

# Strategy for the management of solid low level radioactive waste from the non-nuclear industry in the United Kingdom

Consultation Summary document

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# Strategy for the management of solid low level radioactive waste from the non-nuclear industry in the United Kingdom

## Summary of consultation responses

### Introduction

i. Government (Department of Energy and Climate Change, Welsh Assembly Government, The Scottish Government, Department of the Environment Northern Ireland) published a draft strategy on 7 December 2010 for the management of solid low level radioactive waste from the non-nuclear industry in the United Kingdom. A decision was made to split the Strategy in two parts; the first considering arisings of wastes containing mainly anthropogenic radionuclides, which was the focus of this consultation; and the second considering arisings of wastes containing Naturally Occurring Radioactive Materials (NORM). Wastes containing NORM were not considered in this consultation and will be part of a separate consultation process.

ii. The consultation period ended on 8 March 2011. A total of 29 responses were received from a range of stakeholders, including the nuclear and non-nuclear industries, regulators, local authorities, environmental groups and other interested parties. The list of respondents can be found at Annex 1.

| <i>Sector</i>         | <i>Number of respondents</i> |
|-----------------------|------------------------------|
| Government & Agencies | 8                            |
| Nuclear Industry      | 3                            |
| Non-Nuclear Industry  | 7                            |
| Environmental & NGOs  | 1                            |
| Local Authorities     | 7                            |
| Other                 | 3                            |
| <b>Total</b>          | <b>29</b>                    |

iii. Twelve questions were posed within the consultation document and the table below shows the responses to these questions.

| <i>Question</i> | <i>Number of Respondents</i> |                 |                   |
|-----------------|------------------------------|-----------------|-------------------|
|                 | <i>Agree</i>                 | <i>Disagree</i> | <i>No Comment</i> |
| Q1              | 13                           | 4               | 12                |
| Q2              | 14                           | 2               | 13                |
| Q3              | 9                            | 8               | 11                |
| Q4              | 13                           | 2               | 14                |
| Q5              | 11                           | 5               | 13                |
| Q6              | 13                           | 2               | 14                |
| Q7              | 8                            | 6               | 15                |
| Q8              | 13                           | 4               | 12                |
| Q9              | 11                           | 2               | 17                |
| *Q10            |                              |                 |                   |
| *Q11            |                              |                 |                   |
| *Q12            |                              |                 |                   |

\* These 3 questions requested the views of the respondent and could not be turned into a statement. They are dealt with later on in the document.

iv. Government welcomes the overall support for the draft Strategy for the Management of Solid Low Level Radioactive Waste (LLW) from the Non-Nuclear Industry (NNI) in the United Kingdom. Following analysis of the consultation responses there was clear support for the strategy's aim to ensure an adequate supply of disposal capacity to meet the waste disposal requirements for solid LLW arising from the NNI.

v. Generally, it was felt that the strategy was a good review of the current situation and clearly identified the fundamental problems facing the NNI for the disposal of radioactive wastes. However, some respondents did not believe the strategy to constitute a positive way forward for resolving the issues faced.

vi. Government notes suggestions for further development, clarification and evidence before the strategy is published. The following section provides greater detail on the views expressed for each question and presents an overall Government response to the issues raised.

| Consultation Question |  |
|-----------------------|--|
| 1.                    | <b>Is the Executive Summary fit for purpose?</b> |

### Summary of comments

1.1 The majority of respondents (13) that responded to this question felt that the executive summary was fit for purpose and accurately reflected the contents of the strategy as a whole. There were a variety of comments and suggestions to provide more clarity to this chapter, particularly with regard to its remit concerning NORM wastes.

1.2 A minority of the stakeholders (4) felt that the executive summary was not fit for purpose because it only covered the government expectations for the strategy and did not describe the basic strategy itself.

### Government response

1.3 No detailed response to these points will be made here; the executive summary reflects the overall content of the strategy, and as such, points of detail will be dealt with in the remainder of this summary.

1.4 Regarding NORM wastes, we have decided to separate the Strategy into two parts; one dealing with relatively low volume arisings of wastes containing mainly anthropogenic radionuclides (the focus of this Summary), and one specifically for NORM wastes. This is appropriate because, in general, a NORM waste strategy is concerned with relatively high volumes of waste from a limited number of sources (the Oil and Gas Sector, contaminated land remediation from historical activities not related to the nuclear industry, and metals extraction/refining). This Summary is concerned mainly with artificial radioactivity arising from a very wide range of industrial and medical activities in low volumes. Disposal routes for each type are in different generic classes, and the proximity principle can be interpreted in a different way depending on whether the issue is high volume NORM or low volume artificial radionuclides.

1.5 Consideration will be given at a later time to possibly amalgamating the two documents and also the possible integration of the Low Level Waste strategy developed for the nuclear sector. Although all three strategies deal with different issues, most of the principles of radioactive waste management apply in all three strategies. We recognise that there are some overlaps between the three strategies, not least the fact that the national Low Level Radioactive Waste Repository is an accepted disposal route for wastes from all sectors, for certain wastes.

1.6 The consultation version of the strategy did, indeed, set out Government expectations. We recognise that, in some circumstances, the strategy is simply a guide as to what is expected of waste producers, waste disposers and planning authorities. The current legislative framework means that it is not appropriate for Government to mandate certain actions within this strategy. Local accountability and ownership of radioactive waste is key, but so is the local democratic process.

Consultation Question

**2. Is Chapter 1 - Background and Scope fit for purpose?**

**Summary of comments**

2.1 The majority of respondents (14) that responded to this question felt that it did provide adequate background and scope to cover the NNI LLW strategy. However, there were a variety of inclusions suggested by stakeholders, one for example, was to explain “risk informed” in relation to the decision making process.

2.2 There was general support for the separation of NNI small user low level wastes and NNI NORM low level wastes as the disposal streams were significantly different.

2.3 It was felt by some respondents that the strategy should emphasise the importance of the NNI waste management hierarchy, particularly waste avoidance and the utilisation of waste incineration. However, one respondent was concerned that rigid application of the waste hierarchy could result in problems for the disposer if too extreme a segregation produced Intermediate Level Waste (ILW) which could not be disposed of in the UK.

2.4 Some respondents believed that Chapter 1 could have clearer overall objectives and include how the success of the strategy would be measured within the scope. For example, one respondent believed that organisations should minimise their reliance on radioactive materials and that the proportion of sites safely accepting such wastes should be increased.

2.5 A minority of respondents (2) felt that this chapter was not fit for purpose because it required greater clarity. One respondent believed that the current quantity and quality of data provided by the Atkins report was insufficient and suggested that this could be raised to show how data collection could be improved.

**Government response**

2.6 We believe that the waste hierarchy is an important consideration, and the 2007 LLW policy statement makes this clear. Application of the waste hierarchy is not intended to be prescriptive, and should be interpreted on a case-by-case basis. There is no intention in either

the 2007 policy or this strategy to constrain management practices to an extent, for instance, that increased quantities of ILW are generated.

2.7 ‘Avoidance’ is already a key part of Government policy, and to some extent is enshrined in legislation – the Justification Regulations. Radioactive materials may not be used (and, by extension, wastes must not be generated) unless there is a justified purpose for this use. A use is not justified if alternative and adequate, non-radioactive, means are at the disposal of any user at reasonable cost. We are aware of efforts made in various sectors to eliminate the use of radioactive materials altogether; whereas we support such initiatives, we recognise that technology is not currently available to supplant most common uses of radioactive materials.

2.8 Whether or not more sites for radioactive waste disposal are available in the future is not a matter for Government. We do not design, build or operate such sites<sup>1</sup>. Rather, the availability of facilities depends on the private sector, and ultimately on the market. The job of Government (including local government) is to ensure, so far as it can, that there are no legal or policy obstacles to radioactive waste disposal, provided that the relevant and well-established safety criteria can be met.

2.9 The term ‘risk informed’ means that decisions on legislation and policy direction take into account scientifically calculated risk. However, ‘risk’ cannot be the only dimension in the decision process. Social and political considerations (for instance, local accountability, national defence) also need to be applied; these are usually a matter for elected representatives, rather than Government officials.

2.10 Detailed comments on the quality and quantity of the data used in the development of the strategy are set out under another question.

### Consultation Question

**3. Is Chapter 2 - Strategy for the Management of Solid Low Level Radioactive Waste from the Non-Nuclear Industry in the United Kingdom fit for purpose?**

### Summary of comments

3.1 There was a mixed reaction as to whether the strategy, was fit for purpose. Some respondents (9) felt that it provided a good review of the problems faced by the NNI and the steps needed to address these. There was, however, strong support amongst these respondents for the establishment of other appropriate routes for waste disposal. It was felt that this would greatly ease the burden of work on producers, the Agencies and waste operators.

3.2 The other respondents (8) felt that the strategy was not fit for purpose. One respondent believed that there was very little in the consultation document that constituted a “strategy”, which is a plan for reaching a desired objective. The document provided expectations, wishes and hopes, but no plans. The respondent also felt that there was a great deal of supplementary information, which was intended to assist or persuade, but which had no place in a strategy and believed that the document was more akin to guidance on policy than to a strategy.

<sup>1</sup> That said, it is worth noting that the low level waste repository (LLWR) at Drigg is currently a nationally owned facility.

3.3 Another respondent, thought that by producing a document with so much information, the actual strategy itself was lost and minimised its impact. The respondent suggested that it would be better if the supplementary information was provided in appendices.

3.4 Some respondents felt that whilst chapter 2 contained a lot of useful information, there was a blurring between the strategy and research results. It was felt that the structure should be carefully examined to distinguish between the strategy, the evidence supporting the strategy and the role of those involved in implementing the strategy.

3.5 One respondent felt that Chapter 2 was informative, technically correct and presented a fair review of the issues surrounding LLW management. However, the respondent was concerned that the incorporation of supporting information within the text of the strategy itself made it difficult to judge where the strategy started, ended or what its key messages and aims were. It was suggested that the strategy would benefit from being re-drafted into a concise, stand-alone, document with the supplementary information in an appendix.

## Government response

3.6 We are considering a reorganisation of the strategy to make clearer the distinction between 'strategy' and 'supporting information'.

3.7 Whether or not 'other appropriate disposal routes' can be established, is not a matter for Government. In addition to the market considerations (see response to Q2 above), the Government does not fund research into radioactive waste disposal, although the Nuclear Decommissioning Authority has a remit and funding for certain types of research in this area. We recognise that new technologies for radioactive waste management and disposal are under continual development in the private sector, and welcome any new thinking in this field. Of particular interest at the moment are the efforts to increase the quantities and types of radioactive waste which can be decontaminated and recycled. Whereas Government does not fund such research, we believe that it is our job to ensure that obstacles – legal, policy or regulatory – are not unnecessarily placed in the way of such developments.

3.8 Supplementary information is a feature of the draft strategy because the document, in many cases, reinforces the 2007 policy statement. For instance, it is already incumbent on the planning authorities to ensure that their plans and strategies allow for wastes generated in their area. The reasons for this requirement, and the way in which the requirement can be fulfilled ('intended to assist or persuade'), are rightly a matter for extensive explanation, which is what we have provided in the draft strategy.

3.9 As this chapter covered the actual strategy, the most important points and comments raised have been collated by issue below:

### *Decay Storage*

3.10 The principle of allowing producers to undertake decay storage in a safe manner was supported. This included the appropriate role of decay storage for storing materials with short half lives. However, there were some concerns regarding the statement 'government wishes to encourage use of decay storage where it is appropriate to do so', which raised the question of who would determine where decay storage was appropriate and using what criteria?

3.11 One respondent believed that "guidance on storage under the waste disposal regulation" did not permit an operator to accumulate waste solely for decay to Very Low Level Radioactive

Waste (VLLW), as this could affect the maximum permitted pollution inventory and may limit the legitimate use of this pathway.

### **Government response**

3.12 Decay storage is an acceptable method by which some radioactive wastes, in some circumstances, are best managed, at least as an interim step to final disposal. Decay storage is not acceptable if the sole purpose of the storage is to defer waste management costs to the future.

3.13 Neither the 2007 policy nor the strategy preclude, explicitly or implicitly, decay storage to VLLW levels. The question of how much permitted waste may be accumulated is a matter for discussion and agreement with the environmental regulators.

3.14 It is incumbent on a waste generator to make an initial assessment on whether decay storage is appropriate. A number of factors need to be taken into account, including operator dose, the security of storage facilities, the length of time required in order to meet the desired reduction in activity etc. For permitted facilities, a case for decay storage needs to be made to, and accepted by, the environmental regulators as part of a waste management plan. For situations where the waste is exempt, no regulatory submission is required.

### **Proximity principle**

3.15 It was felt by the majority of respondents that the proximity of the disposal site was critical to reduce the transport of waste. However, there were some concerns regarding the vague meaning of “Appropriate consideration of the proximity principle and transport issues” which should be further clarified in the strategy.

3.16 Respondents who supported the implementation of the proximity principle believed it should be qualified, as there was not a large range of disposal options available. They felt that it should apply “subject to availability”, otherwise a regional proximity would be adequate.

3.17 Some respondents believed that proximity may have less weight in the producers/planners decision making process because of the estimated low volumes involved and suggested that specialist treatments would only be viable for large waste volumes.

### **Government Response**

3.18 The points by respondents listed above are already, we believe, adequately set out in the draft strategy, but we will revisit the wording of the strategy to see if improvements can be made.

3.19 We do not intend, in this strategy, to define ‘proximity’ by reference to any particular geographical area. ‘Appropriate consideration’ means that proximity must be a feature of any options’ assessment process which supports a proposed waste management plan. The ‘appropriate consideration’ means that the proximity principle will assume a different importance in an options’ assessment for, say, a site producing large volumes of contaminated steel, for which only a limited number of decontamination facilities are available, to a hospital generating low volumes of radioactive waste suitable for (local) incineration or landfill. The term ‘subject to availability’ is already inherent in the strategy description.

### **Links to other legislation**

3.20 It was noted that there were a number of key legislative and policy interactions which had not been recognised by the strategy, for example, the revised Exemption Orders, the recast Basic Safety Standard Directive, revisions to waste management legislation in Scotland and the introduction of the Zero Waste Plan for Scotland. It was felt that these interactions should be included as they were likely to have an impact on aspects of the management of NNI waste.



### **Government Response**

3.21 The strategy has been developed with inputs from various Government departments responsible for related legislation. We do not believe that the strategy compromises any such legislation, or that there will be unforeseen impacts of this other legislation on the working of the strategy. In particular:

- Regarding the proposed exemptions provisions, the proposals will not significantly affect the available waste disposal routes for LLW or VLLW. The proposals may affect, in some cases, the way in which the disposals are regulated.
- The Basic Safety Standards Directive (proposed revision) likewise is not expected to change the allowed and non-allowed waste disposal options. Some concentration values at the exempt/excluded boundary in the legislation may change, thus marginally changing waste volumes in the VLLW (exempt) category. For this reason, there will be no impact on the strategy itself.
- Scottish policy and legislation places greater emphasis on the recovery/reuse steps in the waste hierarchy. The application of the waste hierarchy in practice (but not in principle) may well be done in a slightly different way in Scotland. This does not change the direction of the strategy itself.

### **Collective waste management opportunities**

3.22 It was recommended that Government encourage local authorities to collaborate together to consider collective waste management opportunities. If this could not be achieved, then the strategy should include a requirement from Government that local or regional waste planning frameworks should not include conditions that would allow only for management of NNI LLW arising in the area covered by that planning framework.

### **Government response**

3.23 Government recognises that collaborative efforts by several authorities are not only desirable but necessary. The strategy does not require that disposal of radioactive waste is carried out locally within any defined authority region; there are many local authority areas which, for instance, have a low density of medical establishments generating radioactive waste. It would not be reasonable to draw boundaries within which all wastes should be managed. But conversely, there are areas of the UK, containing several local authorities, where management of wastes within these areas would be a viable commercial proposition for any company wishing to establish facilities for such management. Government encourages consortia of authorities to ensure that undue obstacles are not placed in the way of such companies.

### **Information on existing disposal routes**

3.24 Some respondents felt that environmental regulators needed to provide more information to enable waste producers to easily identify disposal site operators able to deal specifically with either VLLW or LLW.

### **Government response**

3.25 The environment agencies already hold such information, at least for some waste facilities. Advice on the location and suitability of such facilities is available free of charge. Any company wishing to set up management facilities for LLW needs to apply for a permit to do so; as such, the environment agencies are aware of these facilities. Any company wishing to dispose of low level wastes can contact the local agency office to inform them of the business

they are conducting. However, in the latter case, the agencies can not formally endorse any particular company.

### **Supporting evidence**

3.26 Several respondents noted that the strategy placed considerable emphasis on the Atkins Report, which simply reviewed the status of available waste routes, likely developments and non-nuclear waste inventory. They were concerned with the lack of information arising from the Atkins study, which had a response rate of around 20% of organisations holding the appropriate authorisations. It was felt that this highlighted the fragility of the strategy and questioned whether there was intent to gather more reliable information across all sectors to ensure the strategy was appropriate.

3.27 Some respondents questioned the need for a strategy when 22 out of 32 respondents to the Atkins survey said that they had not experienced any problems in disposing of their wastes. They believed a simple guidance note for Waste Planning Authorities and environmental regulators was a preferable option.

### **Government response**

3.28 Although the number of returns from the survey was disappointingly low, and hence the statistical treatment of the numbers has to be caveated with significant uncertainty, Government does not believe that repeating the exercise will be worthwhile or, indeed, will succeed in getting better results. We had the choice, during the survey, of using regulatory levers to obtain the required information by compulsory means, but decided that this approach would not be proportionate to the issue.

3.29 The low number of returns itself tells a story; that waste producers do not see an immediate problem. However, many of the qualitative responses indicate that although the problem may not be acute, it could possibly be chronic. The LLW waste management sector currently comprises a small number of companies, and is thus is vulnerable to sudden reduction in capacity.

3.30 Production of a brief guidance note to local authorities on the strategy is under consideration. However, this would be a supplement to the strategy, which is more than a simple guide for local authority planning officials.

### **Hazardous wastes**

3.31 One respondent suggested that the strategy should advise that where wastes were both hazardous and radioactive, the hazardous properties should also be looked at and the appropriate treatment used.

### **Government response**

3.32 Government recognises that the radioactive properties of LLW represent only one of several possible hazards. For instance, much LLW arising in the medical sector is also classified as clinical waste, which constrains the choice of available disposal routes. However, these other hazardous properties do not affect the overall direction of the strategy, and no changes are proposed in this regard. When a waste producer is considering the available options for disposal, obviously all hazardous properties of the waste need to be taken into account.

### **Dose to workers**

3.33 Some respondents were concerned that there was no consideration given to the doses to workers at the point of origin of the waste. They believed that the trade off between increased

doses to workers resulting from decay storage and the corresponding reduced dose to workers at the waste facility and members of the public should be explored in the strategy.

### Government response

3.34 The management of radioactive waste can lead to radiation doses for both workers and members of the public. A balance needs to be struck, particularly in the case of decay storage where a slight decrease in public dose can result in a slight increase in worker dose. This balance is a matter for the regulators, both the environment agencies and HSE. A memorandum of understanding between these regulators is in place, and a mechanism exists by which the regulators can determine the appropriate balance on a case by case basis.

#### Consultation Question

|           |   |
|-----------|---|
| <b>4.</b> | <b>Is Chapter 3 - Radioactivity and Radiation Dose fit for purpose?</b> |
|-----------|---|

### Summary of comments

4.1 The majority of respondents (13) that responded felt that this chapter was fit for purpose as it provided enough information on the basic summary of radioactivity, radiation and dose to put the problems faced in context along with the actual risks to health.

4.2 One respondent pointed out that exposure to workers had not been captured in this chapter and should be included. The respondent also highlighted some inconsistencies regarding the dose to members of the public through various chapters in the document.

4.3 Some respondents (2) felt that this chapter was not fit for purpose. They believed that further information was required to provide non-technical readers with a balanced view of the issues surrounding radiation dose. They were concerned that current content was unbalanced and so it skewed the perspective of the non-technical reader towards the view that ionising radiation could not be tolerated in any amount.

4.4 Some respondents believed that the main point of this chapter was the risk posed to workers, the general public and the natural environment by radiation emanating from facilities for the management of low level radioactive waste, which was dealt with in Chapter 7. They recommended that it should be merged with chapters 7 and 8 to avoid duplication of information on dose and risk and moved to a supporting appendix.

### Government response

4.5 The strategy contains a significant amount of background information relating to the risks posed by the management of LLW. We do not intend to go further, or expand on the detail already in the strategy. The target audience for the strategy is a person who is technically and scientifically literate, but who may not be conversant with this particular scientific field (radiation protection). It is not intended as a lay guide to radiation protection; readers are referred to Health Protection Agency publications for this.

4.6 Regarding a possible re-arrangement of the strategy content, the above comments, and related comments throughout the remainder of this summary, will be taken into account before a

final decision is taken on its structure. We accept that a different arrangement of information may lead to easier reading.

Consultation Question

**5. Is Chapter 4 - Regulatory Framework fit for purpose?**

**Summary of comments**

5.1 The majority of respondents (11) believed that this chapter adequately covered the regulatory framework for NNI LLW. One supportive respondent added that it was important that the strategy should also include a full inventory of NNI waste.

5.2 Some respondents (5) felt that the chapter was not fit for purpose and was just a compilation of studies, regulatory descriptions, and chronology of regulatory changes with no apparent focus or intent. They felt that it needed to be significantly expanded to show how the regulatory framework enabled appropriate management of the risks involved in radioactive waste management.

**Government response**

5.3 The strategy will be updated with recent developments in the legal and regulatory requirements, but overall we believe that this chapter adequately covers the necessary ground.

5.4 An inventory of radioactive wastes is published on a three-yearly basis, although this currently excludes wastes from small users from the non-nuclear industry. The inventory information for LLW is less complete, and more uncertain, than for higher level wastes, and Government, through the contractors responsible for compiling the inventory on its behalf, is exploring how the LLW component of the inventory could be improved. The Spent Fuel and Radioactive Waste Directive when it is agreed, is likely to require a national inventory of all radioactive waste.

Consultation Question

**6. Is Chapter 5 - Societal Dependence on the Non-Nuclear Industry fit for purpose?**

**Summary of comments**

6.1 The majority of respondents (13) felt that this chapter clearly explained and considered society's dependence on the use and benefits of radiation and supported the need for the NNI to continue to produce radioactive waste from their operations.

6.2 Some respondents believed that the strategy should encourage hospitals to provide secure storage to allow waste to decay to very low levels, enabling final disposal as either inert or clinical waste.

6.3 A minority of respondents (2) felt the chapter was not fit for purpose as they were concerned that the overall strategy appeared weak when compared against the obvious contributions that the non-nuclear uses of radiation provided to society.

6.4 One respondent was concerned about cyclotrons and the current lack of reference made in the strategy to the assessment of the significant activation of target materials and the disposal challenges that these present.

### Government response

6.5 This chapter is intended to provide more background to the strategy and, in some ways, addresses some of the criticisms set out under Chapter 5 above.

6.6 Government recognises the obvious benefits of using radioactive materials, but must always be conscious that, because of the associated risks, such use must be avoided if economically viable alternatives exist.

6.7 The benefits of decay storage have been addressed previously in this summary. The consideration of decay storage applies to all sectors, not simply the medical sector, and we believe that the strategy makes this clear.

6.8 The strategy does not go into extensive detail relating to any one particular radioactive waste stream (e.g. cyclotron housing waste). We believe that the strategy deals with waste management issues at the level of 'principle'. Specific waste management problems relating to any one waste stream are a matter for waste producers and, where possible, regulatory advice and guidance.

### Consultation Question

|           |   |
|-----------|---|
| <b>7.</b> | <b>Is Chapter 6 - Waste Arisings from the Non-Nuclear Industry fit for purpose?</b> |
|-----------|---|

### Summary of comments

7.1 There was a mixed reaction as to whether chapter 6, which covered the waste arisings from the NNI, was fit for purpose. Some of the respondents (8) agreed that it provided a good summary of the data gathering exercises, waste arisings and disposal routes for the NNI LLW. Other respondents (6), however, believed that although it was presented satisfactorily, there were a number of issues in the data collection exercise and the extrapolation of the data to produce an estimate of UK arisings, which they cautioned were not fit for purpose.

7.2 One respondent warned that new diagnostic and therapy techniques within the health and non-nuclear sectors could lead to new challenges in the future and concluded that future proofing of disposal policy needed to be considered by the strategy.

7.3 One respondent warned that contaminated land wastes may become a significant issue due to the safety case constraints on radium nuclides at the LLWR near Drigg. The respondent highlighted that the same safety case issues would apply to specified landfills and so it was likely that there would be a strategic shortfall in the national disposal capability for radium nuclides which were found in significant volumes in contaminated land or NORM.

7.4 One respondent suggested that the Atkins study should analyse the results of the study rather than simply report them in summary form. The respondent also felt that the studies response rate could be further broken down by sector to improve its data interpretation.

### Government response

7.5 The data collection exercise and its shortcomings have been covered in other sections of this summary. Regarding the statistical treatment of the results, we believe that the analysis went as far as it reasonably could, and did not make extrapolations of the data which could not be warranted by the volume of data. We do not intend to revisit the data collection exercise at present, although if new collection methods or new needs come to light, we will revisit this decision. Data collection in this way is expensive, and we have to be certain that any funds dedicated to this kind of work have a real benefit. Neither do we intend to revisit the statistical treatment of the data, but we would welcome any analysis of the current published data by any individual or organisation. We will consider any inputs along these lines when drafting of the final version of the strategy. Even at this stage of strategy development, we would particularly welcome any information, data or analysis that can be provided by or on behalf of any particular industrial sector and will take such input into account if we can.

7.6 We are aware that medical diagnostics is a continually evolving science, and new developments are happening in this field. However, we do not believe that new developments will add substantially to the LLW inventory in terms of *mass* or *volume* by comparison with existing masses or volumes. But we need to be aware of any such developments which will substantially change the inventory by *waste type*. At present, we are not aware of any developments in this field which would result in an entirely unforeseen waste stream, but recognise that we need to be vigilant on this matter.

7.7 Whereas historical arisings of waste can be some guide in predicting future arisings for many waste streams and industries, the volumes of waste which have historically arisen from contaminated land remediation projects are no guide to what may happen in the future. Arisings in this category will depend on the extent and nature of land development, and are largely a matter of chance (how many land development projects will encounter radioactive wastes?). This issue will be examined in the development of the parallel strategy for NORM wastes, and the radium limits for the LLWR will be one consideration in this parallel strategy. It is also an important consideration for the NDA, which has developed and published a strategy, on behalf of Government, for the management of LLW in the nuclear estate. NDA also has responsibility for management of the LLWR and are considering the need to expand this facility for some waste types or develop a new facility in the future. We can note, however, that so far as our data collection exercise was concerned, no enterprise involved in the disposal of spoils resulting from land remediation projects reported any immediate waste disposal problems. We should also note that there appears to have been no increase in waste arisings as a result of the 2007 Regulations on radioactive contaminated land; in fact, no site up to now (May 2011) has been designated a special site under these regulations.

### Consultation Question

**8. Is Chapter 7 - Assessment of risk from disposals of non-nuclear industry radioactive waste fit for purpose?**

### Summary of comments

8.1 The majority of respondents (13) believed that Chapter 7 represented a good description of the pathways and methods associated with dose and risk assessment. However, some

respondents highlighted some minor omissions, inconsistencies and textual errors over matters of detail which would require amendment.

8.2 Some respondents felt it provided some useful information to the reader, but was not directly related to the actual strategy itself and suggested that it should be merged with chapters 3 and 8 to avoid duplication and should be included in an appendix.

8.3 A minority of respondents (4) felt that this chapter was not fit for purpose as it failed to provide the degree of information required to inform non-technical readers of the risks involved which could lead them to reaching the wrong conclusion with regard to radioactive waste management.

### Government response

8.4 The many suggestions for improvement of the strategy by minor additions and corrections are accepted. They will all be considered in drafting the final version of the strategy.

8.5 Reorganisation of the strategy into a core element plus supporting (appended) information will be considered.

8.6 The readership issue has been dealt with in previous sections of this summary. The strategy is not intended for a lay readership – other publications, particularly from the Health Protection Agency – fulfil this need. Rather, the target audience is a person versed in waste management technology, but not necessarily *radioactive* waste management technology.

### Consultation Question

**9. Is Chapter 8 - Risks from radiation fit for purpose?**

### Summary of comments

9.1 The majority of respondents (11) that answered this question believed that it provided a useful summary of the risks, the health effects and context of the risks associated with NNI wastes. But some suggested there would be a greater benefit to the reader if chapters 3 and 8 were merged as both chapters provided general background information and supported each other.

9.2 A minority of respondents (2) felt that the structure of this chapter was not clear and believed that some references, such as to the nuclear bomb tests, created the very suspicions in managing radioactive waste that the strategy was intended to relieve.

9.3 One respondent suggested that lifetime rather than annual occupational dose should be used when making a comparison between the risk of cancer expressed over a lifetime, naturally and as a result of occupational radiation exposure.

### Government response

9.4 Re-organisation of the content of the strategy will be considered, as set out in other sections of this summary.

9.5 Lifetime dose will be a useful comparator; we will employ this measure, but do this in addition to the annual exposure figures already present.

9.6 In considering the risks from radiation, we cannot ignore the fact that historical testing of nuclear weapons has made a contribution to the radiation dose received by modern populations. Hence reference is made to this in the strategy. However, we accept that the context in which radioactive doses from weapons testing needs careful thought. We will revisit the draft wording to ensure that this aspect is not given undue prominence, but the reference must remain or the chapter will not represent the totality of radiation risks. The information and background sections of the strategy are intended, in part, to inform our readership that radioactive materials are used in a significant number and range of benign and beneficial activities. These activities would be carried out today even if there had not been a weapons programme.

Consultation Question

**10. General comments on the References Section**

**Summary of comments**

10.1 Some respondents believed that the presentation could be improved by standardisation of the reference style used in the text. They felt that references should be presented in numerical order within the text and consistent throughout, for example, foot note references in the main text should be superscripted as this was the normal format for this type of reference.

10.2 Some respondents highlighted a list of missing and incorrectly referenced material that required amendment within the strategy.

10.3 One respondent believed the reference to the location of the Atkins report on the DECC website was difficult to follow up and suggested that a pdf of the report (and other key references) actually located on the consultation page would be helpful.

**Government response**

10.4 The reference section of the strategy will be revisited in the light of these comments. The accessibility of all supporting reports will be tested and any necessary corrections made.

Consultation Question

**11. General comments on the Glossary**

**Summary of comments**

11.1 Some respondents reported on minor formatting issues and omissions within the glossary section.

**Government response**

11.2 Points of detail as raised by respondents will all be addressed when drafting the final version of the strategy.

Consultation Question



## 12. General comments about the consultation document

### Summary of comments

12.1 One respondent believed that comments on the strategy did not always fit in a chapter-by-chapter appraisal of “fitness for purpose” as the Strategy contained a great deal of information. The respondent believed that the “fitness for purpose” of the strategy was better judged by evaluation of the impact of implementation.

12.2 One respondent was concerned that VLLW was subject to controls under DfT regulations, for the transport of radioactive materials and were not currently covered in the strategy.

12.3 One respondent suggested that the final version of the NNI LLW Strategy should be appropriately referenced in the Governments consolidated ‘National Planning Framework’, to help ensure that waste planning policy was not fragmented across different policy documents.

12.4 One respondent was concerned that the level of regulation for incineration and other low level radioactive waste disposals was not proportionate to the risk, as the doses were significantly below a risk of 1 in a million, a level at which no further active reduction requirements were required.

### Government response

12.5 The strategy will not be successful if it is regarded as a one-off guidance document. Its implementation must be monitored. Although the need for this monitoring is accepted, the mechanisms by which this will be done have not yet been worked out in detail. Furthermore, the strategy needs to be revisited and reviewed on a regular basis. The review and revision period for the strategy has not been decided, but the five-yearly review of the UK annual discharge strategy for radioactive waste may represent an appropriate model.

12.6 Transport of most (that is, non-exempt) VLLW is, indeed, regulated by DfT. This will be made clear in the strategy, but we would point out that the strategy is concerned with ultimate disposal of wastes, and the capacity of the waste management industry to deal with the expected volumes and types of LLW and VLLW. Transport of all hazardous wastes is a matter for DfT which produce the appropriate strategies and guidance for this aspect of radioactive waste management. The strategy is, however, intended to reduce waste miles where this is possible. Policy responsibility for radioactive transport is moving to DECC from 1 July 2011.

12.7 It was, and remains, Government’s intention that the LLW strategy be a formal and referenced document within the National Planning Framework and its Scottish equivalent. Considerations of radioactive waste management must be made within the framework of waste management planning generally, and this is one of the main aims of the strategy.

12.8 The degree of regulation, or non-regulation, of radioactive wastes must be proportionate to the risks. This is already a feature of Government and Regulator’s approach to regulation at the low end of the risk spectrum. Certain matters will be made clearer on completion of the Government’s review of radioactive substances legislation and its exemptions provisions. For risks at the levels quoted by the respondent, the waste or waste practice is likely to be out with the scope of radioactive substances and radioactive waste legislation. That is, risks at these levels are beneath regulatory concern.

## Way forward

13.1 Government will amend the NNI LLW strategy, covering low volume anthropogenic wastes and publish the final version in late summer this year. The second part of the strategy, covering NORM wastes is scheduled to be released for public consultation early next year.

13.2 Consideration will be given at a later time to possibly amalgamating the two documents and also the possible integration of the Low Level Waste strategy developed for the nuclear sector.

## Annex 1 List of respondents to the NNI LLW Strategy consultation

1. Department of Health
2. SITA UK
3. Isle of Man Government
4. Chapelcross Site Stakeholder Group
5. Magnox Northsites
6. Central Bedfordshire Council
7. Health Protection Agency
8. Marion Hill Consultant
9. NuLeaF
10. Food Standards Agency
11. Department for Transport
12. Transport for London
13. Scottish Environment Protection Agency
14. LLW Repository Ltd
15. NHS Ayrshire & Arran Health Board
16. Enterpris
17. North Ayrshire Council
18. Devon County Council
19. NHS Gartnavel Royal Hospital
20. Somerset County Council
21. Health and Safety Executive
22. Ministry of Defence
23. Sheffield Teaching Hospitals NHS Foundation Trust
24. Entec UK Ltd
25. Tradebe
26. Scottish Water
27. Lancashire County Council
28. Dorset County Council
29. ARC21 (A local government umbrella organisation)

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