport of waste to a facility, construction and operation of a facility, and in the very long term after the facility has been closed;
- potential effects on lifestyles (e.g. effects on diet / nutrition, education and learning opportunities);
- the physical environment (e.g. effects on living and working conditions, pollutant levels and public and worker safety);
- access to services (e.g. effects on the provision of and access to health care, social services and leisure opportunities);
- the links between socio-economic and health issues (e.g. effects on employment and income levels and how these relate to well-being);and,
- equality issues such as effects on discrimination, equality of opportunity and the relationship between different societal groups (this will also be covered in an Equality Impact Assessment [6]).

RWMD proposes that a health action plan (HAP) would be developed as a result of the HIA. The HAP will document the actions to be undertaken as a result of the GDIP in order to mitigate negative and enhance positive health outcomes wherever possible. A key aspect of the HIA will be the requirement to undertake ongoing monitoring of the relevant 'health indicators' within a participating community/ies during the implementation of the Geological Disposal Implementation Plan.

The Radioactive Waste Management Directorate proposes that it manages the application of mitigation and enhancement measures via the HAP through an adaptive approach as circumstances change and in partnership with the community. Although initially created during MRWS stage 4, the HAP will be enduring and will be updated throughout the MRWS process.

Conclusions

This methodology outlines the Radioactive Waste Management Directorate's proposed high level approach to assessing the potential effects on human health from implementing a geological disposal facility. A separate methodology has been developed for assessing a wider range of effects on the biophysical elements of the environment in support of the SEA that the Radioactive Waste Management Directorate will be producing during Stage 4 of the MRWS site selection process.

Both the HIA and SEA methodologies are intended to be complementary in order to improve focus on a wider range of effects arising from geological disposal, highlight and identify specific or specialist stakeholder requirements and achieve a more sustainable outcome. The Radioactive Waste Management Directorate proposes to keep the methodologies of the HIA and SEA separate, but intends to consult on the scope of the assessments at the beginning of MRWS Stage 4 as part of a single exercise.

This approach will be subject to further review and consultation with stakeholders ahead of and during MRWS Stage 4. HIA and SEA are a process, not an end point, and the Radioactive Waste Management Directorate recognises that the scope of this work may change over time.

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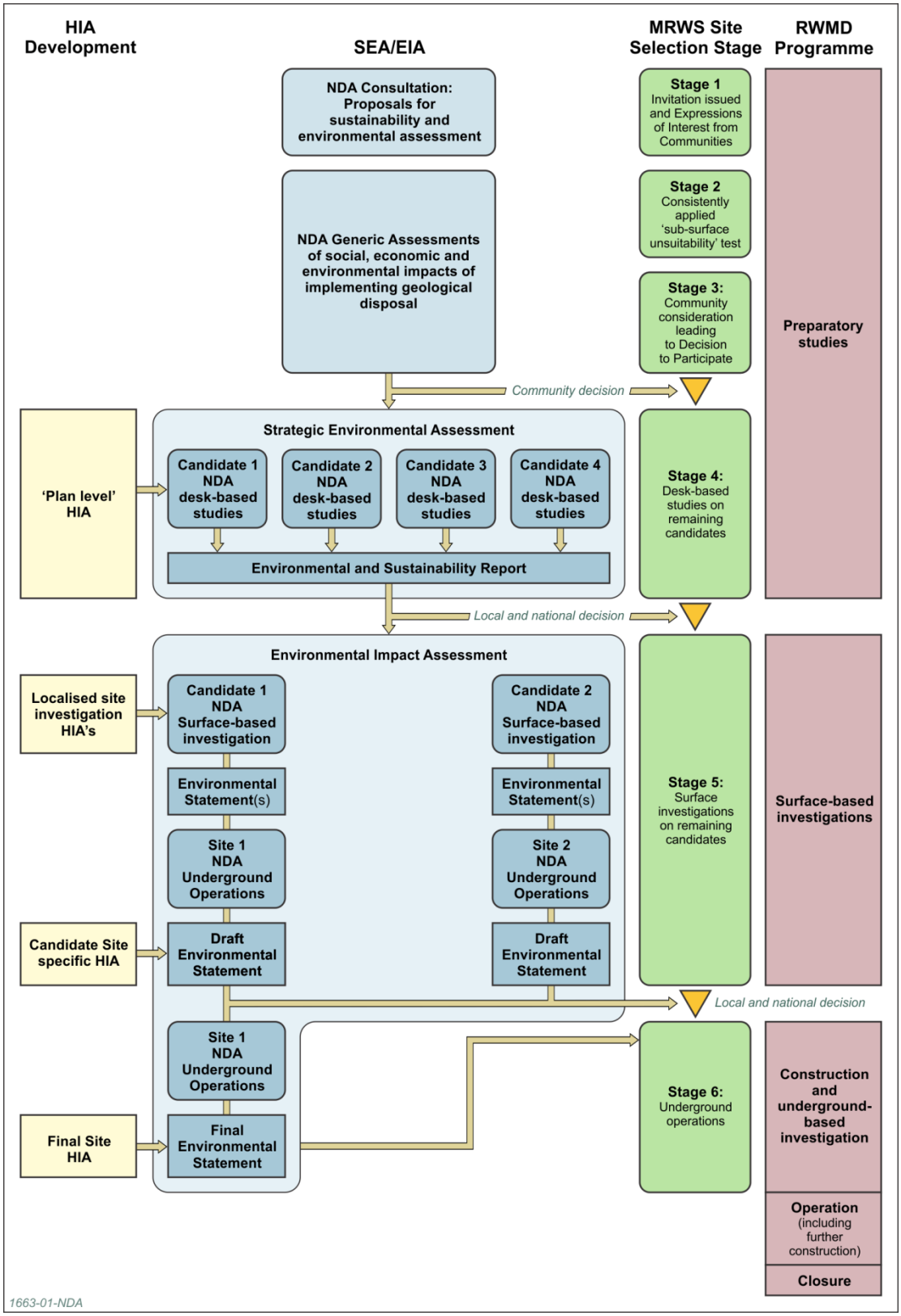
Figure 2 Overview of MRWS assessments



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