ITEM 13

GENERAL MEETING OF THE COUNCIL: 27 APRIL 2010

SCOTLAND'S HIGHER ACTIVITY RADIOACTIVE WASTE POLICY – CONSULTATION 2010

REPORT BY DIRECTOR OF DEVELOPMENT AND ENVIRONMENT SERVICES

1. PURPOSE OF REPORT

1.1 To consider the Council's response to the Scottish Government's consultation on its proposed policy statement on the higher activity radioactive waste.

2. RECOMMENDATIONS

The Council is invited to note:-

2.1 that the Scottish Government is consulting on the Detailed Statement of Policy for Scotland's Higher Activity Radioactive Waste, attached as Appendix 1 to this report;

2.2 that the Environment, Planning and Protective Services Committee, at its meeting held on 24 March 2010, resolved that the Director of Development and Environment Services, following consultation with Councillor S B Heddle, should submit, to the General Meeting of the Council to be held on 27 April 2010, the proposed response by the Council to the consultation referred to at paragraph 2.1 above;

2.3 the Scottish Councils Committee on Radioactive Substances (SCCORS), a forum which to seeks to establish a common local government view regarding the Scottish Government, Scottish Parliament and regulatory bodies' radioactive waste management policy development processes,

2.4 SCCORS' response to the consultation, referred to at paragraph 2.1 above, as detailed in Appendix 2 to this report; and

2.5 the consultation questions and the proposed response, on behalf of the Council, as detailed in Appendix 3 to this report.

It is recommended:-

2.6 that the Council determines its response to the Scottish Government's Detailed Statement of Policy for Scotland's Higher Activity Radioactive Waste, based on the proposed response referred to at paragraph 2.5 above.

3. POLICY ASPECTS

3.1 The Detailed Statement of Policy for Scotland's Higher Activity Radioactive Waste (the Policy) and the eventual identification of disposal or storage sites may impact on the following key priorities of the Council:-

3.1.1 care for our older and other vulnerable people
3.1.2 sustainable communities
3.1.3 improved services and facilities through increased joint working

3.2 It could also impact on all 6 Council values.

4. INTRODUCTION

4.1 At its meeting held on 24 March 2010, the Environment, Planning and Protective Services Committee noted:-

4.1.1 that the Scottish Government was consulting on the Detailed Statement of Policy for Scotland's Higher Activity Radioactive Waste, attached as Appendix 1 to the report by the Director of Development and Environment Services, for which responses were required by 9 April 2010;

4.1.2 that the Policy, referred to at paragraph 4.1.1 above, was required by radioactive waste owners and producers to enable them to plan for management of their higher activity radio active waste now and in the longer term;

4.1.3 Scottish Government policy to support long-term near surface, near site storage and disposal facilities in order that waste was monitorable and retrievable and the need for transporting it over long distances was minimal;

4.1.4 the consultation questions and the proposed response, on behalf of the Council, with the exception of questions 14, 15, 17 and 18, as detailed in Appendix 2 to the report by the Director of Development and Environment Services;

4.1.5 that the Scottish Government had extended the consultation deadline, referred to at paragraph 4.1.1 above, to 27 April 2010, to allow the Council to consider its response; and

4.1.6 the Scottish Government's intention to publish the Policy, referred to at paragraph 4.1.1 above, by the end of June 2010.

4.2 The Committee resolved that the Director of Development and Environment Services, following consultation with Councillor S B Heddle, should submit, to the General Meeting of the Council to be held on 27 April 2010, the proposed response by the Council to the Scottish Government's Detailed Statement of Policy for Scotland's Higher Activity Radioactive Waste, based on the proposed response referred to at paragraph 4.1.4 above, and in particular questions 14, 15, 17 and 18.

5. BACKGROUND

5.1 In June 2007 the Scottish Government announced that its policy for the long-term management of higher activity radioactive wastes (the Waste) arising in Scotland is to: support long-term near surface, near site storage facilities so that the Waste is monitorable and retrievable and the need for transporting it over long distances is minimal.

5.2 Although maintaining that the June 2007 Policy announcement is clear and succinct, Scottish Government's subsequent discussion with stakeholders identified a need for a more detailed statement of policy by those involved in the management of the waste: waste owners and producers, regulators and the Nuclear Decommissioning Authority (NDA). This is particularly relevant to enable the clean-up and decommissioning of nuclear sites. Engagement with stakeholders on the Waste arising in Scotland has also identified the option for extending the Policy to include near surface, near site disposal as well as near surface, near site storage.

5.3 The consultation package comprises; Scotland's Higher Activity Radioactive Waste Policy – Consultation 2010, Environmental Report 2010 and Supplementary Information 2010, copies of which are available in the Members' library.

5.4 The Scottish Government's policy is to support long-term near surface, near site storage and disposal facilities so that waste is monitorable and retrievable and the need for transporting it over long distances is minimal.

5.5 Consultation responses are required to be submitted by 9 April 2010. However, the Radioactive Waste Team at the Scottish Government has confirmed that it will extend that deadline to enable this Council to consider and confirm its response at the General Meeting to be held on 27 April 2010.

5.6 Since Environment, Planning and Protective Services meeting on 24 March, SCCORS have circulated information, as detailed in Appendix 2 to this report. Their response to the consultation has been taken into consideration in this Council's proposed response, Appendix 3 to this report.

6. FINANCIAL IMPLICATIONS

6.1 There are no specific financial implications arising from this report.

7. LEGAL ASPECTS

7.1 There are no legal implications arising from this report which relates to a consultation issued by the Scottish Government.

8. CONTACT OFFICERS

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8.2 David Brown, Environmental Health Manager, Ext 2817, E-mail: david.brown@orkney.gov.uk

9. APPENDICES

9.1 Appendix 1 – Proposed Detailed Statement of Policy
9.2 Appendix 2 – Scottish Councils Committee on Radioactive Substances – Commentary and Response
9.3 Appendix 3 – Proposed Council response

PROPOSED DETAILED STATEMENT OF POLICY

Introduction

This Chapter contains the Proposed Detailed Statement of the Scottish Government Policy (the Policy) for the long-term management of higher activity radioactive waste (the Waste) arising in Scotland. It should be read in conjunction with the Environmental Report which considers the Policy proposals and reasonable alternatives to them and assesses their environmental implications and with the Supplementary Information document.

The Proposed Detailed Statement defines the scope and key terminology of the Policy along with implications of its implementation for the management and control of the Waste. The Contents of the Detailed Statement of Policy are:

6.01 Introduction

6.01.01 In June 2007 the Scottish Government announced that its policy for the long-term management of higher activity radioactive wastes (the Waste) arising in Scotland is to

> support long-term near surface, near site storage facilities so that the Waste is monitorable and retrievable and the need for transporting it over long distances is minimal.

6.01.02 This Detailed Statement of Policy (the Policy) which has been developed in conjunction with a wide range of stakeholders:

- provides the Policy framework to enable regulators, site operators, waste producers and owners and the Nuclear Decommissioning Authority (NDA) to manage the Waste and undertake the work, and duties, for which they are responsible;
- explains the aim of the Policy and the principles underpinning it;
- defines the scope of the Policy;
- defines the terms used in the Policy;
- outlines the implications of the Policy, including planning assumptions for waste producers and owners;
- describes the regulatory framework governing the policy; and
- outlines the implementation and review process for the Policy.

6.02 Summary

6.02.01 The Scottish Government Policy for the Waste is to:

> support long-term near surface, near site storage and disposal facilities so that the Waste is monitorable and retrievable and the need for transporting it over long distances is minimal.

6.02.02 The Scottish Government intention is that the Policy framework for managing higher activity radioactive waste in Scotland will be sufficiently flexible to allow appropriate waste management options to be applied based on the type of waste and its radioactivity.

6.02.03 The Policy is not prescriptive on how to store or dispose of the Waste. It enables those who have responsibilities and duties to manage the Waste to determine the options available to them, all of which will be subject to robust regulatory control.

6.02.04 The Strategy for implementing the Policy will enable a range of long-term management options to be considered. These options will enable waste producers and owners to take account of developments in technology for dealing with the Waste. This recognises that knowledge of how we might deal with the Waste is still relatively new, whilst the lifetimes of some of the radioactive contamination will last many thousands of years. This Policy approach enables further development of technical options and provides opportunities for the public and stakeholders to have confidence in the ability of options to deal with the problems of long-term management and disposal of the Waste.

6.02.05 The Policy:
allows:

- the **storage or disposal** of the Waste in facilities constructed:
  - on the surface,
  - or
  - near to the surface down to depths of several tens of metres;
- the **storage or disposal** of the Waste in facilities located:
  - on existing nuclear sites;
  - or
  - near existing nuclear sites; and
- the treatment of the Waste, including sending it elsewhere for treatment, subject to any requirements by the relevant regulators in the UK and overseas for the return of the Waste.

requires:

- arrangements, including replacement or refurbishment of storage facilities, for safe and secure storage for at least 100 years, with the capability of extension beyond 100 years if necessary;

- disposal facilities to meet the requirements set by the appropriate regulators, including consideration of a period of 300 years for institutional control;
- storage and disposal facilities to be subject to monitoring as required by regulators;
- the Waste to be retrievable based on regulatory requirements;
- the location of facilities to be determined by application of the Proximity Principle;
- the need to transport the Waste over long distances is minimal; and
- the development of a Strategy to implement the Policy.

6.02.06 All storage and disposal options will:

- be subject to the environment, health, safety, security, and transport regulatory requirements and legislation at the time proposals are made; and
- take account of changes in such legislation and requirements as facilities are developed, constructed, maintained and closed.

6.03 Aim and Principles of the Policy

6.03.01 The aim of the Policy is to:

- ensure that all activities for the treatment, storage and disposal of the Waste are made in a way that protects the health and interests of people and the integrity of the environment at the time treatment, storage or disposal is undertaken, and in the future and recognises the risk of foreclosing future options;
- ensure that activities to manage the Waste are undertaken in a way that inspires public and stakeholder confidence; and
- ensure that decisions on the management of the Waste take account of cost and affordability.

6.03.02 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 Waste both at the time of storage or disposal and in the future is consistent with the standards in place at the time;
  and
- developers and operators of facilities will engage with stakeholders throughout the process of managing the Waste.

6.03.03 The Policy requires this aim and these principles to be demonstrated by those proposing storage or disposal facilities and will be subject to regulation by the relevant regulators.

Engagement and Consultation with Stakeholders

6.03.04 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, storage or disposal facilities are being developed. Abe CID 30rties involved in any proposals to provide nID 3ew, or alter existin Dilgs for treatment, storage or disposal will be expected to engage and consult with loc l, national, UK, European Union and international stakeholders, as appropriate.

6.03.05 Engagement and consult0tion is already the practice for, or a requirement of, a number of bodies and of specific legisation. There will be opportunities for more formal engagement with stakeholders as part of the regulatory and planning consent processes which will be needed for options to manage the Waste.

6.04 Scope of the Policy

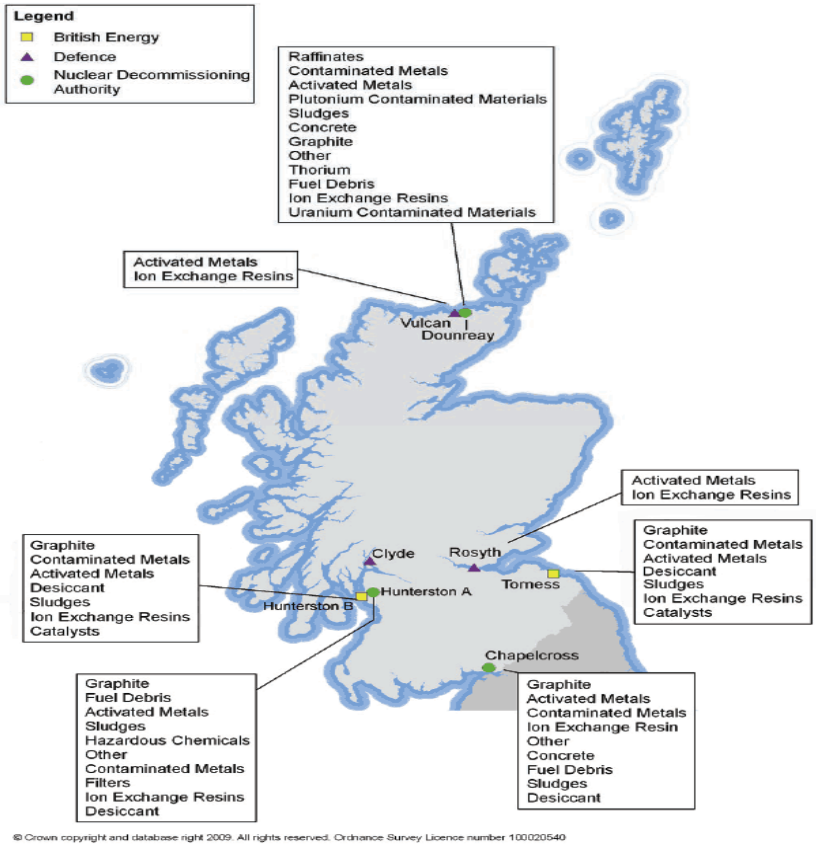
6.04.01 The Policy covers the Waste arising in Scotland from:

- the operation or decommissioning of civil nuclear industry sites in Scotland;
- the operation or decommissioning of that part of the former Defence Establishment at Rosyth which is currently operated as a civil nuclear site; and
- non-nuclear industry sectors, including health, education and oil and gas.

6.04.02 The Policy does not cover:

- waste arising from the decommissioning and dismantling of redundant nuclear submarines including those berthed at the former Defence Establishment at Rosyth;
- waste which has already been dealt with under the policies of previous governments;
- waste which is the subject of previous or existing contractual arrangements, including waste sent to facilities outside of Scotland;
- waste categorised as High Level Waste (HLW) as there is no longer any such waste at nuclear sites 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.

Figure 8: Location of nuclear industry sites in Scotland and the higher activity radioactive waste that they produce



6.05 The Waste

6.05.01 This is primarily solid waste, such as graphite and metal, but also includes Waste such as sludges which may be solidified as part of a treatment and/or packaging process.

6.05.02 The term higher activity radioactive waste (the Waste) as used in this Policy is:

- what is defined in current UK categorisations as Intermediate Level Waste (ILW); and
- 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.

6.05.03 Previous inventories of radioactive waste identified Dounreay as having High Level Waste (HLW): the properties of this Waste have altered over time to enable it now to be classified as Intermediate Level Waste (ILW). If the substances and materials described in paragraph 6.04.02 were to be classified as Waste in the future, it is probable that most of them would be deemed to be HLW and as such they would not be covered by this Policy. The Scottish Government would need to review its Policy to consider the potential impact of any such classification changes.

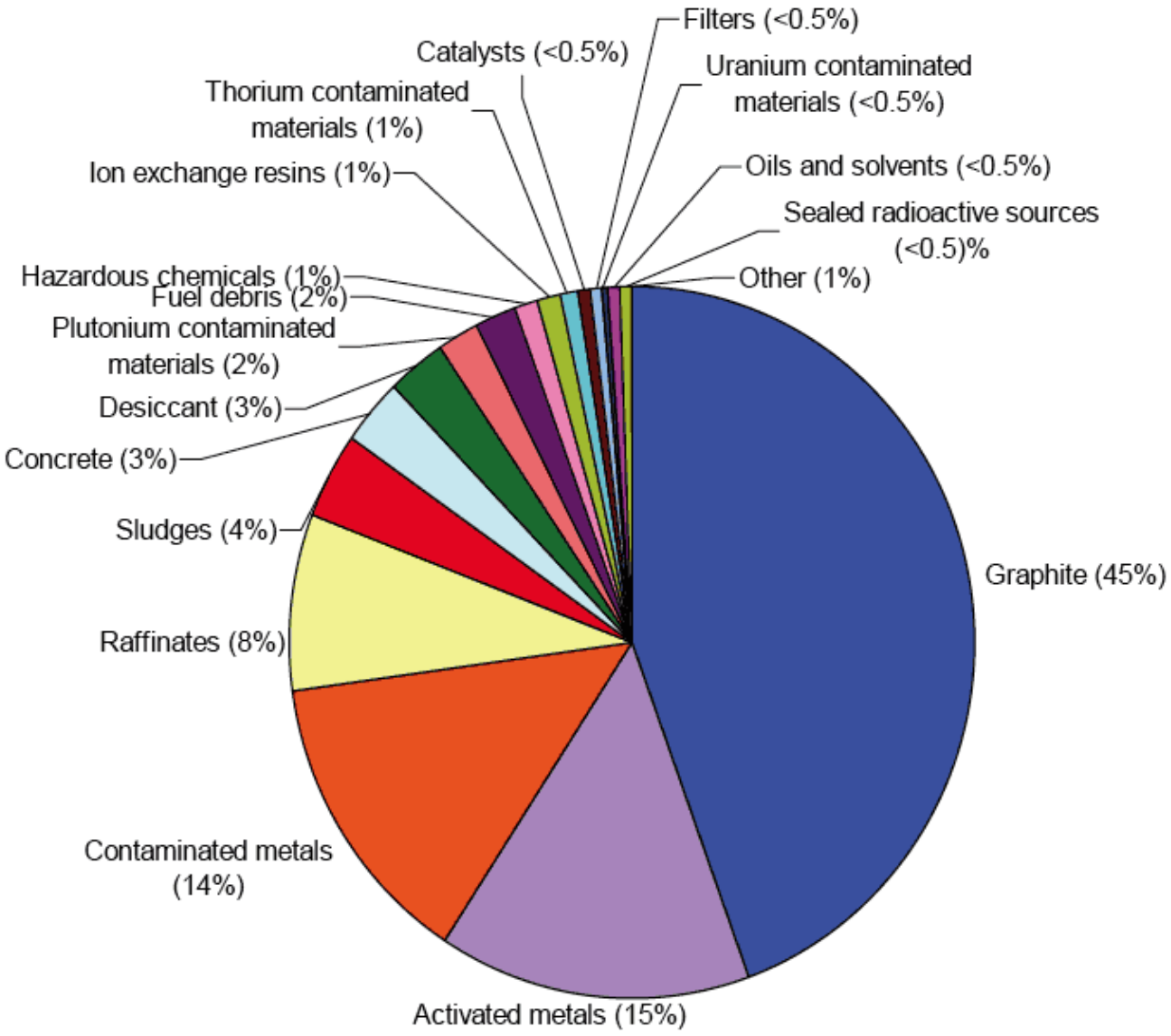
Categorisation and Descriptions of the Waste

6.05.04 The Waste is categorised as:

- ILW with radioactivity levels exceeding the upper boundaries for LLW but which does not generate enough heat for this to need to be taken into account in the design of storage or disposal facilities; and
- LLW as defined in the March 2007 LLW policy (Ref 3).

6.05.05 The 2007 UK Radioactive Waste Inventory (Ref 4) describes waste volumes in terms of the above categorisation. Figures 8 and 9 illustrate the location and nature of the Waste arising in Scotland.

Figure 9: Estimated volume of higher activity radioactive waste arising in Scotland (m^3)



(Please note due to rounding factors with some small numbers the total percentage comes to over 100%)

6.06 Defining Terms

6.06.01 The Policy has key terms which need further definition. These are:

- long-term
- near surface
- near site
- storage
- disposal
- monitorable
- retrievable
- the need to transport the Waste over long distances is minimal

Long-Term

6.06.02 The Policy defines long-term when applied to a storage facility as at least 100 years, with the capability of extension beyond 100 years, including the replacement or refurbishment of structures and services. The timeframe for long-term storage would begin when the first consignment of the Waste is placed into the facility.

6.06.03 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. It expects these facilities to be reviewed at regular intervals, including by regulators, to ensure that they can be maintained for at least 100 years and possibly beyond, if necessary.

6.06.04 The Policy recognises that, in the management of radioactive waste facilities, it is now generally accepted as a matter of custom and practice that 300 years is an acceptable period for institutional control. The definition of long-term reflects this present approach to institutional control.

6.06.05 Disposal facilities would require to be capable of existing for much longer time periods. It will be for regulators to be satisfied that an environmental safety case can be met which complies 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.

Near Surface

6.06.06 The Policy will cover near surface storage and near surface disposal facilities. The definition of near surface, which will apply to both near surface storage and near surface disposal facilities, is:

- 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. They could include facilities constructed under the seabed but accessed from land
- Near surface facilities may use existing structures if an acceptable safety case is made.

Near Site

6.06.07 The definition of near site is not prescriptive nor does it determine a specific distance from a site. The Policy allows the Waste to be moved from a site for treatment, long-term storage or disposal. It does not require such treatment, storage or disposal to take place on the site where the Waste has arisen.

6.06.08 The definition of near site for the Policy is based on the Proximity Principle which is consistent with a risk informed approach to managing and regulating the Waste. The requirement to consider the Proximity Principle is a key element of EU environmental and municipal waste management policy, introduced in Article 5 of the Waste Framework Directive (75/442/EEC) and reflected in subsequent Directives the latest being the Revised Waste Framework Directive 2008/98/EC). Whilst the Directive does not apply to radioactive waste, the principle of proximity is one which is generally used in considering radioactive waste management options.

6.06.09 The definition of near site does not automatically require all non-nuclear industry waste producers to provide facilities to store or dispose of the Waste arising from their activities. The intent is that such waste producers, the majority of whom produce very small amounts of radioactive waste, 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.

6.06.10 There may be circumstances, for example where large volumes of the 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 regulatory controls that apply to the Waste which arises from nuclear industry activities.
Storage and Disposal

6.06.11 The Policy now covers both storage and disposal. Whilst the terms storage and disposal are sometimes used interchangeably, they have specific internationally recognised and accepted definitions when applied to radioactive waste management. These specific definitions are reflected in the regulatory requirements under which the Waste is already regulated in Scotland. The definitions of near surface storage and near surface disposal for the Policy are:

- Storage is placing the Waste in a suitable facility with the intent to retrieve it at a later time.

- Disposal is the emplacement of the Waste in a specialised land-based disposal facility without the intent to retrieve it at a later time. The time of emplacement will be regarded as the time when disposal occurs, even if the facility is eventually closed many years later. Retrieval may be possible but, if intended, the appropriate term is storage.

Monitorable

6.06.12 There is already a well established regulatory framework in Scotland for the management of the Waste which includes requirements for monitoring. The Policy reflects the requirements of the existing regulatory framework to define the term monitorable. The Policy:

- does not prescribe how monitoring should take place, that is a matter for operators to determine to the satisfaction of regulators;
- requires regulators to be satisfied that the monitoring of treatment, storage or disposal facilities is sufficient to ensure that there is protection of the environment and people in accordance with the definition of long-term.

Retrievable

6.06.13 The concept of retrievability is different for storage and disposal and this is reflected in the definitions of storage and disposal in the Policy.

6.06.14 The Policy definition for storage already has retrievability as an inherent concept and this will be built into the design and management plan of any storage facility. This reflects the assumption that storage is an interim stage in the management of the Waste which will require further handling before disposal.

6.06.15 Explicit in the definition of disposal is that there is no intention to retrieve the Waste. It is not to say that if at some point in time material needed to be recovered that it could not happen, rather that there is no intent to do so.

6.06.16 The Policy defines retrievability when applied to a disposal facility as the possibility of reversing the action of waste emplacement and recovering the Waste. This reversal and recovery could happen before or after a facility is closed.

6.06.17 The Policy requires a developer to consider retrievability when planning a near surface disposal facility. It is for a developer to demonstrate to the satisfaction of the regulators when a facility might be deemed to be capable of closure. It is for the regulators to determine whether such closure is possible.

6.06.18 The regulatory framework will have to provide assurance to the public and stakeholders that the Waste has been disposed of in a manner which will continue to protect the environment and people. It will not necessarily determine that the Waste will always be able to be retrievable in the same way as for storage. It will recognise that, if at some point in time, the Waste needed to be recovered it would require further regulatory agreement and, depending on the disposal facility, may require significant engineering to do so.

The Need for Transport over Long Distances is Minimal

6.06.19 The Policy recognises that some transportation of the Waste may be needed, for example, for treatment and this addressed in some detail in the Environmental Report. The Policy does not further define this requirement as the use the Proximity Principle to define near site already requires consideration to be given to transportation issues.

6.06.20 It will be for developers to determine, to the satisfaction of the regulators, the implications of transportation when considering the environment, health, safety, security and transport requirements for treatment, storage or disposal options.

6.07 Implications of the Policy

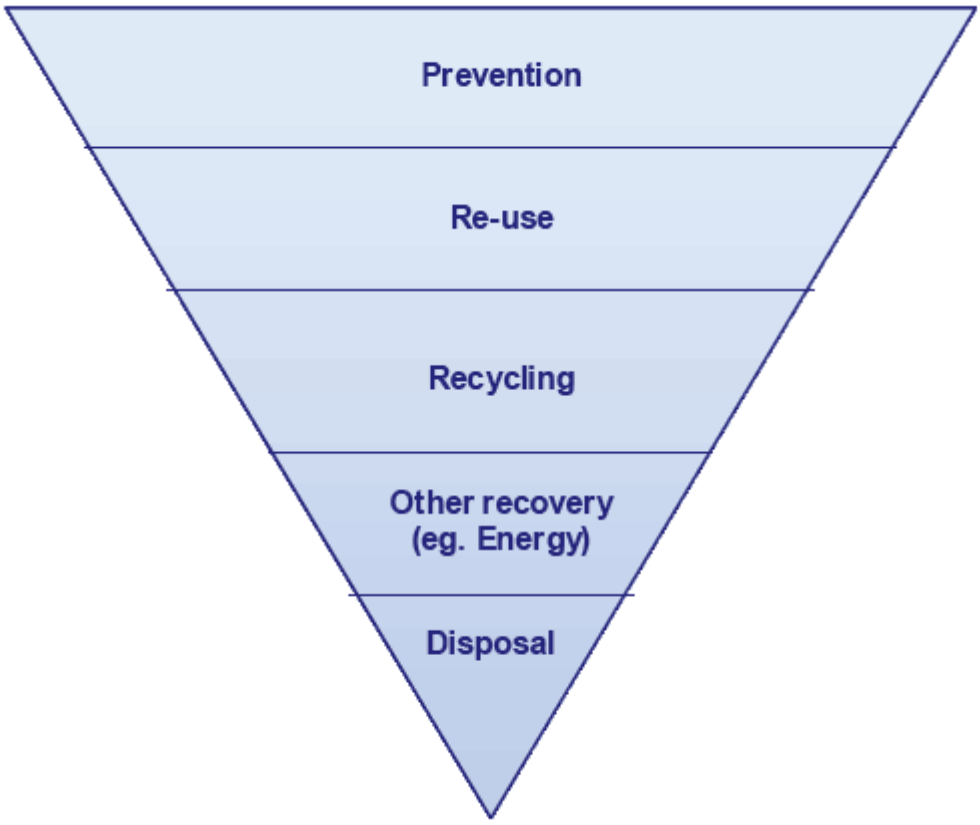
6.07.01 The development of the Policy has identified implications which need to be considered explicitly in considering the management of the Waste. These are:

- application of the Waste Hierarchy
- treatment of Waste, including export for treatment
- packaging
- innovation
- skills

The Waste Hierarchy

6.07.02 Application of the Waste Hierarchy is already an requirement for the management of non-radioactive waste and for LLW in line with the 2007 LLW policy (Ref 3). The Hierarchy requires all waste producers to consider waste management with regard to prevention, minimisation, preparation for re-use, recycling, other recovery and disposal.

Figure 10: Waste Hierarchy Diagram



6.07.03 The Policy:

- requires waste producers to apply the Waste Hierarchy;
- enables waste producers to consider treatment options, taking account of environment, health, safety, security and transport requirements and the cost of options; and
- requires regulators to take account of the application of the Waste Hierarchy when scrutinising the proposals of waste producers and facility operators for management of the Waste.

6.07.04 Regulators already consider the integrated waste management plans of waste producers and owners. It will be for regulators to assess whether the Waste Hierarchy has been applied to those plans in a manner they consider appropriate, recognising that the cost and affordability of proposals will need to be taken into account.

Treatment of the Waste and Export of the Waste for Treatment

6.07.05 The term treatment as used in this Policy does not refer to 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.

6.07.06 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. It recognises that some treatment options may not be available in Scotland, or even in the UK.

6.07.07 The Policy allows consideration to be given to the

6.07.13 In considering the environment, health, safety, security and transport implications the regulators will be expected to take account of best practice both here and in other countries. The Near Surface Disposal Facilities on Land for Solid Radioactive Waste - Guidance on Requirements for Authorisation (Ref 5) already provides advice to developers on the approach to regulation of near surface disposal facilities.

Innovation

6.07.14 The Policy recognises that there have been technical innovations and developments in recent years for example, on treatment and it is to be expected that there will be further innovations in future. The Policy is intended to provide the opportunity for such developments and that they will always be subject to appropriate regulatory requirements. Where appropriate this may require waste producers and owners and facility operators to undertake research and development activities.

Skills

6.07.15 A variety of skills are, and will continue to be, needed to ensure that the Waste is managed in a way that protects the health and interests of people and the integrity of the environment. Some skills will be specific to the radioactive aspects of the Waste and others will be more generic for example, design, engineering and construction skills. It will be for waste producers and owners and facility operators to ensure that they have access to the necessary skills. This does not mean that they will necessarily be direct employees of the organisations.

6.08 Planning Assumptions for Waste Producers

6.08.01 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.

6.08.02 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 and packaging options, and for either near surface, near site storage or near surface, near site disposal. These decisions will be subject to regulatory requirements.

6.08.03 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 site, near surface storage or disposal requirements in the same manner as the nuclear industry waste producers who produce the vast majority of the Waste. Non-nuclear industry waste producers are still subject to appropriate regulatory controls but they have the option of considering the availability of any potential new treatment, storage or disposal options in Scotland, subject to appropriate commercial agreements with facility providers.

6.09 Regulation and Permitting

6.09.01 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.

6.09.02 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 changes in such legislation and regulation as a facility is maintained and 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.

6.09.03 Any proposals for:

- the construction of new treatment, 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.

6.09.04 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 point possible in the process. It is for the planning authority to consider the need for any conditions attached to such consents.

6.10 Implementation of the Policy

6.10.01 The NDA already has the responsibility for developing and ensuring delivery and implementation of the programmes for interim storage and geological disposal for higher activity radioactive waste arising in the UK. The NDA retains this responsibility as regards the Waste arising in Scotland to which the Policy applies and this will need to be reflected in the NDA's Strategy as required by the Energy Act 2004.

6.10.02 The NDA will develop a Strategy for implementing the Policy in conjunction with other producers and owners of the Waste arising in Scotland. Whilst the Policy and Strategy may require the NDA to develop new facilities for the Waste for which it has responsibility, this does not mean that the NDA will provide facilities for other waste producers and owners. The principle remains that the "polluter pays". The NDA already provides services to waste producers and it may decide to make any new facilities available to them. If so, such arrangements would be subject to commercial arrangements. The development of the Strategy will also be subject to a Strategic Environmental Assessment process.

6.11 Review of the Application of the Detailed Statement of Policy

6.11.01 The Waste covered by the Policy may be radioactive for many hundreds and even 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 dealt with, 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.

6.11.02 The Policy is subject to a review process to enable consideration of technological and societal developments, particularly as regards innovation and research and development. The Review will be undertaken by the Scottish Government and the first Review will begin 10 years after publication of this Policy.

Scottish Councils Committee on Radioactive Substances (SCCORS)

Commentary on Scotland's Higher Activity Radioactive Waste Policy Consultation 2010

This SCCORS report contains

1. An Explanatory Introduction
2. A Summary of SCCORS main recommendations
3. A Commentary on Scottish Government's consultation documents.
4. Scientific references to the Commentary.
5. A list of SCCORS answers to most of the questions asked by the Scottish Government's Consultation Document.
6. An Appendix setting out the IAEA Principles of Radioactive Waste Management and the HSE Safety Assessment Principles for Nuclear Facilities.

SCOTLAND'S HIGHER ACTIVITY RADIOACTIVE WASTE POLICY CONSULTATION 2010: SCCORS Commentary

Explanatory Introduction

The Scottish Councils' Committee on Radioactive Substances (SCCORS) was established in May 2009 with the support of CoSLA and the Scottish Government, and with funding from the NDA. The aim of SCCORS is to give independent factual advice to Scottish local governments on radiation and radioactivity matters. SCCORS is currently representative of 29 Scottish Councils.

The Scottish Government is consulting on a proposed "Detailed Statement of Policy for Scotland's Higher Activity Radioactive Waste". The Consultation is proposing to change the Scottish Government's current policy on the long term management of nuclear waste to include disposal, as well as storage, of Intermediate Level Wastes (ILW). The Scottish Government states the proposed policy is needed to allow radioactive waste owners and producers to plan for now and the longer term. Most of Scotland's radioactive wastes are from nuclear power generation.

On March 12, SCCORS convened a meeting of local government representatives at CoSLA HQ in Edinburgh to consider the Scottish Government's Consultation Documents together with an initial report commissioned by SCCORS from an independent Consultant on radioactivity in the environment. The meeting took the view that a number of technical matters remained unclear in the Consultation Documents. Therefore SCCORS sought clarification of these issues from the Scottish Government. SCCORS has now received replies from the Scottish Government and the Nuclear Decommissioning Authority. Although these technical replies were helpful in some instances, a number of larger issues remain outstanding. This makes it difficult for SCCORS and its advisors to furnish informed advice on the contents of the Scottish Government's Consultation Documents to local authorities.

Therefore the main SCCORS recommendation is that the Scottish Government should clarify a number of outstanding matters (see Summary below) and should extend the Consultation accordingly to allow for replies to the clarifications. In particular, it recommends that Scottish Councils should reserve their opinions on the proposal to add disposal to the existing waste policy of storage until more scientific information on the validity of disposal is made available.

The original deadline for responses to the existing Consultation Documents was April 9, but it is understood this has been extended to **Friday, April 30 2010.** Therefore SCCORS recommends that local councils should reply to the Scottish Government Consultation stating that additional information, as listed in the Summary below, is required. Their replies should be sent as soon as possible to:

The Scottish Government, Waste and Pollution Reduction Division
1-J Dockside, Victoria Quay, Edinburgh, EH6 6QQ
radioactivewasteteam@scotland.gsi.gov.uk

SCCORS Commentary on the Scottish Government's Higher Activity Radioactive Waste Consultation

Summary

The Consultation Documents remain unclear on

- the scientific information permitting confidence in the disposal of higher activity nuclear waste
- the definitions of disposal and storage
- the definition of near surface
- the radioactivity concentrations (Bq per m^3) of ILW waste forms, and the radionuclide compositions of ILW waste forms

It is therefore not possible to make informed judgments on the Consultation's proposed policy. SCCORS therefore reserves its opinion on the Consultation Documents and requests the Scottish Government to publish information on the above matters still outstanding, and to extend its Consultation accordingly to allow for replies to the new information. SCCORS recommends that Scottish Councils should reserve their opinions on the proposal to add disposal to the existing waste policy of storage until more scientific information on the validity of disposal is made available.

In the SCCORS Commentary below, **the matters on which more information is necessary are discussed in bold.**

SCCORS Commentary on the Scottish Government's Higher Activity Radioactive Waste Consultation

Introduction

On January 15, 2010, the Scottish Government's Waste and Pollution Reduction Division published three documents on a proposed policy for Scotland's higher activity radioactive waste. The Consultation consists of three documents:
(1) The Consultation Document 2010 (CD)
http://www.scotland.gov.uk/Resource/Doc/298914/0093253.pdf
(2) Environmental Report 2010 (ER)
http://www.scotland.gov.uk/Resource/Doc/298929/0093254.pdf
(3) Supplementary Information 2010 (SI)
http://www.scotland.gov.uk/Resource/Doc/298942/0093255.pdf

Consultees are asked to consider all three documents in preparing their responses. Collectively, the documents set out a proposed policy statement on higher activity radioactive waste. The purposes of the proposed policy are:

- to enable waste owners and producers to plan for the management of their higher activity radioactive waste now and in the longer term; and
- to provide the policy framework to enable regulators to regulate the management of the waste.

Briefly, the proposed policy is to support long-term, near surface, near site storage and disposal facilities so that the waste is monitorable and retrievable and the need for transporting it over long distances is minimal. (CD para 6.02.01)

Proposed Change to Existing Policy

The Scottish Government's existing 2007 policy on nuclear waste management is set out in Appendix A of the Consultation Document (CD page 75). It states, inter alia, that Ministers

"…support the CoRWM recommendations for a robust programme of interim storage and would also support further joint research on other long-term management options. However, we do not accept that it is right to seek to bury nuclear waste, which will remain radioactive for thousands of years, in underground sites. This out of sight, out of mind policy should not extend to Scotland."

The proposed change from supporting storage to supporting storage and disposal is a policy shift in which political considerations are likely to be involved. These matters are not mentioned in the Consultation Documents. For example, there is no Ministerial preface – a common practice in consultations - which sets out Ministerial thinking on the matter. Presumably, Scottish Ministers permitted the present Consultation to take place, but this is unstated.

The Consultation Document (CD para 3.02.02) states the reason for the proposed change was that discussions with stakeholders had

"identified potential opportunities to treat the Waste and the possibility of disposing of some of it now in near surface, near site facilities."

This explanation is unclear; it may well be the case that "potential opportunities" exist, but they are not discussed. This is a serious matter as a change of Scottish Ministerial policy is being proposed here and it is important to ensure that the new policy has a sound scientific foundation. Unfortunately, in some past instances, nuclear policies have been decided on thin grounds and have later turned out to be ill-advised. It is necessary to ensure this does not recur with nuclear waste policy. **Scientific information on "potential opportunities" is required so that informed comments can be made on them.**

Also the above explanation does not appear to concur with some facts. For example, British Energy has a corporate policy not to dispose of waste at its sites and almost all ILW wastes at Dounreay are unsuitable for shallow disposal. **Further discussion and explanation is required on these points.**

Storage and Disposal

The Consultation Document (para 3.03.19) defines storage as placing waste in a suitable facility *with* the intent to retrieve it later. Disposal is defined as the emplacement of waste in a disposal facility *without* the intent to retrieve it later. In other words, the distinction is one of intent. **This is unsatisfactory as site operators' intentions can change in future: it would be preferable if there were substantive norms to be observed by each type of facility, eg degree of institutional control, existence of monitoring.**

The Environment Report (para 4.06**)** further explains that "*the concept of retrievability is built into the Policy as a requirement",* ie for both storage and disposal. Disposal facilities may be approved in situations where, although there is no intention to do so, retrieval may be possible. Unfortunately the Environment Report also states "…*this could mean that disposal facilities can… be backfilled and sealed*" and it is for the regulators to decide when a disposal facility is capable of closure. Therefore retrievability seems to be a rather elastic concept, stretching to mean whatever the site operator or regulator wants it to mean.

In other words, **the Consultation Documents' distinctions between disposal and storage remain unclear and need to be redefined**. In practice, retrievability may not actually be a helpful criterion. In underground repositories of whatever depth, the generation and emission of gases and the degradation of waste packages by oxidative/reductive processes may render wastes unable to be retrieved. For example, the former Nirex (2005, 2006) identified the need to carry out more research on the potential for exposures due to the production and release of methane gas from graphite wastes. Also, in a report for the European Commission's project on the 'Performance Assessment Methodologies in Application' to guide the development of the safety Case (PAMINA), the NDA (2008) drew attention to the uncertainties involved in gas emissions modelling. Gaseous emissions could profitably be discussed in the Consultation Document.

This means that each waste form has to be carefully analysed and decisions made as to whether it is safe enough to be disposed (ie no further institutional control) or whether it needs to be stored for longer periods (ie remain under institutional control).

It is understood that proposed disposal facilities would require a safety case to be drawn up and approved by both main regulators SEPA and the NII. Proposed storage facilities on the other hand would only require approval by the NII. This is unfortunate as **SEPA should be involved in examining the safety cases for storage facilities,** as these facilities will entail nuclide discharges and emissions. Just as important, no provisions exist for public consultation under the Nuclear Installations Act 1965 unlike the situation which would exist if waste storage were regulated under the Radioactive Substances Act 1993.

Designation of long-lived ILW wastes for disposal

The Near Surface Disposal Facilities on Land for Solid Radioactive Waste – Guidance on Requirements for Authorisation (GRA) produced jointly by SEPA, the EA and the Northern Ireland Environment and Heritage Service (SEPA 2009) provides guidance on the approach to regulation of near surface disposal facilities. It currently states (para 3.4.1 page 8)

"We do not envisage that near-surface facilities would be suitable for the disposal of high level waste (HLW), spent nuclear fuel or nuclear materials such as plutonium."

However when SEPA (2008) consulted on the **draft** Near Surface GRA, the draft added "*We do not envisage that near surface facilities would be suitable for disposing of long-lived ILW .....*"

In other words, initially there was no intention to include long-lived ILW. However in response to the consultation, BAe Systems and Energy Solutions (a company formed in 2006 by the merger of the former BNFL Inc with several US companies - specialists in near surface disposal in the US[1]) stated that an acceptable environmental safety case for "less toxic" ILW in a near-surface facility was possible and the GRA should include this type of waste. The guidance was therefore revised to indicate that "less radiotoxic" ie long-lived, intermediate level waste could be suitable for near-surface facilities, provided an acceptable environmental safety case could be made (page 15). However the scientific evidence and reasoning behind this change were not discussed.

Therefore **the evidence and reasoning behind the change to include long-lived ILW in near surface disposal facilities should be presented.**

Need for waste activities to be presented

The wastes addressed here are "higher activity" which means, in practice, Intermediate Level Waste (ILW). This is non-heat generating waste with activities greater than Low Level Waste (LLW) ie greater than 12 GBq of beta/gamma activity per tonne of waste and 4 GBq/tonne of alpha activity. **Unfortunately, the Consultation documents contain no references to specific activities of waste or to constituent radionuclide concentrations. These omissions will need to be rectified before informed replies can be made to the Consultation.**

[1] http://www.spinprofiles.org/index.php/Energy_Solutions

Graphite wastes – not short-lived

A distinction discussed by the Consultation documents is between "long-lived" (LL) and "short-lived" (SL) intermediate level wastes. LL wastes contain nuclides whose half-lives are >30 years and SL wastes contain nuclides whose half-lives are <30 years. LL-ILW (22,971 m^3) consists mainly of irradiated core graphite (49%), activated metals (16%) and contaminated metals (5.4%). SL-ILW (4,637 m^3) consists mainly of sleeve graphite (58%), Magnox fuel debris (13%) and desiccant (10%).

Recently the proportion of LL wastes was reduced to 83% of Scottish ILW inventory. This was done mainly by re-classifying sleeve graphite as short-lived, but the rationale for this reclassification is unclear. Although less radioactive than moderator graphite, sleeve graphite will have been irradiated and neutron activation of N, C and O atoms will have occurred. Undoubtedly it will contain raised levels of C-14 which has a long half-life. **Therefore the Consultation Document should be changed so that all graphite is classified as long-lived.** This issue was clarified in later NDA responses which agreed that all graphite wastes were in fact long-lived.

Radioactive Graphite

The principal long-lived waste is graphite which contains C-14 with a half-life of 5,730 years. As shown in the data in table 1 (which uses waste activities from Hunterston B as an illustrative example), carbon-14 is the source of 98% or more of graphite's radioactivity. C-14 mainly results from neutron activation of stable C-13 (1% of naturally occurring carbon) and of the impurity N-14. The other nuclides result from neutron activation of other impurities in the original graphite.

Table 1 Hunterston B: Waste Stream 4B313 – Decommissioning Wastes - Graphite ILW (only main nuclides are listed)

Nuclide	Half life - years	Principal Decay Mode	Activity MBq/m^3	%
H 3	12.3	β	560	-
C 14	5,730	β	203,000	98
Cl 36	301,000	β	1,800	0.9
Ca 41	103,000	β	76	-
Co 60	5.3	β γ	0.57	-
Ni 59	76,000	β	26	-
Ni 63	100	β	2,300	1.1
Nb 94	20,300	β	0.25	-
Ag 108m	418	β	2.5	-
Sn 121m	55	β	0.1	-
Tc 99	211,000	β	5.2	-
Total beta/gamma	**-**		**208,000**	**100**

data source http://www.nda.gov.uk/ukinventory/documents/index.cfm

Clearly, radioactive graphite is a major issue: its quantities are very large and its longevity extends over millennia. Graphite also presents other problems including the possible sudden release of stored Wigner (heat) energy and the evolution of gases (mainly CO_2, CH_4) during storage/disposal**. The Consultation documents could usefully give more consideration to the problems of dealing with graphite.** CoRWM's view is that graphite wastes should not be disposed of in a surface or near surface facility. After extensive enquiry consultation and review of evidence, CoRWM (2006) recommended that the best way to safely manage HAW in the long term was in a geological disposal facility at significant depth rather than a near surface facility.

On the basis of the information presented in the Consultation, it is difficult to recommend whether graphite should be consigned to a deep repository (ie to be treated as equally dangerous as spent fuel and other HLW) or whether it can be safely consigned to a surface disposal facility**. SCCORS reserves its position on the important matter of how to best to manage graphite wastes until further information is provided.** The views of SEPA should be canvassed on this matter.

Clearly, more research is required on graphite waste. It is reassuring that graphite R&D is currently being carried out by the European Commission under its 4-year Carbowaste programme. In addition, the NDA is considering UK strategy development for graphite, with support from Magnox SLCs and EdF involvement, and the IAEA is also establishing a Co-ordinated Research Project on graphite. Future policies on graphite waste management should await the completion of these studies.

<u>What is near-surface?</u>

The definition of near surface is indeterminate: it extends to above ground or below ground structures down to depths of "several tens of metres". This is unsatisfactory as it could extend down to 50 or even 60 metres or more, which is not what most people think of as "near" the surface. **SCCORS therefore recommends that the definition should be amended to state "less than 15 metres (ie 50 feet)".** The Consultation should contain detailed descriptions (and operating experiences) of a range of such facilities: in particular, the new LLW disposal facilities at Dounreay and the El Cabrera facilities. This would allow the advantages and disadvantages of such options to be assessed.

<u>Is near surface disposal "safe"?</u>

In recent years, various reports (especially in the US) have indicated that major uncertainties exist in the modelling of the possible health impacts of disposed nuclear waste. It is likely that a safety case for near surface disposal may have fewer uncertainties than those associated with deep geological disposal, but there will always be concern that if mistakes have been made in environmental computer models, then radiation doses to the public living nearby may be higher than anticipated, but little remedial action may be available.

Even if the environmental transport computer models predict correctly, there is no 'safe' dose of radiation, and estimates of radiation doses/risks usually contain unquantified uncertainties. The methodology used in estimating doses to individuals is quite complicated, and is derived using at least three other computer models in sequence. The cumulative uncertainty in dose and risk estimates could be large as was recognised by the UK Government's CERRIE (2004) report.

The Consultation Documents do not acknowledge these uncertainties. For example, the Environment Report (paras 3.14 and 3.15) implies that radioactive discharges to the environment are of little concern provided th

Therefore an additional nine facilities of the same size as the very large Hunterston A ILW store will be required to manage the ILW in Scotland as of 2007. The Consultation should discuss where these nine new large facilities are likely to be located.

Applicable principles

The Consultation refers to two main Principles as "underpinning" its aims

- the level of protection provided to people and the environment against radiological and any other hazards of the Waste both at the time of storage or disposal and in the future is consistent with the standards in place at the time; and
- developers and operators of facilities will engage with stakeholders throughout the process of managing the Waste.

These are welcome but the Consultation Documents do not discuss the IAEA's Principles of Radioactive Waste Management (IAEA 1995) or the HSE's more detailed radioactive waste principles contained in its Safety Assessment Principles for Nuclear Facilities (HSE 2006). Both are pertinent and are set out in Appendix B. It would be useful for the Consultation Documents to discuss the IAEA and HSE Principles, and in particular the guidance on HSE's first principle re a strategy for managing radioactive waste. This contains 20 points for guidance on waste strategy and these are also set out in Appendix B. Of these points, the following are considered particularly relevant to the Consultation.

Radwaste strategy should:
b) … **demonstrate that the radiological hazards posed by historic wastes are reduced progressively;**
c) include a description of the **dutyholder's policy and objectives** for the management of radioactive waste;
e) cover the **current and future inventory of radioactive waste**, including waste arising from proposed new facilities;
f) encompass the **anticipated timescales for the management of radioactive wastes**, from production to disposal (where appropriate), including intermediate management steps;
t) **describe the significant assumptions, uncertainties and project risks** associated with the achievement of the strategy, and how these will be managed.

Conclusions (also see answers to questions in Appendix A)

The Consultation issued by the Scottish Government's Waste and Pollution Reduction Division is proposing to change the Scottish Government's current policy on the long term management of nuclear waste to include disposal as well as storage in the management ILW radioactive wastes.

The Consultation documents remain unclear on the following

- the rationale for the proposed policy change, ie the scientific information and research justifying this change and permitting confidence in the disposal of nuclear waste
- the definitions of disposal and storage
- the definition of near surface
- information on the radioactivity concentrations and radionuclide compositions of waste forms

As a result, it is difficult to make informed judgments on the Consultation's proposed policy. **It is recommended that Councils should reserve their opinions on the proposal to add disposal to the existing waste policy of storage until more scientific information on the validity of disposal is made available.**

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SCCORS Answers to Consultation Questions

The Consultation does not ask whether consultees agree with the proposal to include disposal as well as storage in the proposed Policy on HAW wastes. **It is recommended that Councils should reply indicating that they defer their decision on this matter until further information (see Summary on page 1) is provided by the Scottish Government's Waste and Pollution Reduction Division.**

Question 1. *Have we explained what waste we have in Scotland and how it is managed?*
Answer 1. Clearly much effort and preliminary discussion has gone into producing the consultation and into policy development. This is acknowledged, however the documents could be usefully expanded in a number of areas. For example, the information on waste volumes is useful but information on nuclide contents and radioactivity concentrations in waste at each nuclear industry site is also needed. Also it would be useful to know the proportions of conditioned and unconditioned wastes. The draft Policy could also identify which materials are suitable/unsuitable for proposed near surface and which should be stored along with supporting evidence on waste form stability. For example, the draft Policy should clarify that 98% of Dounreay ILW is not suitable for near-surface disposal.

Question2. *Have we explained why we need to define the terms used in the Policy?*
Answer 2. In most cases yes, but more information could be provided on the reasons for introducing disposal was to the proposed policy, as it was excluded from the original 2007 Ministerial statement. Also it would be helpful to see technical and scientific evidence on near-surface ILW disposal including the experiences of other countries in this regard.

Question 3. *Do you agree with the definition of long-term?*
Answer 3. The definitions of long-term are up to 100 years for the design life of structures, and up to 300 years for institutional control of a disposal facility. However para 4.6.6 of the GRA for near-surface disposal facilities (SEPA 2009) states "it is …unreasonable to rely on people to take action for more than a few hundred years at most to control risks from a disposal facility ... It is not likely that we would accept an environmental safety case… for longer …." It is unclear whether 300 years would meet the "a few hundred years at most" criterion.

Question 4. *Do you agree with the definition of near surface?*
Answer 4. The definition of near surface is indeterminate: it extends to above ground or below ground structures down to depths of "several tens of metres". This is unclear and unsatisfactory: it should be qualified to state "but less than 30 metres". The Consultation should contain descriptions of a range of such facilities and more fully discuss the new LLW Disposal Facilities at Dounreay and the Hunterston ILW store. This would allow the advantages and disadvantages of such options to be assessed.

Question 6. *Do you agree with the definition of storage?*
Answer 6. The definition is consistent with the regulatory use of the word at present. However the term "storage" should be divided into long-term and short-term. Long-term stores should have a design life of ~300 years, and should require rigorous safety cases to be approved by NII and SEPA to protect people and the environment in the remote case that wastes were not removed from the store and declared to be "disposed" after 300 years. A short-term store would have a life of ~100 years and its waste would be retrieved before then. This would not require the equivalent of a disposal safety case.

Question 7. *Do you agree with the definition of disposal?*
Answer 7. Again the definition is broadly consistent with the regulatory use of the word at present. But that is not the main point. The main question is whether consultees agree with the proposal to change to a storage plus disposal policy. See above.

Question 8. *Do you agree with the definition of monitorable?*
Answer 8. Monitoring arrangements are not discussed in detail in the Consultation documents. The different monitoring requirements for stored waste and disposed waste need to be described.

Question 9. *Do you agree with definition of retrievable?*
Answer 9. No. The Environment Report (para 4.06) explains that "the concept of retrievability is built into the Policy as a requirement", ie for both storage and disposal. Disposal facilities may be approved in situations where, although there is no intention to do so, retrieval may be possible. Unfortunately the Environment Report adds "…this could mean that disposal facilities can… be backfilled and sealed" and it is for the regulators to decide when a disposal facility is capable of closure. Therefore retrievability seems to be an elastic concept, stretching to mean whatever the site operator or regulator wants it to mean. It would be preferable if there were substantive norms to be observed by each type of facility, eg degree of institutional control, existence of monitoring.

Question 12. *Have we explained the implications of the Policy?*
Answer 12. Not for all aspects. For example, the financial, social and environmental implications of storing ILW remain unclear.

Question 17. *Do you agree that the Nuclear Decommissioning Authority should be responsible for developing the Strategy to implement the Policy?*
Answer 17. But what about the Scottish plants of EdF?

Question 20. *Does the Proposed Detailed Statement of Policy include all relevant issues?*
Answer 20. No. Three matters in particular need more consideration.

a. Stakeholder engagement The Consultation recognises the need for public and in developing policy. The Consultation Document states (para 5.01.04) that the Scottish Government expects developers and operators to engage with "local communities and the relevant regulatory and authorities to ensure their views are taken into account when plans for storage or disposal facilities are being developed". However the responsibilities of Scottish Ministers and the Waste and Pollution Reduction Division of the Scottish civil service in public and stakeholder engagement in future steps are not well defined.

b**. Research and Development** The Consultation document contains few references to R&D (eg at 4.05.03). This is stated to be the responsibility of waste owners, producers, and facility operators. More R&D on near-surface disposal of HAW is clearly needed.

c. Costs The Consultation documents only briefly refer to financial planning and financial costs. Some financial modelling would be useful to understand the costs and benefits to the public purse for a range of the possible scenarios that the policy could result in. For example a comparison could be made of the costs and benefits for establishing individual facilities at each of Scotland's main civil nuclear sites against the option of sharing a facility between several nuclear site licensees. This may show that costs can be reduced, but that transportation risk is increased.

Appendix: Principles and Guidance on Radioactive Waste Management

1. IAEA Principles of Radioactive Waste Management (IAEA 1995)

Principle 1: Radioactive waste shall be managed in such a way as to secure an acceptable level of protection for human health.
Principle 2: Radioactive waste shall be managed in such a way as to provide an acceptable level of protection of the environment.
Principle 3: Radioactive waste shall be managed in such a way as to assure that possible effects on human health and the environment beyond national borders will be taken into account.
Principle 4: Radioactive waste shall be managed in such a way that predicted impacts on the health of future generations will not be greater than relevant levels of impact that are acceptable today.
Principle 5: Radioactive waste shall be managed in such a way that will not impose undue burdens on future generations.
Principle 6: Radioactive waste shall be managed within an appropriate national legal framework including clear allocation of responsibilities and provision for independent regulatory functions.
Principle 7: Generation of radioactive waste shall be kept to the minimum practicable.
Principle 8: Interdependencies among all steps in radioactive waste generation and management shall be appropriately taken into account.
Principle 9: The safety of facilities for radioactive waste management shall be appropriately assured during their lifetime.

2. HSE Safety Assessment Principles for Nuclear Facilities (HSE 2006)

Principle RW1. A strategy should be produced and implemented for the management of radioactive waste on a site.
Principle RW2. The generation of radioactive waste should be prevented or, where this is not reasonably practicable, minimised in terms of quantity and activity.
Principle RW3. The accumulation of radioactive waste on site should be minimised.
Principle RW4. Radioactive waste should be characterised and segregated to facilitate subsequent safe and effective management.
Principle RW5. Radioactive waste should be stored in accordance with good engineering practice and in a passively safe condition.
Principle RW6. Radioactive waste should be processed into a passively safe state as soon as is reasonably practicable.
Principle RW7. Information that might be required now and in the future for the safe management of radioactive waste should be recorded and preserved.

3. Under Principle RW1, the HSE gives the following guidance (see para 651)

Radioactive waste strategy should:
a) be consistent with Government policy, including the Government's overall policy aims on sustainable development;
b) be integrated with the decommissioning strategy and other relevant strategies, and should demonstrate that the radiological hazards posed by historic wastes are reduced progressively;
c) include a description of the dutyholder's policy and objectives for the management of radioactive waste;
d) ensure that the generation of radioactive waste is prevented or minimised;
e) cover the current and future inventory of radioactive waste, including waste arising from proposed new facilities;
f) encompass the anticipated timescales for the management of radioactive wastes, from production to disposal (where appropriate), including intermediate management steps;
g) consider a full range of options during its development. The optioneering process should take account of relevant factors, which may include those listed in Principle RW.6 concerned with timing;
h) describe, or refer to, the different options that were considered during its development and the case for the chosen option(s);
i) contain, or refer to, the plan for the management of each radioactive waste stream from generation to the final management step, including nuclear matter that may be categorised as waste in the future;
j) identify the optimum waste management route;
k) take account of off-site and on-site interdependencies, eg between waste processing facilities;
l) ensure that radioactive waste is managed in a manner that minimises the need for future processing;
m) ensure that the generation of radioactive waste of a type or form incompatible with currently available storage or disposal technology is prevented or minimised;
n) ensure that waste that cannot be managed using current techniques, or techniques under current development, is not created;

o) take account of biological, chemical and other hazards that may influence the management of radioactive waste;
p) ensure that the adequacy of the storage capacity is reviewed at appropriate intervals taking account of current and future arisings, the expected life of existing stores, and planned additional stores;
q) be compatible with the requirements of authorisations granted by the environment agencies;
r) be compatible with facility safety cases;
s) include an outline of the safety management system and the general approach to ensure that radioactive waste will continue to be managed safely;
t) describe the significant assumptions, uncertainties and project risks associated with the achievement of the strategy, and how these will be managed

ends

Consultation Questions – Scotland's Higher activity Radioactive Waste Policy

Question CD1	Have we explained what Waste we have in Scotland and how it is managed? No The documents could be expanded to include information on nuclide contents and radioactivity concentrations in waste at each nuclear industry site and the proportions of conditioned and unconditioned wastes. The Policy should also identify which materials are suitable/unsuitable for proposed near surface and which should be stored along with supporting evidence on waste form stability. For example, the draft Policy should clarify that 98% of Dounreay ILW is not suitable for near-surface disposal.
Question CD2	Have we explained why we need to define the terms used in the Policy? In most cases yes, but more information should be provided on the reasons for introducing disposal in the policy, as this was excluded from the original 2007 Ministerial statement. What is the technical and scientific evidence on near-surface ILW disposal including the experiences of other countries in this regard.
Question CD3	Do you agree with the definition of long-term *?* The definitions of long-term are up to 100 years for the design life of structures, and up to 300 years for institutional control of a disposal facility. However para 4.6.6 of the GRA for near-surface disposal facilities (SEPA 2009) states "it is …unreasonable to rely on people to take action for more than a few hundred years at most to control risks from a disposal facility ... It is not likely that we would accept an environmental safety case… for longer …." It is unclear whether 300 years would meet the "a few hundred years at most" criterion.
Question CD4	Do you agree with the definition of near surface *?* No It is noted that near surface is defined as up to 10s meters underground and can include facilities under the seabed accessed from the land, is their a maximum depth? As a deep geological facility is 250m underground there is no clear distinction between the two type of facilities. The definition should preclude facilities under the seabed whether accessed from land or otherwise. Such facilities introduce other technical difficulties and avoidable risks not presented by land based sites. In the event of barrier failures the marine environment is put at a greater risk and clean up difficult if not impossible due the dispersal associated with leakage from a subsea

	dump/store. Chapter 3.22 of the Environmental report states that a quarter of Scotland's waste can not be disposed of in near surface sites but must be stored until future technological developments emerge. Most of this type of waste is at Dounreay.
Question CD5	Do you agree with the definition of near site *?* Yes However, it is noted that the Environment Report recognises that near site does not determine a fixed distance and that waste at current locations could be moved to a facility some distance from the site providing that it is the nearest available. In effect waste could be transported the length of the Country.
Question CD6	Do you agree with the definition of storage *?* No The time scales involved 100 - 300 years are in effect disposal. The question should be, when the waste is deposited has the ability for removal, as determined by future generations, been facilitated? Further to the response in question CD4, it appears the policy supports buildings with a life span of up to 100 years, but as Dounreay's waste in accordance with the proposed Policy is to be stored and it's decay times for nuclides is 1000's years, much longer time scales need to be considered.
Question CD7	Do you agree with the definition of disposal? Yes It is noted that in the Policy retrievability is still an option. However, the main question is whether consultees agree with the proposal to change to a storage plus disposal policy.
Question CD8	Do you agree with the definition of monitorable? Yes, although monitoring arrangements are not discussed in detail in the Consultation documents. The different monitoring requirements for stored waste and disposed waste need to be described.
Question CD9	Do you agree with the definition of retrievable? Yes Operators and regulators must be given conditions that are to be met e.g. degree of institutional control and monitoring to be undertaken, to aid the decision of when a disposal facility is capable of closure.

Question CD10	Do you agree with the definition of the need for transport over long distances is minimal? Yes However, see CD5
Question CD11	Do you wish to propose any other definitions? Yes Define the waste groups that can be disposed of and those that cannot, at this time, be considered for disposal.
Question CD12	Have we explained the implications of the Policy? Not fully, please refer to responses to other questions.
Question CD13	Do you agree with the application of the Waste Hierarchy? Yes
Question CD14	Do you agree with transport of the Waste for treatment? Yes, however transportation by sea or air should be excluded except for waste derived form the non nuclear industry. Both modes of transport are susceptible to natural forces and following any incident recovery of material would be problematic if not impossible.
Question CD15	Do you agree with export of the Waste for treatment? Yes but only within the UK. The UK should retain control of its waste and develop the Best Practicable Means for treatment and disposal and in doing so develop our own knowledge and skills and workforce.
Question CD16	Do you agree with the need to develop a Strategy to implement the Policy? Yes
Question CD17	Do you agree that the Nuclear Decommissioning Authority should be responsible for developing the Strategy to implement the Policy? No the Scottish Government should develop the Strategy and ensure adequate representation from the NDA, regulators, producers and other stakeholders.

Question CD18	Do you agree with the proposal to review the application of the Detailed Statement of Policy 10 years after it is published? Yes – recognise that any proposed site for disposal/storage would be subject to formal applications to various regulatory bodies and would undergo detailed public scrutiny. The process is likely to take a number of years.
Question CD19	Have we adequately explained the Regulatory Framework for managing the Waste in Scotland? Yes
Question CD20	Does the Proposed Detailed Statement of Policy include all relevant issues? No, see CD21 and below Three matters in particular need more consideration. **a. Stakeholder engagement** The Consultation recognises the need for public and in developing policy. The Consultation Document states (para 5.01.04) that the Scottish Government expects developers and operators to engage with "local communities and the relevant regulatory and authorities to ensure their views are taken into account when plans for storage or disposal facilities are being developed". However the responsibilities of Scottish Ministers and the Waste and Pollution Reduction Division of the Scottish civil service in public and stakeholder engagement in future steps are not well defined. **b. Research and Development** The Consultation document contains few references to R&D (e.g. at 4.05.03). This is stated to be the responsibility of waste owners, producers, and facility operators. More R&D on near-surface disposal of HAW is clearly needed. **c. Costs** The Consultation documents only briefly refer to financial planning and financial costs. Some financial modelling would be useful to understand the costs and benefits to the public purse for a range of the possible scenarios that the policy could result in. For example a comparison could be made of the costs and benefits for establishing individual facilities at each of Scotland's main civil nuclear sites against the option of sharing a facility between several nuclear site licensees. This may show that costs can be reduced, but that transportation risk is increased.
Question CD21	Should the Proposed Detailed Statement of Policy include anything else? Please see responses to questions 4, 6, 11, 14, 15, and 17. In addition, the report does not cover funding for the disposal/storage or regulatory regime following decommissioning. The UK Government funds the Nuclear Decommissioning Authority (NDA) if the Scottish Government policy differs from the UK Government policy who will be responsible when the NDA's remit ends after decommissioning?

Question ER1	Do you agree that the Environmental Report has captured the significant environmental effects of the Policy? Yes
Question ER2	Is there any other baseline or environmental information which could be used to further inform the SEA? No
Question ER3	Do you agree with the proposed arrangements for environmental mitigation and monitoring, identified in the Environmental Report? Yes