

## SCOTLAND'S HIGHER ACTIVITY RADIOACTIVE WASTE POLICY 2011



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SCOTTISH GOVERNMENT



# **SCOTLAND'S HIGHER ACTIVITY RADIOACTIVE WASTE POLICY 2011**

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## 1 Introduction

### **Consultation on the Detailed Statement of Policy of Scotland's Higher Activity Radioactive Waste Policy and the Strategic Environmental Assessment Environmental Report**

**1.01** The Scottish Government conducted a public consultation on its draft Detailed Statement of Policy (DSP) for Scotland's Higher Activity Radioactive Waste ([Ref 1](#)) and the Environmental Report (ER) ([Ref 2](#)) on the Strategic Environmental Assessment (SEA) of the Policy. These documents were published on 15 January 2010 along with a Supplementary Information (SI) document ([Ref 3](#)) providing additional factual information to assist consultees.

**1.02** Responses were requested by 9 April 2010, however the internal approval processes of some respondents meant that they were unable to submit their responses by that date. We were advised of this before the deadline and, in those circumstances, agreed to accept late responses. The last response was received on 26 May 2010.

### **Consultation on the Annex to the Strategic Environmental Assessment Environmental Report: Supplementary Assessment of Policy Alternatives**

**1.03** In response to comments received on the DSP and ER published on 15 January 2010 a Supplementary Environmental Assessment was undertaken. The Supplementary Environmental Assessment was published for public consultation on 9 September 2010, inviting responses by 21 October 2010 ([Ref 4](#)).

### **Stakeholder Engagement**

**1.04** During the initial January to April 2010 consultation period meetings were held with a wide range of stakeholders at locations around Scotland. Following the initial analysis of responses, further meetings were held between September and November 2010 with stakeholders, including organisations and individuals who responded to the consultation. These meetings provided feedback on the initial analysis of, and outlined the proposed Scottish Government response to, the comments received.

### Scottish Government Policy Statement: Response to Comments from the Consultation Processes

**1.05** The Scottish Government Policy Statement for higher activity radioactive waste arising in Scotland has been informed by the responses to the consultations on the DSP and ER including the Supplementary Environmental Assessment. These are reflected particularly in the Scottish Government Policy Statement in Section 2 of this document. The structure of the Policy Statement now differs from that proposed in the DSP to describe more clearly the long-term management options for the waste. Section 3, which outlines the Implementation Strategy (IS) for the Policy, also reflects comments received and the content of the Post-Adoption Strategic Environmental Assessment Statement (PAS).

**1.06** The Policy Statement draws more heavily on the “Near-surface Disposal Facilities on Land for Solid Radioactive Wastes - Guidance on Requirements for Authorisation - February 2009” (GRA) ([Ref 5](#)) than in the DSP. The GRA was specifically referred to in a number of the responses to the DSP.

**1.07** The Scottish Government Policy also reflects the 2006 report from the Committee on Radioactive Waste Management (CoRWM), “Managing our Radioactive Waste Safely, CoRWM’s recommendations to Government”. ([Ref 6](#)) In particular, recommendation 8 in the report which recommended that consideration should be given to other management options for reactor decommissioning wastes. Such wastes represent a significant volume of the waste produced in Scotland.

**1.08** In addition to this document, the Scottish Government is also publishing separately:

- a document summarising its analysis of the responses to the DSP Consultation and the Scottish Government response to them; ([Ref 7](#)) and
- a Post-Adoption Strategic Environmental Assessment Statement. ([Ref 8](#))

**1.09** The Post-Adoption Strategic Environmental Assessment Statement reaffirms the Scottish Government position that it does not support deep geological disposal of radioactive waste as it does not consider it to be a “reasonable alternative” at this point in time. The Scottish Government Policy remains that the long-term management of higher activity

radioactive waste, as defined in Section 2, should be in near-surface facilities.

**1.10** A number of respondents sought additional information and clarification on issues raised in the DSP and ER, some of which were already addressed in part in the SI document. In response to those requests the Scottish Government has now prepared separate documents drawing on information in the DSP, ER and SI, supplemented and updated by additional information received since those documents were published in January 2010.

**1.11** These additional documents (Ref 9) cover:

- Radiation and Radioactivity
- Higher Activity Radioactive Waste in Scotland
- Legislative and Regulatory Framework for the Management of Radioactive Waste
- Treatment Options for Radioactive Waste
- International Examples of Near-Surface Facilities
- Retrievability and Reversibility
- Glossary of Terms

**1.12** These documents illustrate that the Scottish Government Policy reflects existing practice in other countries, in some cases near-surface facilities have been operating for many years. They will be published separately on the Scottish Government website. The intention is that they will be individual documents which can be revised and updated more easily. This will enable them to reflect more timely any changes in facts or technological advances to inform the next stages of this process, particularly the Implementation Strategy outlined in Section 3.

## **Scottish Government Policy Statement and Implementation Strategy**

**1.13** Section 2 of this document is the Scottish Government Policy Statement for higher activity radioactive waste arising in Scotland. The waste to which the Policy applies is defined in Section 2 as are those materials such as spent nuclear fuel which are specifically excluded from the Policy.

**1.14** This is a high level Policy which provides the framework for the long-term management of the waste. The Policy is not prescriptive in its approach, recognising that it applies to waste:

- which may not be produced for decades; and
- for which long-term management options may not be feasible at present or have yet to be developed.

**1.15** The Policy provides the framework within which regulators, facility operators, waste producers and owners and the Nuclear Decommissioning Authority (NDA) will take decisions on the long-term management of the waste and undertake the work, and duties, for which they are responsible. The Policy enables options to be considered which may require research or development, recognising that advances may be made over time to manage wastes for which long-term options are not currently feasible.

**1.16** The Policy is explicit that all options for the long-term management of the waste will be subject to robust regulatory scrutiny and cannot be undertaken without approval by the relevant regulatory bodies.

**1.17** The Policy requires all long-term management options to be assessed taking account of fundamental principles, including the application of the Waste Hierarchy (Ref 10) and the Proximity Principle (Ref 11). The presumption is that options will be undertaken as close to the sites where the waste is produced as is practicable.

**1.18** Section 3 of this document reflects comments on the DSP and ER on the need to explain in more detail how the Policy will be implemented. The section outlines the process for the Implementation Strategy which will be subject to a Strategic Environmental Assessment and public consultation before it is adopted. Development of the Strategy will be led by the Scottish Government.

### Scottish Government Policy

**1.19** The Scottish Government Policy is that the long-term management of higher activity radioactive waste, as defined in Section 2, should be in near-surface facilities. Facilities should be located as near to the site where the waste is produced as possible. Developers will need to demonstrate how the facilities will be monitored and how waste packages, or waste, could be retrieved. All long-term waste management options will be subject to robust regulatory requirements.

## 2 Scottish Government Policy Statement

This is a high level Policy which provides the framework for the long-term management of higher activity radioactive waste arising in Scotland. The Policy is not prescriptive in its approach, recognising that it applies to waste:

- which may not be produced for decades; and
- for which long-term management options may not be feasible at present or have yet to be developed.

The Policy Statement contains the following:

- 2.01 Policy Aim and Principles
- 2.02 Policy Framework and Scope
- 2.03 Radioactive Waste to which the Policy Applies
- 2.04 Long-Term Waste Management Options
- 2.05 Planning Assumptions for Waste Producers and Owners
- 2.06 Regulation and Permitting
- 2.07 Policy Implementation and Review
- 2.08 Policy Summary

### 2.01 Policy Aim and Principles

**2.01.01** The **aim** of the Policy is to ensure that all activities for the long-term management of the waste are made in a way that protects the health and interests of people and the integrity of the environment now and in the future. This aim needs to be considered at the time long-term management decisions are made and when treatment or storage or disposal of the waste is undertaken. These decisions will need to recognise the risk of foreclosing alternative long-term management options and the future impact of these long-term management activities on people and the environment.

**2.01.02** Underpinning this aim are the **principles** that:

- the level of protection provided to people and the environment against radiological and any other hazards of the treatment or storage or disposal of the waste at the time decisions are taken, now and in the future, is consistent with the standards in place at the time those decisions are made; and

- developers and operators of facilities will engage with stakeholders, including local communities where any facilities may be located, throughout the process of managing the waste.

**2.01.03** These fundamental principles are not the only ones which might be applied in decision making for the long-term management of radioactive waste. For example, the “Near-surface Disposal Facilities on Land for Solid Radioactive Wastes - Guidance on Requirements for Authorisation - February 2009” (GRA) ([Ref 5](#)) identifies others which the regulators will apply in considering near-surface disposal facilities. The Policy does not preclude consideration of other principles as required.

**2.01.04** In addition to the fundamental principles, there are two principles which the Policy requires to be explicitly addressed when considering long-term management options for the waste. These are the Waste Hierarchy and the Proximity Principle. These two principles will be fundamental in considering long-term management option of the waste as described in Section 2.04 below in relation to treatment or storage or disposal options.

**2.01.05** The Policy requires application of the principles of the Waste Hierarchy to the long-term management of the waste. This is already a requirement for the management of non-radioactive waste and for low level radioactive waste. The Hierarchy requires all waste producers to consider waste management with regard to prevention, minimisation, preparation for re-use, recycling and other recovery with disposal as the final option. Regulators will take account of the application of the Waste Hierarchy when scrutinising proposals for the long-term management of the waste.

**2.01.06** The Policy requires long-term management options to take account of the Proximity Principle. The requirement to consider the Proximity Principle is a key element of European Union environmental and municipal waste management Policy, introduced in Article 5 of the Waste Framework Directive (75/442/EEC) ([Ref 11](#)) and reflected in subsequent Directives the latest being Article 16 in the Revised Waste Framework Directive (2008/98/EC) ([Ref 12](#)). Whilst the Directive itself does not apply to radioactive waste, the principle of proximity is one which is already generally used in considering radioactive waste management options.

**2.01.07** The Policy requires this aim and these principles to be demonstrated by those proposing long-term management options

including the development of treatment or storage or disposal facilities. All long-term management options will be subject to robust regulation by the relevant regulators.

## 2.02 Policy Framework and Scope

**2.02.01** The Policy Statement provides the framework for decisions to be taken on the long-term management of the waste arising in Scotland. It provides clarity on the options available to those who produce, own, manage and regulate the waste in the long-term. It enables consideration of technological advances, which are being developed now, or may be developed in the future, when making long-term management decisions.

**2.02.02** The Policy is not prescriptive on how to manage the waste or on the design and construction of facilities, rather it sets the parameters within which such decisions may be made. The Policy enables a risk informed approach to managing and regulating the waste.

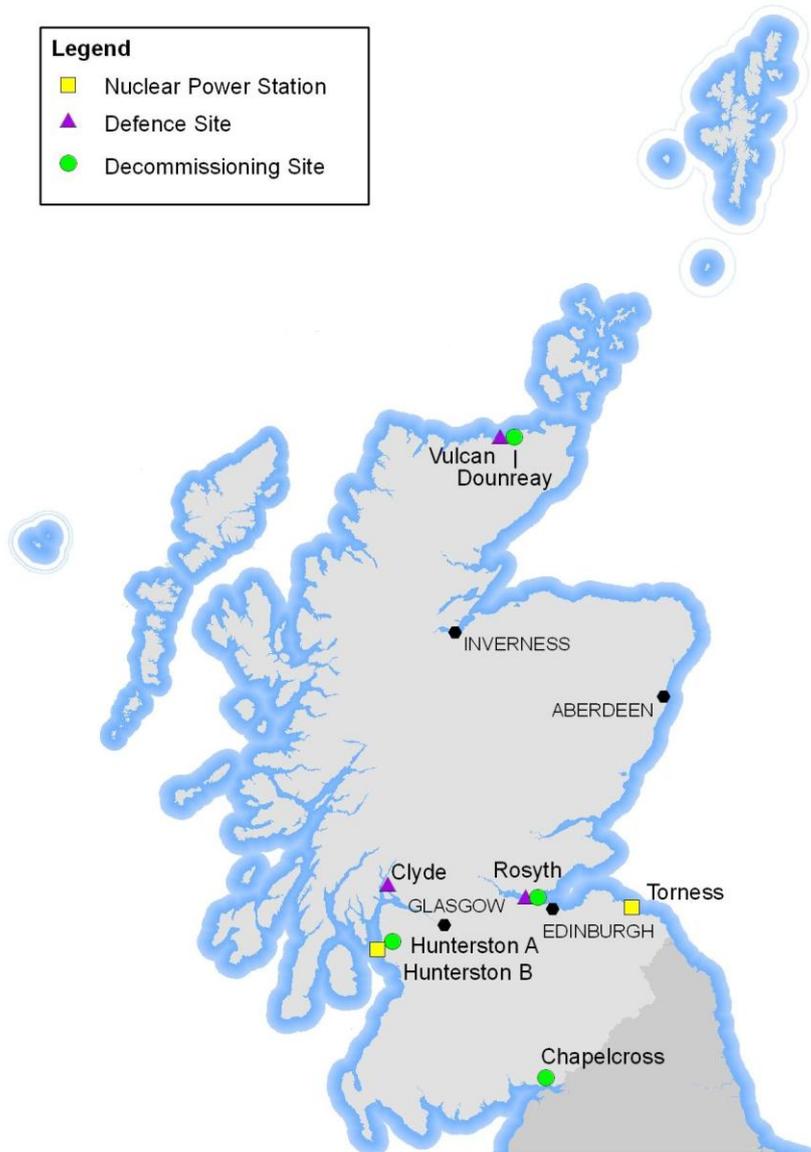
**2.02.03** Higher activity radioactive waste is produced in Scotland from operations in the **nuclear** and **non-nuclear industries** as well as from **defence establishments**. There are two types of civil nuclear sites:

- operational nuclear power stations which are generating electricity; and
- decommissioning sites which have undertaken research on, or generated power from, nuclear energy or undertaken activities related to that research or generation.

The Map at **Figure 1** illustrates the civil nuclear and defence sites in Scotland which produce radioactive waste. The Policy does not apply to all of these sites.

**2.02.04** The non-nuclear industries which produce radioactive waste include health and education and other industrial users such as oil and gas. Radioactive waste from non-nuclear industry sectors arises at locations throughout Scotland.

Figure 1: Location of Civil Nuclear Industry and Defence Sites in Scotland



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**2.02.05** The Policy applies to the operational and decommissioning waste generated at nuclear sites and from non-nuclear industry activities throughout Scotland. The nuclear sites in Scotland to which the Policy applies are shown in Figure 2 which also describes the waste which is estimated will arise from activities on those sites. The waste from these nuclear sites and from non-nuclear industry sectors is regulated under the Radioactive Substances Act 1993 (RSA93). (Ref 13)

**2.02.06** The Policy does not apply to all of the sites in Figure 1. It does not apply to radioactive waste from those defence establishments which are not subject to regulation under the Radioactive Substances Act 1993 (RSA93). This includes waste arising from the operational nuclear submarine bases on the Clyde and from the decommissioning and dismantling of redundant nuclear submarines including those berthed at the former Defence Establishment at Rosyth.

**2.02.07** The Policy also does not apply to radioactive waste which has already been dealt with under the policies of previous governments. This includes radioactive waste which is the subject of previous or existing contractual arrangements, including waste sent to facilities outside of Scotland, including Sellafield.

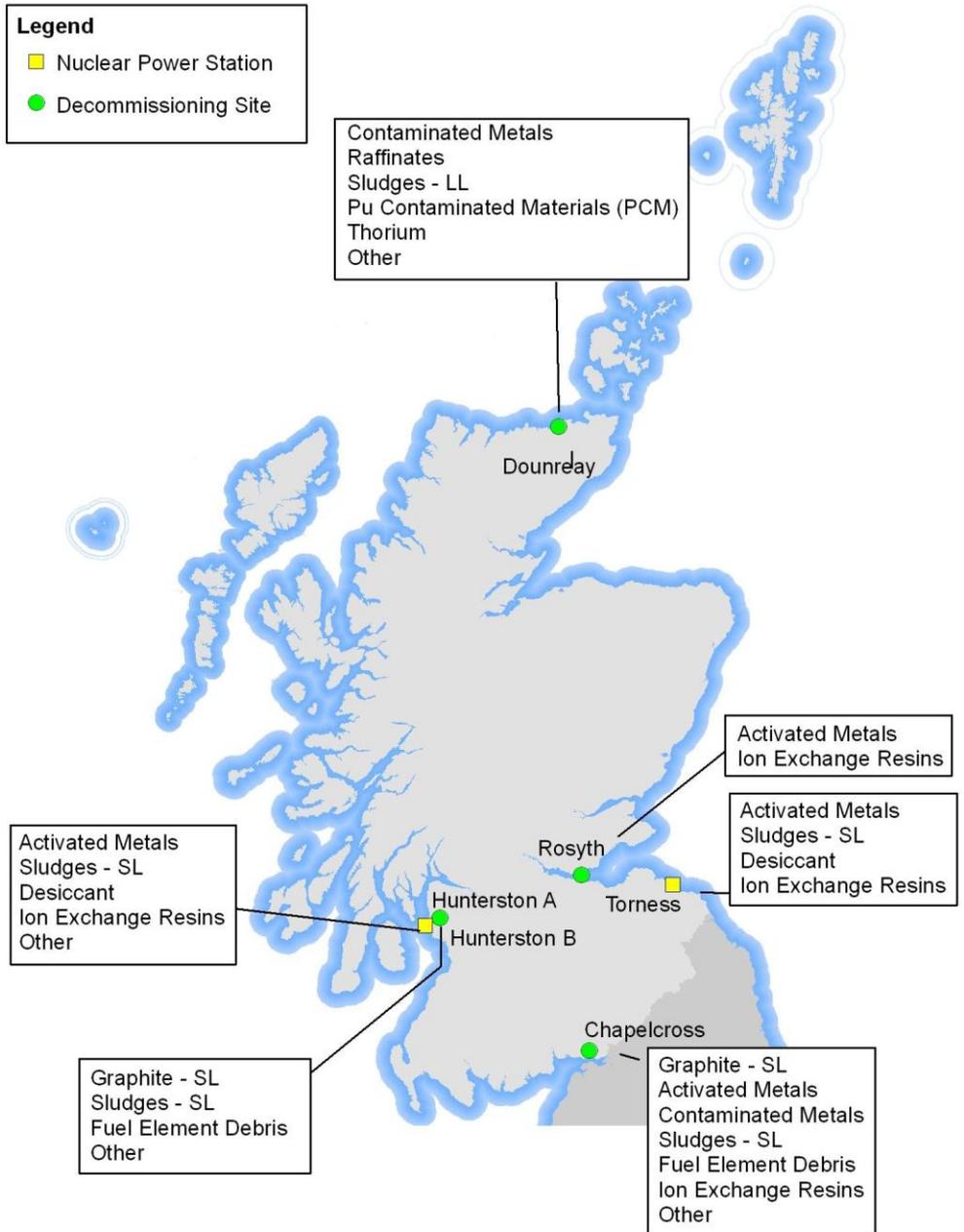
## **2.03 Radioactive Waste to which the Policy Applies**

**2.03.01** The radioactive waste is primarily solid waste, such as graphite and metal, but also includes waste such as sludges and liquid waste, such as raffinates, which may be solidified as part of a treatment or packaging process.

**2.03.02** For the purposes of this Policy the term higher activity radioactive waste means:

- Radioactive waste defined in current UK categorisations as Intermediate Level Waste (ILW).
- Intermediate Level Waste is waste which has radioactivity levels exceeding the upper boundaries for Low Level Waste and which does not generate enough heat for this to need to be taken into account in the design of treatment or storage or disposal facilities.

**Figure 2: Location of Nuclear Sites in Scotland to which the Higher Activity Radioactive Waste Policy Applies**



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**2.03.03** The Policy also applies to waste which is not higher activity radioactive waste as defined in paragraph 2.03.02. This is waste for which the most appropriate long-term management option may be the same as that for higher activity radioactive waste. This includes:

- certain wastes categorised as Low Level Waste (LLW), which by their nature are not currently suitable for disposal in existing LLW facilities as, for example, they may be longer-lived waste.
- LLW is as defined in the March 2007 LLW Policy (Ref 14).

**2.03.04** For the purposes of this Policy the term higher activity radioactive waste does not mean:

- **High Level Waste (HLW)** as there is no HLW in Scotland;  
**and**
- radioactive substances and material which are not currently classified as radioactive waste, such as **spent nuclear fuel, plutonium, uranium or other such radioactive fuels and materials.**

**2.03.05** If, in the future, HLW is produced or any of the substances and materials described in paragraph 2.03.04 were to be classified as waste or were to be classified as HLW, as is probable for such materials, they would not be covered by this Policy.

## **2.04 Long-Term Waste Management Options**

**2.04.01** The waste to which this Policy applies will remain radioactive for very long periods of time. How long it will remain radioactive will depend on the radionuclides contained within it and could remain radioactive for up to hundreds of thousands of years.

**2.04.02** It may be many years, even decades, before the waste is produced and is in a form which needs to be managed. This is particularly true of nuclear sites where facilities may not begin to be dismantled and decommissioned until many years from now. These lengthy timescales mean that there have to be options for managing the waste in the long-term.

**2.04.03** There remain uncertainties as to how to deal with much of the waste, therefore the Scottish Government Policy at the present time is that long-term storage is still the primary long-term

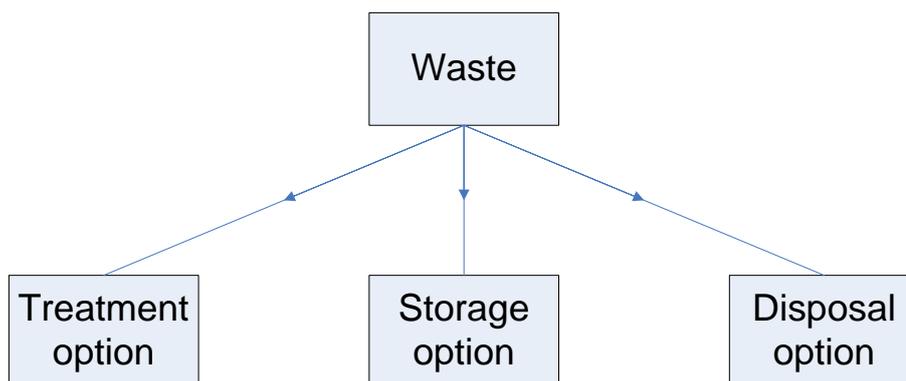
**management option.** However, recognising that there have been technological developments which enable treatment of some radioactive waste, primarily to reduce volumes, the Scottish Government Policy enables such options to be considered. Similarly, there are international examples of near-surface disposal facilities for radioactive waste that is similar to some of the waste we have in Scotland. The Scottish Government Policy is consistent with such international approaches.

**2.04.04** In line with waste management principles, notably the Waste Hierarchy and the Proximity Principle, the Policy requires that the waste should be dealt with as close as possible to the site where it is produced. This means that long-term radioactive waste management facilities should be as near to those sites as practicable so that the need to transport the waste over long distances is minimal.

**2.04.05** The Scottish Government Policy recognises these uncertainties and developments and requires that the waste should be managed in the long-term in near-surface facilities where it can be monitored and where there is the capability of retrieving it.

**2.04.06** There are at present three principle options for the long-term management of the waste: treatment; storage; disposal.

**Figure 3: Principle options for the long-term management of radioactive waste**



**2.04.07** The Policy does not prescribe how treatment or storage or disposal should be undertaken. Such decisions will be made on a case by case basis recognising that for some of the waste one or more of these options may not yet be feasible. The fact that the Policy allows treatment or storage or disposal does not mean that all waste will need

to be managed in each of these three options, rather than each option will be available for consideration if appropriate for a particular form of waste.

## Treatment

**2.04.08** The Policy allows consideration of waste treatment as a management option. It does not prescribe types of treatment as it was clear from the Strategic Environmental Assessment (SEA) that new technologies are being developed and some are in the very early stages of development. The Policy allows such advances to be considered.

**2.04.09** Whilst the Policy does not prescribe specific types of treatment it does prescribe what treatment is not as regards the Policy. The term “**treatment**” as used **in this Policy excludes** the reprocessing of spent nuclear fuel for the recovery of plutonium and uranium as the Policy does not apply to spent nuclear fuel or to those nuclear materials.

**2.04.10** The Policy allows treatment options to be used to comply with the Waste Hierarchy, for example, to minimise the volume of waste and to recover material. This recognises that some treatment options may not be available in Scotland, or even in other parts of the UK.

**2.04.11** The Policy allows consideration to be given to the transport of the waste from where it arises for treatment elsewhere in the UK, and to the export of the waste overseas, for the reasons prescribed below, in line with international agreements and robust regulatory requirements.

**2.04.12** The export of waste to other OECD (Organisation for Economic Co-operation and Development) and EU (European Union) countries may only be authorised or consented to by the competent authority in light of an assessment of all practicable options, and should not be permitted except:

- for the recovery of reusable materials;  
or
- for treatment that will make the subsequent storage or disposal of the waste more manageable.

**2.04.13** In all cases where such processes would add materially to the waste needing to be disposed of in a country of destination, including in other parts of the UK, the presumption should be that it will be returned to Scotland, to a timescale agreed by regulators and competent authorities in Scotland and in the country of destination.

**2.04.14** The Policy does not allow disposal of waste overseas other than as described in paragraphs 2.04.12 and 2.04.13. It will be for the competent authorities in those countries to assess if the waste adds materially to that in their country.

## Storage

**2.04.15** **Storage** has a specific internationally recognised and accepted definition when applied to radioactive waste management. **For the purposes of the Policy storage is placing the waste in a suitable facility with the intent to retrieve it at a later time.**

**2.04.16** **When waste is managed in a store it is always on the basis that it will have to be retrieved.** This means that the waste is regulated on the basis that its **retrievability**, and the way that it is being **monitored**, whilst in storage, can be demonstrated to the satisfaction of the regulator. This is reflected in the robust regulatory requirements under which radioactive waste is already regulated in Scotland.

**2.04.17** The Policy does not specify what monitoring is required or how retrievability will be demonstrated. It will be for operators to demonstrate how this is to be done in the design and management plan for any storage facility to the satisfaction of the regulators. This reflects the assumption that storage is an interim stage in the long-term management of the waste which will require further handling before disposal.

**2.04.18** The Policy does not specify what a storage facility should look like or how it should be constructed. It also does not specify a specific depth for near-surface as this will need to take account of the geography and geology of the location for any facility. **However, the presumption is that a storage facility will be as near to the surface as practicable taking account of all factors.** Existing stores in Scotland are generally located on or very near to the surface.

**2.04.19** Decisions will be made by those developing storage facilities. They will need to satisfy regulators as to their ability to meet health, safety, security and environmental requirements. **For the purposes of the Policy near-surface for storage facilities means:**

- Facilities located at the surface of the ground or at depths down to several tens of metres below the surface.

- Near-surface facilities may use the geology (rock structure) to provide an environmental safety function, but some may rely solely on engineered barriers.
- Near-surface facilities may use existing structures if an acceptable safety case is made.

**2.04.20** In the nuclear industry storage facilities are currently on nuclear licensed sites. This is generally not the case for non-nuclear industries where the volumes of waste are much smaller and where it is not possible to provide long-term storage facilities on individual premises, for example in hospitals.

**2.04.21** The circumstances where the waste is produced and where it can be stored may be in different locations, particularly for non-nuclear industry waste producers. Therefore there will not be a prescriptive definition of **near to the site for storage facilities**. **The presumption in the Policy is that storage facilities will be as near to the site where waste is produced as practicable**. Decisions will be made on a case by case basis and will be subject to robust regulatory requirements and the principles underlying the Policy.

**2.04.22** In circumstances where the waste needs to be transported for storage at a site near to but other than the one on which it was produced, it will be for waste producers and owners to determine, to the satisfaction of the regulators, the implications of transportation. This will require consideration of the environment, health, safety, security and **transport** requirements for storage options. This is consistent with the principles underpinning the Policy, particularly the Proximity Principle.

**2.04.23** The Policy intent for **non-nuclear industry waste producers**, the majority of whom produce very small amounts of radioactive waste, is that they will have the opportunity to use appropriate sites and facilities which are in proximity to them and are operated by others, including by the Nuclear Decommissioning Authority (NDA) or its contractors. However, there may be circumstances, for example where large volumes of waste are being produced, where it will be appropriate for such non-nuclear industry waste producers to provide their own facilities. These facilities will be subject to the same requirements and robust regulatory controls that apply to waste from nuclear industry activities.

**2.04.24** There will be a need to ensure that storage facilities are capable of managing the waste in the **long-term**. Long-term does not

mean indefinite storage but it may mean waste is stored for many decades.

**2.04.25** The Policy requires that decisions to construct new, or adapt existing storage facilities, should be based on compliance with a period of stability and capability of at least 100 years. This means that a facility will have the capability to last for at least 100 years, with the capability of extension beyond 100 years, including the replacement or refurbishment of its structures and services. The capability of these facilities will be reviewed at regular intervals, including by regulators, to ensure that they can be maintained for at least 100 years and beyond, if necessary.

## Disposal

**2.04.26** **Disposal** has a specific internationally recognised and accepted definition when applied to radioactive waste management. **For the purposes of the Policy disposal is placing the waste in a suitable specialised land-based facility without the intent to retrieve it at a later time.**

**2.04.27** **When waste is managed in a disposal facility it is on the basis that there is no intention to retrieve it. It is not that the waste cannot be retrieved, if that proved to be necessary, rather that there is no intention to retrieve it.** It is not the facility which determines whether waste is regarded as stored or disposed of, it is the intention which determines whether a facility is for storage or disposal. The time waste is placed in a disposal facility is when disposal occurs, even if the facility is eventually closed many years later.

**2.04.28** Disposal facilities, unlike storage facilities, have not been designed in the past with the intention to retrieve either the waste packages or the waste itself. Similarly, any monitoring requirements have reflected the fact that there was no intention to retrieve the waste. However, whilst there may still be no intention to retrieve waste, many countries are now looking at the issues of monitoring and retrievability for long-term disposal facilities.

**2.04.29** **The Policy requires that disposal facilities should be monitored and that there should be a capability to retrieve waste packages and waste if necessary.** The Policy does not specify what monitoring is required or how retrievability will be demonstrated. It will be for operators to demonstrate how this is to be done in the design and management plan for any disposal facility to the satisfaction of the

regulators. This reflects the GRA which provides guidance on the regulatory requirements and addresses both monitoring and retrievability.

**2.04.30** The Policy does not specify what a disposal facility should look like or how it should be constructed. It also does not specify a specific depth for near-surface as this will need to take account of the geography and geology of the location for any facility. **This is consistent with the GRA approach and reflects International examples of near-surface disposal facilities. The presumption in the Policy is that a disposal facility will be as near to the surface as practicable taking account of all factors.**

**2.04.31** Decisions will be made by those developing disposal facilities. They will need to satisfy regulators as to their ability to meet health, safety, security and environmental requirements. **For the purposes of the Policy near-surface for disposal facilities means:**

- Facilities located at the surface of the ground or at depths down to several tens of metres below the surface.
- Near-surface facilities may use the geology (rock structure) to provide an environmental safety function, but some may rely solely on engineered barriers.
- Near-surface facilities may use existing structures if an acceptable safety case is made.

**2.04.32** The Policy recognises that at present it may be possible to dispose of relatively small volumes of the waste in Scotland and that such waste may arise at different sites around Scotland. The circumstances where waste is produced and where it can be disposed of may be in different locations, particularly for non-nuclear industry waste producers. Therefore there will not be a prescriptive definition of **near to the site for disposal facilities. However, the presumption will be that disposal facilities will be as near to the site where waste is produced as practicable.** Decisions will be made on a case by case basis and will be subject to robust regulatory requirements and the principles underlying the Policy.

**2.04.33** In circumstances where the waste needs to be transported for disposal at a site other than the one on which it was produced, it will be for waste producers and owners to determine, to the satisfaction of the regulators, the implications of transportation. This will require consideration of the environment, health, safety, security and **transport**

requirements for disposal options. This is consistent with the principles underpinning the Policy, particularly the Proximity Principle.

**2.04.34** The Policy intent for **non-nuclear industry waste producers**, the majority of whom produce very small amounts of radioactive waste, is that they will have the opportunity to use appropriate sites and facilities which are in proximity to them and are operated by others, including by the NDA or its contractors. However, there may be circumstances, for example where large volumes of waste are being produced, where it will be appropriate for such non-nuclear industry waste producers to provide their own facilities. These facilities will be subject to the same requirements and robust regulatory controls that apply to waste from nuclear industry activities.

**2.04.35** Disposal facilities need to be capable of existing for much longer time periods than storage facilities. It is not possible to put a specific time capability on such facilities in the same way as for storage facilities where, unlike disposal, there is always the intention to retrieve waste. Disposal facilities will need to be designed to contain waste for much longer periods. Developers will need to satisfy regulators that an environmental safety case can be met. Such an environmental safety case will need to comply with the principle that the level of protection provided to people and the environment against radiological hazards of the waste, both at the time of disposal and in the future, is consistent with the standards at the time of disposal.

**2.04.36** The presumption in the Policy is that, whilst no specific period is prescribed, current practice in the management of radioactive waste facilities, reflects that up to 300 years is an acceptable period for institutional control. In this context institutional control means that there will be control and monitoring of a disposal facility to the satisfaction of regulators to ensure that there is protection of the environment and people. The issue of active institutional control is addressed in the GRA.

## **2.05 Planning Assumptions for Waste Producers and Owners**

**2.05.01 Nuclear site operators** in Scotland have to make provision, including financial provision, in their plans for the long-term management of the waste they produce. They will need to take account of the Policy in making their future planning assumptions, taking account of regulatory requirements.

**2.05.02** It is for the NDA, its Site Licence Companies and non-NDA site operators to consider how they reflect the Policy in their forward planning assumptions. Their assumptions will need to take account of their own individual decisions on long-term management options, including treatment or packaging options, and for either near-surface, near to the site storage or near-surface, near to the site disposal. These decisions will be subject to robust regulatory requirements.

**2.05.03 Non-nuclear industry waste producers** also make planning assumptions for managing their waste but the Policy does not require them to make provision for near to the site, near-surface storage or near-surface, near site disposal requirements in the same manner as the nuclear industry waste producers who produce the vast majority of the waste to which the Policy applies. Non-nuclear industry waste producers are still subject to robust regulatory controls but they have the option of considering the availability of any potential new treatment or storage or disposal options in Scotland, which are in proximity to them. Such arrangements will be subject to appropriate commercial agreements with facility providers.

## Engagement and Consultation with Stakeholders

**2.05.04** The Scottish Government expects waste producers and owners, developers and operators to engage at an early stage with local communities and the relevant regulatory and permitting authorities to ensure their views are taken into account when plans for treatment or storage or disposal facilities are being developed. All parties involved in any proposals to provide new, or alter existing, facilities for treatment or storage or disposal will be expected to engage and consult with local, national, UK, EU and international stakeholders, in a manner appropriate for their proposals.

## 2.06 Regulation and Permitting

**2.06.01** There is already a well established regulatory framework in Scotland for the management of the waste. This Policy does not alter the existing legislative and regulatory arrangements.

**2.06.02** Waste management activities by operators, or others, covered by this Policy will need to comply with the regulatory requirements in place at the time any action is proposed. This includes complying with any applicable changes in legislation that occur whilst

long-term management options are being considered or a facility is being maintained or developed. Proposals will be scrutinised and regulated by the environment, health, safety, security and transport regulators, who will take account of best practice in Scotland and elsewhere in considering any permitting.

**2.06.03** Any proposals for:

- the construction of new treatment or storage or disposal facilities, or any other facilities for managing the waste, or
- the adaptation of existing facilities for managing the waste,

will need to comply with the planning legislation in place at the time an application is made.

**2.06.04** The Policy expects a developer of a facility to take account of public and stakeholder views concerning the amenity, value and impact, including visual impact, of any such construction at the earliest stage possible in the process. It will also be for a developer to demonstrate how it has taken account of such views. It is for the relevant planning authority to consider the need for any conditions attached to such consents.

## **2.07 Policy Implementation and Review**

**2.07.01** The waste to which the Policy applies may be radioactive for up to many hundreds of thousands of years. This Policy reflects technological advances in recent years which are enabling the waste to be treated, or managed, in different ways.

It is likely that there will be further technological developments in future years which may result in new and better methods of managing the waste than are available at the present time.

**2.07.02** There will be a Strategy to implement the Policy which will be subject to a Strategic Environmental Assessment. The Strategy Implementation process will be led by the Scottish Government. Section 3 of this document explains how the process will be managed and issues which will need to be addressed within the context of the Strategy.

**2.07.03** The Policy is subject to a review process to enable consideration of technological and societal developments, particularly as

regards innovation and research and development. Reviews will be led by the Scottish Government and will be undertaken at intervals of no more than 10 years after publication of the Policy. This will not preclude a review in a shorter timeframe if appropriate.

## 2.08 Policy Summary

**02.08.01** This is a high level Policy which provides the framework for the long-term management of higher activity radioactive waste arising in Scotland. The Policy is not prescriptive in its approach, recognising that it will be applicable to waste:

- which may not be produced for decades; and
- for which long-term management options may not be feasible at present or have yet to be developed.

**02.08.02** The Policy provides the framework within which regulators, facility operators, waste producers and owners and the NDA will take decisions on the long-term management of the waste and undertake the work, and duties, for which they are responsible. The Policy enables options to be considered which may require research or development, recognising that advances may be made over time to manage wastes for which long-term options are not currently feasible.

**02.08.03** The Policy is explicit that all options for the long-term management of the waste will be subject to robust regulatory scrutiny and cannot be undertaken without approval by the relevant regulatory bodies.

**02.08.04** The Post-Adoption Strategic Environmental Assessment Statement reaffirms the Scottish Government position that it does not support deep geological disposal of radioactive waste as it does not consider it to be a “reasonable alternative” at this point in time. The Scottish Government Policy remains that the long-term management of higher activity radioactive waste, as defined in Section 2, should be in near-surface facilities.

**02.08.05** The Scottish Government Policy is that the long-term management of higher activity radioactive waste, as defined in Section 2, should be in near-surface facilities. Facilities should be located as near to the site where the waste is produced as possible. Developers will need to demonstrate how the facilities will be monitored and how waste

packages, or waste, could be retrieved. All long-term waste management options will be subject to robust regulatory requirements.

**02.08.06** The Policy requires all long-term management options to be assessed taking account of fundamental principles, including the application of the Waste Hierarchy and the Proximity Principle. The presumption is that options will be undertaken as close to the sites where waste is produced as is practicable.

**02.08.07** The Policy allows waste producers and owners to consider long-term management options for:

- treatment, including sending it to another location for treatment, either in Scotland or elsewhere including overseas, subject to any requirements by the relevant regulators in the UK and overseas for the return of the waste;

OR

- storage in near-surface facilities which are near to the site where waste is produced;

OR

- disposal in near-surface facilities which are near to the site where waste is produced.

**02.08.08** The Scottish Government expects waste producers and owners, developers and operators to engage at an early stage with local communities and the relevant regulatory and permitting authorities to ensure their views are taken into account when plans for treatment or storage or disposal facilities are being developed. All parties involved in any proposals to provide new, or alter existing, facilities for treatment or storage or disposal will be expected to engage and consult with local, national, UK, EU and international stakeholders, as appropriate.

**02.08.09** There will be a Strategy to implement the Policy which will be subject to its own Strategic Environmental Assessment. The Strategy Implementation process is described in Section 3 of this document.

**02.08.10** The Policy will be subject to review by the Scottish Government at interval of no more than ten years after publication of the Policy. This will not preclude reviews within ten years if necessary.

### 3 Scottish Government Policy Implementation Strategy and Strategic Environmental Assessment

- 3.01 Introduction
- 3.02 Strategy Process
- 3.03 Strategy Content
- 3.04 Summary

#### 3.01 Introduction

**3.01.01** The Scottish Government Policy for the long-term management of higher -activity radioactive waste is stated in Section 2 of this document. Responses to the consultation on the draft Detailed Statement of Policy (DSP) ([Ref 1](#)) and the Environmental Report (ER) ([Ref 2](#)) on its Strategic Environmental Assessment (SEA) heavily endorsed the Scottish Government proposal that a Strategy would be required to implement the Policy should be subject to a SEA.

**3.01.02** This Section outlines the Scottish Government proposals for the Implementation Strategy (IS) and its SEA. These reflect particularly, the Next Steps proposed in the Post-Adoption Strategic Environmental Assessment Statement (PAS) ([Ref 4](#)). These initial proposals are not exhaustive. They reflect the position at the present time and, as was the case in developing the Policy Statement in Section 2, it is likely that they will be adapted and revised to take account of changing circumstances as the IS is developed.

**3.01.03** The Scottish Government will lead the process to develop the IS and its SEA. In doing so the Scottish Government will continue to engage with stakeholders whose input to the development of the Policy Statement has been invaluable.

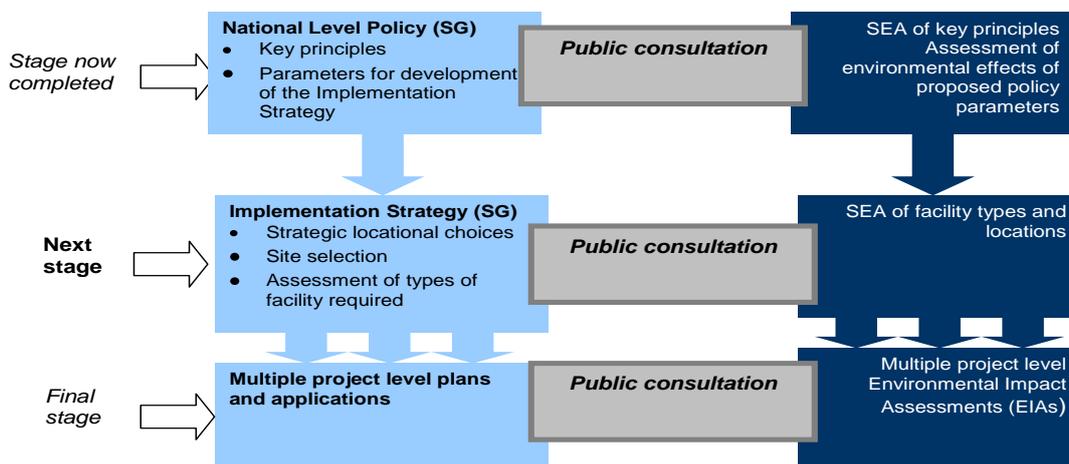
#### Timescales

**3.01.04** The Scottish Government has adopted a stepwise approach to the development of the Policy Statement and this will continue in the IS stage. **Figure 3** illustrates the overall process to develop and implement the Policy for the long-term management of the waste.

**3.01.05** The first stage, development of the Policy Statement, was undertaken between 2007 and 2010. It is not the intention at this point in

time to define a specific date to complete the second stage, the development of a Strategy. The process to develop the IS will require detailed planning and it will be at that point that milestones will be set.

**Figure 3: Decision Making and Environmental Assessment of Policy Development and Implementation**



### 3.02 Strategy Process

**3.02.01** The Scottish Government will continue its stepwise approach in future stages of the process as described in **Figure 3**. The process will be informed by the Policy Statement and the PAS as well as by comments received in response to the consultation on the DSP and ER. It is clear that more detailed information will be needed to inform the IS and its SEA as indicated in the following paragraphs.

#### Managing the Process and Engaging with Stakeholders

**3.02.02** The IS process will be led by the Scottish Government and will involve engagement with stakeholders in the same manner as the development of the draft DSP and its ER. Ongoing engagement with stakeholders will be needed as the IS and its SEA are developed and there will be a formal public consultation on the draft IS and its SEA. In line with a stepwise approach, it is not intended that every aspect of the IS and its SEA will be prescribed now. This Section outlines the initial approach which will need to be reviewed and adjusted as appropriate to reflect circumstances and the different stages of the work.

**3.02.03** The Scottish Government will adopt a project management approach with a Project Board and associated supporting working groups. The Project Board will be chaired by the Scottish Government and will initially comprise representatives of the Scottish Government, Regulators (environment, health, safety, security and transport), local authorities in Scotland and the Nuclear Decommissioning Authority (NDA). The Project Board will have terms of reference which will be published on the Scottish Government website as will agendas, papers and minutes of meetings. Membership and terms of reference may be reviewed and adjusted, if necessary.

**3.02.04** The Project Board will be able to set up associated supporting working groups to inform and assist in the development of the IS and its SEA. The membership of these groups will be dependant on the topics they will be considering and will be similar, but not restricted to, that of the Project Board: representatives of the Scottish Government, Regulators, local authorities in Scotland and the NDA. In light of previous experience, we would expect such supporting groups to include representatives of site operating companies, local stakeholders, including members of Site Stakeholder Groups (SSGs), the Committee on Radioactive Waste Management (CoRWM) and non-governmental organisations.

**3.02.05** Supporting groups will have their own terms of reference which will be published on the Scottish Government website as will agendas, papers and minutes of meetings. They may reflect the initial issues to be addressed as described below and, as with the Project Board, membership and terms of reference may be reviewed and adjusted, if necessary.

## Principles

**3.02.06** The Policy clearly states the principles which underpin it. These principles will need to be addressed in the IS and its SEA and will need in turn to be underpinned by information and evidence to support the IS. Section 5 of the PAS addresses environmental assessment issues to be considered in the next stage. These are issues which have been identified now. They are not restrictive as it is likely that others will be identified as the IS and its SEA are developed. It is also worth reiterating here that in all circumstances the IS and SEA will reflect regulatory principles applicable at the time decisions are taken.

### 3.03 Strategy Content

**3.03.01** Section 3.02 above describes the process to manage the development of the IS and its SEA. This section addresses the content of the IS and its SEA. Adopting a stepwise approach means that the content is not restricted to the issues identified in this document or the PAS. They are the initial considerations which will be reviewed and revised as necessary as information and evidence are obtained and analysed. This will involve testing the environmental consequences of the IS and identifying mitigation measures that can be put in place to ensure that implementation of the Policy avoids generating unexpected or significant negative environmental effects as far as possible.

**3.03.02** The information gathered during the SEA of the Policy will form a starting point for the IS and its SEA. The key issues which should be addressed in the initial work on the next stage are:

- Knowledge and Information Management
- Legislation, Regulation and Guidance
- Waste Identification, Treatment and Packaging
- Location, Design and Construction of Treatment or Storage or Disposal Facilities
- Social and Economic Costs and Benefits
- Best Practice and Experience in the UK and Internationally

#### **Knowledge and Information Management: Baseline Assessments, Monitoring and Long-Term Maintenance**

**3.03.03** The Policy Statement and PAS are clear and consistent that more information is needed for the IS and its SEA. These will form a basis for determining the baseline information for the IS and its SEA.

**3.03.04** There is also a clear need for information and knowledge to be maintained in the long-term to manage the waste. There will be a need for information on specific issues and a more general need to consider how information and knowledge should be maintained so that it is accessible now and to future generations. Intergenerational equity will be a key consideration for the IS along with the following issues:

- what research and development may be needed to deliver the IS;
- how new innovations and technology will be considered to inform future decisions;

- how skills and experience can be maintained over long timescales; and
- how best practice and experience elsewhere in the World is considered.

**3.03.05** This approach will ensure that environmental impact is minimised and linked with the cost implications of the Policy as well as informing monitoring requirements. A baseline is required for monitoring to allow for future assessments to clearly identify the impact of any future facility (or facilities) and its (or their) performance in relation to authorised radioactive discharge limits. Monitoring of non-radiological matters may also be required. The IS and its SEA will develop further information which can be used to inform the development of a baseline. Further site specific baseline evidence will be required to be gathered at the later project stage through Environmental Impact Assessment (EIA).

**3.03.06** Monitoring should set thresholds for specific contaminants, which trigger action if they are exceeded. As required by the "Near-surface Disposal Facilities on Land for Solid Radioactive Wastes - Guidance on Requirements for Authorisation - February 2009" (GRA) (Ref 5), published jointly by the environmental regulators in the UK, in the interests of avoiding placing an unreasonable emphasis on current or long-term future action, the safety of any future facility should not be reliant on post-authorisation period monitoring. The IS and project level assessments will confirm the detailed monitoring requirements. In line with respondent's comments, future monitoring should be delivered in an open and participative manner, involving stakeholders and communities.

### **Legislation, Regulation and Guidance**

**3.03.07** National, UK and international legislation, regulations and guidance are required to be followed at all times in the IS and in any subsequent project for the development of, or siting of, facilities. This will include the application of the concepts of Best Practicable Environmental Option (BPEO), Best Practicable Means (BPM) and Best Available Technology (BAT) to underpin the development of the IS and to steer consideration of options within its SEA. Other concepts including As Low as Reasonably Practicable (ALARP) and As Low as Reasonably Achievable (ALARA) will also form an integral part of decision making. The GRA is a particularly relevant document at this time.

## Waste Identification, Treatment and Packaging

**3.03.08** Further work is needed to define the waste to be managed in the long-term in terms of radionuclides and type (for example, graphite, metal etc) as well as by volume. This will lead to an exploration of the scope for treatment to reduce the volume of the waste, to help reduce the scale and therefore potentially the effects of facilities. Ongoing and future research on treatment options will need to be reviewed as a part of the development of the IS, as will the options for packaging, including packaging for transport.

## Location, Design and Construction of Treatment or Storage or Disposal Facilities

**3.03.09** The IS should systematically and transparently explore spatial options and consider the types of facilities required in relation to the waste. Where feasible and to maximise the positive environmental effects of the IS, opportunities for the reuse of brownfield, derelict or contaminated land should be prioritised.

**3.03.10** Where all other considerations are equal, the Proximity Principle should be applied to define the location of facilities in order to minimise potential risk and reduce any potential environmental impacts. This should not outweigh other considerations including safety, technical feasibility of specific locations and ability of communities and environments to accommodate developments without experiencing significant negative effects.

**3.03.11** Consideration of transport optimisation will take into account any movement of the waste required for treatment, possibility of waste movements between sites, and movement required for emplacement of the waste within any future facility.

**3.03.12** The design of treatment or storage or disposal facilities will need to identify clearly how monitoring will be undertaken. Similarly they will need to clearly demonstrate how waste packages and waste can be retrieved from storage or disposal facilities.

**3.03.13** Good practice will be used during any construction, to avoid or minimise impacts on population and human health, soil, water, air and biodiversity. The IS will begin to explore the scope for this in order to establish the extent to which mitigation will be available for effects arising

at a project level. This process will be taken forward in more detail at the Stage 3 project level and finalised through an Environmental Impact Assessment (EIA).

### **Social and Economic Costs and Benefits**

**3.03.14** A fuller social and economic assessment of the options will be required, in addition to a SEA of the IS. The Scottish Government, through its Project Board, will give further consideration to how this is best achieved, either through a distinct workstream, or amalgamated into a comprehensive sustainability appraisal as part of the SEA.

**3.03.15** Close liaison with communities who could be affected by any facilities or the transportation of waste will be required at all subsequent stages in the planning and development process and into the long-term as management responsibility passes to future generations. Intergenerational equity will be a key issue in this area.

### **Best Practice and Experience in the UK and Internationally**

**3.03.16** The Policy Statement and PAS have taken account of experience elsewhere, notably the Scottish Government's direct involvement in the Organisation for Economic Cooperation and Development work on retrievability and stakeholder engagement for the long-term management of radioactive waste. This will continue into the next stages of the IS where further work will be undertaken to establish and make use of international experiences in planning and developing near-surface facilities. These international examples are also at different stages of development and there will be an ongoing need to maintain up to date information on them and to learn from the experience of those involved in the programmes.

## **3.04 Summary**

**3.04.01** There will be an Implementation Strategy (IS) which will be subject to a Strategic Environmental Assessment (SEA). The IS and SEA will be led by the Scottish Government and will be based on a stepwise approach engaging with stakeholders in the development of the Strategy and the SEA. The process will be undertaken on a project management basis.

**3.04.02** The content of the Strategy and SEA will be informed by the Policy Statement and the Post-Adoption Strategic Environmental Assessment Statement as outlined in Section 3 of this document.

**3.04.03** The draft IS and its SEA will be subject to public consultation.

### References and Links

The references below are specific to this document. Further information and links on radioactive waste can be found in separate reference documents (Ref 9).

1. Scotland's Higher Activity Radioactive Waste Policy:  
14 January 2010

<http://www.scotland.gov.uk/Publications/2010/01/14151207/0>

2. Scotland's Higher Activity Radioactive Waste Policy Environmental Report: 14 January 2010

<http://www.scotland.gov.uk/Publications/2010/01/14151255/11>

3. Scotland's Higher Activity Radioactive Waste Policy Supplementary Information Report: 14 January 2010

<http://www.scotland.gov.uk/Publications/2010/01/14151345/0>

4. Scotland's Higher Activity Radioactive Waste Policy – Annex to the Environmental Report: Supplementary Assessment of Policy Alternatives: 09 September 2010

<http://www.scotland.gov.uk/Publications/2010/09/09094844>

5. Near-surface Disposal Facilities on Land for Solid Radioactive Wastes – Guidance on Requirements for Authorisation:  
February 2009

[http://www.sepa.org.uk/radioactive\\_substances/radioactive\\_waste/near-surface\\_disposal.aspx](http://www.sepa.org.uk/radioactive_substances/radioactive_waste/near-surface_disposal.aspx)

6. Committee on Radioactive Waste Management, “Managing our Radioactive Waste Safely, CoRWM’s recommendations to Government”.  
July 2006

<http://corwm.decc.gov.uk/assets/corwm/post-nov%2007%20doc%20store/documents/reports%20to%20government/nov%20and%20dec%202007/700%20-%20corwm%20july%202006%20recommendations%20to%20government.pdf>

7. Scotland's Higher Activity Radioactive Waste Policy Summary of Comments and Scottish Government Response 2011  
January 2011

<http://www.scotland.gov.uk/hawresponse>

8. Scotland's Higher Activity Radioactive Waste Policy Post-Adoption Strategic Environmental Assessment Statement  
January 2011

<http://www.scotland.gov.uk/hawpostadoption>

9. Scotland's Higher Activity Radioactive Waste Policy documents:  
January 2011

- Radiation and Radioactivity
- Higher Activity Radioactive Waste in Scotland
- Legislative and Regulatory Framework for the Management of Radioactive Waste
- Treatment Options for Radioactive Waste
- International Examples of Near-surface Facilities
- Retrievability and Reversibility
- Glossary of Terms

<http://www.scotland.gov.uk/hawsupplementary>

10. Waste Hierarchy

[http://www.sepa.org.uk/waste/moving\\_towards\\_zero\\_waste/waste\\_hierarchy.aspx](http://www.sepa.org.uk/waste/moving_towards_zero_waste/waste_hierarchy.aspx)

11. Waste Framework Directive (75/442/EEC) 15 July 1975

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1975L0442:20031120:EN:PDF>

12. Revised Waste Framework Directive (2008/98/EC):  
19 November 2008

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:312:0003:0030:en:PDF>

13. Radioactive Substances Act 1993: May 1993

<http://www.legislation.gov.uk/ukpga/1993/12/contents>

14. Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom: March 2007:

<http://www.scotland.gov.uk/Topics/Environment/Waste/16293/176481>

### Abbreviations

The abbreviations below are specific to this document. Further information and links on radioactive waste can be found in separate reference documents ([Ref 9](#)).

<b>ALARA</b>	As Low As Reasonably Achievable
<b>ALARP</b>	As Low As Reasonably Practicable
<b>BAT</b>	Best Available Technology
<b>BPEO</b>	Best Practicable Environmental Options
<b>BPM</b>	Best Practicable Means
<b>CoRWM</b>	Committee on Radioactive Waste Management
<b>DSP</b>	Detailed Statement of Policy
<b>EIA</b>	Environmental Impact Assessment
<b>ER</b>	Environmental Report
<b>EU</b>	European Union
<b>GRA</b>	"Near-surface Disposal Facilities on Land for Solid Radioactive Wastes - Guidance on Requirements for Authorisation - February 2009"
<b>HLW</b>	High Level Radioactive Waste
<b>ILW</b>	Intermediate Level Radioactive Waste
<b>IS</b>	Implementation Strategy
<b>LLW</b>	Low Level Radioactive Waste
<b>NDA</b>	Nuclear Decommissioning Authority
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>PAS</b>	Post-Adoption Strategic Environmental Assessment Statement
<b>RSA93</b>	Radioactive Substances Act 1993
<b>SEA</b>	Strategic Environmental Assessment
<b>SI</b>	Supplementary Information
<b>SSG</b>	Site Stakeholder Groups



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This document is also available on the Scottish Government website: [www.scotland.gov.uk](http://www.scotland.gov.uk)

Further information is available from:  
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