Defence Equipment and Support
Submarine Dismantling Project

Interim Intermediate Level Waste Storage Site Selection: Strategic Environmental Assessment Environmental Report

November 2014

Defence Equipment & Support

MINISTRY OF DEFENCE

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1 Introduction

1.1 Overview

The overarching objective of the Submarine Dismantling Project (SDP) is to develop and implement a timely solution for the dismantling and ultimate disposal of the UK's 27 defueled nuclear submarines at the end of their life. This report presents the results of the Strategic Environmental Assessment (SEA) of the transportation and interim storage of the submarine Reactor Pressure Vessels (RPVs) as part of the SDP.

SEA supports decision-making by helping to ensure that environmental issues are considered effectively in the preparation of plans and programmes. The requirement for SEA is derived from a European Directive (2001/42/EC). The main objectives of SEA are to provide for a high level of protection of the environment, to promote sustainable development and to fully integrate environmental considerations into the decision-making process at an early stage. SDP is a UK Central Government project therefore this SEA has been undertaken in accordance with The Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No.1633), 'the SEA Regulations

This SEA builds upon a previous, overarching 2010/11 SEA which considered the end-to-end process of submarine dismantling but was not able to consider any specific locations for potential storage of the RPVs, which are classified as Intermediate Level Waste radioactive Waste (ILW). Further information on the previous overarching SEA is provided below in sections 1.2 and 2.2.

The Consultation Document on the Site for Interim Storage of Intermediate Level Radioactive Waste (November 2014) is considered for the purpose of this SEA to be the 'draft plan'. However, it should be noted that SEA is an iterative process and the SDP is still evolving. Is it anticipated that a further iteration of the ER and 'draft plan' may be required to address any uncertainty, inconsistencies, and the consultation responses before the 'draft plan' is adopted.

1.2 Context

The SDP, formerly known as Project ISOLUS (Interim Storage of Laid-Up Submarines), was established in 2000. It extends over a 60-year period, and encompasses the provision of facilities, personnel and processes to dismantle the defueled nuclear submarines, up to and including Vanguard Class[1].

Three public consultations on the project have been held to date. The most recent of these was undertaken between October 2010 and February 2011 in conjunction with the technical assessment of the options for submarine dismantling, including how the radioactive materials should be removed from the submarines, and where this should be done.

As part of this assessment process, an SEA was undertaken in 2011 on the potentially significant whole-life environmental effects of submarine dismantling. This was undertaken at both a generic level and at a site-specific level for the locations of the candidate initial dismantling sites. The resulting SDP Environmental Report[2] was one of the key consultation

[1] i.e. not including the new Astute class or the next planned class of submarine (known as 'Successor') – see Section 2.1.

[2] Amec Environment and Infrastructure (2011). *Submarine Dismantling Project: Strategic Environmental Assessment: Environmental Report.* Issue 1.0. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/34113/20111021SDP_SEA_Reportv1_0WEBU.pdf plus non-technical summary: Amec Environment and Infrastructure (2011). *Submarine Dismantling Project Strategic*

documents. The SDP SEA Environmental Report and associated Non-Technical Summary are available via links from the following website:

https://www.gov.uk/government/consultations/consultation-on-the-submarine-dismantling-project

The findings of the previous SEA and stakeholder comments received[3] were then used to inform decision-making on the way forward. The assessment of comments received can be found in MOD's Response to Consultation[4], whilst the SEA Post-Adoption Report[5] provides greater detail about how the previous SEA took the findings of the assessment into account in coming to its decisions.

Following approval of the project's first Main Gate Business Case (MGBC1), the MOD announced in March 2013 that the RPVs will be removed from the submarines and stored intact. All radioactive materials will be removed from the submarines in situ, this is 'initial dismantling', at Rosyth (where seven boats are stored) and at Devonport (where 12 boats are stored and where the remaining eight boats, which are still in service, will be stored once they have left service). The first submarine to be initially dismantled will at Rosyth as a demonstration of the radioactive waste removal process. The completion of this demonstration, however, is subject to a storage solution being agreed for the RPVs and any necessary planning approvals obtained.

The first part of initial dismantling will be removal of the low-level waste (LLW) which will be sent for disposal at existing licensed facilities such as the UK LLW repository (LLWR). Once the necessary approvals and permits have been received for the construction of the interim Intermediate Level Waste radioactive waste (ILW) store, the RPVs will be removed intact so that they can be sent there for interim storage until the UK's planned Geological Disposal Facility (GDF) becomes available. The UK Government policy for Higher Activity Waste (HAW) is eventual disposal in a deep geological facility, while Scottish Government policy is long-term management in near-surface facilities in accordance with the Government's policy on the long-term management of higher-activity radioactive waste.[6] Definitions of LLW, ILW and HAW are provided in the glossary, section 13 of this report.

The original intent had been to propose a specific interim ILW storage site in the MGBC1 submission. However, it was decided not to compare specific storage sites at that stage because of the different contexts and developing strategies affecting different types of site. For example, the Nuclear Decommissioning Authority (NDA) was exploring with stakeholders whether there could be any opportunities to consolidate ILW across its current and planned storage facilities.

Only the type of site could therefore be factored into the option assessment at that stage (i.e. differentiated by ownership and its proximity to an initial dismantling site). Joint economic assessment with the NDA, however, revealed relatively little difference in cost and

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Environmental Assessment: Non-Technical Summary. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/157989/20111000SDP_SEA_NonTechSummaryWEBU.pdf)

3 Defence Equipment and Support and Ministry of Defence (2012). *Submarine Dismantling Project: Post Consultation Report: Environmental Report*. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/35911/post_consultation_report.pdf

4 Ministry of Defence, March 2013. *Submarine Dismantling Project: MOD's Response to Consultation.* Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/229356/20130322-MODs_Response_for_web_correct.pdf

5 Defence Equipment and Support (2013). *Submarine Dismantling Project: Post Adoption Statement.* Issue 1.0. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/229357/20130315-SDP_SEA_PAR_V1_0_updated-U.pdf

6 http://www.nda.gov.uk/wp-content/uploads/2012/02/An-overview-of-NDA-higher-activity-waste-February-2012.pdf

performance between these different types of site, so no recommendation about site type could be made as part of the business case submission.

Now that MGBC1 decisions have been taken, a further stage of analysis and public consultation is necessary to determine the specific interim ILW storage site. Stakeholders recommended that the SDP's analysis must consider all candidate interim ILW storage sites, including NDA sites, on a 'level playing field'. The SDP received legal advice that this would also be the most robust approach in demonstrating a rational and transparent site selection process, and so the Screening and Option Assessment processes described below have been designed on that basis.

1.3 Requirement for SEA

The SEA Regulations require that an SEA develops alongside and influences the plan or programme it is assessing.

The key findings of the overarching SDP SEA in 2010/2011 were that the significant environmental effects of initial dismantling would be related to the size of the interim ILW store, and to transportation[7]. However, at that time, it was not possible to identify individual potential interim ILW storage sites. As a result, the previous SEA could only consider generic interim ILW storage options, and the lack of site-specific information was noted as an uncertainty in the Environmental Report.

It was therefore acknowledged in the overarching SDP SEA, that the assessment would need to be revisited to consider alternative interim ILW storage sites (candidate interim ILW storage sites), once these were identified.

As part of the interim ILW storage site selection process, the previous SEA has therefore been reviewed and applied to assess the potentially significant environmental effects of developing, operating and eventually decommissioning interim ILW storage facilities for the RPVs at each candidate site, and to consider the wider effects that this could have on the other elements of the submarine dismantling process (and hence the conclusions of the original assessment).

This SEA has followed the statutory process as detailed in the 2011 Environmental Report[2], but focusing upon interim ILW storage. This Environmental Report is published to inform the public consultation on the site selection process, and should be considered in the context of the 2011 SDP Environmental Report[2].

1.4 Purpose of this Report

The purpose of this SEA Environmental Report is to provide information and to facilitate public and stakeholder consultation on the SEA process for SDP candidate interim ILW storage sites. In doing so, it contributes towards transparent decision-making and consultation and assists the aim of ensuring that the information supplied for the assessment is comprehensive and reliable. The environmental assessment of the SDP candidate interim ILW storage sites has now been conducted. This Environmental Report concludes the main assessment and reporting stages (Stages B and C of the SEA process - see Section 3.1 which details the main stages). This Environmental Report has been written in accordance with Regulation 12 and Schedule 2 of S.I. 1633 of 2004. It does this by reporting on:

[7] *Submarine Dismantling Project Strategic Environmental Assessment Post-Adoption Report, March 2013, DE&S. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/229357/20130315-SDP_SEA_PAR_V1_0_updated-U.pdf*

- how the SEA of the candidate interim ILW storage sites was undertaken;
- the definition of the SEA study area and temporal scope (assessment timescales);
- any existing environmental constraints or opportunities which are relevant to the candidate interim ILW storage sites;
- the environmental protection legislation and policy context of the SDP, including relevant policy context at the candidate interim ILW storage sites;
- the identified likely significant effects on the environment of the candidate interim ILW storage sites across relevant environmental topics (the reasonable alternatives in the context of the adopted SDP);
- the measures identified to prevent and mitigate any significant negative effects on the environment of implementing any of the candidate interim ILW storage sites; and
- proposed measures to monitor the environmental performance of interim ILW storage, and in particular to monitor the predicted significant environmental effects and to identify at an early stage any unforeseen effects.

1.5 Interim ILW Storage Environmental Report Structure

This Environmental Report is structured as outlined in Table 1.1.

Table 1.1: Structure of this SEA Environmental Report

Chapter	Description
Chapter 1: Introduction	Summarises the context in which the SEA has been conducted, and explains how to respond to the consultation.
Chapter 2: The Submarine Dismantling Project (p6)	Outlines the evolution of the SDP in more detail.
Chapter 3: Approach and Scope of this SEA	Describes the approach taken to conducting this SEA, and summarises the completed scoping stage.
Chapter 4: Generic Assumptions for All Candidate interim ILW Interim Storage Sites	Provides information on what the interim storage of ILW entails and the standard measures that would be implemented to manage the environmental and health risks, regardless of which site is selected.
Chapter 5: Legislative / Policy Context and Consenting	Describes how relevant international, national and regional documents are relevant to interim ILW storage. It also discusses the requirements upon interim ILW storage regarding consenting and statutory obligations.
Chapters 6 – 10: Assessment Results	Provides the results of the SEA, including: • background to each of the candidate interim ILW storage sites, including an overview baseline description; • the likely evolution of baseline conditions without interim ILW storage; • relevant plans and programmes at the candidate interim ILW storage site; • a description of any site-specific proposals, including local transport route options assumed; and • a topic-by-topic assessment of potential effects, incorporating the site-specific baseline information. The topic-specific assessments consider the pre-existing

Chapter	Description
	and committed mitigation at interim ILW storage sites, the potential effects with this 'baseline' mitigation, and any additional measures envisaged which could avoid or reduce negative effects, monitor them for potential response, or create net beneficial effects.
Chapter 11: Summary and Conclusions	Summarises the results of the SEA and concludes with any variation from the 2010/11 SDP results with regard to interim ILW storage specifically as a result of the site assessments in this SEA.
Chapter 12: Next Steps	Details the next steps in the SEA process.
Chapter 13: Glossary	A glossary of terms and acronyms has been provided.
Annexes	Provide supporting detail as referred to in the main body of the Environmental Report.

1.6 How to Comment on this Environmental Report and Key Questions

This Environmental Report has been sent to the UK statutory consultees identified under the SEA Regulations[8]. Other relevant central government departments and agencies will also be invited to provide input. Comments are invited during the consultation period, which starts on 14th November 2014 and finishes on 20th February 2015.

The documents available with this Environmental Report on the SDP web pages[9] include:

- *SEA Scoping Report* (interim ILW storage);
- *Approach to Decision-Making* – an overview of the decision process for selection of an interim ILW Storage Site;
- *Provisional Criteria and Screening Report* (CSR) – a description of the work done to date on interim ILW storage site screening;
- *Approach to Public and Stakeholder Engagement* – overview of how MOD intends to engage the public and stakeholders as part of its decision making process;
- Consultation Document – On the site for interim storage of Intermediate Level Radioactive Waste.[9]

The selection of a preferred interim ILW storage site will be informed by both this SEA and feedback received during consultation. Comments relating to the SEA, the candidate interim ILW storage sites or the decisions made to-date will be assessed at the end of the comment period. Please provide comments by 5pm on Friday 20th February 2015 to:

Submarine Dismantling Project

Email: sdp@instinctif.com

Telephone: 0118 9839474

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c/o Instinctif Partners Ltd, 4th Floor, Dukesbridge Chambers, 1 Duke Street, Reading RG1 4SA.

8 The Environment Agency, English Heritage, Natural England, Northern Ireland Environment Agency, Scottish government, Historic Scotland, Scottish Natural Heritage, SEPA, Welsh government, Cadw (Welsh Historic Monuments), NRW.

9 https://www.gov.uk/government/publications/submarine-dismantling-project-interim-storage-of-intermediate-level-radioactive-waste

2 The Submarine Dismantling Project

2.1 Background

The overall aim of the SDP is to deliver a timely and cost-effective solution for the dismantling of the UK's defueled nuclear-powered submarines which is safe, environmentally responsible, secure and cost-effective, and which inspires confidence. The MOD established the SDP (formerly known as 'ISOLUS') in 2000 to dismantle the Royal Navy's 27 defueled nuclear-powered submarines (from 'Dreadnought' up to and including Vanguard Class) after they have left service, including the 19 currently stored afloat at Rosyth and Devonport, and a further nine yet to leave service.

Dismantling of the new Astute class, currently being brought into service, and the next planned class of submarine (known as 'Successor') will be subject to future decisions and are not within the scope of the SDP.

Of the 12 submarines stored at Devonport, eight await defueling. The seven submarines at Rosyth are all defueled.

SDP, which will provide an alternative to the continued afloat storage of the defueled submarines, consists of the following elements, all of which were assessed by the previous overarching SEA:

- Removing all radioactive materials from the submarines *in situ* at both Rosyth and Devonport. This is known as 'initial dismantling' and will be subject to specific regulatory approvals from the Office of Nuclear Regulation (ONR), the Environment Agency (EA) and the Scottish Environment Protection Agency (SEPA) as appropriate before work can begin.
- Dismantling the submarines at a conventional UK Ship Recycling facility, once initial dismantling has been completed and radiological clearance has been approved by the Regulator. As much of the residual material as possible will be reused or recycled, in line with the UK Ship Recycling strategy.
- Provision of a land-based interim store for the 27 Reactor Pressure Vessels (RPVs), which are classified as ILW. This facility is required because, unlike low-level waste (LLW), there is currently no national disposal route available. The RPVs will be held in the interim store until the proposed UK ILW disposal facility, referred to in this report as the GDF[10], becomes available, sometime after 2040. ***This element is the subject of this SEA***.
- Transportation of the RPVs from the initial dismantling facilities at Devonport and Rosyth to the interim ILW store, with eventual RPV size reduction to packaged waste and transportation to the planned GDF for disposal. There may be an opportunity to dispose of the RPVs directly to the planned GDF without further size reduction; this is being investigated by the UK government but cannot be assumed as a certainty. ***Transport has been included in the scope of this SEA, but not size reduction, which was considered at a generic level as part of the previous SEA and would be covered***

[10] Details of the planned GDF programme can be found at http://mrws.decc.gov.uk/en/mrws/cms/home/What_is_geolog/What_is_geolog.aspx. Note that the Scottish Government position differs from the UK government position and is that of 'near site, near surface' long-term storage. Further information can be found at http://www.scotland.gov.uk/Topics/Environment/waste-and-pollution/Waste-1/16293/higheractivitywastepolicy

under a future environmental assessment by the relevant authority/authorities, if required.

- The decommissioning of the interim ILW store once it is no longer required. ***This element has been included in this SEA.***

2.2 2010/11 SEA and Public Consultation

Recognising the importance that public acceptability would play in the development of any solution, Ministerial commitments were made that public consultation would be undertaken before any major decisions are taken.

Three previous public consultations on the project have been held to-date. The most recent of these was undertaken between October 2010 and February 2011 on the strategic options for submarine dismantling, including how the radioactive materials should be removed from the submarines, and where this should be done.

Although the strict applicability of the SEA Directive and Regulations to the SDP remains unclear, the MOD undertook an assessment fulfilling the requirements of SEA to inform the public about the environmental effects of the SDP proposals as part of this public consultation and to inform MOD's decision-making processes.

The 2010/11 SEA[11] covered the end-to-end process of submarine dismantling. It firstly assessed the direct, indirect and cumulative effects associated with each of the seven generic SDP stages, including a generic assessment of developing SDP facilities on undeveloped, previously developed and existing Licensed/Authorised sites. The generic assessment was followed by a determination of the potential environmental effects arising from implementing the reasonable alternatives for each of these stages. The results of both assessments were used to determine the MOD's recommended options at public consultation, and to make decisions about the recommended way forward following the consultation.

Following the Ministerial Announcement in March 2013 that the RPVs will be removed *in situ* at Devonport and Rosyth and stored intact, an SEA Post-Adoption Report[12] was produced to demonstrate how the MOD took the findings of the previous SEA into account.

Annex 1 summarises the comments received from statutory consultees about interim ILW storage during the 2010/11 SEA. A full summary of the feedback received on the previous SEA from the public consultation can be found in the SDP Post-Consultation Report[13]; the results of MOD's assessment of the responses and its response to them can be found in the SDP Response to Consultation report[14].

2.3 Aim and Scope of the Current Stage of the SDP

As discussed, it was not possible to identify individual candidate interim ILW storage sites during the original assessment. The aim of the current stage of the SDP is to identify the benefits and dis-benefits of developing an interim ILW store – alone or in combination with

[11] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/157990/20111021SDP_SEA_Reportv1_0WEBU.pdf

[12] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/229357/20130315-SDP_SEA_PAR_V1_0_updated-U.pdf

[13] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/35911/post_consultation_report.pdf

[14] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/229356/20130322-MODs_Response_for_web_correct.pdf

pre-existing storage facilities – at one of a number of candidate UK-licensed sites. The aim of this SEA is therefore to identify the potentially significant environmental effects of developing, operating and eventually decommissioning an interim ILW store. The rationale for the indicative site selection can be found at https://www.gov.uk/government/publications/submarine-dismantling-project-interim-storage-of-intermediate-level-radioactive-waste.

This SEA forms part of a hierarchy of environmental assessments on the SDP, which started with the 2010/11 SEA, as shown in Figure 2-1. The environmental assessments are progressing from broad coverage of the entire SDP to specific phases of the SDP, and also to specific sites. Proportionately, they provide increasing levels of detail on potential environmental effects, as SDP proposals are defined in increasingly greater detail.

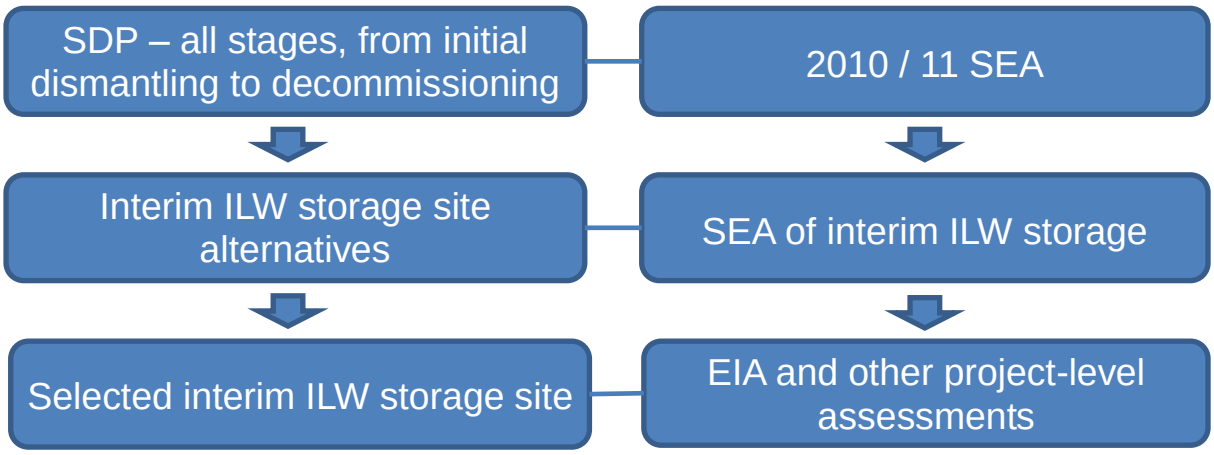


Figure 2-1: Hierarchy of SDP environmental assessments

Figure 2-2 below, which was originally used in the 2011 SEA Scoping Report[15], has been updated to show how both the previous and current SEA processes inform the various stages of the SDP, including which aspects of the SDP have been addressed by this SEA.

The public consultation following the 2010/11 SEA sought views on the MOD's proposed choice of dismantling approach and site, and the type of storage site. On that occasion, the Consultation Document provided information on the options and their performance against the assessment criteria and set out the provisional decision logic.

The findings of this SEA are provided to inform public consultation on interim ILW storage site options and subsequently to inform the selection of the interim ILW storage site.

[15] Entec UK Limited and Defence Estates for Defence Equipment and Support, Ministry of Defence (2011). *Submarine Dismantling Project – Strategic Environmental Assessment: Final Scoping Report*. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/34133/StrategicEnvironmentAssessment_Final_Scoping_Report.pdf

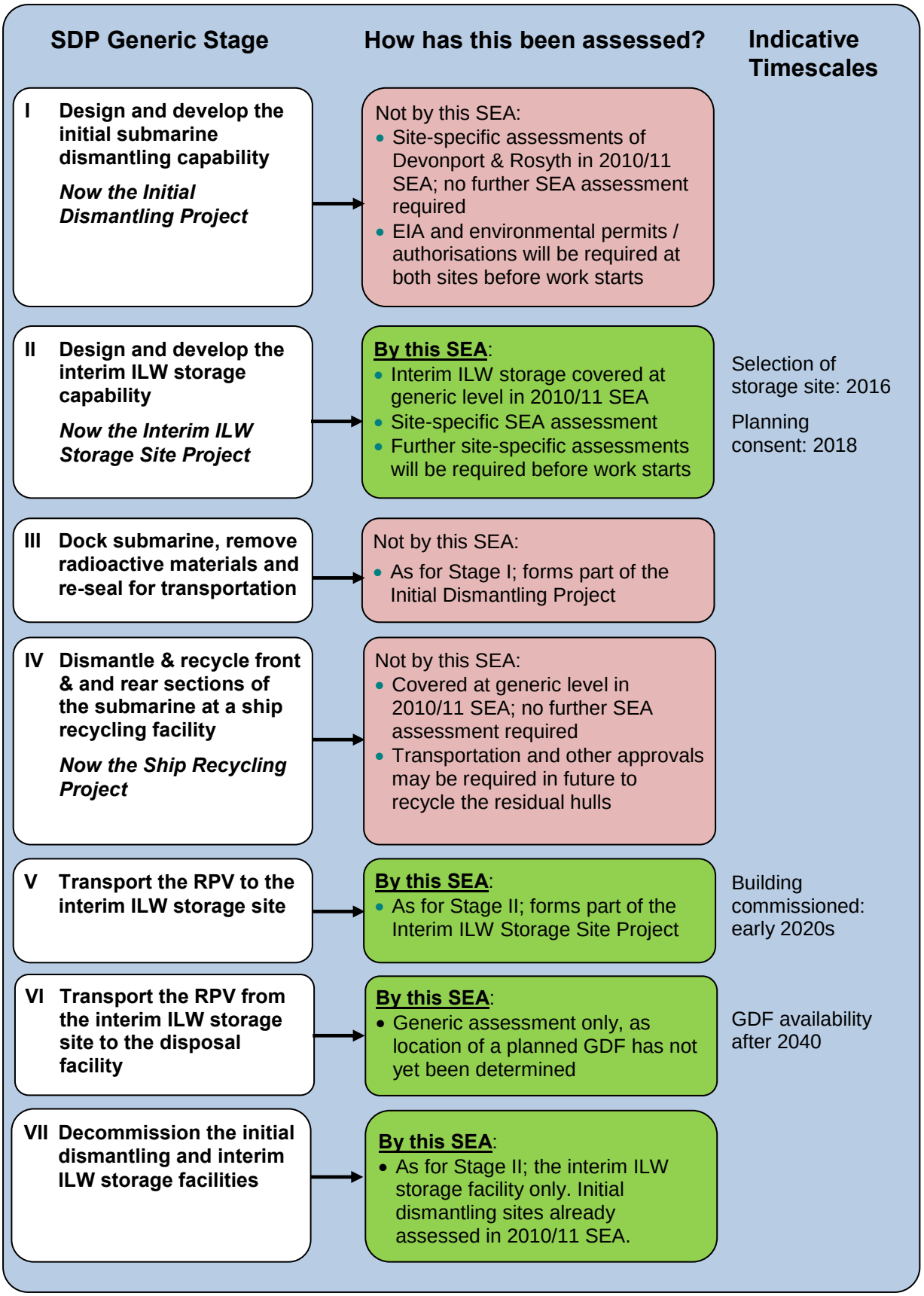


Figure 2-2: Stages of the SDP and relevance to this SEA

2.4 Candidate Sites for Interim ILW Storage

The following sites were shortlisted by the SDP from a 'long list' of UK nuclear-licensed and/or authorised sites[16] (the MOD 2014 *Interim ILW storage site selection – Criteria and Screening Report* is available at Annex 6) on the basis of a previous analysis and information submitted by site owners (including MOD, NDA and commercial site owners). The process for down-selecting candidate storage sites is detailed in the SDP Criteria and Screening Report[17].

These candidate sites have been put forward as reasonable alternatives and assessed by this SEA.

- AWE Aldermaston (Berkshire, England): the Atomic Weapons Establishment (AWE) provides and maintains the fundamental components of the UK's nuclear deterrent (Trident). The site includes existing interim ILW storage, and capacity increases are already planned (see Section 6.2).
- AWE Burghfield (Berkshire, England): a 'sister' site to Aldermaston, 7.5 km to the northeast, which hosts facilities for the final assembly and decommissioning of nuclear warheads.
- Capenhurst Nuclear Services (CNS) Capenhurst (Cheshire, England)[18]: CNS operates on part of the part of the Capenhurst nuclear licensed site as a tenant of URENCO UK Ltd. CNS offers storage, decommissioning and recycling of uranic and other materials. There are also three plants producing enriched uranium on the site.
- NDA Sellafield (Cumbria, England): This site is owned by the NDA and operated by Sellafield Limited. Site activities include fuel reprocessing at the Magnox Reprocessing Plant and Thermal Oxide Reprocessing Plant (THORP); decommissioning and clean-up of redundant nuclear facilities (including Calder Hall Magnox and Windscale power stations); and radioactive waste treatment and storage.
- NDA Chapelcross (Dumfries and Galloway, Scotland): Chapelcross was Scotland's first commercial nuclear power station, and after 45 years of operation, electricity generation ceased in 2004. The station is now being decommissioned.

The candidate interim ILW storage sites' locations in the context of the proposed initial dismantling facilities and national boundaries are shown in Figure 2-3. Maps showing the candidate site locations and the key environmental features / constraints in the vicinity of each can be found in Annex 2.

[16] MOD (2014). *Interim ILW storage site selection – Criteria and Screening Report*. https://www.gov.uk/government/publications/submarine-dismantling-project-interim-storage-of-intermediate-level-radioactive-waste

[17] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/278987/20140205-SDP_CSR_v1_0_Final_including_Enclosure-clean-U.pdf

[18] Capenhurst Nuclear Services operates as a tenant of URENCO UK Limited.

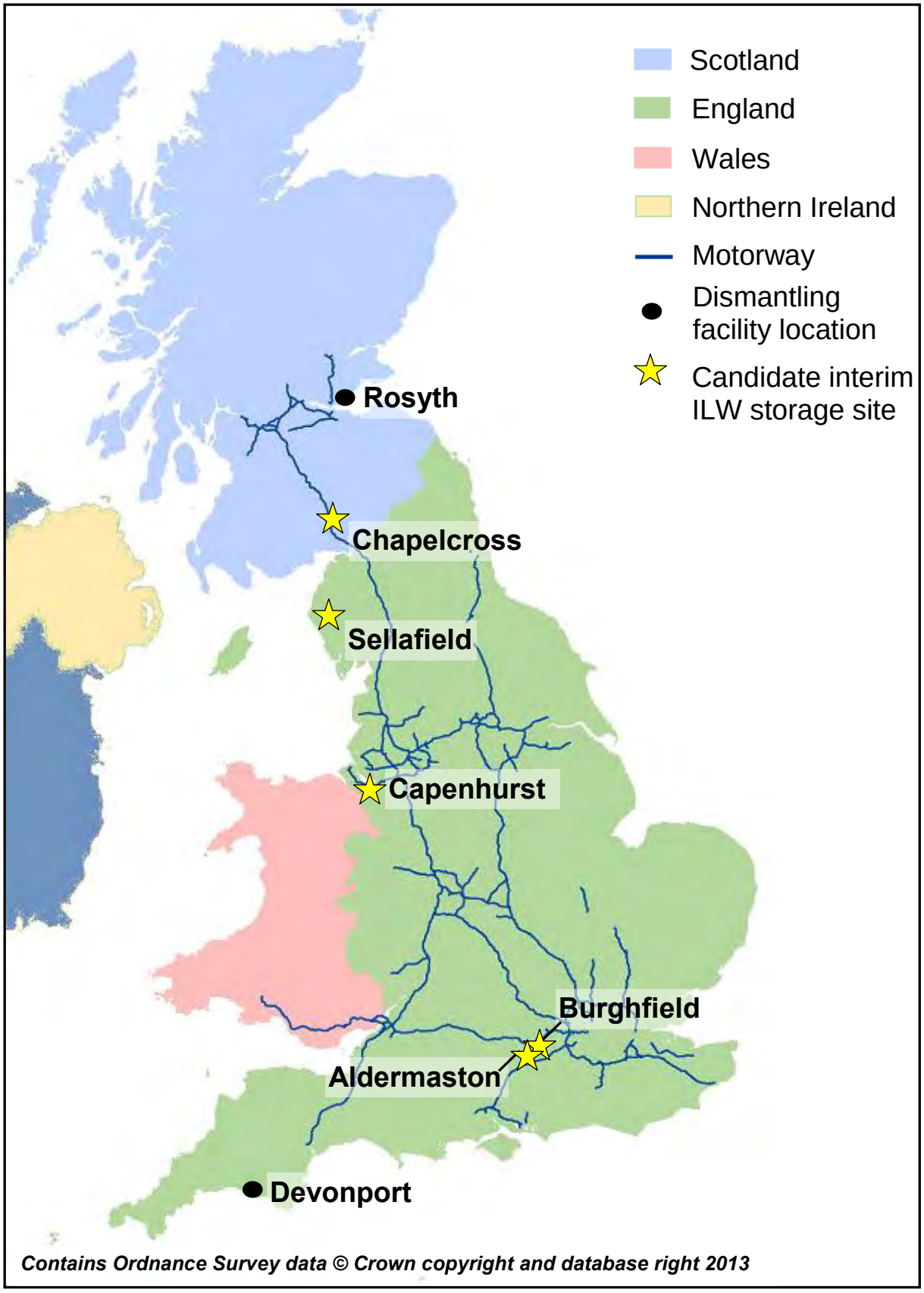


Figure 2-3: Candidate interim ILW storage site locations

3 Approach and Scope of this SEA

3.1 Stages of SEA

3.1.1 Guidance

Account has been taken of *A Practical Guide to the Strategic Environmental Assessment Directive*[19]. This sets out five stages for SEA as used in the 2010/11 SDP assessment (Table 3.1).

The Scottish SEA guidance[20], produced by the Scottish Government (with support and input from SEPA, Scottish Natural Heritage and Historic Scotland), has also been considered.

SEA stages and tasks	Purpose
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope	
Identifying other relevant plans, programmes and environmental protection objectives	To establish how the plan or programme is affected by outside factors, to suggest ideas for how any constraints can be addressed, and to help to identify SEA objectives.
Collecting baseline information	To provide an evidence base for environmental problems, prediction of effects, and monitoring; to help in the development of SEA objectives.
Identifying environmental problems	To help focus the SEA and streamline the subsequent stages, including baseline information analysis, setting of the SEA objectives, prediction of effects and monitoring.
Developing SEA objectives	To provide a means by which the environmental performance of the plan or programme and alternatives can be assessed.
Consulting on the scope of the SEA	To ensure that the SEA covers the likely significant environmental effects of the plan or programme.
Stage B: Developing and refining alternatives and assessing effects	
Testing the plan or programme objectives against the SEA objectives	To identify potential synergies or inconsistencies between the objectives of the plan or programme and the SEA objectives and help in developing alternatives.
Developing strategic alternatives	To develop and refine strategic alternatives.
Predicting the effects of the plan or programme, including alternatives	To predict the significant environmental effects of the plan or programme and alternatives.
Evaluating the effects of the plan or programme, including alternatives	To evaluate the predicted effects of the plan or programme and its alternatives and assist in the refinement of the plan or programme.
Mitigating adverse effects	To ensure that adverse effects are identified and potential mitigation measures are considered.
Proposing measures to monitor the environmental effects of plan or programme implementation	To detail the means by which the environmental performance of the plan or programme can be assessed.

[19] Office of the Deputy Prime Minister, Scottish Executive, Welsh Assembly Government and Department of the Environment, Northern Ireland (2005). *A Practical Guide to the Strategic Environmental Assessment Directive: Practical guidance on applying European Directive 2001/42/EC "on the assessment of the effects of certain plans and programmes on the environment".* Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf

[20] The Scottish Government (2013). *Strategic Environmental Assessment Guidance*. http://www.scotland.gov.uk/Publications/2013/08/3355

Stage C: Preparing the Environmental Report	
Preparing the Environmental Report	To present the predicted environmental effects of the plan or programme, including alternatives, in a form suitable for public consultation and use by decision-makers.
Stage D: Consulting on the draft plan or programme and the Environmental Report	
Consulting the public and Consultation Bodies on the draft plan or programme and the Environmental Report	To give the public and the Consultation Bodies an opportunity to express their opinions on the findings of the Environmental Report and to use it as a reference point in commenting on the plan or programme. To gather more information through the opinions and concerns of the public.
Assessing significant changes	To ensure that the environmental implications of any significant changes to the draft plan or programme at this stage are assessed and taken into account.
Making decisions and providing information	To provide information on how the Environmental Report and consultees' opinions were taken into account in deciding the final form of the plan or programme to be adopted.
Stage E: Monitoring the significant effects of implementing the plan or programme on the environment	
Developing aims and methods for monitoring	To track the environmental effects of the plan or programme to show whether they are as predicted; to help identify adverse effects.
Responding to adverse effects	To prepare for appropriate responses where adverse effects are identified.

Table 3.1: Stages in the SEA Process

3.1.2 Stages of this Interim ILW Storage SEA

- **Scoping (Stage A)**: The steps conducted at the scoping stage are set out in section 3.3.
- **Assessment and development of alternatives (Stage B)**: this SEA has identified the likely significant effects of developing an interim ILW store at each of the candidate sites (the 'reasonable alternatives')[21], and has made recommendations for mitigation measures to minimise negative effects and identified opportunities for positive effects;
- **Reporting (Stage C)**: this Environmental Report documents the process and results of the SEA in a form suitable for public consultation and use by decision-makers;
- **Consultation (Stage D)**: the current stage – consulting the public and statutory consultation bodies on the Environmental Report, integrating the SEA findings and the feedback received into the decisions on how to proceed with interim ILW storage. This will be followed by providing information to the public about the decision and the extent to which the SEA and consultation findings have been taken into account; and
- **Monitoring (Stage E)**: monitoring the environmental effects of the preferred alternative throughout its development and operation, to ensure that any unforeseen effects are managed and mitigated.

3.2 Reasonable Alternatives

As identified in Section 2.4, the reasonable alternatives considered in this SEA are the candidate sites for the interim ILW store. It is no longer considered that a 'do minimum'

[21] A preferred site will be selected after the SEA Environmental Report is published for consultation. 'Next steps' are described further in Section 12.

option is a reasonable alternative since the option of continued afloat storage has now been discarded following the 2010/2011 SEA process. Alternatives to interim ILW storage were assessed in the 2010/2011 SEA and therefore not covered within this Environmental Report.

3.3 Steps Conducted at the Scoping Stage

The scoping stage of this SEA was conducted between October 2013 and March 2014. This culminated in consultation on an SEA Scoping Report in February and March 2014. The Scoping Report set out:

- **Relevant plans and programmes**: relevant regional and sub-regional plans and programmes to establish how the candidate RPV storage sites could be affected by outside factors, and to help identify any relevant environmental protection objectives which need to be taken into account;
- **Baseline information**: current baseline environmental conditions on and around each candidate site, and also as predicted to occur should the SDP not take place. This desk-based study was limited to publicly available information and that from site licensees. This evidence base firstly informed the setting of the technical scope of the SEA (as consulted upon through the Scoping Report), and secondly, has informed the assessment stage. Baseline from the scoping stage relevant to the assessment is reported in this Environmental Report;
- **Environmental problems:** key environmental issues which have been accounted for within this SEA;
- **Geographic scope of the SEA**: the 'study area' of the SEA, indicating the geographic extent over which the potential for significant effects has been assessed;
- **Assessment timescales**: the 'temporal scope' of the SEA, indicating the approximate timeframe / range of years considered over the short, medium and long-term within the assessment;
- **Technical scope of the SEA**: the environmental categories and issues which could potentially be significantly affected, and which therefore have been addressed within this SEA, alongside the proposed methodology; and
- **SEA objectives and guiding questions for the assessment**: objectives and a scoring regime tailored to this SEA, used to assess the benefits and disbenefits associated with the different site options.

The following activities were undertaken to conduct the scoping stage of this SEA and produce the Scoping Report.

1. Comments on the previous SEA scoping and environmental reports were reviewed;
2. The site-specific policy context and baseline for each candidate interim ILW storage site was established;
3. The 2011 SEA Environmental Report[2], and in particular the likely significant effects, assumptions and uncertainties of this previous SEA, was reviewed;
4. Information on the interim ILW storage design, stages of implementation and activities was sought;
5. The draft SEA scope (technical, temporal and geographic) was set using the above information;

6. Consultation on the SEA Scoping Report was undertaken with the statutory consultees and a number of non-statutory consultees as identified in Table 3.2 below in February and March 2014; and
7. Consultation responses were collated and reviewed, and amendments were made to the scope where appropriate, as reflected in this Environmental Report.

The MOD did not produce a second, amended scoping report, but has incorporated the findings into this Environmental Report.

The organisations consulted are set out in Table 3.2. Of the responses that were received, the Environment Agency, Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Public Health England (PHE) provided detailed responses. Annex 1 provides a record of the responses received along with notes on how those responses have been addressed in this SEA Environmental Report. For example, as a result of comments received from Public Health England, the scope of assessment has been amended to consider the category 'radiological discharges and exposures', rather than 'radiological discharges and emissions' as previously proposed. Furthermore, the Environment Agency provided further information about environmental issues at some of the candidate sites and so the baseline information set out in this Environmental Report has been updated accordingly.

Table 3.2: SEA Scoping Consultees

Type of Consultee	Consultee Organisation
Statutory (as required by SEA legislation)	Environment Agency (EA) English Heritage (EH) Natural England (NE) Scottish Government Historic Scotland Scottish Environment Protection Agency (SEPA) Scottish Natural Heritage (SNH) Welsh Government (WG) Cadw (Welsh Government historic environment service) Natural Resources Wales (NRW) Department of the Environment's Environment and Heritage Service (Northern Ireland)
Non-statutory	Office for Nuclear Regulation (ONR) Department for Communities and Local Government (DCLG) Department of Energy and Climate Change (DECC) Department of Environment, Food and Rural Affairs (Defra) Department of Health (DoH) Department for Transport (DfT) Public Health England (PHE) Nuclear Decommissioning Authority (NDA) Marine Management Organisation (MMO) Marine Scotland (MS)

3.4 Technical Scope (Including Method of Assessment)

3.4.1 SEA Categories

This SEA has been based on SEA categories, objectives and guide questions (the 'SEA Framework') consulted upon at the scoping stage with the statutory bodies, which in turn were based on the previous 2010/11 SEA. The SEA categories are described in Table 3.3 below. They are based in part upon Annex I of the SEA Directive, which requires that the Environmental Report should include information on the likely significant effects of the plan or programme on issues such as: biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage, including architectural and archaeological heritage; landscape; and the inter-relationship between them.

Table 3.3 presents how the categories used in this report are consistent with the SEA Directive requirements, and sets out what each one covers (including key links with other topics). This reflects the structure used in the 2010/11 SEA, which used the MOD's Sustainable Development[2], categories set out in the MOD Appraisal Tools Handbook[22].

Table 3.3: Range and description of SEA categories, with links to SEA Directive topics

SDP SEA Category	Annex I SEA Directive Issue	Proposed Scope of SEA Category
Radiological Discharges / Exposure	Air, water, soil, human health	Potential effects of interim ILW storage and transport on radiological discharges and emissions, including from construction (e.g. any contaminated land), transport and operational discharges / emissions.
Biodiversity and Nature Conservation	Biodiversity, flora and fauna	The potential effects of interim ILW storage and transport on the natural environment, including fisheries and areas protected for their wildlife and conservation importance.
Population	Population	Potential effects of interim ILW storage and transport on local communities, including socio-economic impacts and the extent to which proposals present opportunities for community benefit, e.g. through skills development. (Note that assessment of economic effects is not an environmental issue and is not required by SEA, but has been included to reflect the importance of these issues to the wider public).
Health and Well-Being	Human health	The potential effects of interim ILW storage and transport on people's health, including recreation (which in turn can be provided by biodiversity, landscapes and the historic environment) have been assessed. This includes issues related to any radiological and non-radiological discharges or emissions.
Noise and Vibration	Human health, biodiversity, fauna	The potential effects of interim ILW storage and transport on noise and vibration levels relative to established standards and potential receptors.
Geology and Soils	Soil	Potential effects of interim ILW storage and transport on soil extent and quality (including contamination and the potential of interim ILW storage to disturb historic contamination). The potential for effects on protected/ important geological features have also been considered.

[22] Ministry of Defence (2009). *The Environmental and Sustainability Appraisal Tool Handbook for the MOD Estate (Volume Two: SEA)*. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/33341/SEAT_handbook_section_2.pdf

SDP SEA Category	Annex I SEA Directive Issue	Proposed Scope of SEA Category
Water	Water	Potential effects on surface waters, groundwater systems and the marine environment, including the effects of licensed and unplanned discharges to water.
Air	Air	Potential effects on air quality, including construction, transport and the effects of licensed and unplanned discharges to the atmosphere.
Climate Change and Energy Use	Climatic factors	The potential effects of interim ILW storage and transport on energy use and greenhouse gas emissions. *The likely impacts of climate change, such as storminess and water availability have been accounted for within the other relevant categories (e.g. coastal change and flood risk, water and health and well-being) as part of the future baseline.*
Coastal Change and Flood Risk	Climatic factors, water	Existing and future flood risks, as well as the effects on coastlines of projected sea level rise and a possible increase in storm intensity. The effects of land instability and erosion have also been considered.
Transportation	Material assets, human health	Interim ILW storage will involve RPVs being transported to and from an interim ILW storage site, as well as construction and operational transport. Consideration has been given to the potential effects of vehicle movements on the transport network. *The effects of transport on other receptors, such as noise effects, emissions or community access, have been considered under other relevant categories (e.g. noise and vibration, population and health and well-being).*
Waste Management	Material assets, soil	The generation of new waste volumes and the effects this may have on current waste management infrastructure and landfill. *The SDP is essentially a waste management programme, and RPV management has not been considered as an impact (but rather as baseline, as the waste either exists or will exist regardless of SDP, as does the Government's commitment to eventual geological disposal of this waste).*
Land Use and Materials	Material assets, soil	The potential effects of interim ILW storage and transport on how people use or manage the land. *Fossil fuels and water resources have not been considered under this category, but rather under climate change and energy use, and water, respectively.*
Cultural Heritage	Cultural heritage, including architectural and archaeological heritage	The potential effects of interim ILW storage and transport on the historic environment, including cultural heritage resources, historic buildings and archaeological features.
Landscape and Townscape	Landscape	The potential effects of interim ILW storage and transport on the quality and attractiveness of landscapes and townscapes, including visual amenity.

3.4.2 Technical Scope of the SEA for Interim ILW Storage

This SEA has been based on SEA categories, objectives and guide questions (the 'SEA Framework') agreed at the scoping stage with the statutory bodies, which in turn were based on the previous 2010/11 SEA. The SEA categories are described in Table 3.3 (Section 3.4.1).

Table 3.4 below presents the technical scope in terms of the questions scoped into this SEA, and also level of coverage required in order to identify the 'likely significant effects' of interim ILW storage and associated transport on the environment and local communities. The detailed rationale for this technical scope can be found in the February 2015 Scoping Report, with amendments as summarised in Annex 1 regarding consultee comments on the SEA scope.

Table 3.4: SEA Framework and level of detail

SEA Framework		Proposed Level of Assessment
Category & Objective	**Assessment Questions *Will the SDP Proposals…***	
A. Radiological Discharges / Exposures Ensure that the exposure of people and the environment to radiation and radioactivity is as low as reasonably achievable.	Lead to an increase in the risks to people and/or the environment from actual or potential exposures to radiation or radioactivity?	New assessment considering all potential pathways.
B. Biodiversity and Nature Conservation Protect and enhance habitats, species and ecosystems.	Affect habitats, including designated nature conservation sites (accounting also for designating species) and non-designated habitat?	New assessment considering all potential pathways.
	Affect animals or plants outside of designated sites, including protected species and fisheries?	New assessment considering all potential pathways.
C. Population Promote a strong, diverse and stable economy with opportunities for all; minimise disturbance to local communities and maximise positive social impacts.	Affect the number or types of jobs available in local economies, and levels of deprivation in surrounding areas?	High level review – consider the conclusions of the previous SEA relative to alternatives sites and relative deprivation levels, if applicable, and report the potentially significant effect at each site.

SEA Framework		Proposed Level of Assessment
Category & Objective	**Assessment Questions *Will the SDP Proposals…***	
D. Health and Wellbeing Protect and enhance health, safety and wellbeing of workers and communities; minimise any health risks associated with interim ILW storage and transport.	Affect the health, safety and well-being of local communities?	New assessment considering all potential pathways.
E. Noise and Vibration Minimise disturbance and stress to people, wildlife and historic buildings caused by noise and vibration.	Significantly increase levels of noise and vibration?	New assessment considering all potential pathways, but focusing on potential for highway closures during RPV transport. Will provide generic coverage of other noise and vibration issues, as the baseline shows that there are no particular noise issues associated with the sites, and temporary construction impacts are better dealt with (and typically can be managed to within acceptable levels) at the project level.
F. Geology and Soils Minimise threats to the extent and quality of soils and geological resources.	Affect soil quality, variety, extent and/or compaction levels?	High level review – consider site-specific baselines and the conclusions of the previous SEA. Assessment will be largely generic, as any impacts are better dealt with (and typically can be managed to within acceptable levels) at the project level.
G. Water Maximise water efficiency, protect and enhance water quality.	Affect water availability as a resource for abstraction or other use?	New assessment considering all potential pathways.
	Affect the quality of surface or sea water?	New assessment considering all potential pathways.
	Affect the quality of groundwater?	New assessment considering all potential pathways.
	Affect hydrology / geomorphology, including the distribution and quality of freshwater or marine sediments?	New assessment considering all potential pathways.
H. Air Minimise emissions of pollutant gases and particulates and enhance air quality	Affect air quality?	New assessment considering all potential pathways.
I. Climate Change and Energy Use Reduce energy consumption, minimise greenhouse gas emissions	Affect the amount of carbon dioxide and other greenhouse gases emitted?	New assessment considering transport differences only. Will otherwise only provide generic data which is available or able to be estimated.
J. Coastal Change and Flood Risk Minimise the risks	Affect levels or the extent of flood risk?	High level review – consider generic flood risks and associated mitigation measures.

SEA Framework		Proposed Level of Assessment
Category & Objective	**Assessment Questions *Will the SDP Proposals…***	
from coastal change and flooding to people, property and communities.	Be at risk of flooding from any source?	New assessment considering all potential pathways.
K. Material Assets (Transport) Minimise the detrimental impacts on travel and transport within communities, whilst maximising positive effects.	Affect transport infrastructure, such as through increased heavy loads and possible damage?	New assessment considering construction and RPV transportation. Operational employee, materials delivery or general waste collection traffic is unlikely to be significant, and thus will not be covered.
	Increase or decrease traffic congestion between and around SDP sites?	New assessment considering all potential pathways.
L. Material Assets (Waste Management) Minimise waste arisings, promote reuse, recovery and recycling and minimise the impact of wastes on the environment and communities.	Increase the amount of radioactive waste to be disposed of?	High level review – consider the conclusions of the previous SEA relative to alternatives sites, land use and land contamination information.
	Affect the amount of hazardous waste to be disposed of?	
	Affect the amount of non-hazardous wastes produced?	
	Affect the capacity of existing waste management systems, both nationally and locally?	
M. Land Use and Materials Contribute to the sustainable use of land and natural and material assets.	Affect any existing or proposed redevelopment/regeneration programmes?	New assessment considering the potential impact on site after use relative to long-term strategies.
	Lead to the loss of undeveloped land or green spaces?	New assessment considering all potential pathways.
	Increase the burden on limited natural resources such as aggregates or wood (but excluding water or fossil fuels)?	Review / confirm previous SEA's conclusions.
N. Cultural Heritage Protect and where appropriate enhance the historic environment including cultural heritage resources, historic buildings and archaeological features.	Affect designated or locally important archaeological features?	New assessment considering all potential pathways.
	Affect the fabric and setting of historic buildings, structures or spaces?	New assessment considering all potential pathways.
	Affect the historic landscape, including its distinctive context and character?	New assessment considering all potential pathways.
O. Landscape and Townscape Protect and enhance landscape and townscape quality and visual amenity.	Affect landscapes?	New desk-based study and assessment considering all potential pathways.
	Have significant visual impacts?	

3.4.3 Method of Assessment

The assessment of the alternative interim ILW storage site options has been undertaken by testing the proposals against the baseline information for each site, using the detailed

assessment questions presented in Table 3.4 and guideline assessment criteria presented in Annex 4.

Effects have been characterised based on the generic assumptions for interim ILW storage presented in Section 4, and the assessment timescales as described in Section 3.4.5 below. For each relevant timescale (from construction to decommissioning, and also the 'extended operation' scenario (refer to sections 3.4.5 and 3.5.24)), the assessment includes:

- pre-existing mitigation which can reasonably be expected to be implemented (e.g. site nuclear safety case and compliance with site license conditions);
- the 'likely significant effects' on that basis, without any additional mitigation;
- mitigation measures envisaged, which focus on actions additional to the above minimum requirements which can avoid, reduce, remedy or compensate for negative effects;
- consideration of the likely significant residual effects with recommended mitigation, if appropriate; and
- the potential beneficial effects or enhancements.

The predicted likely significant effects for each SEA category have been recorded in tables with columns for each timescale. The assessment has presented potential negative effects and potential benefits separately. This is because in general there is more certainty about the potential negative effects for the proposed interim ILW store, whereas the potential positive effects largely depend upon optional measures for enhancement and are suggested rather than committed (refer to section 3.5.5). The potential for negative effects is potentially of greater interest to stakeholders and decision-making. Consideration has been given to the nature of effects, for example, whether they are secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary, positive and negative effects.

Proposals for interim ILW storage and transport have been assessed against the baseline conditions at each site, thereby allowing this SEA to focus on local issues (and regional or national issues, if appropriate), whereby wider regional and national issues have been the focus of the 2010/11 SEA of the wider SDP.

3.4.4 Method of Assessment for Cumulative Effects

The SEA Directive requires an analysis of *"…the likely significant effects on the environment... These effects should include secondary, cumulative, synergistic... effects".* There are main types of cumulative effect:

- Additive: the sum of all the effects (e.g. another project in the vicinity leading to loss of greenfield land, combining with loss of greenfield land from the project);
- Neutralising: where effects counteract each other to reduce the overall effect (e.g. a road improvement scheme which increases road capacity to levels which can accommodate the project); and
- Synergistic: where effects interact to produce a total effect greater than the sum of the individual effects. Negative synergistic effects often happen as habitats and resources get close to capacity: for instance a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the areas too small to support the species at all.

Cumulative effects considered comprise the combined effects of activities arising from the SDP (including interim ILW storage and transport) which could affect sensitive receptors or locations; and the combined effects of interim ILW storage and transport with effects from other proposed infrastructure projects or developments located in proximity to the sites, which may magnify the effects. An example of the latter would be the increase in construction-related effects (dust, disruption to traffic, disturbance to residents) where two or more major projects are constructed at the same time.

Potential combined effects within the SDP have been considered through the assessment of each candidate site.

3.4.5 Assessment Timescales

The following timescales have been estimated and assumed by this SEA:

- **Planning and construction** (short-term): 4 years;
- **Operation** – fill, store and empty (medium-term): 4 – 32 years;
- **Decommissioning** (long-term with GDF availability after 2040): approximately 36 years onwards, after store has been emptied; and
- **Extended operation** (long-term with GDF availability delayed significantly beyond 2040): up to 70 additional years of operation. Note that eventual GDF availability is a project assumption. The assessment will reflect, where appropriate, any implications of the 'delayed planned GDF' scenario on decommissioning. (refer to section 3.5.2).

3.4.6 Geographic Scope

Given the location of the candidate interim ILW storage sites, the geographic scope of this SEA includes the national strategic highway network from Devonport and Rosyth to each candidate site as well as relevant local roads. It addresses the likely zone of influence around candidate interim ILW storage sites for each SEA category (e.g. visual effects including the extent of significant views to the site, and archaeological effects including local site boundaries).

The scope of this assessment does not cover the facilities or environmental context of Rosyth and Devonport. The overarching 2010/2011 SEA has covered the initial dismantling sites (refer to Figure 2-2), which will not be influenced by the choice of candidate site for interim ILW storage.

Rail transport and sea transport have not been considered further in this assessment since the SDP assumption is that transport would be via road.

3.5 Dealing with Uncertainty

3.5.1 Making Assumptions

The proposals for interim ILW storage are being developed and as a result there are uncertainties at this stage of the project. This SEA has therefore been based upon a series of assumptions provided by the SDP in relation to transport, timescales, design and operation of the proposed interim ILW store. The assumptions which were current at the time this assessment was undertaken are set out in section 4.

3.5.2 Store design

Given that the final design of the interim ILW store will be determined by the operator of the site, yet to be chosen for SDP ILW storage it is not possible at this stage to consider detailed proposals.

3.5.3 Transport

Given that the interim ILW storage site has not been selected, detailed transport requirements have not been refined and route planning has not been undertaken it has not been possible to assess detailed effects of transport on major trunk roads and motorways. However due to infrequency of RPV transport, regulation and anticipated security and transport planning it is currently assumed that the effect from transport on major roads will be minimal. Local roads linking the dockyards and the candidate ILW storage sites to the major road network have been considered in this SEA.

Due to uncertainty regarding the locations of the planned GDF and potential size reduction facilities it has not been possible to assess transport from the candidate ILW stores to final disposal.

3.5.4 The 'Extended Operation' Scenario

There is uncertainty over the timescales in which the GDF will be available. To account for this uncertainty, this SEA has also assessed an 'extended operation' scenario. This has allowed opportunity to provide further information on what effects are likely if the interim ILW store is operated beyond the timescales currently assumed. Under this scenario it is assumed that as the facility approaches the end of its design life (100 years) there would be an intervention to extend the design life in accordance with standards current at that time.

3.5.5 Opportunities for Positive Effects

The nature of the assessed scheme is such that positive effects upon the environment from the proposed interim ILW store itself are unlikely without the implementation of additional, optional measures by the site operator. However opportunities for positive effects have been identified for some topics during the assessment. Since it is uncertain that the measures that could lead to positive effects would be implemented, the assessment of positive effects has been presented separately.

4 Assumptions for All Candidate Interim ILW Storage Sites

4.1 Introduction

As shown in Figure 2-2 of Section 2.3, the activities associated with the interim ILW storage Site element of SDP are Stage II: design and develop interim ILW storage; Stage V: move the RPV to the interim storage site; Stage VI: move the RPVs to the proposed GDF; and Stage VII: decommission the interim ILW storage facilities.

The SEA is of necessity based upon a number of assumptions about how interim ILW storage and transport of RPVs are expected to occur. These assumptions reflect current intentions by the MOD, and are provided in order to allow stakeholders to provide informed opinions on the scope of the SEA. Table 4.1 below sets out an approximate sequence of key activities expected in the implementation and operation of interim ILW storage and transport, and assumptions made.

Table 4.1: Assumptions about Implementing Interim ILW storage

Activity	Generic Assumptions
Store design and construction	Store design: • Building currently estimated to be approximately 20 m tall. • The store must be large enough to take the 27 RPVs in their containers, with a contingency of 50% spare floor area in case of delays and to allow space for possible repackaging. RPV containers are too heavy to stack, so this will require a floor area equivalent to about 56 x 56m. • Adjacent 11 kV electricity sub-station may be required subject to power requirements, existing site infrastructure availability and capacity. • 100-year design life of the interim ILW store, with allowance for periodic intervention and upkeep (e.g. replacement of cladding). • Construction of the interim ILW store would take in the region of one year. Typical construction activities associated with a large industrial-type storage building. These may include: • Heavy machinery and plant (e.g. bulldozers, dumper trucks, cranes), small-scale on-site power generation and powered equipment / tools. • Temporary accommodation during construction. • Arrival and presence of construction site staff (assumed to be fewer than 100 full-time equivalent staff). • Deliveries of construction materials. • Site / vegetation clearance and exposure of bare earth, plus excavation. • Materials storage mounds and fenced-off areas. • Erection of the interim store. • Transport for removal of construction wastes.
Transportation of the RPVs	• Transport of RPV packages weighing up to 135 tonnes by a specialised road vehicle. • The MOD will be responsible for moving the RPVs to the storage site. Detailed container design work is not yet complete but road, rail and sea options have been provisionally assessed. The indications are that the RPV Containers are almost certainly too wide for the railways and the complexities and costs of sea transport would be a big disadvantage, especially since some shortlisted sites are inland. Economics and practicality therefore currently favour road transport but whichever solution is finally adopted, it will

Activity	Generic Assumptions
	have to be shown to be a safe choice. • It is envisaged there would be one delivery per year on average but with a maximum of three deliveries in any one year. • No road closures are anticipated on strategic highway network. However there may be some restrictions on local roads close to site. • Due to regulation and transport planning it is currently assumed that the effect transport on major roads will be minimal. • Transport will be managed to minimise effects on the environment. Nuclear and security aspects of RPV transport will be subject to strict regulation. • External dose rates for the package will be in accordance with the transport regulation requirements, that is 2 mSv/h contact and 0.1 mSv/h at 2m from the package.
Operation/ Extended Operation	• RPV transport (see above) and placement of shielded containers using lifting machines or overhead crane. • Limited operational staff (employment generation at the site would be minimal – fewer than 10 full-time equivalent jobs per year). • Commuting of limited operational staff – potential use / reallocation of existing site staff. • Small numbers of HGVs delivering materials or for site waste collection. • Building maintenance, assuming a 100-year design life including allowance for periodic intervention and upkeep (e.g. replacement of cladding). • The majority of operational period will be passive storage (closed and locked facility). • Connection into existing site drainage if required. With exception of electricity, minimal services required. Requirements for water, drainage, telecommunications, etc. would be to service basic welfare facilities. • The very low maximum external dose target of 0.5 micro Sieverts/hour on the external walls will ensure that local communities experience no practically measurable increased dose from the interim ILW store. • Shielding of the RPVs: Some interim stores need thick walls to keep radiation levels on site low. However, the RPVs and Containers will already provide a significant degree of shielding and would potentially also be placed into shielded bays inside the store. The RPV Store will therefore probably be of steel-framed construction with intrusion-resistant cladding rather than, for instance, reinforced concrete and its main function will be to protect its contents from adverse weather and minimise any potential corrosion. • Conditions in the store will be continuously monitored and the containers will be checked to a schedule agreed with the regulators. The RPVs containers will be designed to store the RPVs for the design life of the store (at least 100 years) but the design will allow for visual inspection of the RPVs if required and for repackaging . • Potential for occasional maintenance of the RPV transport containers involving them being moved within the interim ILW store. • It is assumed that the RPV transport/ container will not be suitable for onward transport and repackaging of the RPVs will be required at the end of interim storage. The 50 % footprint contingency (mentioned above) will provide the capacity to repackage RPVs if required. The discarded package will not be radioactive: in the absence of neutrons from a working reactor, there can be no radioactive 'activation' of the transport/storage package. Similarly, since the RPV will be sealed and the outside surface of the RPV will be clean, the package should not become contaminated in use. The emptied package should therefore be able to be consigned as clean scrap at end of life.

Activity	Generic Assumptions
	• Use of mobile lifting plant such as a straddle carrier to move RPVs within the store. • Loading of the repackaged RPVs onto road vehicles for transport to the size reduction facility or GDF (near end of operation). • Under normal operation there would be no discharges to air, water or soil from the ILW interim store and therefore there would be no requirement to vary existing site permits / authorisations.
Decommissioning (assuming interim ILW store will be removed)	• Disconnecting existing services (e.g. electricity, drainage and water supply). • Set up demolition site compounds / areas. • Transport (arrival / departure) of demolition equipment, e.g. dumper trucks and hydraulic excavators. • Commuting site staff. • Removal of superstructure and substructure. • Reinstatement of footprint area for subsequent use. • Collection and removal of demolition waste for disposal or recycling. • Identification of an appropriate after use for the site.

5 Legislative / Policy Context and Consenting

5.1 Review of legislation and planning policy

The SDP SEA conducted in 2010/11 (see Section 1.2) included a review of relevant plans, programmes and environmental protection objectives established at International, European and National level. The purpose of this review is to outline the nature of the project's relationship with these documents in order to guide the SEA of the SDP and better identify potential significant effects on the environment and communities, including opportunities for beneficial effects.

The key environmental protection objectives identified through this review can be found in Annex 3, including updates which reflect the below changes since 2011.

Since 2011, there have been some significant updates to international and national policy. For example, the National Planning Policy Framework (NPPF) was introduced in England in March 2012[23]. It replaced much of the English planning policy documents which were included in the 2011 Scoping Report, with the exception of the following which remain in force:

- Planning Policy Statement 10: *Waste Management* (May 2006);
- Marine Minerals Guidance 1: *Extraction by dredging from the English seabed* (July 2002);
- Marine Minerals Guidance 2: *The control of marine minerals dredging from British seabeds* (July 2002);
- Mineral Planning Guidance 4: *Revocation, modification, discontinuance, prohibition and suspension orders* (August 1997);
- Mineral Planning Guidance 8: *Interim Development Order Permissions* (October 1991);
- Mineral Planning Guidance 9: *Planning and Compensation Act 1991: Interim Development Order Permissions (IDOs)* (March 1992);
- Mineral Planning Guidance 14: *Environment Act 1995: Review of Mineral Planning Permissions* (October 1995); and
- Mineral Planning Guidance 15: *Provision of Silica Sand in England* (September 1996).

The Localism Act came into force in 2011 in England, amending and updating some of the aims identified in the previous SEA from the 'Strong and prosperous communities' White Paper (2006). It has devolved more decision-making powers from central government to local government, as well as local communities and individuals. This includes new community rights enshrined in law, as well as statutory neighbourhood planning[24].

Furthermore, the national Scottish Planning Policy (SPP) and National Planning Framework (Scotland's third – NPF3) were revised in June 2014. SPP sets out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land. NPF3 sets out a long-term vision for development and investment across Scotland over the next 20 to 30 years. During the scoping stage for this SEA, reference was made to the draft SPP consulted upon by the Scottish Government in 2013.

[23] Department for Communities and Local Government (2012). *National Planning Policy Framework*. Available from: https://www.gov.uk/government/publications/national-planning-policy-framework--2

[24] Department for Communities and Local Government (2011). *A plain English guide to the Localism Act.* Available from: http://www.local.gov.uk/localism-act

The European Union's (EU) 7th Environmental Action Programme (EAP)[25] was proposed in 2012, and agreed in June 2013. The four priority areas from the 6th EAP (climate change; nature and biodiversity; environment and health; and natural resources and waste) have been consolidated into three thematic priority objectives, which are:

- Protect nature and strengthen ecological resilience;
- Boost sustainable resource-efficient low-carbon growth; and
- Effectively address environment-related threats to health.

Targets of the 7th EAP have been somewhat modified; however, the overall aims and objectives remain in line with those identified in the previous 2010/11 SDP SEA[2]. The scope of this SEA set out in this report includes an approach and criteria which cover the above issues.

Aside from updates presented in Annex 3, the full review of national plans and programmes (including those for devolved administrations) is provided in Annex B of the 2011 SEA Scoping Report[15]. The summary objectives and policy messages presented in Annex 3 have been reviewed, and no significant changes have been found. However, a small number of additions have been made to reflect the NPPF. The scope of this assessment has therefore been informed by the policy and plan context up until the preparation of the scoping report in December 2013.

In addition, site-specific planning context can be found in Sections 6 to 10, which has helped to inform the understanding of the evolution of the baseline and assessment itself.

5.2 Interim ILW Storage Consenting and Regulatory Background

The interim ILW store will be subject to regulation and permissions irrespective of which candidate site is chosen.

The interim ILW store will need planning permission under the Town and Country Planning Acts. The planning application will be required to be accompanied by and Environmental Impact assessment (EIA) which will outline alternatives studied by the applicant and the reasons for the choice made taking into account the environmental effects and mitigations. The local planning authority will be obliged to consult with a wide range of statutory consultees and the public on the planning application and EIA.

In addition to securing planning permission for the proposed interim ILW store regulatory consent will be required by the Office of Nuclear Regulation (ONR) before the interim ILW store can be built commissioned or operated.

Nuclear site licensees require and environmental permits in England or authorisations in Scotland for any emission or disposal of radioactive waste. Consideration will be required as to whether there could be any variation to the permitted or authorised limits set for discharges of liquid radioactive effluents or discharges to air and land as a result of the interim ILW store.

The transport of the ILW will be regulated by the Defence Nuclear Safety Regulator (DNSR) to ensure that risks to public and the environment are as low as reasonably practicable/achievable (ALARP/ALARA).

[25] The European Commissions Proposal for a new EU Environment Action Programme to 2020. Available from: http://ec.europa.eu/environment/newprg/intro.htm

Emergency planning will be a requirement under the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR) to inform management of emergencies.

The interim ILW store consenting and regulatory background is outlined at Annex 8 of this report.

5.3 Environmental Impact Assessment

The interim ILW store would require an Environmental Impact Assessment (EIA) since it would fall within Schedule 1 of the EIA regulations[26]. The relevant EIA regulations would ensure that the likely significant environmental impacts are investigated further, assessed to a greater detail and mitigation is put forward where appropriate, with further consultation being undertaken. An Environmental Statement (ES) would be prepared to accompany any planning application for the proposed interim ILW store.

Environmental protection and environmental permitting legislation would ensure no significant risk of significant harm to human health or the environment from potential contamination, and that contaminated materials are managed and used in an appropriate manner. Furthermore, many species of wildlife are protected by legislation (such as the Wildlife and Countryside Act). It is therefore assumed that compliance with the relevant environmental legislation would minimise risks of unacceptable harm to the environment and people.

It is assumed for all sites that a Construction Environmental Management Plan (CEMP) would be implemented during construction, as this is now commonly recommended for EIA development. This would help to ensure that the relevant legislation and required mitigation to be applied during construction is made clear, that activities are monitored accordingly, and the environment is protected appropriately. These legislative controls and environmental management practices have therefore been taken into account as pre-existing mitigation for all sites.

5.4 Radiological Discharges / Emissions and Waste

5.4.1 Radioactive Waste

In terms of nuclear waste and activities, the nuclear industry is heavily regulated to ensure public safety.

In England, DECC is the lead department for managing the use and disposal of radioactive and nuclear substances and waste. DECC works closely with Defra and the Environment Agency to plan for and regulate management of nuclear substances and waste. The ONR, a Statutory Corporation since April 2014, regulates aspects of the UK's nuclear industry and provides DECC with advice and support on developing policy for implementing radioactive substance safeguards. The ONR was formed from the merger of the HSE's Nuclear Directorate (the Nuclear Installations Inspectorate, the Office for Civil Nuclear Security and the UK Safeguards Office) and from 1 June 2011, the Department for Transport's Radioactive Materials Transport Team.

The Committee on Radioactive Waste Management (CoRWM) provides DECC with technical advice on strategy for managing nuclear waste.

[26] In England these are the Town and Country Planning (Environmental Impact Assessment) Regulations 2011. In Scotland these are The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011.

In Scotland SEPA is the lead authority for regulation of nuclear waste, responsible to the Scottish Government.

Nuclear installations licensing and environmental permitting are two separate regulatory activities. The ONR regulates nuclear licensed sites under the Nuclear Installations Act 1965 and is responsible for regulation of the storage and accumulation of radioactive waste on those sites.

Environmental permitting is carried out by SEPA by authorisation under the Radioactive Substances Act 1963 for nuclear sites in Scotland, and by the EA under the Environmental Permitting Regulations 2010 for nuclear sites in England.

The site operator would be required to demonstrate to the EA or SEPA that under normal operation there would be no discharges to air, water or soil from the ILW interim store and therefore there would be no requirement to vary existing site permits / authorisations.

For the transport and storage of ILW such as an RPV, 'shielded' containers are typically required. The RPV containers will be thick walled steel vessels with shock absorbing features. As well as protecting the RPVs they provide additional shielding so that workers and the public will be protected during transport or in the unlikely event of a road accident or other unforeseen event.

5.4.2 Other Wastes

The European Waste Framework Directive[27] provides the legislative framework for the collection, transport, recovery and disposal of waste, includes the common definition of waste and introduces the waste hierarchy (Figure 5.2).

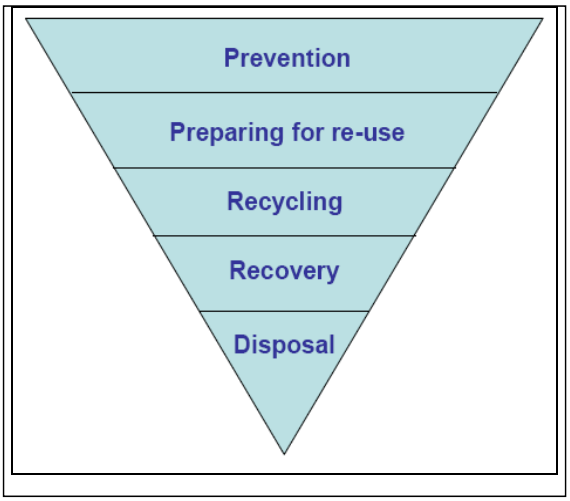


Figure 5-1: The Waste Hierarchy

The Waste Framework Directive is transposed into legislation in England via the Waste (England and Wales) Regulations 2011 and in Scotland via the Waste Management Licensing (Scotland) Regulations 2011 as amended by the Waste (Scotland) Regulations 2012. It is assumed that any waste covered by this legislation from the interim ILW store would be managed in compliance with these regulations.

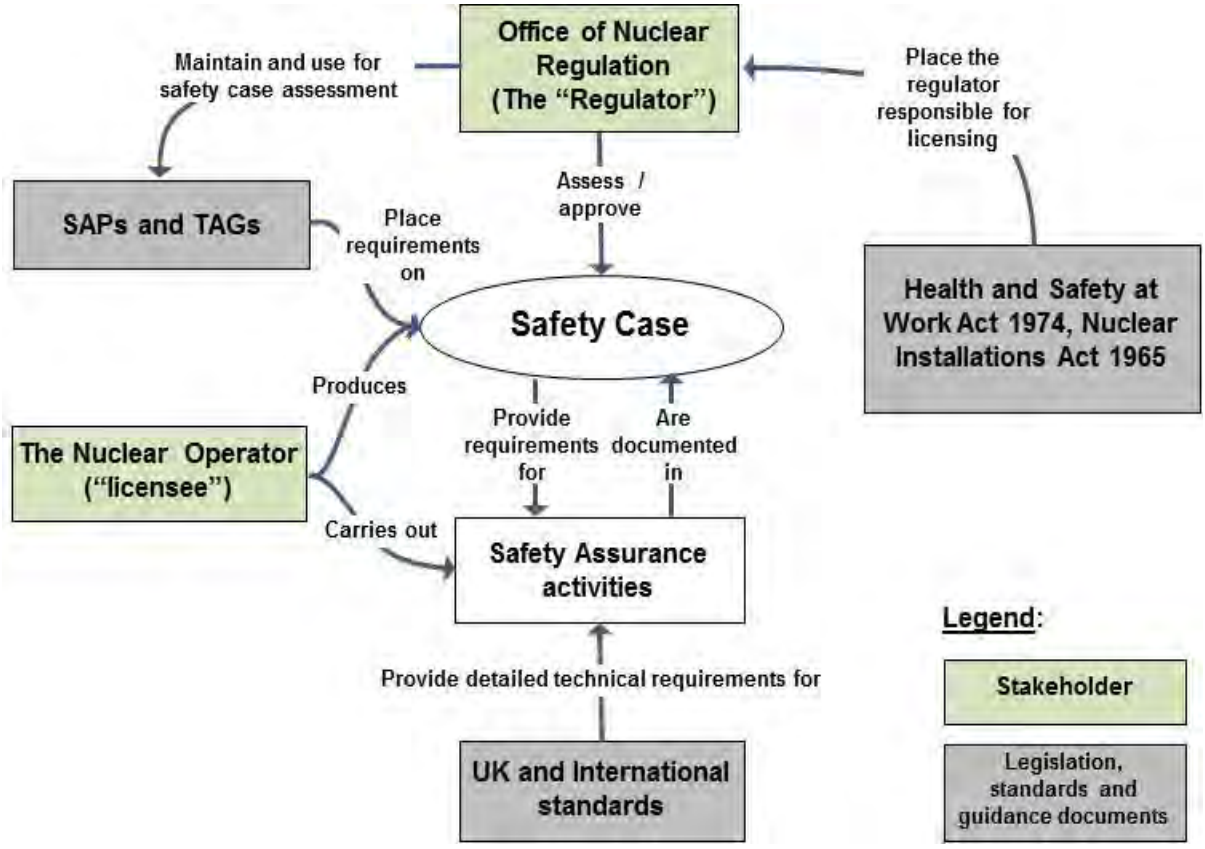
[27] Directive 2008/98/EC on waste (Waste Framework Directive). It should be noted that the Waste Framework Directive does not apply to radioactive waste

5.4.3 UK Nuclear Regulatory Framework

Under the Nuclear Installations Act 1965, a site operator will require a licensed instrument to design, construct, commission, operate and decommission the interim ILW store. The site operator to obtain the licensed instrument will need to demonstrate to ONR, within a nuclear safety case, that all safety functional requirements have been assessed and all risks are as low as reasonably practicable (ALARP).

The 'nuclear safety case' is the basis for the assurance of safety at a nuclear-licensed site in the UK. It is a basis for communication to the ONR that grants the licence. Its primary purpose, however, is to provide the licensee with the information required to enable safe management of the facility or activity in question.

More information can be found via the ONR website: www.onr.org.uk.[28]



Source: The Health Foundation, 2012[29]

Figure 5-2: UK Regulatory Framework Surrounding Site Safety Cases

A site and its safety case are subject to regular inspection. ONR inspectors use a set of Safety Assessment Principles (SAPs) and supporting Technical Assessment Guidelines (TAGs) to guide decision-making in the nuclear licensing process. Underpinning such decisions is the legal requirement on nuclear site licensees to reduce risks to use "Best Available Techniques" (BAT) to ensure that radiological emissions to members of the public is reduced to a level that is ALARP, and the environment is protected.[30] Another phrase which is essentially equivalent to ALARP is as low as reasonably achievable (ALARA). (Any

[28] See also http://www.onr.org.uk/licensing-nuclear-installations.pdf.

[29] http://www.health.org.uk/media_manager/public/75/publications_pdfs/Safety%20cases_supplement%20D.pdf

[30] Environment Agency (2012). *Criteria for setting limits on the discharge of radioactive waste from nuclear sites*. http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geho0612buqp-e-e.pdf

procedural differences are considered to be of no consequence to this SEA, and the terms are used in tandem and interchangeably.)

Also, the site operator would be required to apply for a permit or variation to an existing permit from the EA or the SEPA to receive SDP ILW onto the site, and also potentially certain aspects of the storage of ILW. The site would be required to comply with the conditions in their permits, and be subject to inspections by the EA or SEPA to ensure conditions are complied with.

The robust legislative regime around the management of radioactive materials would, as pre-existing mitigation, minimise any risk from radiological discharges to the environment and human population to ALARA / ALARP.

5.5 Managing Potential Climate Change

Given the design life of the project, the predicted effects of climate change would need to be taken into account in the design of the interim ILW store. This would include considering the long-term risk of flooding and ensuring adequate protection is provided. There is guidance on the design of flood mitigation and building design to take account of climate change adaptation and mitigation. It is assumed for this SEA that the standard of protection to the effects of climate change would be maintained throughout the life of the project and that measures to optimise energy efficiency would also be employed.

5.6 Protection of Landscape, Heritage and Visual Amenity

Guidance on acceptable design is usually set out in the relevant local development documents and planning guidance. The design of the building would need to take account of potential effects upon landscape and local heritage character where relevant. The appropriate design and mitigation for potential negative visual effects would normally be negotiated as part of the town and country planning process. For example there is usually a sectional agreement under the Town and Country Planning Act 1990 (or Town and County Planning (Scotland) Act 1997) and the design requirements would also be informed by site specific EIA. It is therefore assumed that this pre-existing mitigation would ensure that the proposed store would be of a design acceptable to the community and local planning authority, taking account of local sensitivities. The SEA has highlighted where location specific sensitivities are likely to require particular design consideration, for example if there may be potential to affect the setting of a listed building.

5.7 Management of Transport

5.7.1 Construction

In terms of construction traffic, it is good practice, and sometimes a condition of planning permission, that a Construction Traffic Management Plan is submitted to the local planning authority to set out the proposed access routes, haul routes, delivery times, estimated numbers of trips etc. This would help to minimise disruption during construction and is envisaged by this SEA for all sites as mitigation. The Construction Traffic Management Plan would normally form part of the CEMP.

5.7.2 Day-to-day operation

It should be noted that once operational, the facilities are expected to generate negligible additional traffic and therefore no significant effect from transport is anticipated during normal day-to-day operation.

5.7.3 RPV transport

It is envisaged that on average one RPV will be delivered to the interim ILW store per year but there may be a maximum of three deliveries per year at the start of interim ILW store operation.

The UK has more than 50 years experience of transporting radioactive materials by road rail and sea. There have been no transport incidents resulting in any significant radiation dose to an individual in connection with the transportation of radioactive waste and materials between UK nuclear facilities.

Radioactive waste transport is subject to strict controls to protect people property and the environment. The Office for Nuclear Regulation (ONR) regulates the transport of civil radioactive wastes and the Defence Nuclear Safety Regulator (DNSR) does the same for MOD. Both apply regulations based on standards developed by the International Atomic Energy Agency (IAEA). The RPV containers will be approved for transport by the DNSR).

External dose rates for the RPV transport package will be in accordance with the transport regulation requirements, that is 2 mSv/h in contact and 0.1 mSv/h at 2m from the package and will be managed to ALARP/ALARA.

The MOD will be responsible for moving the RPVs to the interim storage site. Detailed container design work is not yet complete but road, rail and sea options have been provisionally assessed. The indications are that the RPV Containers are almost certainly too wide for the railways and the complexities and costs of sea transport would be a big disadvantage, especially since some shortlisted sites are inland. Economics and practicality therefore currently favour road transport but whichever solution is finally adopted, it will have to be shown to be a safe choice.

The RPV transport package including RPV, container and outer cover will weigh over 90 tonnes so it will have to be moved under the Abnormal and Indivisible Load Regulations and will be escorted. There are over 150,000 escorted road transport movements every year and loads of comparable size or weight are regularly moved on British Roads so a standard long wheelbase heavy transport vehicle is assumed. It would be longed than a normal HGV to spread the load over a large number of axles and there may be limitations on bridge crossings but the lorry is expected to be only a little wider than a normal HGV so main road or motorway lane closures are not expected.

Local authorities and emergency services will be consulted and informed about proposed movements as required by regulations. In the unlikely event of an accident, comprehensive transport emergency arrangements will be in place.

5.8 Mitigating Residential Disruption

ILW stores are largely passive facilities and therefore require little day-to-day maintenance. No significant noise is anticipated from the proposed interim ILW store.

As identified in section 5.5, the application of a Construction Transport Management Plan would help to minimise disruption from construction traffic, although some disruption would be expected.

Noise and potential vibration may occur during construction and this potential effect would require further assessment as part of an EIA. The levels and times of noisy activities to be undertaken during construction are likely to be conditioned by the planning authority and therefore it is assumed that noise would be managed within acceptable limits and restricted to acceptable working hours.

5.9 Managing Air Quality

The assumption is that under normal operation there would be no discharges to air from the interim ILW store and therefore there would be no requirement to vary existing site permits / authorisations. Should this not be the case, there would be a requirement for the site licensee to seek a variation to permitted / authorised discharge limits.

During construction, it is envisaged that emissions such as dust would be managed through standard construction site practices, to be set out within a CEMP. Typical measures to manage dust during construction and demolition projects include:

- Dampening down site access roads as necessary to reduce airborne dust.
- Locating internal haulage routes away from sensitive receptors where possible
- Re-vegetating or temporarily sealing completed earthworks as soon as is practicable;
- Vehicles carrying spoil, fill or earthworks material leaving the site would be sheeted to prevent loss of materials off-site.

5.10 Habitats Regulations Assessment

The Defence Infrastructure Organisation (as the MOD Competent Authority) undertook a plan-level Habitats Regulations Assessment (HRA)[31] of the SDP proposals alongside (but separate to) the previous SEA, in 2010/11. This was consulted upon with the relevant Statutory Bodies, in accordance with the EC Habitats Directive (92/43/EEC) and transposing regulations, ahead of the Ministerial Announcement on the way forward in March 2013.

It was determined that, although both Rosyth and Devonport are close to a number of Natura 2000 sites, the activities in the dockyards would be unlikely to have significant effects on the integrity of those sites and associated "designating" species (i.e. species which are a reason for designating those sites).

Following consultation on the proposed scope of the SEA, it has been determined that the Plan-level HRA requires updating, since the potential locations for an interim ILW store were not available at the time of the previous HRA. This has been undertaken separately, and can found at Annex 7 of this Environmental Report.

[31] Defence Infrastructure Organisation (2011). *Submarine Dismantling Project – Draft Habitats Regulations Assessment.* Issue 1.

6 Assessment Results: AWE Aldermaston

6.1 Site Background

AWE Aldermaston is situated near to the southern boundary of West Berkshire District, and neighbours the town of Tadley in Hampshire (Basingstoke and Deane Borough) to the south.

The site was initially developed in 1942 as a World War II RAF airfield. The airfield was taken over in 1950 as a site for the UK's nuclear weapons programme. The site extends to 285 hectares (ha). There are a number of other developments within the site recently constructed or under construction.

Figure 6-1 below provides a map of the site, indicating also the approximate maximum size of an interim ILW storage site (3,150 m^2) and the likely construction and RPV transport routes (see Section 6.4). It should be noted that the particular location for the proposed interim ILW store has not been specified and Figure 6-1 is intended to provide context only in terms of the size of footprint within the context of the licensed site. The exact location would be determined following detailed investigations should the candidate site be selected for the interim ILW storage.

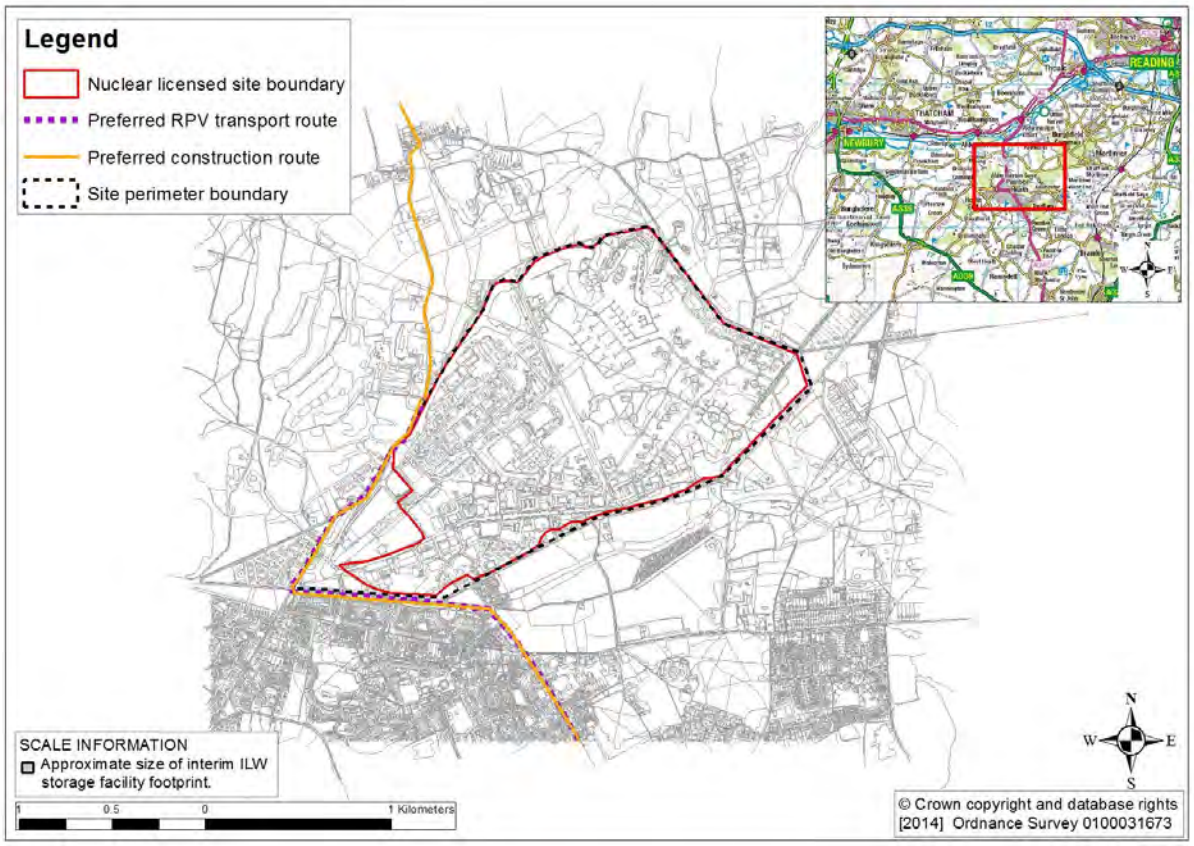


Figure 6-1: Map of AWE Aldermaston indicating nuclear-licensed boundary and likely construction and RPV transport routes

6.2 Evolution of the Baseline

In July 2005, the then Secretary of State for Defence announced a major capital investment programme at AWE of some £350 million over the next 3 years *"…to ensure that we [the UK] can maintain the existing Trident warhead stockpile throughout its intended in-service life…".*

Following the Government announcement of investment into the facilities at AWE Aldermaston and AWE Burghfield, a Site Development Context Plan (SDCP) was published in November 2005. The primary purpose of the SDCP is to define the broad parameters of the Government's investment programme, announced in July 2005, in land use terms and to facilitate early discussion and consultation with the relevant planning authorities and other stakeholders. The overall approach to the modernisation of AWE Aldermaston and AWE Burghfield in the SDCP is based on refurbishing and replacing facilities constructed principally in the 1950s and 60s. It is proposed that capacity will be increased to existing stores for containing ILW, which have approximately 6 years' capacity remaining at the current rate of generation. AWE aims to provide additional capacity through to 2025, or potentially further into the future.[32]

The SDCP was accompanied by a Strategic Sustainability Appraisal (SSA) that identified the main environmental and related issues that were likely to arise in the course of implementation of the programme.

The SDCP was updated in 2008 and incorporates progress made as well as including some new development.

The first SDCP included 10-year Illustrative Site Development Framework Plans for each of the two sites at Aldermaston and Burghfield. These plans set out the principal land use proposals that were the subject of the investment programme at an end date of 2015.

Since November 2005, considerable progress has been made towards the programme as set out in the SDCP 2005 and 2008. Over 2 million square metres of development is currently under construction at the two sites to meet this need. The new investments will be matched by the demolition and clearance of the facilities which have been replaced by the new developments.

Key developments for AWE Aldermaston include Project Pegasus; the Technology Development Centre (TDC) and Project Circinus. Project Pegasus is the largest capital project at AWE Aldermaston. It will provide a new single facility for the storage and handling of enriched uranium to replace the existing, ageing facilities at the site which date back to the 1950s and 60s. It is currently under construction. The TDC is currently being built and would secure 30 full time equivalent jobs. It will be a purpose built secure research facility that will house a radiographic development hall, laboratories, workshops, offices, plant rooms, conference and welfare facilities. Project Circinus will be a high explosives fabrication facility and is due for completion in 2015. The ongoing development indicates that AWE Aldermaston would remain an active, secure site in the research, development and handling of nuclear weaponry for the foreseeable future.

Trend data available for radiological discharges from Aldermaston (which includes data from AWE Burghfield) shows that they declined significantly over the past 10 years to consistently low levels. There are no capital projects which would lead to any significant change in radiological discharges in the future.

AWE has identified historic land contamination across the site typical of any previously developed post WWII industrial site. AWE is developing and implementing appropriate management strategies through an Environmental Operations Land Quality programme.

[32] ONR (2013). *Quinquennial review of AWE's strategy for nuclear decommissioning at Aldermaston and Burghfield as submitted December 2012*. http://www.hse.gov.uk/nuclear/documents/2013/quinquennial-review-awe.pdf

The 2013 quinquennial review (QQR) of AWE's strategy for nuclear decommissioning describes the future management of operational and legacy radiological waste.[33]

Climate change in the region is expected to lead to the following impacts of most relevance to the site: increased scarcity of water, such as frequency of drought in the summer months – this is accounted for to some extent in the water resource status reported in Section 6.11.1; increased intensity of rainfall and frequency of intense rainfall events, leading to increased flood risk; changes in woodland species, with possible increases in pests and disease; increased wildfires, affecting in particular gorse, heath and grass; and increased risk of the spread of invasive species.[34]

As a baseline assumption, the nature conservation sites and notable habitats around Aldermaston and Burghfield are not predicted to change in area / boundary significantly into the long-term. However, there are a number of generic national threats to biodiversity, which may contribute towards a decline in condition. This includes the effects of climate change, which may drive changes in vegetation cover and increase vulnerability to certain impacts, such as drought and spread of invasive species. For the assessment, it will be assumed that designated or priority habitats maintain their overall nature conservation value into the future, whilst biodiversity generally would be under increasing pressure from climate change and development.

Population projections for West Berkshire are for an approximately 10% increase between 2011 and 2021. The age profile is expected to change significantly, with a notable increase in people aged 65 and over[35]. As stated in Section 6.3, Tadley and Burghfield have been a focus for new development over the past 30 years, which may place additional pressure on resources such as water and biodiversity in the area.

6.3 Local Planning Context

The West Berkshire Core Strategy 2006 – 2026 was adopted in July 2012[36]. The Core Strategy takes account of national planning policy and therefore implements at a local level, objectives consistent with those laid out in Annex 3.

Area Delivery Plan Policy 6 for the East Kennet Valley identifies an allocation of 800 homes for the East Kennet Valley. The amount of development for the surrounding area is limited by the lack of suitable existing infrastructure, particularly public transport links. Aldermaston is shown in the Core Strategy as a service village, providing a range of services to the surrounding area, and it also is stated to have some limited development potential.

Policy CS9 lists AWE as one of three existing employment sites which are strategically important for the district's economy. The policy goes on to states that the Site Allocations Development Planning Document will *"…Assess the role and function of these three sites to determine whether they should be designated as Protected Employment Areas or an alternative bespoke designation consistent with their importance to the local economy…".*

There is also a specific policy (policy CS8) for the AWE Aldermaston and Burghfield sites, which sets out consultation zones for proposed development within 3 km, 5 km and 8 km of

[33] http://www.hse.gov.uk/nuclear/documents/2013/quinquennial-review-awe.pdf

[34] ClimateUK (2012). *Summary of Climate Change Risks for South East England*. Available from: http://www.climatesoutheast.org.uk/images/uploads/South_East_LOW_RES.pdf

[35] West Berkshire Council (2013). *Population Projections (2011-21)*. Available from: http://www.westberks.gov.uk/index.aspx?articleid=19553

[36] West Berkshire Council (2012). *West Berkshire Local Plan. West Berkshire Core Strategy (2006-2026) Version for Adoption.* Available from: http://www.westberks.gov.uk/index.aspx?articleid=25436

AWE Aldermaston in the interests of public safety, to assist in the management of the unlikely event of an accident involving the spread of radioactive materials beyond the nuclear site boundary. Proposals must consider, amongst a number of criteria, the impact on emergency services and the emergency off-site plan. Policy CS8 requires the Council to consult with the ONR regarding planning applications within the emergency planning zones and to have regard to ONR's advice.

The applicable development policy in Tadley, to the south, is the saved policies of the adopted Local Plan for Basingstoke and Deane Borough Council (1996 – 2011)[37]. Under this Local Plan, Tadley has been a focus for new development, due to its good provision of community services.

The West Berkshire Local Transport Plan 2011 – 2026[38] proposes to improve safety and reduce the impact of the A340 through Aldermaston, and to discourage longer-distance traffic, especially freight, from using the A340.

The site is also partly designated under the Berkshire Biodiversity Strategy as a Biodiversity Opportunity Area across its eastern part, with further area surrounding the site (all part of the Burghfield to Tadley Plateau area), which shows where biodiversity improvements are likely to have the most beneficial results at a strategic scale. Each area has specific targets, which can be found at the Berkshire Local Nature Partnership website[39].

The site is also subject to the Public Right of Way (PROW) Improvement Plan corridors, which aim to create public access around the site in order to restore connectivity between residents and the countryside.

6.4 Proposals

AWE has confirmed that an interim ILW store at the site could be located within the existing Aldermaston nuclear-licensed site.

The West Berkshire Council freight strategy requires access to AWE Aldermaston to be either from the M3 J6 and A340 or via the M4 J12, A4 and A340.

Due to a possible width restriction over the Kennet and Avon canal which could affect the route from the M4, it is therefore expected that RPV transport would be routed from the M3 to the site, via the A340.

6.5 Radiological Discharges and Exposures

6.5.1 Baseline Overview

Ionising radiation exposure from **natural sources** in the vicinity of AWE Aldermaston is estimated to be less than 2 mSv per year[40]. Figure 6-2 below presents an excerpt from the 2005 review of ionising radiation exposure of the UK by the Health Protection Agency (HPA)

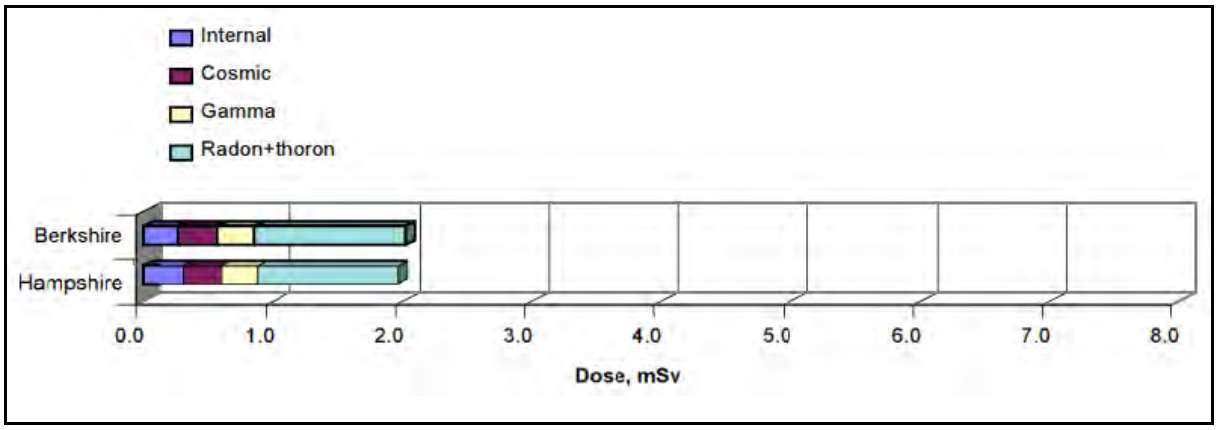
[37] Basingstoke and Deane Borough Council (2006). *Basingstoke and Deane Borough Adopted Local Plan 1996 – 2011 (Adopted July 2006)*. Available from: http://www.basingstoke.gov.uk/browse/environment-and-planning/planning/adopted-local-plan/

[38] West Berkshire Council. *Local Transport Plan for West Berkshire 2011-2026*. Available from: http://www.westberks.gov.uk/index.aspx?articleid=18646

[39] Berkshire Local Nature Partnership website, available from: http://berkshirelnp.org/index.php/what-we-do/strategy/biodiversity-opportunity-areas

[40] Health Protection Agency (2005). *Ionising Radiation Exposure of the UK Population: 2005 Review*. Available from: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947389360

(now part of Public Health England), illustrating the average annual doses to residents from different natural background sources.



NOTE: "internal" refers to radiation originating from terrestrial sources which, via the food chain, end up in our bodies, and "gamma" radiation is received externally from mainly terrestrial sources (rocks, soil and building materials such as stone). Source: extract of figures in HPA, 2005, p.76.[40]

Figure 6-2: Annual exposure to natural background radiation in Berkshire and Hampshire

Activities at AWE Aldermaston which could result in radiological discharges comprise:

- Gaseous emissions to air;
- Discharge of liquid waste to Aldermaston Stream;
- Discharge of liquid waste to Silchester sewage treatment works, and subsequently into the River Kennett; and
- The current and/or planned removal of a historic legacy of radioactive waste and/or decontamination of groundwater.

Table 6.1 below summarises the discharges or emissions to air and water from AWE Aldermaston relative to the permitted levels authorised by the Environment Agency. The latest Environment Agency monitoring data available for 2011 indicates that emissions have remained within their respective limits for 10 years (zero notifiable releases)[41].

Table 6.1: Radiological discharges / emissions at AWE Aldermaston (2012)

Discharge / emission	Discharge Limit (annual equivalent)	Discharges during 2012	
		Measured annual discharge	% of Annual Limit
Air: alpha	165 kBq	27.2 kBq	17
Air: particulate beta	600 kBq	10 kBq	1.7
Air: tritium	39 TBq	710 GBq	1.8
Air: carbon-14	6 MBq	Nil	Nil
Air: activation products	NA	20 kBq	NA
Air: volatile beta	4.4 MBq	290 kBq	6.6
Water (Silchester): alpha	10 MBq	2.69 MBq	27
Water (Silchester): other beta emitting radionuclides	20 MBq	3.51 MBq	18
Water (Silchester): tritium	25 GBq	140 MBq	<1

[41] Environment Agency (2013). *Interactive Maps.* Available from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

Discharge / emission	Discharge Limit (annual equivalent)	Discharges during 2012	
		Measured annual discharge	% of Annual Limit
Water (to stream): tritium	NA	560 MBq	NA

According to the 2012 Radioactivity in Food and the Environment (RIFE) report[42], the radiation total dose from all pathways and sources at AWE Aldermaston and Burghfield sites was less than 0.005 mSv, which is less than 0.5% of the legal dose limit.

The RIFE report notes that historical groundwater contamination at the site has been reduced in recent years by radioactive decay and dilution by natural processes.

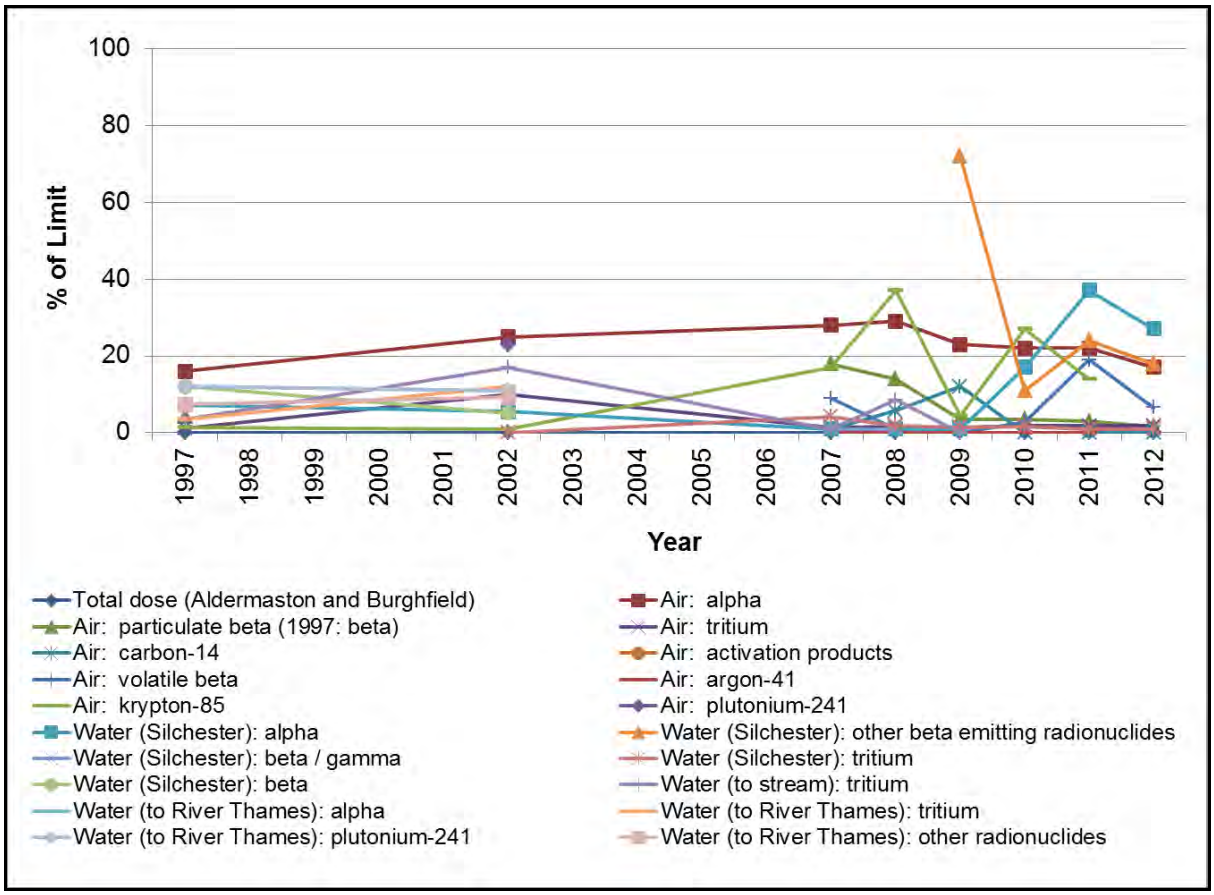


Figure 6-3 Radiological discharges and dose over time at AWE Aldermaston (Source: RIFE reports - see footnote)

Figure 6-3 above shows the available RIFE report radiological discharge and monitoring data for the years 1997, 2002 and each of the past five years from 2007 to 2012. (Note: the specific discharges requiring monitoring at the site have changed over time, and hence data for every discharge is not available for every year). The data shows the discharges and dose to the public have remained well within their respective limits over the past 15 years.

[42] Environment Agency, Food Standards Agency, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2013). *Radioactivity in Food and the Environment, 2012*. Available from: http://www.food.gov.uk/science/research/radiologicalresearch/radiosurv/rife/radioactivity-report2011/#.UlOVzlDYjpU and http://sepa.org.uk/radioactive_substances/publications/rife_reports.aspx

6.5.2 Pre-existing and Committed Mitigation and Management

Section 5.4 provides details of the regulation and management of radiological discharges and exposures for nuclear sites.

AWE's 'nuclear safety case' is the key pre-existing, committed mitigation for the management and minimisation of radiological discharges in order to reduce risk to ALARP / ALARA. This is supported by regulation of the receipt of radioactive waste onto nuclear sites and the disposal of radioactive waste on or from nuclear sites by the Environment Agency[43] (refer to Section 5.4 for details of the regulation of nuclear sites and the need to review the nuclear safety case to reflect any proposed alteration of activities).

An on-site and off-site emergency plan must be prepared for licensed nuclear facilities and kept up to date under The Radiation Emergency Preparedness & Public Information Regulations (REPPIR) 2001[44].

The off-site emergency plans are prepared and updated by the relevant local authority. These plans are reviewed every three years or less, as required, to ensure that all emergency services involved in an emergency are aware of their roles and have the sufficient preparedness to act at any time. The size of the emergency planning area differs site by site in the UK, with due consideration given to individual factors associated with each site. The current emergency planning distance for the AWE Aldermaston site is understood to cover a radial distance of 3 km[45].

Under REPPIR, the addition of any new operation (e.g. the interim ILW store) would require the off-site emergency plan to be reviewed.

An on-site emergency plan is also required by REPPIR, which is prepared by the site operator. The AWE Aldermaston Site Emergency Plan (January 2013) is the current such plan.

6.5.3 Assessment of Potential Negative Effects

Radiological exposures from implementing interim ILW storage are predicted to be limited to small levels of direct irradiation exposure from RPV sources within shielded containers (see further below). SDP has confirmed that there will be no radiological discharges to air, soil or water directly from the operation of the interim ILW store.

During construction, there is some potential for discovering historic radioactive contamination in the ground during site preparation and construction phases but this would be carefully managed in accordance with legislation and best practice including: full risk assessment and mitigation measures implemented to minimise potential exposure to humans (see Section 5.4). With required controls, it is considered that any potential for increased exposure to radiation would be limited to site workers. Significant effects to site workers' health are unlikely given construction good practice and stringent health and safety requirements.

[43] For more information, see Environment Agency (2013). *Nuclear*. http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/sectors/32517.aspx, and also HSE (accessed 2013). *ONR: How we regulate*. http://www.hse.gov.uk/nuclear/regulation-and-licensing.htm

[44] The Radiation Emergency Preparedness and Public Information Regulations (REPPIR), 2001. Available from: http://www.legislation.gov.uk/uksi/2001/2975/contents/made

[45] http://www.onr.org.uk/depz.htm

During operation, the risk of exposure is mainly limited to direct radiation to workers and is subject to regulation and will be managed to ALARP / ALARA. The very low maximum external dose target of 0.5 mSv/hr at the external walls of the interim store will ensure that local communities experience no practically measurable increased dose from the interim ILW store.

During transport from Rosyth and Devonport to Aldermaston, direct radiation from the RPV would be through a shielded container, designed to ALARP / ALARA levels of potential exposure (see Section 5.4.3). Shielding will reduce the levels of direct radiation to very low levels outside of the RPV vehicle, which would present no significant risk of exposing members of the public to high levels of radiation. The very low frequency of transport (one to three movements per year) is taken into account in this assessment.

Emergency scenarios and preparedness would be planned for, and will ensure that under any incident scenario it would be very unlikely that people could be exposed to levels of radiation significantly above background levels, and in the 'worst case', they would be unlikely to be exposed to levels of radiation which would adversely affect their health.

The assumption is that it is highly unlikely that degradation of the waste package will occur necessitating repackaging before the end of interim storage. However, it is assumed that repackaging will be required at the end of interim storage due to the likely evolution of regulations, policy and standards. This would involve no radioactive discharges and the discarded packaging would not be radioactive.

Given the pre-existing and committed mitigation above, the likely effects across the phases of implementation of interim ILW storage at AWE Aldermaston are envisaged to be negligible for all four stages (Construction, Operation, Decommissioning and Extended Operation Stages), as summarised in Table 6.2 below.

Under normal operation there would be no discharges to air, water or soil from the interim ILW store. Direct radiological emissions from the store will be managed to ALARP / ALARA standards and will be significantly small as to make them practically unmeasurable at the site boundary. Therefore, there will be no increase in the effective dose to the public locally relative to current levels.

Table 6.2: Summary SEA Assessment for Radiological Discharges, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

Under REPPIR, the addition of an interim ILW store would require that the off-site emergency plan is reviewed.

6.5.4 Measures Envisaged to Mitigate and Monitor Radiological Safety

No additional measures have been identified. The pre-existing mitigation set out in Section 5.4 and Section 6.5.2 means that risks are reduced to ALARP/ALARA and there is an established monitoring regime associated with nuclear installations (refer to Section 6.5.2).

6.5.5 Opportunities for Potential Benefits and Enhancements

No opportunities for potential benefits or further enhancement have been identified for radiological discharges.

Table 6.3: Summary SEA Assessment for Radiological Discharges, Positive Effects

	Construction	Operation	Decommissioning	Extended operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

6.6 Biodiversity and Nature Conservation

6.6.1 Baseline Overview

The AWE Aldermaston site is located in the London Basin Natural Area, which is *"a large, trough-like basin which was formed around 50 million years ago*", drained by the River Thames and its extensive network of tributaries[46]. The London Basin is characterised by islands of habitats which include large areas of woodland and notable areas of heathland, alongside a number of other important habitats.

Table 6.4 below lists the key biodiversity features within 5 km of AWE Aldermaston. Figure A2-2 also provides a wider radius around the site, and shows that there are three Special Areas of Conservation (SAC), one Special Protection Area (SPA) and no Ramsar sites within 20 km of the site.

Table 6.4: Biodiversity / nature conservation features within 5 km of AWE Aldermaston

Features	Notable Types / Examples
11 SSSIs	See text below
1 NNR	Ashford Hill NNR, approximately 2 km to the west of the site.
UK BAP priority habitats	Lowland heathland; Lowland meadow; Deciduous woodland; Woodpasture and Parkland; Fens; Traditional orchard
15+ Ancient woodland areas	More than 15 distinct areas
15 LWSs	See text below.

Designated nature conservation near to the site's boundaries include West's Meadow, Aldermaston Site of Special Scientific Interest (SSSI) approximately 200 m south, Decoy Pit, Pools and Wood SSSI approximately adjacent to the east and Wasing Wood Ponds SSSI approximately 250 m west. All three are in overall favourable condition. There are also two woodland Local Wildlife Sites (LWSs) near to the site's boundary both north and south (one of which comprises Ancient Woodland). In total within 1 km there are three Ancient and Semi Natural Woodlands and one Ancient replanted Woodland. Wasing Wood Ponds is also partly covered by a non-statutory Important Bird Area (IBA) (which also covers habitat

[46] Natural England (2013). *Natural Areas: 66 London Basin*. Available from: http://www.naturalareas.naturalengland.org.uk/SCIENCE/NATURAL/NA_DETAILS.ASP?NA_ID=66&S=&R=6

outside of the SSSI from 100 m west of the site), showing its significance to birds. Another extensive IBA begins approximately 350 m to the east, and extends for nearly five kilometres.

The UK Biodiversity Action Plan (BAP) priority habitats in proximity to the site's boundaries are deciduous woodland and lowland heathland. Deciduous woodland borders approximately 70% of the site boundary to the north, east and west, sections of which are also classified as ancient woodland. To the north and south of the site, the deciduous woodland is also within the site boundary. Also within the eastern boundary is woodpasture and parkland, and also lowland heathland. There are traditional orchards nearby, but not within or adjacent to the site.

Within 1 km of the site and within the site are several fish ponds. A large area extending across the northeast boundary of the site is locally designated as a Biodiversity Opportunity Area, which is for the creation and enhancement of habitat and networks of habitats.

Known protected species within the site comprise a variety of birds, with most sightings on the heathland in the northeast of the site. There are a number of protected and notable plant and animal species within 2 km of the site.[47]

6.6.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on nature conservation and the potential for encountering protected species during construction. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures (e.g. fencing, compensatory habitat, species translocation) required to avoid or minimise any significant impacts.

AWE has an appointed Technical Authority for Ecology and operates a Biodiversity Action Plan (BAP) to protect and manage the species and habitats of interest on their sites. The Technical Authority for Ecology at AWE has already prepared a Biodiversity Action Plan (BAP) report identifying areas of BAP heathland habitat and outlining measures to protect and manage it.

6.6.3 Assessment of Potential Negative Effects

Interim ILW storage would not require any discharges to air or water.

The specific location of an interim ILW store includes the possibility of parts of the site which include a blanket designation of 'woodpasture and parkland' UK BAP priority habitat, and also some smaller, more specific areas of lowland fen BAP priority habitat. The latter is an area of residual acid heathland which is typical of this area, but becoming scarce. There is existing development in both of these land areas designated as UK BAP habitat.

The area of the lowland fen habitat is a built-up area, with some improved grassland. It is envisaged that even in this area, an interim ILW store could be sited without significantly affecting the lowland heathland, as long as good practice construction measures are followed. AWE would involve its internal Technical Authority for Ecology in the development of proposals for any interim ILW store within the site, including the specific location (aiming to avoid negative effects where possible, and then minimise negative effects). Where not

[47] AWE, 2005. *Sites Development Strategy Update 2005*. Available from: http://www.awe.co.uk/Contents/Publication/1567930Site%20Development%20Strategy%202005.pdf

avoided, AWE's Technical Authority for Ecology would assist in proposing further mitigation required to minimise negative effects (e.g. compensatory habitat).

It is expected that lowland fen habitat would be avoided. AWE has 'best practice' management procedures in place, including that all trees of potential ecological or landscape value are protected. Should any trees need to be removed in order to construct a facility, permission must be sought from the Head of Environment. Where permitted, at least three trees must be planted in place of the removed tree.

Despite mitigation, during construction, there remains potential for temporary habitat loss, and also noise, dust and lighting to have an effect on wildlife. Measures would be identified, outlined in the CEMP and taken to minimise such effects, but it is impossible at this stage to predict the site-specific issues which may be encountered, and therefore ensure full avoidance of impacts. A minor negative effect is expected.

Also during construction, transport movements associated with the interim ILW store are anticipated to be so low as to cause no significant air quality effects upon nature conservation. The potential for other significant projects at AWE Aldermaston (see Section 6.2) to cause cumulative construction transport effects has been considered. In particular, coastal and floodplain grazing marsh either side of the A340 between Aldermaston and the M4 is potentially sensitive to harm from transport emissions. However, the A340 is heavily trafficked, and there is little potential for the total transport contribution from AWE to significantly increase emissions. No significant effects are expected.

During operation, there would be little activity associated with the interim ILW store, and no significant effects are likely. The very infrequent RPV movements expected are unlikely to affect habitats or species.

During decommissioning, as with construction, there would be the potential for noise, dust and lighting to have an effect on ecological receptors and so a minor negative effect is predicted.

Extended operation if required, assuming it would be within 40 – 100 years, is expected to be similar to the operational period, with no significant effect.

Table 6.5: Summary SEA Assessment for Biodiversity, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

6.6.4 Measures Envisaged to Mitigate and Monitor Effects on Biodiversity

AWE Aldermaston has an environmental management system (EMS) in compliance with ISO 14001. It is envisaged that this could be amended to include the interim ILW store, and include biodiversity considerations. EMS could prove to be an effective way to monitor biodiversity on-site and could incorporate a site biodiversity management plan.

6.6.5 Opportunities for Potential Benefits and Enhancements

The implementation of ecological mitigation could be used to help to improve local biodiversity. There may be potential to expand on the existing BAP with measures to

manage and improve biodiversity at or (where permitted and feasible) in the near vicinity of the site. Habitat creation is likely to have most impact at a strategic scale.

Benefits would most likely not be applicable until the operational period.

Table 6.6: Summary SEA Assessment for Biodiversity, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**+**	**+**	**+**

6.7 Population

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the number or types of jobs available in local economies, and levels of deprivation in surrounding areas'. No significant potential effects upon other aspects of population were anticipated during the scoping stage.

6.7.1 Baseline Overview

The settlements in the near vicinity include the residential area of Tadley to the south, the small village of Aldermaston to the north of the site (opposite a woodland and wildlife area) and Brimpton Common village to the west.

The site is situated within a Lower-layer Super Output Area (LSOA) which includes the village of Aldermaston to the north. The area has low deprivation across economic and related issues (i.e. domains) of the Indices of Multiple Deprivation (IMD). However, access to services is poor as measured by the sub-domain 'geographical barriers', whereby the area is within the 10% most deprived LSOAs in England[48].

Areas (as broken down into LSOAs) surrounding the site perform very similarly with regard to deprivation, except that LSOAs to the south in and around Tadley have high accessibility to services.

AWE employs in excess of 6,000 staff between Aldermaston and Burghfield, which lies approximately 7.5 km to the north-east. The financial contribution of the site to the local economy is relatively substantial.

To the west of the site, there is a small area of 'protected employment land' designated in the West Berkshire Local Plan, and an area of 'committed development' to the east on the other side of Soke Road.

6.7.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on local communities, including any businesses. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures to manage transport effects, for example.

[48] DCLG – Department of Communities and Local Government (2011). *English indices of deprivation 2010*. Available from: https://www.gov.uk/government/publications/english-indices-of-deprivation-2010

6.7.3 Assessment of Potential Negative Effects

No negative effects are considered likely. The site is already subject to on-going development, and this additional construction project is unlikely to alter community perception of the area to an extent which could harm local investment or employment to a significant degree.

There are potential medium-term and long-term employment opportunities from the interim ILW store, although this is not anticipated to generate many jobs (not more than 100 full-time equivalent employees maximum during construction and 10 full-time equivalents during operation).

Table 6.7: Summary SEA Assessment for Population

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

6.7.4 Measures Envisaged to Mitigate and Monitor Effects on Population

No measures have been identified.

6.7.5 Opportunities for Potential Benefits and Enhancements

There are potential short-term, medium-term and long-term employment opportunities from the interim ILW store, although this is not anticipated to generate many jobs (circa 100 full-time equivalents in the short-term and 10 in the medium to long-term).

Table 6.8: Summary SEA Assessment for Population, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**+**	**+**	**+**

6.8 Health and Well-Being

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the health, safety and well-being of local communities'. No significant potential effects upon other aspects of health, including workers / employees, healthcare infrastructure / provision or recreation, were anticipated during the scoping stage.

6.8.1 Baseline Overview

As for 'Population', the site is situated within an LSOA which includes the village of Aldermaston to the north and has low deprivation across health, disability and related issues

(i.e. domains) of the IMD. It is amongst the 40% least deprived nationally for health and disability. LSOAs surrounding the site perform similarly[49].

6.8.2 Pre-existing and Committed Mitigation and Management

Environmental discharges which could affect health and well-being are discussed in Sections 6.5, 6.9, 6.10, 6.11 and 6.12. Potential exposure to radiation is and will in future be managed, regulated and monitored to ALARP/ALARA.

Section 5.4 should be referred to for further information about pre-existing mitigation common to all nuclear installations.

6.8.3 Assessment of Potential Negative Effects

Potential exposure would be in the form of low levels of direct radiation (no discharges are anticipated from the interim ILW store). The main potential for receiving an increased radiation dose would lie with the site workforce, as the public would receive no practically measurable increase in radiation does and all emissions of radioactivity will be managed to ALARP / ALARA.

During operation, it is anticipated that there will be a slight increase in transport movements (likely to be infrequent RPV deliveries and very few personnel / maintenance transport requirements) which will generate minor increases in transport emissions. The scale of these emission increases is not anticipated to be significant.

Disruption from construction traffic, noise and dust may cause some disturbance and inconvenience during construction to local residents, but this would be temporary and is unlikely to affect any determinants of health[50] significantly.

The AWE Aldermaston site has a history of potentially contaminative land uses which are not untypical of a site in long-term industrial use. Although it is not possible to predict likely effects or mitigations until the investigations are complete, interim ILW storage would not affect the existing problem, and is considered unlikely to significantly affect future management or remediation. Suitable testing of ground conditions, compliance with legislation and mitigation planning, would ensure no significant risk of significant effects to health during construction or decommissioning.

Medium-term and long-term employment opportunities can lead indirectly to significant benefits to people's health and well-being. However, interim ILW storage is not anticipated to generate many jobs (circa 10 full-time equivalent), and thus the benefit is neutral.

Table 6.9: Summary SEA Assessment for Health and Well-Being, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

[49] DCLG – Department of Communities and Local Government (2011). *English indices of deprivation 2010*. Available from: https://www.gov.uk/government/publications/english-indices-of-deprivation-2010

[50] 'Determinants' of health and well-being can be defined as key factors which together determine how health a person or community is likely to be. They include factors such as health social networks, mental health and well-being, physical environment (e.g. housing, local area), employment opportunity and access to services.

6.8.4 Measures Envisaged to Mitigate and Monitor Effects on Health and Wellbeing

A future EIA would account for the potential cumulative effects across different environmental topics on health and well-being, including for example, recreation and amenity.

6.8.5 Opportunities for Potential Benefits and Enhancements

Interim ILW storage is expected to generate a relatively small number of jobs and (circa 10 full-time equivalents). It is therefore unlikely to significantly benefit health and well-being in the community.

Table 6.10: Summary SEA Assessment for Health & Well-Being, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

6.9 Noise and Vibration

6.9.1 Baseline Overview

There are a number of potentially sensitive receptors to noise and vibration in the vicinity of the site. The residential area of Tadley is directly to the south, and there are farms, isolated dwellings and villages in all directions. Within 1 km of the site, six schools, one community centre, five places of worship, one library and a hotel have been identified. There is also a residential home for young people with physical and learning disabilities.

Noise levels were measured at potential sensitive receptors to the north of the site for a planning application in 2011, which was approved in 2012. The data showed that without the proposals of the 2011 planning application, noise levels during the day at potential sensitive receptors to the north and northeast were below 50 $L_{Aeq,12h}$ and 50 $L_{Aeq,16h}$ during the day, and below 44 $L_{Aeq,8h}$ during the night.[51] This is below the outdoors limits for noise established by the World Health Organisation (i.e. levels predicted to have an increased probability of annoyance).[52] Noise levels were higher at a receptor near to the A340, due largely to traffic noise. The proposed development was not expected to lead to any significant noise effects during operation.

No records of the site causing any vibration problems in the local area or otherwise.

6.9.2 Pre-existing and Committed Mitigation and Management

A future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on noise and vibration. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures to

[51] RPS (2011). *Technology Development Centre Defence Exempt Environmental Appraisal*.

[52] WHO – World Health Organisation (2009). *Night Noise Guidelines for Europe*. http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf and WHO (1999). *Guidelines for Community Noise*. http://www.who.int/docstore/peh/noise/guidelines2.html

manage transport effects, for example (such as traffic noise from the A340). It is expected that the EIA and CEMP could include such measures as:

- traffic management;
- limiting working hours; and
- monitoring of potential impacts of vibration, and frequency of vibration-generating activities.

It is also expected that AWE Aldermaston's EMS will consider and deal with noise generation and management of this impact during operation.

6.9.3 Assessment of Potential Negative Effects

During construction, it is anticipated that some residual noise and vibration will be generated despite the adoption of mitigation measures. This would constitute a minor negative effect. Whilst it is not possible to guarantee a neutral effect at this stage of assessment (SEA), project-level EIA may identify measures to avoid or fully mitigate any negative effect.

During operation, the activities associated with interim ILW storage will be largely passive. Ventilation and energy supply units may generate low-level hums or ventilation noise, however these potential impacts would be assessed and mitigated as part of EIA and storage design. A neutral effect is therefore predicted.

Decommissioning carries the same risks of negative noise impacts as the construction process.

Table 6.11: Summary SEA Assessment for Noise & Vibration, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

6.9.4 Measures Envisaged to Mitigate and Monitor Noise

AWE's EMS could be amended (if required / appropriate) to include the SDP interim ILW store. Provision of additional noise monitoring may be incorporated if there is substantial uncertainty about potential impacts. This would be determined by a future EIA.

The EMS or CEMP could provide an effective way to monitor noise and vibration from multiple construction projects.

6.9.5 Opportunities for Potential Benefits and Enhancements

No opportunities for benefits or enhancements have been identified.

Table 6.12: Summary SEA Assessment for Noise & Vibration, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

6.10 Geology and Soils

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'soil quality, variety, extent and/or compaction levels'. No significant potential effects upon geological conservation or land stability were anticipated during the scoping stage.

6.10.1 Baseline Overview

The main soil type of the area is loamy / sandy which drains freely. There is a mixture of low fertility areas and moderate to high fertility areas. There are no Grade 1 or 2 ('best and most versatile') soils known to be within or adjacent to the site, with data showing Grade 3 soils to the north and west, plus 'non-agricultural' (woodland) soil to the east.

There is known contamination of soil within the site, including low levels of radiological (tritium) pollution which is not considered to pose a significant risk to future site users. There are also known and suspected chemicals such as solvents, hydrocarbons and asbestos. In a recent planning application, all of the risks presented by pre-existing contaminants were considered low with mitigation, with the exception of asbestos (low to moderate) due to its potential health effects on workers[53].

6.10.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on geology and soils. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any contaminated land issues, for example, and maximising the remediation and reuse of soils. It is expected that the EIA and CEMP could include such measures as:

- maximising reuse of soils on-site, if appropriate;
- dust suppression and wetting down of exposed soils to prevent their erosion;
- spill and other potential pollution prevention;
- appropriate temporary storage of healthy soils to prevent their degradation, prior to a suitable reuse; and/or
- measures to test and remediate potentially contaminated soils.

Early soil testing (Land Quality Assessment (LQA) and land characterisation studies) would enable consideration of on-site remediation and potential re-use of existing soil that would be excavated or moved to allow for the construction of the interim ILW store. The CEMP should

[53] RPS (2012). *Site Setting Report: AWE Aldermaston*.

include measures for the storage of materials during construction and should include emergency procedures in the event of the release of pollutants during construction.

6.10.3 Assessment of Potential Negative Effects

During construction, soil may need to be disposed of which could otherwise be remediated and re-used on-site depending upon the nature of any potential contaminants and time and space available. Soil on the site may be negatively affected through compaction, degradation and pollution etc. It is considered unlikely that an off-site construction compound would be required, thus not affecting soils off-site. A minor negative effect is predicted at this stage.

Given AWE Aldermaston's site history of potentially contaminative land uses, interim ILW storage would not affect the existing problem, and is considered unlikely to significantly affect future management or remediation.

As part of an EIA, it would be necessary for land characterisation and a land quality assessment (LQA) to be undertaken to establish any remedial measures needed to ensure that land is suitable for its proposed use.

During operation, interim ILW storage is unlikely to affect soils because no discharges are anticipated.

Decommissioning carries risks of negative impacts on soils (compaction, degradation, pollution etc.) but these would be managed at the time through appropriate environmental management processes.

Table 6.13: Summary SEA Assessment for Geology & Soils, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

6.10.4 Measures Envisaged to Mitigate and Monitor Effects on Soils

AWE's EMS and the CEMP would address contaminated land issues, and to be an effective way to monitor progress in dealing with historic contaminated land issues.

6.10.5 Opportunities for Potential Benefits and Enhancements

Should contaminated soils be discovered at the site of the interim ILW store, there is the potential for remediation of these soils, and reuse elsewhere, such that the baseline is improved.

Table 6.14: Summary SEA Assessment for Geology & Soils, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**0**	**0**	**0**

6.11 Water

6.11.1 Baseline Overview

The River Kennet is approximately 2 km to the north of the site, and two tributaries of the river originate from an area close to the northern boundary and flow northwards. The River Enborne is approximately 3 km to the west, and it flows northward into the River Kennet. To the south is Upper Moor's Gully, which flows eventually into West End Brook, Foudry Brook and then the River Thames (at Reading).

The southern part of the site drains into a pond which then drains into Upper Moor's Gully. There are several other ponds on-site, and many more in the wider area. The wider surface water drainage of the site includes outfalls to various streams, including West End Brook, Aldermaston Stream and Fisherman's Brook.

Water quality in these watercourses is 'moderate' ecological quality / potential, good chemical quality for tributaries flowing northwards to the River Kennet, and classified as failing for chemical quality in Foudry Brook (into which West End Brook flows). This failure in chemical quality is due to tributyltin compounds, which are not known to be associated with AWE Aldermaston (and tend to be associated with pesticide use).

The latest Environment Agency monitoring data available for 2011 indicates that authorised discharges to sewer include lead, chlorides and previously (prior to 2010) trichloroethylene, and these have remained within their respective limits for all records available (zero notifiable releases)[54].

The Environment Agency has advised in its scoping comments that the site's discharge limits for suspended solids and pH levels have been exceeded on occasions in the last 4 to 5 years. This has been associated with high rainfall events taking place when construction activities were being undertaken, particularly during major concrete works.

Exceedances in pH levels is reported by the Environment Agency to have contributed to major algal blooms in one or two site ponds during warm weather.

A small part of the southeast corner of the site and land directly to the south of it is in a nitrate vulnerable surface water zone.

Regarding water resources, the site is within a confined aquifer groundwater management unit, within which the predominant assessment of water availability is 'over-licensed'[55]. The site lies within a groundwater source protection Zone 3 (total catchment). It has a groundwater abstraction which has been in use since 1983, for drinking, cooling, sanitary purposes and washing. There is also a new water supply borehole near to the northern boundary[56]. In addition, increasing temperatures and water resources constraints may arise due to projected climate change.

There is currently no information available to this SEA for AWE's annual water consumption.

[54] Environment Agency (2013). *Interactive Maps.* Available from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

[55] Environment Agency (2004). *The Kennet and Pang Catchment Abstraction Management Strategy*. Available from: http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geth0404bhxh-e-e.pdf

[56] RPS (2012). *Site Setting Report: AWE Aldermaston.*

6.11.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on the water environment. This would have to comply with a number of statutory requirements, as well as guidelines on the protection of surface and groundwater. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any pollution prevention measures, for example. It is expected that the EIA and CEMP could include such measures as:

- measures to properly store potentially polluting substances;
- measures to intercept and attenuate any site runoff;
- measures to prevent the pollution of groundwater due to creation of pathways from contaminated land; and
- minimisation of water consumption.

6.11.3 Assessment of Potential Negative Effects

Legislative requirements with regard to discharges will be complied with and construction will be managed through the CEMP to avoid run-off into watercourses therefore no significant effect upon the water environment is predicted. Any modifications to water bodies would need to be compliant with Water Framework Directive objectives.

Very little water consumption is assumed for the operation of the interim ILW store (Table 4.1: **Assumptions about Implementing Interim**) and so no significant effect is anticipated upon availability of water resources.

No likely modifications have been identified based upon current information.

Table 6.15: Summary **SEA Assessment for Water Environment, Negative Effects**

	Construction	**Operation**	**Decommissioning**	**Extended Operation**
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

6.11.4 Measures Envisaged to Mitigate and Monitor Effects on Water Environment

It is envisaged that AWE's EMS would be used to monitor discharges and ensure they are minimised. There will be no discharges from the operation of the ILW store but particular attention to pollution prevention and control should be exercised during periods of high rainfall events to minimise risk of construction site run-off reaching water bodies. Details of appropriate pollution control protocols for high rainfall events should be set out clearly within the CEMP and construction staff advised on these measures.

Opportunities for Potential Benefits and Enhancements

Should contaminated soils be discovered at the site of the interim ILW store, there is the potential for remediation of these soils, which could remove a potential hazard to water quality.

Table 6.16: Summary SEA Assessment for Water Environment, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**0**	**0**	**0**

6.12 Air Quality

6.12.1 Baseline Overview

In addition to transport emissions, AWE Aldermaston has licensed (non-radiological) discharges of NO_x, CO and PM_{10} through combustion of gas and oil. Its licensed limits of discharge (i.e. at source) are NO_x: 180 mg/m^3; CO: 100 mg/m^3; and PM_{10}: 25 mg/m^3. [57] The latest Environment Agency monitoring data available for 2011 indicates that these emissions have remained within their respective limits for all records available. It also indicates licensed discharges of sulphur oxides, ammonia, beryllium, HFCs, inorganic chlorine compounds, methane, hydrogen chloride, hydrogen cyanide, trichloroethylene, tetrachloroethylene, methylene chloride and carbon dioxide, all of which have remained within their respective limits[41].

Estimates of total pollutant concentrations in the area of the site are 15.0 μg/m^3 for NO_x and 15.5 μg/m^3 for PM_{10}, well within the NAQS objectives. There are no Air Quality Management Areas in near proximity to the site.

6.12.2 Pre-existing and Committed Mitigation and Management

Details of the anticipated pre-existing mitigation are set out in Section 5.9. The EIA process, use of a CEMP and application of environmental permitting requirements would limit potential effects upon air quality during construction and operation.

It is also expected that AWE Aldermaston's EMS will further consider and deal with the minimisation of air emissions during operation.

6.12.3 Assessment of Potential Negative Effects

Legislative requirements will be complied with and the site construction will be managed to avoid cumulative impacts on air quality that breach air quality objectives. As a result, no significant effect upon air quality is predicted. This applies to both the construction and decommissioning periods.

During construction, there will be traffic movements associated with the transport of plant and construction workers to and from the site. This could result in air emissions. Given the relatively short-term period over which construction will take place, this would constitute a minor negative effect.

During operation, there will be some traffic movements associated with the transport of ILW / RPVs and staff travelling to and from the site which could result in air emissions. Given the volume of traffic predicted, this effect is considered to be minor.

[57] AWE (2011). *Sustainability Plan 2010 – 2030*. Available from: http://www.awe.co.uk/publications_b667d6b.html

Table 6.17: Summary SEA Assessment for Air Quality, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

6.12.4 Measures Envisaged to Mitigate and Monitor Air Quality

It is envisaged that AWE Aldermaston's EMS, together with the requirements of any permitting, would mean that air quality is monitored and managed as required.

A site-wide transport plan would be beneficial for managing emissions associated with potential cumulative transport requirements across construction projects, combined with staff transport.

6.12.5 Opportunities for Potential Benefits and Enhancements

No benefits or enhancements, nor opportunities for further enhancement have been identified at this stage.

Table 6.18: Summary SEA Assessment for Air Quality, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

6.13 Climate Change and Energy Use

6.13.1 Baseline Overview

The latest Environment Agency monitoring data available for 2011 indicates that carbon dioxide emissions from combustion plant were about 43,000 tonnes in 2011, and the level of emissions has been similar since 2008[41]. However, this is only a partial picture of the site's total CO_2e (carbon dioxide and equivalents) emissions. AWE has a target of reducing its emissions by 25% against the 1999/2000 baseline by end March 2014[58].

AWE has a Combustion Activity Permit (issued by the Environment Agency) which includes four 22 megawatt (MW) boilers primarily fuelled by gas, four 3.5 MW gas turbine generators fuelled by gas oil, various distributed gas boilers totalling 11.83 MW and various backup electrical generators totalling 11.97 MW. Future energy production includes three planned 377 kW gas-fired boilers at a new manufacturing facility, a new 440 kW backup diesel generator at the new process facility under construction.

[58] AWE (2012). *Sustainability Plan 2012 – 2030* . http://www.awe.co.uk/contents/Publication/SustainabilityPlan2012Final.pdf

6.13.2 Pre-existing and Committed Mitigation and Management

Details of the anticipated pre-existing mitigation are set out in Section 5.5. AWE's EMS would help to ensure that energy use is minimised through operation. Energy may be required for climate control such as fans and dehumidifiers.

6.13.3 Assessment of Potential Negative Effects

During construction, use of materials with high embodied carbon content such as steel and concrete, as well as fuel consumption of construction plant would increase greenhouse gas emissions. Therefore a minor negative effect is predicted.

During operation, an ILW store would generate some greenhouse gas emissions. As these are anticipated to be relatively small, a minor negative effect is predicted.

During decommissioning, the use of plant and processes (such as demolition and recycling) would be likely to increase greenhouse gas emissions. A minor negative effect is therefore predicted.

Extended operation, if required, is expected to be similar to the operational period, with minor significant effect.

Table 6.19: Summary SEA Assessment for Climate Change and Energy Use, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	-	-	-

6.13.4 Measures Envisaged to Mitigate and Monitor Climate Change and Energy Use

It is envisaged that AWE's EMS could be amended to include the interim ILW store, and include climate change mitigation and energy usage considerations.

The use of recycled materials and locally sourced materials would help to minimise consumption of greenhouse gas emissions. The use of sustainably sourced biofuels would help to reduce overall greenhouse gas emissions from fuel.

The EIA and design of the interim ILW store should take account of the full lifecycle. Choosing materials with lower embedded carbon where possible and recycled material.

6.13.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 6.20: Summary SEA Assessment for Climate Change and Energy Usage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	0	0	0

6.14 Coastal Change and Flood Risk

6.14.1 Baseline Overview

The site is not located on the coast and is not within an identified flood risk area. Key components of the road network around the site are not currently at significant risk of flooding. However, the Environment Agency has classified the A340 north of Aldermaston village within Flood zone 2 and Flood zone 3. The A340 southwards is relatively free of flood risk, although there are smaller areas of flood risk here and on roads in the wider area.

6.14.2 Pre-existing and Committed Mitigation and Management

A flood risk assessment (FRA) if required as part of planning would address the potential impacts on flood risk, taking into account the predicted effects of climate change. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures required to avoid or minimise significant impacts.

It is assumed that the national road network will be maintained to a level suitable for continued use and that any effects of vehicles transporting the ILW to the GDF will not be significant. In the event that alternative national highways are developed these would be considered to determine if they are suitable for the transport of the RPVs and the decommissioning stage traffic.

6.14.3 Assessment of Potential Negative Effects

No significant negative effects to coastal change and flood risk are considered likely.

Table 6.21: Summary SEA Assessment for Coastal Change and Flood Risk, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

6.14.4 Measures Envisaged to Mitigate and Monitor Coastal Change and Flood Risk

It is envisaged that AWE's EMS could be amended to include the interim ILW store, and include flood risk considerations. It is recommended that the standards of drainage are periodically reviewed to ensure they meet the requirements of the time.

6.14.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 6.22: Summary SEA Assessment for Coastal Change and Flood Risk, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

6.15 Transportation

6.15.1 Baseline Overview

The WBC freight strategy requires access to AWE to be either from the M3 J6 and A340 or via the M4 J12, A4 and A340. The main roads connecting into motorways both north and south of the site are the A340 and A4, which pass through the town of Basingstoke, Theale and Tadley, a number of villages including Aldermaston Wharf and Aldermaston. The most significant constraint is the possible width restriction over the Kennet and Avon canal which may influence the transport route from the M4. The West Berkshire Transport Plan 2011 - 2026 proposes to improve safety and reduce the impact of the A340 through Aldermaston, and to discourage longer-distance traffic, especially freight, from using the A340. We would therefore expect to route the vehicles from the M3 (a journey of approximately 8 miles).

Most of the Aldermaston workforce lives within the surrounding three local authorities, with four main clusters in Tadley directly to the south, Reading to the northeast, Newbury / Thatcham to the north / northwest, and Basingstoke to the south. There is also a smaller cluster living in Andover to the southwest.[59]

A traffic survey carried out as part of a recent planning application indicates that there is AM and PM peak hour congestion on roads in the vicinity, and that perhaps the most sensitive roads to additional traffic are the B3051 and A340 heading south through Tadley. Operational traffic at the site has different peak hours from the baseline peak traffic flows. There are also a number of known restrictions to heavy and large lorries on local roads in the area, while the A340 remains adequate for HGVs.[60]

To the north of site and Aldermaston, there are two local rail stations, Aldermaston and Midgham. Cycle routes and footpaths are addressed under the SEA category 'Health and Well-Being' (refer to Section 6.8).

6.15.2 Pre-existing and Committed Mitigation and Management

Refer to Section 5.7 for information on pre-existing transport management and mitigation assumed for all sites.

AWE Aldermaston has a Code of Construction Practice which requires each project to prepare and agree with the local highway authority a construction management plan. The fundamental approach is all construction movements are scheduled outside of local traffic peaks.

It is envisaged that a heavy load route study would form part of the transportation planning and that this would inform the optimal route requiring least adaptations to be made.

[59] RPS (2012). *Site Setting Report: AWE Aldermaston*.
[60] RPS (2012). *Site Setting Report: AWE Aldermaston*.

6.15.3 Assessment of Potential Negative Effects

During construction, the use of heavy vehicles may result in increased deterioration of the carriageway and other highway infrastructure. It may also exacerbate existing congestion issues in the area. This would constitute a minor negative effect.

During operation, it is anticipated that minor adaptations to the local transport infrastructure may be required. However it is considered that these adaptations would be so minor as to be inconsequential in terms of transport. As the interim ILW store is anticipated to generate very few additional journeys (refer to Table 4.1: **Assumptions about Implementing Interim**) a neutral effect is predicted for operation.

During decommissioning, heavy vehicles may contribute to increased deterioration of the carriageway and other highway infrastructure. This would constitute a minor negative effect.

Extended operation, if required, is expected to be similar to the operational period, with no significant effect.

Table 6.23: Summary SEA Assessment for Transportation Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

6.15.4 Measures Envisaged to Mitigate and Monitor Transportation

If feasible adaptations to highway should be coordinated to planned highway maintenance or improvements to minimise the risk of abortive work or increased disruption.

The transport of the RPVs should be planned in conjunction with the relevant local authorities, local community and other stakeholders to minimise disruption to the local road network. A Transport Management Plan is recommended to ensure that agreed routes are adhered to and to set out the appropriate frequency and timing of deliveries.

Transport planning would minimise transport effects and disruption.

Continued implementation and updates of a site transport or travel plan would help to encourage sustainable transport choices for employees.

An effective supply chain management should be used to reduce the number of vehicle movement required to and from the site.

6.15.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 6.24: Summary SEA Assessment for Transportation, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

6.16 Waste Management

6.16.1 Baseline Overview

There are currently no data publicly available for the total amount of waste (including construction and demolition waste) disposed of from AWE Aldermaston. In terms of radioactive waste, figures for 2013, for the AWE Aldermaston and Burghfield sites combined, show that approximately 790 tonnes of waste was handled by the AWE sites. The waste management activities include the packaging and storage of solid Intermediate Level/High Activity RA waste; the packaging of Solid Low/Very Low Level RA waste and dispatch for treatment and disposal off site; and the treatment of Low/Very low level aqueous RA effluents. These operations are undertaken by the various waste producing facilities on the AWE sites which output compliant packages. The Aldermaston site receives output from the Burghfield site for consignment and/or storage[61].

Environment Agency data indicates licensed waste transfers off-site for recovery (including for use as fuel, of inorganic and organic material, of metals and compounds, of catalyst components and for land treatment), and for disposal "in/on land", by incineration and by physio-chemical treatment[62]. It is reported that approximately 60% of controlled waste from the site is diverted from landfill to more sustainable management methods, and AWE has targets to achieve 70% for both construction / demolition waste and controlled waste[63].

No known non-radiological waste management facilities have been identified within 5 km of the site.

6.16.2 Pre-existing and Committed Mitigation and Management

Details of the requirements of waste legislation and pre-existing mitigation are set out in Section 5.4. The implementation of AWE's EMS is further anticipated to further establish good practice regarding waste management and minimisation.

6.16.3 Assessment of Potential Negative Effects

No additional significant volumes of waste are anticipated to be produced from operation of the interim ILW store.

During construction and decommissioning, increased volumes of waste may arise. However, it is anticipated that much of the material generated during decommissioning would be steel and concrete which could be widely recycled and re-used. A minor negative effect is predicted prior to appropriate mitigation.

Extended operation, if required, is expected to have similar effects to the operational period. Over time there is likely to be an increase in the level of maintenance required and construction waste generated as some of the infrastructure begins to degrade, however given the overall timescales involved, no significant effect is predicted.

[61] West Berkshire Council Waste Operator Returns data sheet, April 2014, provided by AWE.

[62] Environment Agency (2013). *Interactive Maps.* Available from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

[63] AWE (2011). *Sustainability Plan 2010 – 2030.* Available from: http://www.awe.co.uk/publications_b667d6b.html

Table 6.25: Summary SEA Assessment for Waste Management, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	0	-	0

6.16.4 Measures Envisaged to Mitigate and Monitor Waste Management

It is envisaged that AWE's EMS could be amended to include the interim ILW store, and include Waste Management considerations.

The specification of materials with a high recycled content in the design would help to minimise use of raw materials. Where possible, existing material on site should be re-used provided it is suitable for use and in accordance with environmental permitting regulations.

Prior to construction, site investigations will be required to include land quality assessment and site characterisation to identify if any historic chemical or radiological contamination is present, and if present, mitigation measures to ensure the site is suitable for use.

6.16.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 6.26: Summary SEA Assessment for Waste Management, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	0	0	0

6.17 Land Use and Materials

6.17.1 Baseline Overview

Most of the site is an existing, developed site, and the land cover of the site ranges from what would be classed as industrial development (urban) to heathland and woodland (including remnants of a former part of Aldermaston Park, now part of the site). The surrounding area is varied, with Aldermaston Registered Park directly to the north; Harbourhill Copse LWS and ancient woodland to the northwest; the A340 bounding the site to the west and partly to the south; and minor roads, woodland, wildlife areas, dwellings and a relatively new commercial development to the south and east.

Opposite the A340 are two commercial areas, an apparently disused waste ground, a wildlife area, a farm and a community allotment.

Planning allocations in the vicinity include two protected employment areas (existing development) to the west of the A340, and a committed development area to the east of the site.

6.17.2 Pre-existing and Committed Mitigation and Management

No site-specific mitigation is identified.

6.17.3 Assessment of Potential Negative Effects

No significant negative effects to land use and materials are considered likely since it is predicted that the proposed interim ILW store would be contained within the existing licensed site.

Table 6.27: Summary SEA Assessment for Land Use and Materials, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

6.17.4 Measures Envisaged to Mitigate and Monitor Land Use and Materials

No further measures have been identified.

6.17.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 6.28: Summary SEA Assessment for Land Use and Materials, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

6.18 Cultural Heritage

6.18.1 Baseline Overview

Aldermaston is a former RAF airfield which, since the Second World War, has been central to the UK's role in the Cold War and the development of the UK's Strategic nuclear deterrent.

There is one Scheduled Monument within the boundary of AWE Aldermaston: 'Grim's Bank: section extending 430 m in Little Heath', an early Dark Age to Medieval earthwork of no precise dating. It is noted as being extremely well preserved[64], and is actively managed by AWE. Further sections of Grim's Bank (two additional sites) exist to the east, severed by a road junction. 'Round barrow cemetery at Brimpton Common' is another Scheduled Monument over 600 m to the west.

[64] West Berkshire Council (2012). *West Berkshire HER* (Grim's Bank – Little Heath (AWE)). Available from: http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MWB1350&resourceID=1030

There is one Grade I Listed Building within 1 km of the site: 'Church of St. Mary', approximately 500 m to the north, within Aldermaston Park. There are three Grade II* Listed Buildings within 1 km – one in Aldermaston village, one in Aldermaston Park, and the third in Old Warren to the east. There are 37 Grade II Listed Buildings within 1 km, with a concentration of them in the village of Aldermaston to the north. The nearest are two Grade II houses to the west of the site, along the opposite side of the A340.The majority of Aldermaston village is also designated as a Conservation Area.

Aldermaston Court is a Grade II Registered Park and Garden directly to the north of the site. The entirety of the site was once a part of a manor estate, but its majority from the western boundary was developed into the RAF airfield. Therefore, whilst the park does not extend into the site, it still contains signs of its former connection to the Registered Park, such as mature specimen trees and walking paths.

Wasing Place Grade II Registered Park and Garden is approximately 750 m to 1 km to the west of the site.

The former line of a Roman Road runs diagonally across the site (northwest to southeast), largely through the eastern 'Aldermaston Park' section. There have been several archaeological finds on the site, but little purposeful archaeological investigation has been undertaken within the site. There is potential for Iron Age, Roman and Medieval / Post-Medieval archaeology, in addition to finds associated with the WWII airfield and Cold War features[65].

6.18.2 Pre-existing and Committed Mitigation and Management

Section 5.6 sets out pre-existing mitigation to ensure protection of heritage features. The Scheduled Monument on the site has been well preserved, is statutorily protected, and there is a management plan in place.

6.18.3 Assessment of Potential Negative Effects

No effects are anticipated on the Scheduled Monument since it is well preserved by the site management.

During construction and decommissioning, depending upon the location of the interim ILW store, there could be a slight potential to disturb historic or archaeological remains, particularly given the presence of the route of a former Roman Road across the site. There may be minor disturbance (noise, dust, tall structures such as cranes) to Aldermaston Court Registered Park and Garden. In the event that the local highway needs improvement there is potential to affect the setting of Aldermaston Conservation Area and buildings along the A340, although at present it is considered more likely that the route would be from the M3, south of the site. All these negative effects are predicted to be minor.

During operation and extended operation there would be potential for a negative effect on the setting of Aldermaston Court, depending upon siting of the store and the effectiveness of surrounding vegetation at screening views.

[65] RPS (2012). *Site Setting Report: AWE Aldermaston*.

Table 6.29: Summary SEA Assessment for Cultural Heritage, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	-	-	-

6.18.4 Measures Envisaged to Mitigate and Monitor Cultural Heritage

It is envisaged that a future EIA would identify features of value and propose measures for their protection during construction and operation of the ILW store, in addition to taking into account the potential for cumulative effects on cultural heritage sites.

6.18.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 6.30: Summary SEA Assessment for Cultural Heritage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

6.19 Landscape and Townscape

6.19.1 Baseline Overview

AWE Aldermaston is a large, mainly industrial site which is undergoing periodic development. The site itself sits within the Thames Basin Heaths National Character Area, which is described as a "particularly diverse landscape unified by the high incidence of heathland and coniferous *forestry, the open unenclosed nature of which is unusual within the context of the south-east region*"[66].

The site lies to the south of the Kennet River valley on a flat plateau. The northeast of the site includes fragmented groups of parkland trees and individual exotic specimen trees, while the southeast of the site contains heathland with characteristic associated tree species. Central and western areas of the site are industrial and urban, surrounded by office-type development, with little vegetation.

North Wessex Downs Area of Outstanding Natural Beauty (AONB) is over 2.5 km to the north of the site. There are no locally designated landscape areas in proximity to the site.

The site is largely visually contained by surrounding woodland, though larger buildings and stacks are visible above the tree canopy. On-site woodland in the south of the site provides effective visual screening to the residential areas of Tadley, to the south. The site is visible from certain residential properties, workplaces and roads in the near vicinity, as well as from PROWs both nearby and up to 10km away (including from the AONB).

[66] Natural England (2004). *Thames Basin Heaths*. Available from: http://www.naturalengland.org.uk/Images/jca129_tcm6-5326.pdf

At night, the site is lit mainly by sodium lighting, which is non-directional and domestic in scale. From distant views, it forms part of a contiguous lit ridgeline with Tadley and lights at Aldermaston Court.

6.19.2 Pre-existing and Committed Mitigation and Management

Section 5.6 sets out pre-existing mitigation anticipated for the proposed interim ILW store, regardless of site. No site specific pre-existing mitigation has been identified.

6.19.3 Assessment of Potential Negative Effects

Despite mitigation, during construction plant and traffic may be visible, particularly if tall plant such as cranes are in use. A minor negative effect is predicted.

During operation, there would be little activity associated with the site, and no significant effects are likely. Very infrequent RPV movements are unlikely to affect landscape and townscape.

During decommissioning, it is likewise expected that plant and traffic may be visible, particularly if tall plant such as cranes are in use.

Extended operation, if required, is expected to be similar to the operational period, with no significant effect.

Table 6.31: Summary SEA Assessment for Landscape and Townscape, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

6.19.4 Measures Envisaged to Mitigate and Monitor Landscape and Townscape (Quality and Visual Amenity)

A project-level landscape and visual impact assessment may be needed to determine whether there is a need for a long-term landscape management plan to screen the development.

6.19.5 Opportunities for Potential Benefits and Enhancements

The implementation of recommendations from the landscape and visual impact assessment may improve landscape, albeit on a small scale once established after construction and during extended operations, if appropriately managed.

Table 6.32: Summary SEA Assessment for Landscape and Townscape, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**+**	**0**	**+**

7 Assessment Results: AWE Burghfield

7.1 Site Background

AWE Burghfield is approximately 0.5 km east of Burghfield village in West Berkshire district, and also approximately 3 km southwest of Reading. The site was initially developed in 1938 as a munitions factory, and has been in use by the nuclear industry since 1954. In 1987, the word 'Research' was dropped and 'AWRE' became 'AWE'. The maps in Annex 2 show the environmental and cultural setting of the site.

AWE Burghfield occupies a 91 hectare site and is responsible for the complex final assembly and maintenance of the UK's nuclear deterrent warheads while in service, as well as their decommissioning. Figure 7-1 below provides a map of the site, indicating also the approximate maximum size of an interim ILW storage site (3,150m^2) and the likely construction and RPV transport routes (see section 7.4). It should be noted that the particular location for the proposed interim ILW store has not been specified and figure 7-1 is intended to provide context only in terms of the size of footprint within the context of the licensed site. The exact location would be determined following detailed investigations should the candidate site be selected for the interim ILW storage.

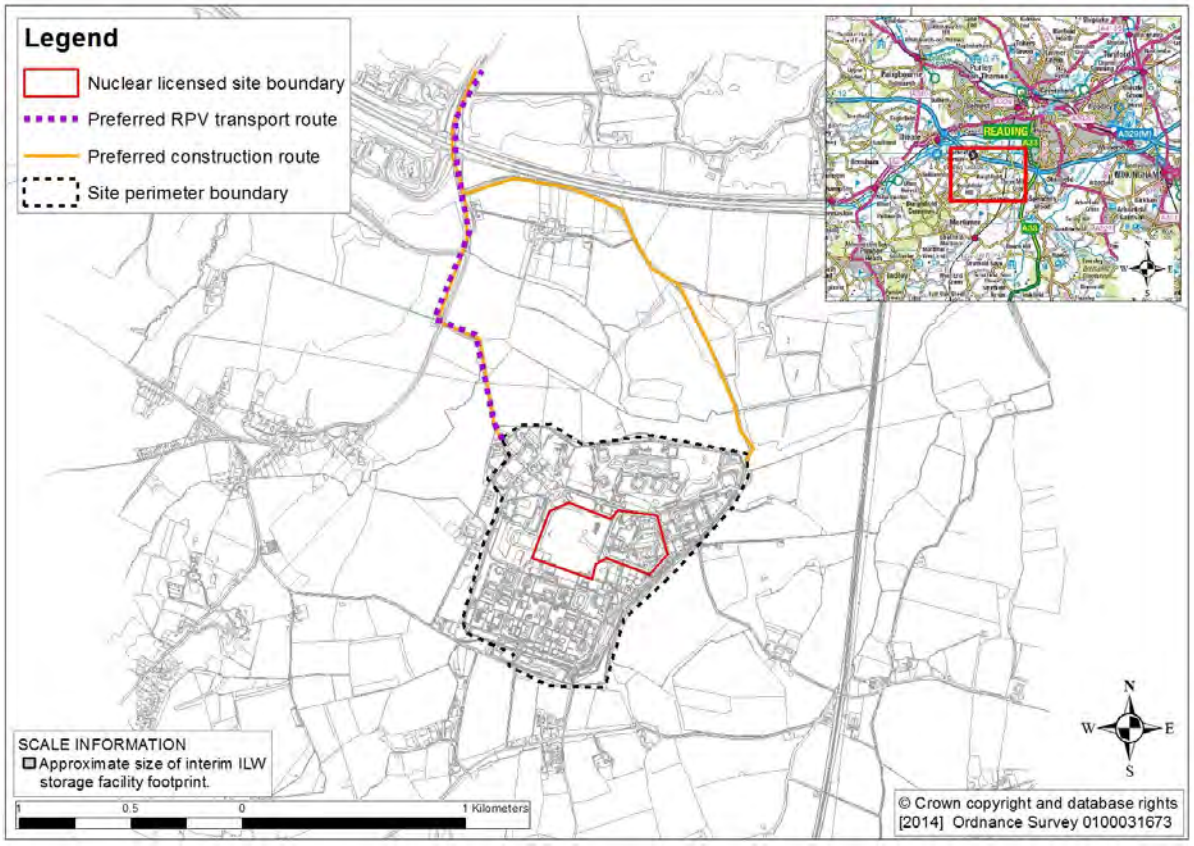


Figure 7-1: Map of Burghfield (AWE) indicating nuclear-licensed boundary and likely construction and RPV transport routes

7.2 Evolution of Baseline

In July 2005, the then Secretary of State for Defence announced a major capital investment programme at AWE of some £350 million over the next three years *"…to ensure that we [the*

UK] can maintain the existing Trident warhead stockpile throughout its intended in-service life…".

Following the Government announcement of investment into the facilities at AWE Aldermaston and AWE Burghfield, a Site Development Context Plan (SDCP) was published in November 2005. The primary purpose of the SDCP is to define the broad parameters of the Government's investment programme, announced in July 2005, in land use terms and to facilitate early discussion and consultation with the relevant planning authorities and other stakeholders. The overall approach to the modernisation of AWE Aldermaston and AWE Burghfield in the SDCP is based on refurbishing and replacing facilities constructed principally in the 1950s and 60s. It is proposed that capacity will be increased to existing stores for containing ILW, which have approximately 6 years' capacity remaining at the current rate of generation. AWE aims to provide additional future capacity. There is currently no ILW storage capacity at Burghfield.

The SDCP was accompanied by a Strategic Sustainability Appraisal (SSA) that identified the main environmental and related issues that were likely to arise in the course of implementation of the programme.

Both documents provided the context in which elements of the investment programme would be brought forward over the following three years. The programme as a whole is expected to be completed by 2015. The SDCP was updated in 2008 and incorporates progress made, as well as including some new development.

The first SDCP included 10-year Illustrative Site Development Framework Plans for each of the two sites at Aldermaston and Burghfield. These plans set out the principal land use proposals that were the subject of the investment programme at an end date of 2015.

Since November 2005, considerable progress has been made towards the programme as set out in the SDCP 2005 and 2008. Over 2 million square metres of development is currently under construction at the two sites to meet this need. These investments are and will continue to influence the physical view of the sites to the outside world. The new investments will be matched by the demolition and clearance of the facilities which have been replaced by the new developments.

Trend data available for radiological discharges from Aldermaston (which includes data from AWE Burghfield) shows that they declined significantly over the past 10 years to consistently low levels. There are no capital projects which would lead to any significant change in radiological discharges in the future.

AWE has identified historic land contamination across the site typical of any previously developed post WWII industrial site. AWE is developing and implementing appropriate management strategies through an Environmental Operations Land Quality programme. The 2013 quinquennial review (QQR) of AWE's strategy for nuclear decommissioning describes the future management of operational and legacy radiological waste.[67]

Climate change in the region is expected to lead to the following impacts of most relevance to the site: increased scarcity of water, such as frequency of drought in the summer months – this is accounted for to some extent in the water resource status reported in Section 7.11.1; increased intensity of rainfall and frequency of intense rainfall events, leading to increased flood risk; changes in woodland species, with possible increases in pests and disease; increased wildfires, affecting in particular gorse, heath and grass; and increased risk of the spread of invasive species.

[67] http://www.hse.gov.uk/nuclear/documents/2013/quinquennial-review-awe.pdf

As a baseline assumption, the nature conservation sites and notable habitats around Aldermaston and Burghfield are not predicted to change in area / boundary significantly into the long-term. However, there are a number of threats to biodiversity generally, which may contribute towards a decline in condition. This includes the effects of climate change, which may drive changes in vegetation cover and increase vulnerability to certain impacts, such as drought and spread of invasive species. For the assessment, it will be assumed that designated or priority habitats maintain their overall nature conservation value into the future, whilst biodiversity generally would be under increasing pressure from climate change and development.

Population projections for West Berkshire are for an approximately 10% increase between 2011 and 2021. The age profile is expected to change significantly, with a notable increase in people aged 65 and over. As stated in Section 7.7.1, Tadley and Burghfield have been a focus for new development, which may place additional pressure on resources such as water and biodiversity in the area. Policy indicates it will be accompanied by an increased provision of services and facilities in Tadley. Also, as a result of the Local Transport Plan 2011 – 2026, the A340 may see additional improvements and a reduction in freight traffic.

7.3 Local Planning Context

The West Berkshire Core Strategy 2006 – 2026 was adopted in July 2012[68]. The Core Strategy takes account of national planning policy and therefore implements at a local level, objectives consistent with those laid out in Annex 3.

Area Delivery Plan Policy 6 for the East Kennet Valley identifies an allocation of 800 homes for the East Kennet Valley. The amount of development for the surrounding area is limited by the lack of suitable existing infrastructure, particularly public transport links. Aldermaston is shown in the Core Strategy as a service village, providing a range of services to the surrounding area, and it also is stated to have some limited development potential.

Policy CS9 lists AWE as one of three existing employment sites which are strategically important for the district's economy. The policy goes on to states that the Site Allocations Development Planning Document will *"…Assess the role and function of these three sites to determine whether they should be designated as Protected Employment Areas or an alternative bespoke designation consistent with their importance to the local economy…".*

There is also a specific policy (policy CS8) for the AWE Aldermaston and Burghfield sites, which sets out consultation zones for proposed development within 3 km, 5 km and 8 km of AWE Aldermaston in the interests of public safety, to assist in the management of the unlikely event of an accident involving the spread of radioactive materials beyond the nuclear site boundary. Proposals must consider, amongst a number of criteria, the impact on emergency services and the emergency off-site plan. Policy CS8 requires the Council to consult with the ONR regarding planning applications within the emergency planning zones and to have regard to ONR's advice.

Burghfield Common is shown in the Core Strategy as a rural service centre, providing a range of services to the surrounding area and public transport provision, with opportunities to improve the range of services.

The West Berkshire Local Transport Plan 2011 – 2026[69] encourages opportunities to improve connectivity between Burghfield Common and nearby employment and essential

[68] West Berkshire Council (2012). *West Berkshire Local Plan. West Berkshire Core Strategy (2006-2026) Version for Adoption.* Available from: http://www.westberks.gov.uk/index.aspx?articleid=25436

services and facilities, reducing reliance on cars. This includes improved safety for pedestrians and cyclists while preserving local access routes for freight traffic.

7.4 Proposals

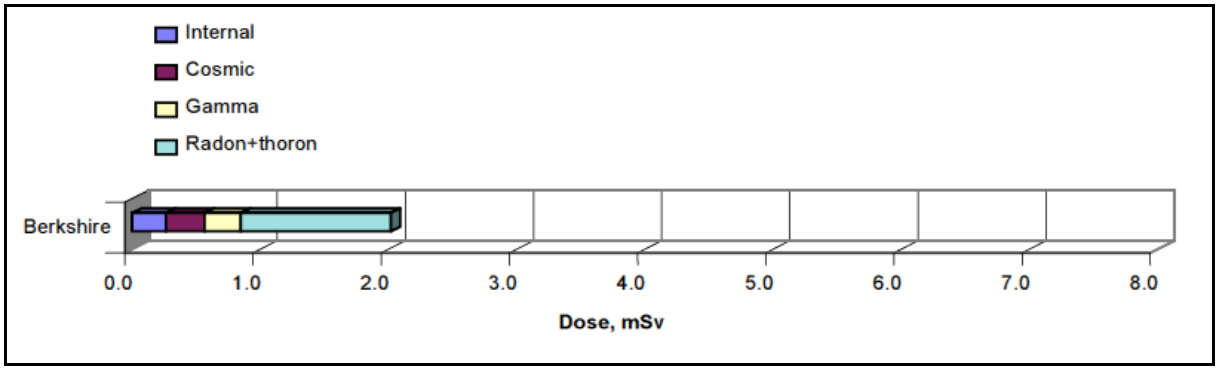
AWE Burghfield has confirmed that the proposed interim ILW store at the site would be located within the existing AWE site boundary, although an extension to the nuclear license site would be required. The West Berkshire Council freight strategy requires access to AWE Burghfield to be via M4 J12, A4 and Reading Road to Burghfield Common.

7.5 Radiological Discharges and Exposures

7.5.1 Baseline overview

Ionising radiation exposure from **natural sources** in the vicinity of AWE Burghfield is estimated to be less than 2 mSv per year, given county-level data available[40]. Under normal operation there would be no discharges to air, water or soil from the ILW interim store and therefore there would be theoretically no increase locally in the effective dose to the public (including people who are most exposed) above current levels, which are dominated by natural background sources.

Figure 7-2 below presents an excerpt from the 2005 review of ionising radiation exposure of the UK by the HPA, illustrating the average annual doses to residents from different natural background sources.



NOTE: "internal" refers to radiation originating from terrestrial sources which, via the food chain, end up in our bodies, and "gamma" radiation is received externally from mainly terrestrial sources (rocks, soil and building materials such as stone).
Source: extract of figures in HPA, 2005, p.76[40]

Figure 7-2: Annual exposure to natural background radiation in Berkshire county

Activities at AWE Burghfield which could result in radiological discharges comprise:

- Gaseous emissions to air;
- Discharge of liquid waste to Burghfield Brook; and
- Discharge of liquid waste to Silchester sewage treatment works, and subsequently into the River Kennett.

Table 7.1 below summarises the discharges or emissions to air and water from AWE Burghfield relative to the permitted levels authorised by the Environment Agency. The latest

[69] West Berkshire Council. *Local Transport Plan for West Berkshire 2011-2026*. Available from: http://www.westberks.gov.uk/index.aspx?articleid=18646

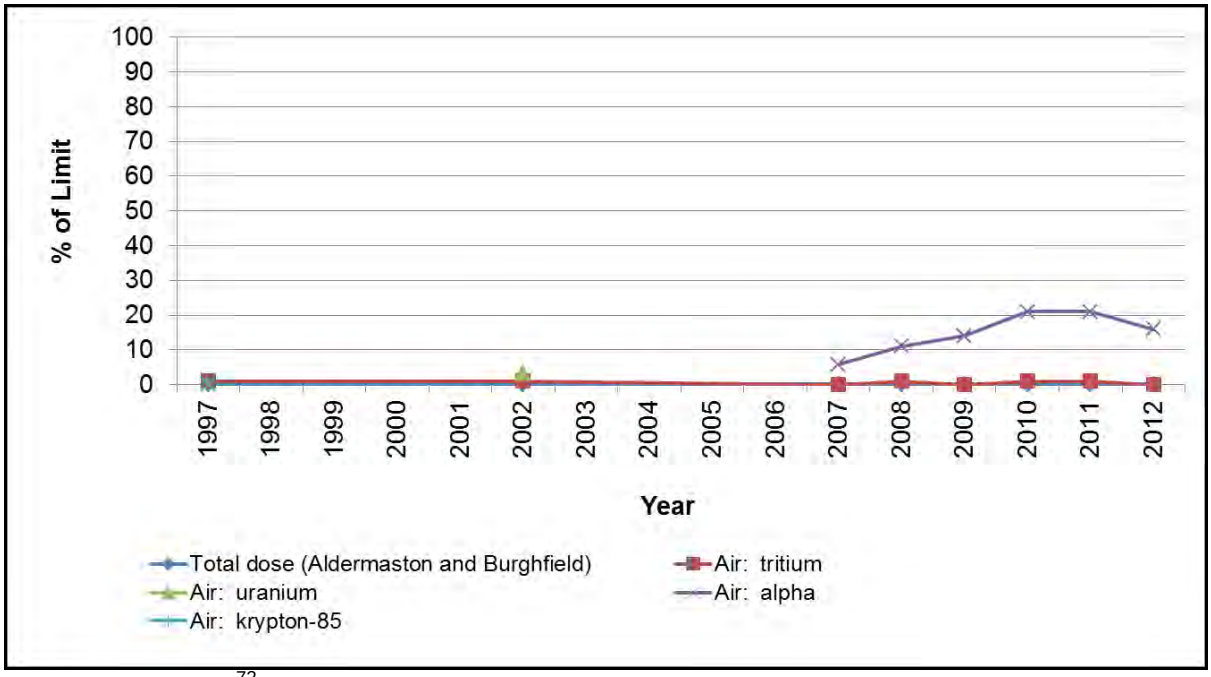
Environment Agency monitoring data available for 2011 indicates that emissions have remained within their respective limits for 10 years (zero notifiable releases)[70].

Table 7.1: Radiological discharges at AWE Burghfield (2012)

Discharge	Discharge Limit (annual equivalent)	Discharges during 2012	
		Measured annual discharge	% of Annual Limit
Air: tritium	10 GBq	Nil	Nil
Air: alpha	5 kBq	0.82 kBq	16

According to the 2012 RIFE report[71], the radiation total dose from all pathways and sources of radiation at AWE Aldermaston and Burghfield sites was less than 0.005 mSv, which is less than 0.5% of the legal dose limit. The most exposed people in the vicinity are estimated to be infant milk consumers.

Figure 7-3 below shows the available RIFE report radiological discharge and monitoring data for the years 1997, 2002 and each of the past five years from 2007 to 2012. (Note: the specific discharges requiring monitoring at the site have changed over time, and hence data for every discharge is not available for every year.) The data shows the discharges and dose to the public have remained well within their respective limits over the past 15 years.



Source: RIFE reports[72]

Figure 7-3: Radiological discharges and dose over time at AWE Burghfield

It is assumed that the baseline would remain relatively similar over the timescales of the project as standards of nuclear safety and security would remain in place and maintained up to date.

[70] Environment Agency (2013). *Interactive Maps.* Available from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

[71] Environment Agency, Food Standards Agency, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2013). *Radioactivity in Food and the Environment, 2012.* Available from: http://www.food.gov.uk/science/research/radiologicalresearch/radiosurv/rife/radioactivity-report2011/#.UlOVzIDYjpU

[72] RIFE reports 1 through 18: http://sepa.org.uk/radioactive_substances/publications/rife_reports.aspx

7.5.2 Pre-existing and Committed Mitigation and Management

Section 5.4 provides details of the regulation and management of radiological discharges and exposures for nuclear sites.

AWE's 'nuclear safety case' is the key pre-existing, committed mitigation for the management and minimisation of radiological discharges in order to reduce risk to ALARP / ALARA. This is supported by regulation of the receipt of radioactive waste onto nuclear sites and the disposal of radioactive waste on or from nuclear sites by the Environment Agency (refer to Section 5.4 for details of the regulation of nuclear sites and the need to review the nuclear safety case to reflect any proposed alteration of activities).

An on-site and off-site emergency plan must be prepared for licensed nuclear facilities and kept up-to-date under The Radiation Emergency Preparedness & Public Information Regulations (REPPIR) 2001[73].

The off-site emergency plans are prepared and updated by the relevant local authority. These plans are reviewed every three years or less, as required, to ensure that all emergency services involved in an emergency are aware of their roles and have the sufficient preparedness to act at any time. The size of the emergency planning area differs site by site in the UK, with due consideration given to individual factors associated with each site. The current emergency planning distance for AWE Burghfield is understood to cover a radial distance of 1.5km [74].

Under REPPIR, the addition of any new operation (e.g. the interim ILW store) would require the off-site emergency plan to be reviewed.

An on-site emergency plan is also required by REPPIR, which is prepared by the site operator. The AWE Burghfield Site Emergency Plan (January 2013) is the current such plan.

7.5.3 Assessment of Potential Negative Effects

Radiological exposures from implementing interim ILW storage are predicted to be limited to small levels of direct irradiation exposure from RPV sources within shielded containers (see further below). SDP has confirmed that there will be no radiological discharges to air, soil or water directly from the operation of the interim ILW store.

During construction, there is some potential for discovering historic radioactive contamination in the ground during site preparation and construction phases but this would be carefully managed in accordance with legislation and best practice including: full risk assessment and mitigation measures implemented to minimise potential exposure to humans (see Section 5.4). With required controls, it is considered that any potential for increased exposure to radiation would be limited to site workers. Significant effects to site workers' health are unlikely given construction good practice and stringent health and safety requirements.

During operation, the risk of exposure is mainly limited to direct radiation to workers and is subject to regulation and will be managed to ALARP / ALARA. The very low maximum external dose target of 0.5 mSv/hr at the external walls of the interim store will ensure that

[73] The Radiation Emergency Preparedness and Public Information Regulations (REPPIR), 2001. Available from: http://www.legislation.gov.uk/uksi/2001/2975/contents/made

[74] http://www.onr.org.uk/depz.htm

local communities experience no practically measurable increased dose from the interim ILW store.

During transport from Rosyth and Devonport to Aldermaston, direct radiation from the RPV would be through a shielded container, designed to ALARP / ALARA levels of potential exposure (see Section 5.4.3). Shielding will reduce the levels of direct radiation to very low levels outside of the RPV vehicle, which would present no significant risk of exposing members of the public to high levels of radiation. The very low frequency of transport (one to three movements per year) is taken into account in this assessment.

Emergency scenarios and preparedness would be planned for, and will ensure that under any incident scenario it would be very unlikely that people could be exposed to levels of radiation significantly above background levels, and in the 'worst case', they would be unlikely to be exposed to levels of radiation which would adversely affect their health.

The assumption is that it is highly unlikely that degradation of the waste package will occur necessitating repackaging before the end of interim storage. However, it is assumed that repackaging will be required at the end of interim storage due to the likely evolution of regulations, policy and standards. This would involve no radioactive discharges and the discarded packaging would not be radioactive.

Given the pre-existing and committed mitigation above, the likely effects across the phases of implementation of interim ILW storage at Burghfield are envisaged to be negligible for all four stages (Construction, Operation, Decommissioning and Extended Operation Stages), as summarised in Table 7.2 below.

Under normal operation there would be no discharges to air, water or soil from the interim ILW store. Direct radiological emissions from the store will be managed to ALARP / ALARA standards and will be significantly small as to make them practically unmeasurable at the site boundary. Therefore, there will be no increase in the effective dose to the public locally relative to current levels.

Table 7.2: Summary SEA Assessment for Radiological Discharges and Exposures, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

7.5.4 Measures Envisaged to Mitigate and Monitor Radiological Safety

No additional measures have been identified. The pre-existing mitigation set out in Section 5.4 and Section 7.5.2 means that risks are reduced to ALARP/ALARA and there is an established monitoring regime associated with nuclear installations (refer to Section 5.4).

7.5.5 Opportunities for Potential Benefits and Enhancements

No opportunities for potential benefits or further enhancement have been identified for radiological discharges.

7.6 Biodiversity and Nature Conservation

7.6.1 Baseline Overview

The AWE Burghfield site is located in the London Basin Natural Area, which is *"a large, trough-like basin which was formed around 50 million years ago*", drained by the River Thames and its extensive network of tributaries[75]. The London Basin is characterised by islands of habitats which include large areas of woodland and notable areas of heathland, alongside a number of other important habitats.

Table 7.3 below lists the key biodiversity features within 5 km of AWE Burghfield. Within 20km of the site there are two SACs, one SPA but no Ramsar sites.

Table 7.3: Biodiversity / nature conservation features within 5 km of AWE Aldermaston

Features	Notable Types / Examples
2 SSSIs	Pincents Kiln and Standford End Mill & River Lodden
4 LNRs	See text below.
UK BAP priority habitats	Deciduous woodland; Traditional orchard
Ancient woodland areas	More than 10 distinct areas
20+ LWSs	See text below.

The designated nature conservation sites near to AWE Burghfield are locally designated LWSs, including Pinge Wood c.300 m to the north and Pitchkettle Wood over 600 m to the south. There are three ancient woodland areas within 1 km of the site, including Pinge Wood.

The UK BAP priority habitats in proximity to the site's boundaries are deciduous woodland and traditional orchards. A small area of deciduous woodland borders the site to the southeast, and Amner's Wood is within 100 m to the north. Altogether, there are 18 distinct areas of deciduous woodland within 1 km of the site. A traditional orchard lies adjacent to the western boundary of the site.

There is little semi-natural habitat within the site. Notable species within the site include birds such as lapwing and black redstart, bats and Great Crested Newts. There are a number of notable species recorded within 2 km of the site.

It is assumed that the biodiversity would continue with similar habitats and species to those present up until the medium-term. However longer term, some species and habitats may become under pressure from development in the wider area and the effects of climate change. From a biodiversity perspective it is considered important to support the resilience of habitats and species wherever possible.

7.6.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on nature conservation, including any potential loss of woodland habitat, and the potential for encountering protected species during construction. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This

[75] Natural England (2013). *Natural Areas: 66 London Basin*. Available from: http://www.naturalareas.naturalengland.org.uk/SCIENCE/NATURAL/NA_DETAILS.ASP?NA_ID=66&S=&R=6

would include any measures (e.g. fencing, compensatory habitat, species translocation) required to avoid or minimise and significant impacts.

AWE has an appointed Technical Authority for Ecology and operates a Biodiversity Action Plan (BAP) to protect and manage the species and habitats of interest on their sites.

7.6.3 Assessment of Potential Negative Effects

Interim ILW storage would not require any discharges to air or water. Since the interim ILW store would be contained within the existing site boundary, on previously developed land, no significant effect upon surrounding habitats is anticipated.

Despite mitigation, during construction, there remains potential for noise, dust and lighting to have an effect on ecological receptors. A minor negative effect is predicted.

Transport movements are anticipated to be so low as to cause no significant effects upon nature conservation locally.

During operation, there would be little activity associated with the interim ILW store, and no significant effects are likely. The very infrequent RPV movements expected are unlikely to affect habitats or species.

During decommissioning, as with construction, there would be the potential for noise, dust and lighting to have an effect on ecological receptors and so a minor negative effect is predicted.

Extended operation if required, assuming it would be within 40 – 100 years, is expected to be similar to the operational period, with no significant effect.

Table 7.4: Summary SEA Assessment for Biodiversity, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

7.6.4 Measures Envisaged to Mitigate and Monitor Effects on Biodiversity

AWE Burghfield has an environmental management system (EMS) in compliance with ISO 14001. AWE also operates a BAP. It is envisaged that these could be amended to include the interim ILW store, and include measures to protect and promote biodiversity considerations where appropriate.

The EMS and BAP could prove to be effective ways to monitor biodiversity on-site.

7.6.5 Opportunities for Potential Benefits and Enhancements

The implementation of ecological mitigation for the chosen site could be used to help to improve local biodiversity.

There may be potential to create a site-wide biodiversity action plan, with measures to manage and improve biodiversity at or (where permitted and feasible) in the near vicinity of the site.

Benefits would most likely not be applicable until the operational period.

Table 7.5: Summary SEA Assessment for Biodiversity, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	+	+	+

7.7 Population

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the number or types of jobs available in local economies, and levels of deprivation in surrounding areas'. No significant potential effects upon other aspects of population were anticipated during the scoping stage.

7.7.1 Baseline Overview

AWE Burghfield is approximately 0.5 km east of Burghfield village in West Berkshire district, and also approximately 3 km southwest of Reading.

The settlements in the near vicinity include Burghfield and the larger village of Burghfield Common to the west, the small villages of Grazeley Green (directly south), Poundgreen and Grazeley (opposite the railway southeast), and Reading to the north/northeast.

The site crosses the boundary between two LSOAs, both of which have low deprivation across economic and related issues (i.e. domains) of the IMD. However, access to services is poor as measured by the sub-domain 'geographical barriers'[76].

Areas (as broken down into LSOAs) more widely around the site perform very similarly with regard to deprivation, except that LSOAs to the west in and around Burghfield Common have relatively high accessibility to services.

AWE employs approximately 4,500 staff between two sites – Burghfield and Aldermaston approximately 7.5 km to the southwest. The relative financial contribution of the site to the local economy is not currently known.

7.7.2 Pre-Existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would be scoped to address the potential impacts on local communities, including any businesses, should potentially significant effects be identified.

7.7.3 Assessment of Potential Negative Effects

No negative effects are considered likely. This is an established site and an additional facility such as the interim ILW store is unlikely to alter community perception of the area to an extent which could harm local investment or employment to a significant degree.

[76] Specifically for the sub-domain 'geographical barriers', the area is within the 10% most deprived LSOAs in England. See Appendix 4 for background information on the IMD and how deprivation is measured.

Table 7.6: Summary SEA Assessment for Population

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

7.7.4 Measures Envisaged to Mitigate and Monitor Effects on Population

No measures have been identified.

7.7.5 Opportunities for Potential Benefits and Enhancements

There are potential short-term, medium-term and long-term employment opportunities from the interim ILW store, although this is not anticipated to generate many jobs (circa 100 full-time equivalents in the short-term and 10 in the medium to long-term).

Table 7.7: Summary SEA Assessment for Population, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**+**	**+**	**+**

7.8 Health and Well-Being

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the health, safety and well-being of local communities'. No significant potential effects upon other aspects of health, including workers / employees, healthcare infrastructure / provision or recreation, were anticipated during the scoping stage.

7.8.1 Baseline Overview

As for 'Population', the site crosses two LSOAs, and these have mixed levels of deprivation across health and related issues (i.e. domains) of the IMD. The LSOAs are amongst the 20% least deprived nationally for health and disability, 50% least deprived (thus about average) for living environment, but one is within the 30% most deprived for crime. LSOAs surrounding the site perform similarly, with crime rates lower in Burghfield and further into the countryside to the south[77].

The projected increase in population in the area is likely to place demand on recreational resources as well health infrastructure.

[77] Department for Communities and Local Government (2011). *A plain English guide to the Localism Act.* Available from: http://www.local.gov.uk/localism-act

7.8.2 Pre-Existing and Committed Mitigation and Management

Environmental discharges which could affect health and well-being are discussed in Sections 7.5, 7.9, 7.10, 7.11 and 7.12. Potential exposure to radiation is and will in future be managed, regulated and monitored to ALARP/ALARA.

Chapter 5 should be referred to for further information about pre-existing mitigation common to all nuclear installations.

7.8.3 Assessment of Potential Negative Effects

Potential exposure would be in the form of low levels of direct radiation (no discharges are anticipated from the interim ILW store). The main potential for receiving an increased radiation dose would lie with the site workforce, as the public would receive no practically measurable increase in radiation does and all emissions of radioactivity will be managed to ALARP / ALARA.

During operation, it is anticipated that there will be a slight increase in transport movements (likely to be infrequent RPV deliveries and very few personnel / maintenance transport requirements) which will generate minor increases in transport emissions. The scale of these emission increases is not anticipated to be significant.

Disruption from construction traffic, noise and dust may cause nuisance and inconvenience during construction to local residents, but this would be temporary and is unlikely to affect any determinants of health[78] significantly.

The Burghfield site has a history of contaminative land uses (refer to Section 7.10) and the key receptors to any contamination in the ground would be site workers during construction. Interim ILW storage would not affect the existing problem, and is considered unlikely to significantly affect future management or remediation. Suitable testing of ground conditions, compliance with legislation and mitigation planning, including the specification of appropriate PPE (personal protective equipment) would ensure no significant risk of significant effects to health during construction or decommissioning.

Medium-term and long-term employment opportunities can lead indirectly to significant benefits to people's health and well-being. However, interim ILW storage is not anticipated to generate many jobs (circa 10 full-time equivalent), and thus the benefit is neutral.

Table 7.8: Summary SEA Assessment for Health and Well-Being, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

[78] 'Determinants' of health and well-being can be defined as key factors which together determine how health a person or community is likely to be. They include factors such as health social networks, mental health and well-being, physical environment (e.g. housing, local area), employment opportunity and access to services.

7.8.4 Measures Envisaged to Mitigate and Monitor Radiological Safety

A future EIA would account for the potential cumulative effects across different environmental topics on health and well-being, including for example, recreation and amenity.

It is envisaged that AWE's EMS would be amended to include the interim ILW store, and include consideration of any impacts on local health and well-being, including recreation and amenity.

7.8.5 Opportunities for Potential Benefits and Enhancements

Interim ILW storage is expected to generate a relatively small number of jobs and (circa 10 full-time equivalents). It is therefore unlikely to significantly benefit health and well-being in the community.

Table 7.9: Summary SEA Assessment for Health & Well-Being, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

7.9 Noise and Vibration

7.9.1 Baseline overview

There are a few potentially sensitive receptors to noise and vibration in the vicinity of the site, being residential properties adjacent to the west of the site, in Grazeley Green and Burghfield; isolated dwellings around the site; and a place of worship in Burghfield to the west.

Noise levels were measured at potential sensitive receptors around the site for a planning application in 2010. The data showed that noise levels during the day were between 50 and 59 L_{Aeq}, and during the night between 40 and 46 $L_{Aeq,8h}$. This is slightly above the outdoors limits for noise established by the World Health Organisation (i.e. levels predicted to have an increased probability of annoyance).[79] Noise levels were higher to the north and near Burghfield, to the west of the site, due largely to local traffic noise, including HGVs not associated with the site. The M4 was also a significant contributor to local noise levels. Audible sources from the site included security vehicle patrols, low transformer hum, and a PA system test.

No records of the site causing any vibration problems in the local area or otherwise.

In the future, there may be an increase in overall noise in the wider area as population growth and associated development leads to an increase in traffic and construction activities.

[79] WHO – World Health Organisation (2009). *Night Noise Guidelines for Europe*. http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf and WHO (1999). *Guidelines for Community Noise*. http://www.who.int/docstore/peh/noise/guidelines2.html

7.9.2 Pre-existing and Committed Mitigation and Management

A future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on noise and vibration. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures to manage transport effects, for example. It is expected that CEMP could include such measures as:

- traffic management;
- limiting working hours; and
- monitoring of potential impacts of vibration, and frequency of vibration-generating activities.

It is also expected that Burghfield's EMS will consider and deal with noise generation and management of this impact during operation.

7.9.3 Assessment of Potential Negative Effects

During construction, it is anticipated that some residual noise and vibration will be generated despite the adoption of mitigation measures. This would constitute a minor negative effect. Whilst it is not possible to guarantee a neutral effect at this stage of assessment (SEA), project-level EIA may identify measures to avoid or fully mitigate any negative effect.

During operation, the activities associated with interim ILW storage will be largely passive. Ventilation and energy supply units may generate low-level hums or ventilation noise, however these potential impacts would be assessed and mitigated as part of EIA and storage design. A neutral effect is therefore predicted.

Decommissioning carries the same risks of negative noise impacts as the construction process.

Table 7.10: Summary SEA Assessment for Noise & Vibration, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

7.9.4 Measures Envisaged to Mitigate and Monitor Noise

AWE's EMS could be amended (if required / appropriate) to include the SDP interim ILW store. Provision of additional noise monitoring may be incorporated if there is substantial uncertainty about potential impacts. This would be determined by a future EIA.

The EMS or CEMP could provide an effective way to monitor noise and vibration from multiple construction projects.

7.9.5 Opportunities for Potential Benefits and Enhancements

No opportunities for benefits or enhancements have been identified.

Table 7.11: Summary SEA Assessment for Noise & Vibration, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

7.10 Geology and Soils

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'soil quality, variety, extent and/or compaction levels'. No significant potential effects upon geological conservation or land stability were anticipated during the scoping stage.

7.10.1 Baseline overview

The main soil type of the site is loamy / clayey soil with impeded drainage and of moderate fertility. There are no Grade 1 or 2 soils known to be within or adjacent to the site, with data showing Grade 3 and 4 soils surrounding the site.

There is known contamination of soil within the site, including a former site tip. In a 2008 planning application, the risks presented by pre-existing contaminants were not considered to raise any significant issues[80].

Improvements in handling and remediation of potentially contaminated land means that ongoing development on the site is not likely to give rise to significant increases in contaminated materials. Therefore, no significant change to the baseline is expected over time.

7.10.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on geology and soils. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any contaminated land issues, for example, and maximising the remediation and reuse of soils. It is expected that the EIA and CEMP could include such measures as:

- maximising reuse of soils on-site, if appropriate;
- dust suppression and wetting down of exposed soils to prevent their erosion;
- spill and other potential pollution prevention;
- appropriate temporary storage of healthy soils to prevent their degradation, prior to a suitable reuse; and/or
- measures to test and remediate potentially contaminated soils.

Early soil testing (Land Quality Assessment (LQA) and land characterisation studies) would enable consideration of on-site remediation and potential re-use of existing soil that would be excavated or moved to allow for the construction of the interim ILW store. The CEMP should

[80] RPS (2008). *AWE Burghfield: Conventional Manufacturing Rationalisation: Defence Exempt Environmental Appraisal*.

include measures for the storage of materials during construction and should include emergency procedures in the event of the release of pollutants during construction.

7.10.3 Assessment of Potential Negative Effects

During construction, it is expected that there may be asbestos containing materials and other contaminants to be managed. The key potential receptors would be construction workers and staff on site. With appropriate management and use of personal protective equipment the risks to health and the environment can be mitigated. Soil on the site may be negatively affected through compaction, degradation and pollution etc. It is considered unlikely that an off-site construction compound would be required, thus not affecting soils off-site. A minor negative effect is predicted at this stage.

As part of an EIA, it would be necessary for land characterisation and a LQA to be undertaken to establish any remedial measures required to ensure that land is suitable for its proposed use.

During operation, interim ILW storage is unlikely to affect soils because no discharges are anticipated.

Decommissioning carries risks of negative impacts on soils (compaction, degradation, pollution etc.) but these would be managed at the time through appropriate environmental management processes. As with construction, on-site remediation and /or off site transport and disposal may be required. Therefore, a minor negative effect is envisaged.

Table 7.12: Summary SEA Assessment for Geology & Soils, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

7.10.4 Measures Envisaged to Mitigate and Monitor Radiological Safety

AWE's EMS and the CEMP would address contaminated land issues, and to be an effective way to monitor progress in dealing with historic contaminated land issues.

7.10.5 Opportunities for Potential Benefits and Enhancements

Early contaminant testing and advice would allow the opportunity for on-site remediation and re-use elsewhere of suitable existing soil, such that the baseline is improved.

Table 7.13: Summary SEA Assessment for Geology & Soils, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**0**	**0**	**0**

7.11 Water

7.11.1 Baseline overview

The River Kennet (combined in places with the Kennet and Avon Canal) is over 2 km to the north of the site. Burghfield Brook flows southwest to northeast around the southern edge of the site (having previously been diverted), on its way to join Foudry Brook to the east and eventually the River Kennet and Avon Canal. An unnamed watercourse, approximately 100 m to the north also flows east to Foudry Brook. The site has outfalls to Burghfield Brook and the unnamed watercourse.

AWE has a license to discharge to Burghfield Brook and the unnamed watercourse, including runoff, effluent and trade waters. There is currently no monitoring information available to this SEA for AWE's licensed discharges to water.

As with AWE Aldermaston, the Environment Agency has advised in its scoping response that AWE Burghfield has experienced challenges to limits for suspended solids and pH in their aqueous discharges. These have usually been as a result of high rainfall at a time when major construction activities were taking place.

Water quality in Burghfield Brook is 'moderate' ecological status and good chemical quality, as is Foudry Brook from its confluence with Burghfield Brook downstream to the canal.

Regarding water resources, the site is within a confined aquifer groundwater management unit, within which the predominant assessment of water availability is 'over-licensed' (Environment Agency, 2004). The site lies within a groundwater source protection zone, Zone 1 (inner zone) and Zone 2 (outer zone).

The site has a groundwater abstraction operated by the MOD for the purposes of drinking, licensed for up to 700 m^3/day.[81] There is currently no monitoring information available to this SEA for AWE's annual water consumption.

An increase in population, coupled with potential effects of climate change, is likely to put increasing pressure on water resources over time.

7.11.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on the water environment. This would have to comply with a number of statutory requirements, as well as guidelines on the protection of surface and groundwater. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any pollution prevention measures, for example. It is expected that the EIA and CEMP could include such measures as:

- measures to properly store potentially polluting substances;
- measures to intercept and attenuate any site runoff;
- measures to prevent the pollution of groundwater due to creation of pathways from contaminated land; and
- minimisation of water consumption.

[81] Environment Agency (2013). *Interactive Maps.* Available from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

7.11.3 Assessment of Potential Negative Effects

Legislative requirements with regard to discharges will be complied with and construction will be managed through the CEMP to avoid run-off into watercourses (refer to Section 8.10). Therefore no significant effect upon the water environment is predicted. Any modifications to water bodies would need to be compliant with Water Framework Directive objectives. No likely modifications have been identified based upon current information and water consumption from the proposed interim ILW store is anticipated to be minimal (refer to Table 4.1 for assumptions on the operational use of water).

Table 7.14: Summary SEA Assessment for Water Environment, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

7.11.4 Measures Envisaged to Mitigate and Monitor Effects on Water Environment

It is envisaged that AWE's EMS would be used to monitor discharges and ensure they are minimised. There will be no discharges from the operation of the ILW store but particular attention to pollution prevention and control should be exercised during periods of high rainfall events to minimise risk of construction site run-off reaching water bodies. Details of appropriate pollution control protocols for high rainfall events should be set out clearly within the CEMP and construction staff advised on these measures.

7.11.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 7.15: Summary SEA Assessment for Water Environment, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

7.12 Air Quality

7.12.1 Baseline overview

In addition to transport emissions, AWE Burghfield has licensed discharges of NO_x, CO and PM_{10} through combustion of gas and oil. Its licensed limits of discharge (i.e. at source) are NOx: 180 mg/m3 (gas combustion), 280 mg/m^3 (oil); CO:100 mg/m^3; and PM10: 25 mg/m^3. [82]

Estimates of total average pollutant concentrations in the area of the site are 19.3 μg/m^3 for NO_x and 20.8 μg/m^3 for PM_{10}, well within the NAQS objectives.[81] There is currently no

[82] AWE (2011), Sustainability Plan 2010-2030. Available from: http://www.awe.co.uk/publications_b667d5b.html

monitoring information available to this SEA for AWE's discharges, or for CO background levels. There are no Air Quality Management Areas in near proximity to the site.

It is expected that over time, air quality in the UK will improve alongside improving technology in cars and industry.

7.12.2 Pre-existing and Committed Mitigation and Management

Details of the anticipated pre-existing mitigation are set out in Section 5.9. The EIA process, use of a CEMP and application of environmental permitting requirements would limit potential effects upon air quality during construction and operation.

It is also expected that Burghfield's EMS will further consider and deal with the minimisation of air emissions during operation.

7.12.3 Assessment of Potential Negative Effects

Legislative requirements will be complied with and the site construction will be managed to avoid cumulative impacts on air quality that breach air quality objectives. As a result, no significant effect upon air quality is predicted. This applies to both the construction and decommissioning periods.

During construction, there will be traffic movements associated with the transport of plant and construction workers to and from the site. This could result in air emissions. Given the relatively short-term period over which construction will take place, this would constitute a minor negative effect.

During operation, there will be some traffic movements associated with the transport of ILW / RPVs and staff travelling to and from the site which could result in air emissions. Given the volume of traffic predicted, this effect is considered to be minor.

Table 7.16: Summary SEA Assessment for Air Quality, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

7.12.4 Measures Envisaged to Mitigate and Monitor Air Quality

It is envisaged that AWE's EMS, together with the requirements of any permitting, would mean that air quality is monitored and managed as required.

A site-wide transport plan would be beneficial for managing emissions associated with potential cumulative transport requirements across construction projects, combined with staff transport.

7.12.5 Opportunities for Potential Effects and Enhancements

No benefits or enhancements, nor opportunities for further enhancement have been identified at this stage.

Table 7.17: Summary SEA Assessment for Air Quality, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

7.13 Climate Change and Energy Use

7.13.1 Baseline Overview

There is currently no data publicly available for the greenhouse gas emissions associated with transport or operation of AWE Burghfield. AWE has a target of reducing its emissions by 25% against the 1999/2000 baseline by end March 2014. [83]

7.13.2 Pre-existing and Committed Mitigation and Monitoring

Refer to section 5.5 on the assumed measures to address climate change and energy use for all sites.

AWE's EMS would help to ensure that energy use is minimised through operation. Energy may be required for climate control such as fans and dehumidifiers.

7.13.3 Assessment of Potential Negative Effects

During construction, use of materials with high embodied carbon content such as steel and concrete, as well as fuel consumption of construction plant would increase greenhouse gas emissions. A minor negative effect is predicted.

During operation, an ILW store would generate some greenhouse gas emissions. As these are anticipated to be relatively small, a minor negative effect is predicted.

During decommissioning, the use of plant and processes (such as demolition and recycling) would be likely to increase greenhouse gas emissions. A minor negative effect is predicted.

Extended operation, if required, is expected to be similar to the operational period, with minor significant effect.

Table 7.18: Summary SEA Assessment for Climate Change and Energy Use, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**-**	**-**	**-**

[83] AWE (2012). *Sustainability Plan 2012 – 2030* . http://www.awe.co.uk/contents/Publication/SustainabilityPlan2012Final.pdf

7.13.4 Measures Envisaged to Mitigate and Monitor Climate Change and Energy Use

It is envisaged that AWE's EMS could be amended to include the interim ILW store, and include climate change mitigation and energy usage considerations.

The use of recycled materials and locally sourced materials would help to minimise consumption of greenhouse gas emissions. The use of sustainably sourced biofuels would help to reduce overall greenhouse gas emissions from fuel.

The EIA and design of the interim ILW store should take account of the full lifecycle. Choosing materials with lower embedded carbon where possible and recycled material.

7.13.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 7.19: Summary SEA Assessment for Climate Change and Energy Usage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	**0**	**0**	**0**

7.14 Coastal Change and Flood Risk

7.14.1 Baseline overview

Parts of the AWE Burghfield site are within an area of high flood risk (1% probability of flooding in any given year), namely the area which follows the path of the former Burghfield Brook – the Brook was diverted when the site was developed before the Second World War. AWE has developed flood management measures since a flood event which occurred in 2007.

It should be noted that only part of the site is within the high flood risk zone. Any new development would be sited to avoid this area.

AWE is currently developing a proposal for a site flood alleviation scheme which will take into account potential impacts of climate change, which includes an off-site area to provide temporary storage of flood water during extreme rainfall events.

The Environment Agency has advised in its scoping response that some of the proposed measures to manage flood risk have yet to be implemented.

The site is inland so coastal change is of no relevance.

7.14.2 Pre-existing and Committed Mitigation and Monitoring

AWE has developed flood management measures. It is assumed that these would be implemented prior to commencement of the proposed ILW interim storage project.

A flood risk assessment (FRA) required as part of planning would address the potential impacts on flood risk, taking into account the predicted effects of climate change. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-

site measures are carried out appropriately. This would include any measures required to avoid or minimise significant impacts.

7.14.3 Assessment of Potential Negative Effects

High flood risk areas of the site will be avoided. Sufficient measures to mitigate flood risk would also be in place prior to undertaking the proposed ILW interim storage project. It is therefore considered that there would be a neutral effect on flood risk during construction, operation and decommissioning. On the basis that ongoing development and climate change may have a cumulative effect on exacerbating flood risk over time, a negative effect is assumed for the long-term operation.

Table 7.20: Summary SEA Assessment for Coastal Change and Flood Risk, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**-**

7.14.4 Measures Envisaged to Mitigate and Monitor Coastal Change and Flood Risk

It is envisaged that AWE's EMS could be amended to include the interim ILW store, and include flood risk considerations. It is recommended that the standards of drainage are periodically reviewed to ensure they meet the requirements of the time. Flood risk mitigation proposals should take a sufficiently long-term view to accommodate extended operation.

7.14.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 7.21: Summary SEA Assessment for Coastal Change and Flood Risk, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

7.15 Transportation

7.15.1 Baseline overview

The site is surrounded by a network of minor rural roads, which connect into the A33 and then the M4 to the north or M3 to the south.

Most of the AWE Burghfield workforce (about 85%) lives within the surrounding four local authorities, with a cluster to the southwest, which is thought mainly to be in Burghfield Common. About 97% of the workforce is postulated to travel by car, given the isolated

location of the site. There are bus services available to the site, and a rail station about 4 km to the northwest.[84]

A traffic survey carried out as part of a recent planning application indicates that there is AM and PM peak hour congestion on roads in the vicinity, and that perhaps the most sensitive road to additional traffic is Burghfield Road, which connects into Reading to the north (crossing the M4). Operational traffic at the site has different peak hours from the baseline peak traffic flows. There are also a number of known restrictions to heavy and large lorries on a number of the local roads in the area.[85]

Public rights of way are addressed under the SEA category 'Health and Well-Being'.

With projected population increases, traffic congestion is likely to become an increasingly significant issue, depending upon the success of West Berkshire Council's measures to address transport needs.

7.15.2 Pre-existing and Committed Mitigation and Management

Refer to Section 5.7 for information on pre-existing transport management and mitigation assumed for all sites.

7.15.3 Assessment of Potential Negative Effects

During construction, the use of heavy vehicles may result in increased deterioration of the carriageway and other highway infrastructure. This would constitute a minor negative effect.

Similarly, the combination of construction traffic and existing operational site traffic is likely to cause disruption to the local traffic network, particularly during peak times. A minor negative effect is predicted.

During operation, it is anticipated that minor adaptations to the local transport infrastructure may be required. However it is considered that these adaptations would be so minor as to be inconsequential in terms of transport. As the interim ILW store is anticipated to generate very few additional journeys (refer to Table 4.1: Assumptions about Implementing Interim) a neutral effect is predicted for operation.

During decommissioning, heavy vehicles may contribute to increased deterioration of the carriageway and other highway infrastructure. This would constitute a minor negative effect.

Extended operation, if required, is expected to be similar to the operational period, with no significant effect.

Table 7.22: Summary SEA Assessment for Transportation Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

[84] RPS (2008). *AWE Burghfield: Conventional Manufacturing Rationalisation: Defence Exempt Environmental Appraisal*.
[85] RPS (2008). *AWE Burghfield: Conventional Manufacturing Rationalisation: Defence Exempt Environmental Appraisal*.

7.15.4 Measures Envisaged to Mitigate and Monitor Transportation

If feasible any required adaptations to the highways should be coordinated to planned highway maintenance or improvements to minimise the risk of abortive work or increased disruption.

The transport of the RPVs should be planned in conjunction with the relevant local authorities, local community and other stakeholders to minimise disruption to the local road network. A Transport Management Plan is recommended to ensure that agreed routes are adhered to and to set out the appropriate frequency and timing of deliveries.

Transport planning would minimise transport effects and disruption to local traffic and villages.

Continued implementation and updates of a site transport plan would help to encourage sustainable transport choices for employees.

An effective supply chain management should be used to reduce the number of vehicle movement required to and from the site.

7.15.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 7.23: Summary SEA Assessment for Transportation, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

7.16 Waste Management

7.16.1 Baseline overview

There is currently no data publicly available for the total amount of waste (including construction and demolition waste) disposed of from AWE Burghfield. In terms of radioactive waste, figures for 2013, for the AWE Aldermaston and Burghfield sites combined, show that approximately 790 tonnes of waste was handled by the AWE sites. The waste management activities include the packaging and storage of solid Intermediate Level/High Activity radioactive waste; the packaging of Solid Low/Very Low Level radioactive waste and dispatch for treatment and disposal off site; and the treatment of Low/Very low level aqueous radioactive effluents. These operations are undertaken by the various waste producing facilities on the AWE sites which output compliant packages. The Burghfield site sends output to the Aldermaston site for consignment and/or storage[86].

Environment Agency data does not indicate any licensed waste transfers off-site.[87] It is reported that approximately 60% of controlled waste from the site is diverted from landfill to

[86] West Berkshire Council Waste Operator Returns data sheet, April 2014, provided by AWE.

[87] Environment Agency (2013). *Interactive Maps.* Available from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

more sustainable management methods, and AWE has targets to achieve 70% for both construction / demolition waste and controlled waste[88].

There are several recycling facilities indicated within 5 km of the site.

7.16.2 Pre-existing and Committed Mitigation and Management

Refer to Section 5.4 for information on requirements of waste legislation as pre-existing mitigation. The implementation of AWE's EMS is further anticipated to further establish good practice regarding waste management and minimisation.

7.16.3 Assessment of Potential Negative Effects

No additional significant volumes of waste are anticipated to be produced from operation of the interim ILW store.

During construction and decommissioning, increased volumes of waste may arise. However, it is anticipated that much of the material generated during decommissioning would be steel and concrete which could be widely recycled and re-used. A minor negative effect is predicted prior to appropriate mitigation.

Extended operation, if required, is expected to have similar effects to the operational period. Over time there is likely to be an increase in the level of maintenance required and construction waste generated as some of the infrastructure begins to degrade, however given the overall timescales involved, no significant effect is predicted.

Table 7.24: Summary SEA Assessment for Waste Management, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

7.16.4 Measures Envisaged to Mitigate and Monitor Waste Management

It is envisaged that AWE's EMS could be amended to include the interim ILW store, and include Waste Management considerations.

The specification of materials with a high recycled content in the design would help to minimise use of raw materials. Where possible, existing material on site should be re-used, provided it is suitable for use and in accordance with environmental permitting regulations.

Prior to construction, site investigations will be required to include land quality assessment and site characterisation to identify if any historic chemical or radiological contamination is present, and if present, mitigation measures to ensure the site is suitable for use.

7.16.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

[88] AWE (2011). *Sustainability Plan 2010 – 2030*. Available from: http://www.awe.co.uk/publications_b667d6b.html

Table 7.25: Summary SEA Assessment for Waste Management, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	**0**	**0**	**0**

7.17 Land Use and Materials

The vast majority of the site is an existing, developed site, and therefore the land cover of the site could be classed as industrial development. The surrounding area includes minor roads, farmland, woodland and dwellings.

There are no identified planning allocations in the near vicinity.

The site is envisaged to remain a licensed nuclear facility for the foreseeable future.

7.17.1 Pre-existing and Committed Mitigation and Management

No site-specific mitigation is identified.

7.17.2 Assessment of Potential Negative Effects

No significant negative effects to land use and materials are considered likely since it is predicted that the proposed interim ILW store would be contained within the existing site boundary.

Table 7.26: Summary SEA Assessment for Land Use and Materials, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

7.17.3 Measures Envisaged to Mitigate and Monitor Land Use and Materials

No further measures have been identified.

7.17.4 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 7.27: Summary SEA Assessment for Land Use and Materials, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

7.18 Cultural Heritage

7.18.1 Baseline overview

There are no Scheduled Monuments in proximity to AWE Burghfield, the nearest being approximately 3.5 km to the northwest. There are four Grade II Listed Buildings within approximately 1 km.

There have been several archaeological finds in the vicinity of the site, including Neolithic flint flakes and evidence of Bronze Age settlement and agriculture. There are visible signs of the area's Bronze Age history, as well as the site's association with a farm which likely originated in Medieval times. Its greatest potential is considered to be finds associated with the WWII filling factory[89] In addition there are Cold War heritage interests on the site.

The relevant baseline is not anticipated to change significantly in the foreseeable future from current conditions.

7.18.2 Pre-existing and Committed Mitigation and Management

Section 5.6 identifies pre-existing mitigation anticipated for all sites. No site specific pre-existing mitigation has been identified.

7.18.3 Assessment of Potential Negative Effects

During construction there is a slight potential to disturb historic or archaeological remains although this is a low risk as it is currently understood the site would be on previously developed land.

No significant effects are anticipated during operation, decommissioning or extended operation.

Table 7.28: Summary SEA Assessment for Cultural Heritage, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**0**	**0**

7.18.4 Measures Envisaged to Mitigate and Monitor Cultural Heritage (Quality and Visual Amenity)

It is envisaged that a future EIA would identify features of value and propose measures for their protection during construction and operation of the ILW store, in addition to taking into account the potential for cumulative effects on cultural heritage sites.

7.18.5 Opportunities for potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

[89] RPS (2011). *Site Setting Report: AWE Burghfield*.

Table 7.29: Summary SEA Assessment for Cultural Heritage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

7.19 Landscape and Townscape

7.19.1 Baseline overview

AWE Burghfield is a large, mainly industrial site which is undergoing periodic development. The site sits within the Thames Basin Heaths National Character Area, which is described as a *"particularly diverse landscape unified by the high incidence of heathland and coniferous forestry, the open unenclosed nature of which is unusual within the context of the south-east region"*[90].

The site is near the edge of the Kennet River valley on relatively flat land. The site is largely industrial and urban, with some amenity grassland and mature trees, and includes a number of engineered earth mounds. The site has extensive hard surfaces and buildings from the 1940s which are degraded and appear worn.[91] Surrounding the site are agricultural fields, woodland areas and hedgerows. Dwellings adjacent to the west are semi-vacant, and interspersed with vacant MOD land from demolished dwellings.

North Wessex Downs Area of Outstanding Natural Beauty is over 7 km to the north of the site. There are no locally designated landscape areas in proximity to the site.

Due to tree cover, views into the site are largely obscured, but there are intermittent views into the site from the surrounding area. While there is rising topography to the southwest, tree cover at AWE Burghfield and in intervening land and properties limits views to the site, even in winter.

At night, the site is currently lit mainly by sodium lighting, which is non-directional and domestic in scale. While visible lighting at night 'blends in' with urban lighting in the vicinity, the site's lighting may add a small contribution to sky glow associated with Reading and the M4.[92]

7.19.2 Pre-existing and Committed Mitigation and Management

Section 5.6 sets out pre-existing mitigation anticipated for the proposed interim ILW store, regardless of site. No site specific pre-existing mitigation has been identified.

7.19.3 Assessment of Potential Negative Effects

Despite mitigation, during construction plant and traffic may be visible, particularly if tall plant such as cranes are in use. A minor negative effect is predicted.

[90] Natural England (2004). *Thames Basin Heaths*. Available from: http://www.naturalengland.org.uk/Images/jca129_tcm6-5326.pdf

[91] RPS (2011). *Site Setting Report: AWE Burghfield*.

[92] RPS (2011). *Site Setting Report: AWE Burghfield*.

During operation, there would be little activity associated with the site, and no significant effects are likely. Very infrequent RPV movements are unlikely to affect landscape and townscape.

During decommissioning, it is likewise expected that plant and traffic may be visible, particularly if tall plant such as cranes are in use. This however would be within the context of the Burghfield site and therefore the effect is likely to be a minor negative one.

Extended operation, if required, is expected to be similar to the operational period, with no significant effect.

Table 7.30: Summary SEA Assessment for Landscape and Townscape, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

7.19.4 Measures Envisaged to Mitigate and Monitor Landscape and Townscape (Quality and Visual Amenity)

A project-level landscape and visual impact assessment may be needed to determine whether there is a need for a long-term landscape management plan to screen the development.

7.19.5 Opportunities for Potential Benefits and Enhancements

The implementation of recommendations from the landscape and visual impact assessment may improve landscape, albeit on a small scale once established after construction and during extended operations, if appropriately managed.

Table 7.31: Summary SEA Assessment for Landscape and Townscape, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**+**	**0**	**+**

8 Assessment Results: Capenhurst (CNS)

8.1 Site Background

CNS's site at Capenhurst neighbours the town of Ellesmere Port in Cheshire, within the Cheshire West and Chester Council boundary. It is approximately 10 km north of the town of Chester and 4 km from the Welsh border.

The Capenhurst site was originally developed during World War II as a Royal Ordnance factory. After the Second World War it was chosen as the location for a Gaseous Diffusion Plant, the purpose of which was to enrich Uranium. The plant was initially operated by the United Kingdom Atomic Energy Authority (UKAEA) and later British Nuclear Fuels Ltd (BNFL). In 1982 the Gaseous Diffusion Plant was shut down in favour of the gas centrifuge process for producing enriched uranium and a long-term decommissioning program was established. In 1993 the Capenhurst site was later divided into two Nuclear Licensed Sites. BNFL Capenhurst, which became responsible for the remaining diffusion plant and associated buildings and URENCO (Capenhurst) Ltd (UCL) (which later became URENCO UK (UUK)) which became responsible for overseeing the centrifuge operations.

In 2005 the recently formed Nuclear Decommissioning Authority (NDA) took over the nuclear liabilities from BNFL, and activities on that part of the site were then undertaken by Sellafield Ltd, a contractor working on behalf of the NDA. In 2012 the Capenhurst site underwent a re-licencing process that resulted in a single Nuclear Licensed site with UUK as the Site Licence Holder. A proportion of the former Sellafield Ltd (NDA) site was then transferred to a newly formed URENCO subsidiary Capenhurst Nuclear Services (CNS), who operate as a tenant on the Capenhurst Licensed Site, whilst the remaining portion of the Sellafield Ltd site was transferred to UUK. As part of its work, CNS is commissioned to provide responsible management of uranic materials and decommissioning activities on behalf of the NDA.

The Environment Agency has advised in its scoping comments that CNS takes in NDA's Magnox Depleted Uranium for storage and also stores hex tails for NDA. The Tails Management Facility is currently under construction and the Capenhurst site has top tier COMAH status.

Figure 8-1 below provides a map of the site, indicating also the approximate maximum size of an interim ILW storage site (3,150 m^2) and the likely construction and RPV transport routes (see Section 8.4). It should be noted that the particular location for the proposed interim ILW store has not been specified and Figure 8-1 is intended to provide context only in terms of the size of footprint within the context of the licensed site. The exact location would be determined following detailed investigations should the candidate site be selected for the interim ILW storage.

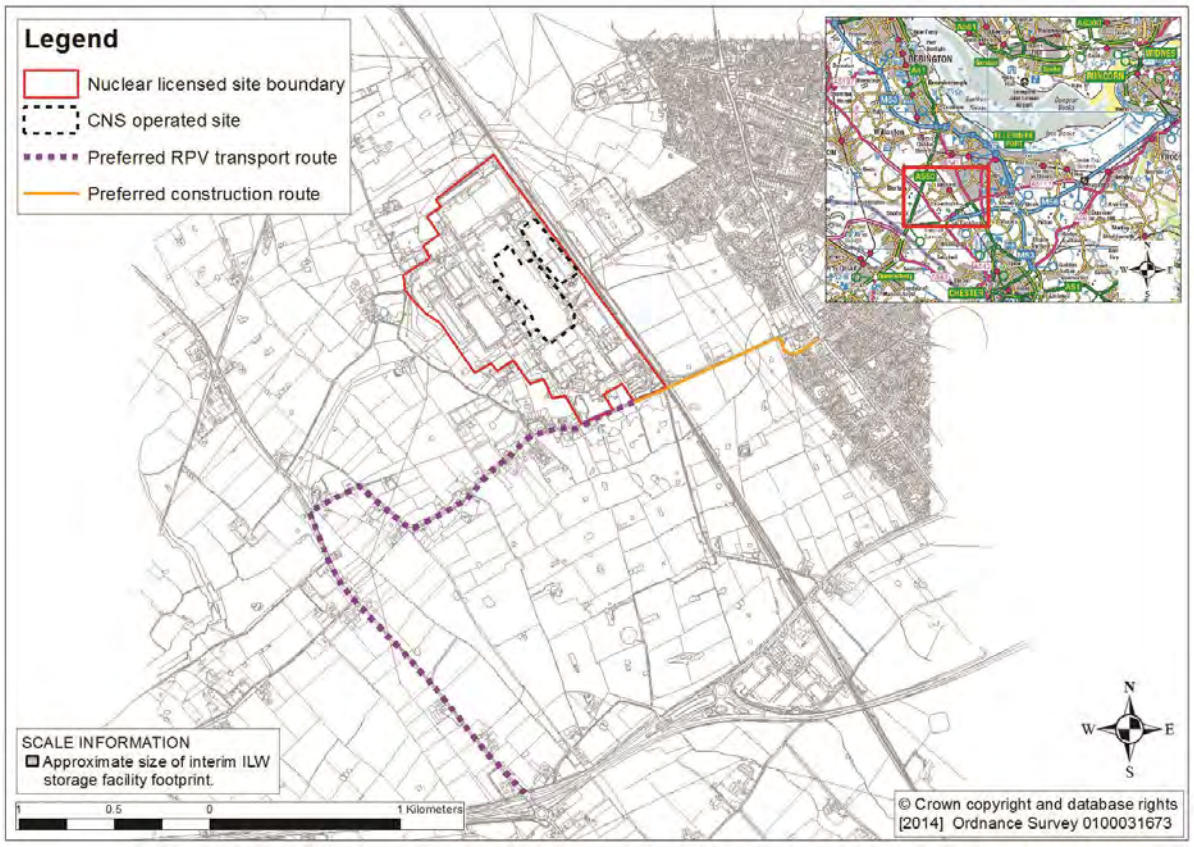


Figure 8-1: Map of Capenhurst (CNS) indicating nuclear-licensed boundary and likely construction and RPV transport routes

8.2 Evolution of the Baseline

The Capenhurst site is envisaged to remain a nuclear-licensed site for at least 100 years, in accordance with the end-state agreement reached through the NDA stakeholder engagement process.

There is a decommissioning strategy in place for future redundant facilities at Capenhurst that includes both near term decommissioning activities for facilities owned by NDA and longer term plans for those operational plants owned and operated by UUK Ltd. The strategy includes the progressive refurbishment, decommissioning and demolition of a range of nuclear facilities and the appropriate treatment and disposal of wastes. Ultimately, the strategy may lead to the eventual de-licensing of land from facilities for an appropriate after use, such as commercial development[93]. However, de-licensing of the site is an activity not envisaged for at least 100 years and the current end state agreed within the NDA stakeholder engagement process is for the site to remain as a licensed nuclear facility for the foreseeable future.

Trend data available for radiological discharges from Capenhurst shows that they have declined significantly and steadily since 2003, and were at their lowest levels in the last recorded year (2012).

Climate change in the region is projected to lead to the following relevant impacts: increased scarcity of water resources and increased frequency of droughts - this is

[93] Health & Safety Executive (2004). *A review by HM Nuclear Installations Inspectorate Urenco (Capenhurst) Ltd's strategy for decommissioning its nuclear-licensed site.* http://www.hse.gov.uk/nuclear/uclqgr.pdf

accounted for to some extent in the water resource status reported in Section 8.11.1; increased intensity of rainfall and frequency of intense rainfall events, leading to increased flood risk; sea level rise increasing coastal flood and erosion risk; sea level rise, and resulting habitat degradation, particularly around urban areas; landscape degradation around urban areas; and increased risk of the spread of invasive species[94].

The Environment Agency coastal management policy for the area is generally to hold the line (defend the coast), with the exception of an area 'no active intervention' to the northwest near Neston and Heswall.

As a baseline assumption, the nature conservation sites and notable habitats around Capenhurst are not predicted to change in area / boundary significantly into the long-term. However, there are a number of threats to biodiversity generally, which may contribute towards a decline in condition. This includes the effects of climate change, which may drive changes in vegetation cover and increase vulnerability to certain impacts, such as drought and spread of invasive species. For the assessment, it will be assumed that designated or priority habitats maintain their overall nature conservation value into the future, whilst biodiversity generally would be under increasing pressure from climate change and development.

Population projections for West Cheshire are for an approximately 3% increase between 2011 and 2021. The age profile is expected to change significantly, with a notable increase in people aged 70 and over, and a reduction in people aged 35 to 50[95]. As a major conurbation in the borough, Ellesmere Port will be a focus for new development, which may place additional pressure on natural resources (e.g. water, biodiversity) in the area. It may be accompanied by an increased provision of services and facilities in the town.

There is a planning application currently being determined for approximately 1,500 new dwellings from 300 m to the northeast of the Capenhurst site, on the opposite side of the railway line that runs alongside the site, plus retail floor space, a new primary school, a community building, a new linear park, playing fields, new allotments, other public open space, and related infrastructure.

There are a number of construction projects on-going at Capenhurst, and it is understood that further construction projects are upcoming within the next five years.

8.3 Local Planning Context

The relevant adopted Local Plan for the site is the Ellesmere Port & Neston Local Plan (prior to a change in local government to Cheshire West & Chester Council), adopted in 2002[96]. As a document which itself has accounted for international and national plans and programmes, it implements at a local level objectives consistent with those laid out in Annex 3.

[94] ClimateUK (2012). *Summary of Climate Change Risks for North West England*. Available from: http://climatechangenorthwest.co.uk/sites/default/files/00112a%20CCRA%20NW%20Pack.pdf

[95] DORIC (2013). *Dataset: Population Projections Interim 2011-2021 (ONS)*. Available from: http://www.doriconline.org.uk/Viewdata.aspx?P=Data&referer=%2fBuildDataView.aspx%3fDataSetID%3d721%26VariableID%3d2519

[96] Ellesmere Port and Neston Borough Council (2002). *Ellesmere Port and Neston Local Plan.* Available from: http://www.cheshirewestandchester.gov.uk/your_council/policies_and_performance/council_plans_and_strategies/planning_policy/current_local_plans.aspx

The emerging replacement Local Plan[97] is at a draft stage and references the URENCO Capenhurst site only to state that waste management policy does not cover radioactive wastes, as they are addressed within the nuclear sector and by national government policy.

Other than conservation and broad socio-economic issues for the borough (see baseline), policies addressing the site or near vicinity include one which classifies the site as a hazardous installation, whereby proposals to extend such installations would only be permitted if it does not increase risk to the general public or prejudice other policies by placing constraints on allocated land.

The Cheshire West & Chester Local Transport Plan 2011 – 2026[98] notes that recent upgrades to motorway standard along the A550 / A5117 corridor have significantly reduced congestion in the borough, and improved connections into Wales.

8.4 Proposals

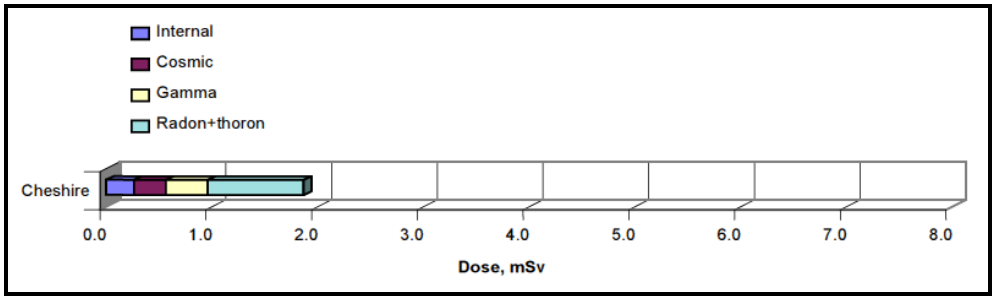
CNS has confirmed that an interim ILW store at the site could be located within the existing nuclear-licensed boundary

CNS's preferred route for both construction traffic and RPV transportation would be via the A41 and Capenhurst Lane avoiding Dunkirk Lane and Capenhurst Village.

8.5 Radiological Discharges and Exposures

8.5.1 Baseline overview

The interim ILW storage SEA Scoping Report (February 2014) provides background baseline for this topic. In summary, ionising radiation exposure from **natural sources** in the vicinity of the Capenhurst site is estimated to be less than 2 mSv per year, given county-level data available[99]. Figure 8-2 below presents an excerpt from the 2005 review of ionising radiation exposure of the UK by the HPA, illustrating the average annual doses to residents from different natural background sources.



NOTE: "internal" refers to radiation originating from terrestrial sources which, via the food chain, end up in our bodies, and "gamma" radiation is received externally from mainly terrestrial sources (rocks, soil and building materials such as stone).
Source: extract of figures in HPA, 2005, p.76[99]

Figure 8-2: Annual exposure to natural background radiation in Cheshire

[97] Cheshire West and Chester Council. *Emerging Local Plan*. Accessed December 2013 from: http://www.cheshirewestandchester.gov.uk/your_council/policies_and_performance/council_plans_and_strategies/planning_policy/emerging_local_plan.aspx

[98] Cheshire West and Cheshire Council. *Local Transport Plan: Integrated Transport Strategy 2011 – 2026*. Available from: http://www.cheshirewestandchester.gov.uk/your_council/policies_and_performance/council_plans_and_strategies/local_transport_plan_200.aspx

[99] Health Protection Agency (2005). *Ionising Radiation Exposure of the UK Population: 2005 Review*. Available from: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947389360

Activities at Capenhurst which result in radiological discharges comprise the gaseous emission of radioactive waste, and the discharge of liquid waste to Rivacre Brook.

Table 8.1 below summarises the discharges of emissions to air and water from the entire Capenhurst site relative to the permitted levels authorised by the Environment Agency.

Table 8.1: Radiological discharges at Capenhurst (2012) [100]

Discharge	Discharge Limit (annual equivalent)	Discharges during 2012	
		Measured annual discharge	% of Annual Limit
Capenhurst (CNS Ltd)[1]			
Air: alpha	BAT	334 kBq*	NA
Air: beta	BAT	678 kBq	NA
Capenhurst (URENCO UK Ltd)			
Air: Uranium	7.5 MBq	423 kBq	5.6
Air: Other alpha	2.4 MBq	Nil	Nil
Air: Technetium-99	100 MBq	Nil	Nil
Air: Others	2.25 GBq	Nil	Nil
Air: Alpha (Incinerator)	200 MBq	Nil	Nil
Air: Beta (Incinerator)	250 MBq	Nil	Nil
Water: Uranium	750 MBq	3.8 MBq	<1
Water: Uranium daughters	1.36 GBq	4.19 MBq	<1
Water: Non-uranic alpha	220 MBq	11 MBq	5.0
Water: Technetium-99	1 GBq	1.27 MBq	<1

[1] *Permit formerly held by Sellafield Limited prior to 30 November 2012*

**Figure amended by CNS (30 July 2014) as RIFE report believed to contain an error*

According to the 2013 Radioactivity in Food and the Environment (RIFE) report[101], the total dose from all pathways and sources of radiation at Capenhurst was approximately 0.085 mSv, which is less than 10% of the legal dose limit.

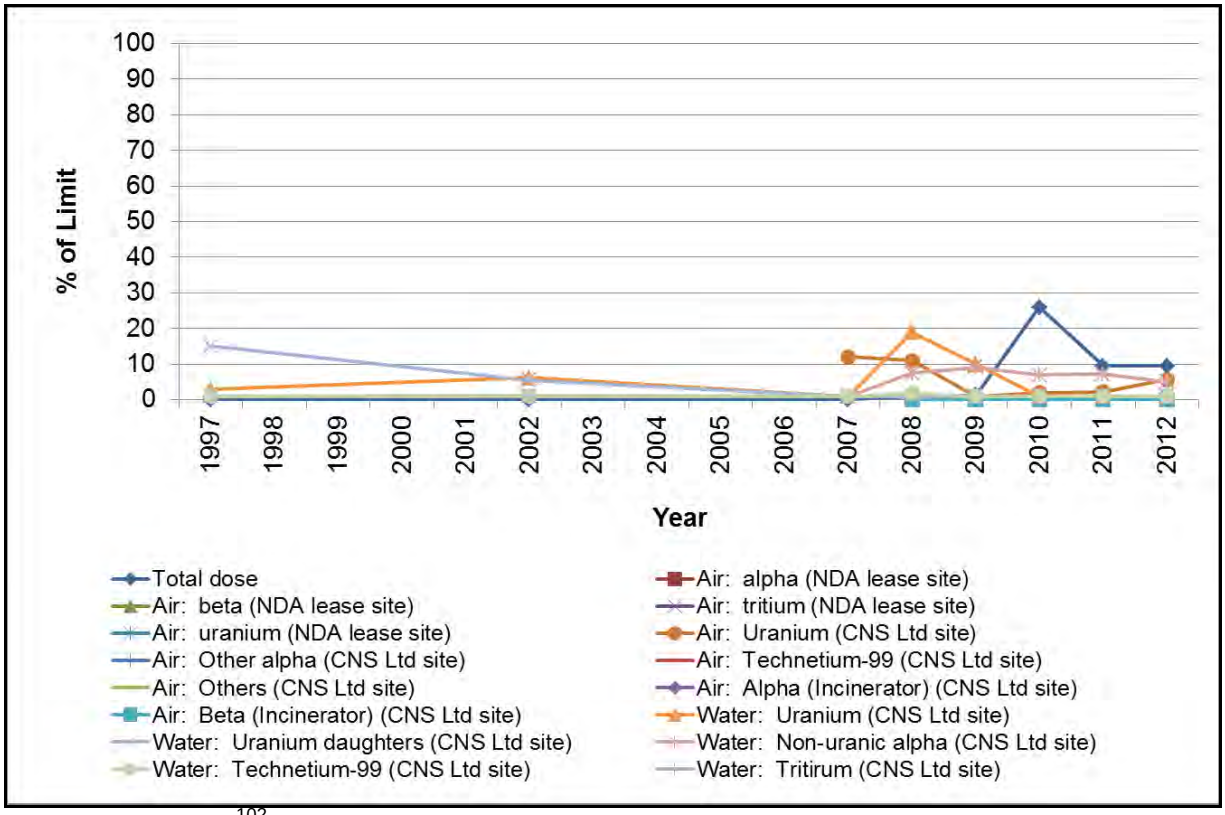
The RIFE report notes that,

"In future UUK is expecting to increase the enrichment of reprocessed uranium, which may lead to increases in discharges of technetium-99 and neptunium-237. However, no increase in the discharge limits is expected" [101].

Figure 8-3 below shows the available RIFE report radiological discharge and monitoring data for the years 1997, 2002 and each of the past five years from 2007 to 2012. (Note: the specific discharges requiring monitoring at the site have changed over time, and hence data for every discharge is not available for every year.) The data shows the discharges and dose to the public have remained well within their respective limits over the past 15 years. Trend data for radiological discharges from the entire Capenhurst site shows that they have declined significantly and steadily since 2003, and were at their lowest levels in the last recorded year (2012).

[100] Environment Agency, Food Standards Agency, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2013). *Radioactivity in Food and the Environment, 2012*. Available from: http://www.food.gov.uk/science/research/radiologicalresearch/radiosurv/rife/radioactivity-report2011/#.UlOVzIDYjpU

[101] http://www.sepa.org.uk/radioactive_substances/publications/rife_reports.aspx



Source: RIFE reports[102]

Figure 8-3: Radiological discharges and dose over time at entire Capenhurst Site

Plans for the CNS site do not indicate any significant increases in operational radiological discharges in the future, although as new facilities are commissioned, applications for any new discharges will be made under the environmental permitting regime. Committed Mitigation and Management

Section 5.4 provides details of the regulation and management of radiological discharges and exposures for nuclear sites.

CNS's 'nuclear safety case' is the key pre-existing, committed mitigation for the management and minimisation of radiological discharges in order to reduce risk to ALARP / ALARA. This is supported by regulation of the receipt of radioactive waste onto nuclear sites and the disposal of radioactive waste on or from nuclear sites by the Environment Agency[103] (refer to Section 5.4 for details of the regulation of nuclear sites and the need to review the nuclear safety case to reflect any proposed alteration of activities).

An on-site and off-site emergency plan must be prepared for licensed nuclear facilities and kept up-to-date under The Radiation Emergency Preparedness & Public Information Regulations (REPPIR) 2001[104].

The off-site emergency plans are prepared and updated by the relevant local authority. These plans are reviewed every three years or fewer, as required, to ensure that all

[102] http://www.sepa.org.uk/radioactive_substances/publications/rife_reports.aspx

[103] For more information, see Environment Agency (2013). *Nuclear*. http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/sectors/32517.aspx, and also HSE (accessed 2013). *ONR: How we regulate*. http://www.hse.gov.uk/nuclear/regulation-and-licensing.htm

[104] The Radiation Emergency Preparedness and Public Information Regulations (REPPIR), 2001. Available from: http://www.legislation.gov.uk/uksi/2001/2975/contents/made

emergency services involved in an emergency are aware of their roles and have the sufficient preparedness to act at any time. The size of the emergency planning area differs site by site in the UK, with due consideration given to individual factors associated with each site. The current emergency planning distance for the Capenhurst site is understood to cover a radial distance of 1km[105].

Under REPPIR, the addition of any new operation (e.g. the ILW store) would require the off-site emergency plan to be reviewed.

An on-site emergency plan is also required by REPPIR, which is prepared by the site operator. The Capenhurst site's most recent on-site emergency plan 'Capenhurst Emergency Plan, C(EP-4) Rev 3' was approved by the ONR in November 2012.[106] This plan covers the whole Capenhurst site.

8.5.2 Assessment of Potential Negative Effects

Radiological exposures from implementing interim ILW storage are predicted to be limited to small levels of direct radiation exposure from RPV sources within shielded containers (see further below). SDP has confirmed that there will be no radiological discharges to air, soil or water directly from the operation of the interim ILW store.

During construction, there is some potential for discovering historic radioactive contamination in the ground during site preparation and construction phases but this would be carefully managed in accordance with legislation and best practice including: full risk assessment and mitigation measures implemented to minimise potential exposure to humans (see Section 5.4). With required controls, it is considered that any potential for increased exposure to radiation would be limited to site workers. Significant effects to site workers' health are unlikely given construction good practice and stringent health and safety requirements.

During operation, the risk of exposure is mainly limited to direct radiation to workers and is subject to regulation and will be managed to ALARP / ALARA. The very low maximum external dose target of 0.5 mSv/hr at the external walls of the interim store will ensure that local communities experience no practically measurable increased dose from the interim ILW store.

During transport from Rosyth and Devonport to Capenhurst, direct radiation from the RPV would be through a shielded container, designed to ALARP / ALARA levels of potential exposure (see Section 5.4). Shielding will reduce the levels of direct radiation to very low levels outside of the RPV vehicle, which would present no significant risk of exposing members of the public to high levels of radiation. The very low frequency of transport (one to three movements per year) is taken into account in this assessment.

Emergency scenarios and preparedness would be planned for, and will ensure that under any incident scenario it would be very unlikely that people could be exposed to levels of radiation significantly above background levels, and in the 'worst case', they would be unlikely to be exposed to levels of radiation which would adversely affect their health.

The assumption is that it is highly unlikely that degradation of the waste package will occur necessitating repackaging before the end of interim storage. However, it is assumed that repackaging will be required at the end of interim storage due to the likely evolution of

[105] http://www.onr.org.uk/depz.htm

[106] ONR (Office for Nuclear Regulation), 2012. *Quarterly site report for the Urenco UK Limited Capenhurst site.* Available from: Quarterly site report for the Urenco UK Limited Capenhurst site.

regulations, policy and standards. This would involve no radioactive discharges and the discarded packaging would not be radioactive.

Given the pre-existing and committed mitigation above, the likely effects across the phases of implementation of interim ILW storage at Capenhurst are envisaged to be negligible for all four stages (Construction, Operation, Decommissioning and Extended Operation Stages), as summarised in Table 8.2 below.

Under normal operation there would be no discharges to air, water or soil from the interim ILW store. Direct radiological emissions from the store will be managed to ALARP / ALARA standards and will be significantly small as to make them practically unmeasurable at the site boundary. Therefore, there will be no increase in the effective dose to the public locally relative to current levels.

Table 8.2: Summary SEA Assessment for Radiological Discharges and Exposures, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

8.5.3 Measures Envisaged to Mitigate and Monitor Radiological Safety

No additional measures have been identified. The pre-existing mitigation set out in 5.4 and Section 0 means that risks are reduced to ALARP/ALARA and there is an established monitoring regime associated with nuclear installations (refer to Section 5.4).

8.5.4 Opportunities for Potential Benefits and Enhancements

No opportunities for potential benefits or further enhancement have been identified for radiological discharges.

Table 8.3: Summary SEA Assessment for Radiological Discharges and Exposures, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
	Neutral	Neutral	Neutral	Neutral
Potential Benefits and Enhancements	0	0	0	0

8.6 Biodiversity and Nature Conservation

8.6.1 Baseline overview

The Capenhurst site is located in the Urban Mersey Basin Natural Area, which is *"the Rivers Mersey and Irwell with an associated network of canals, rivers and valleys, around which the*

major cities and industries have developed"[107]. The Urban Mersey Basin is characterised by a varied assortment of habitats and species, with many of the habitats modified and created by human activity, including ponds and canals. Table 8.4 below lists the key biodiversity features within 5 km of the Capenhurst site. Figure A2-6 also provides a wider radius around the site, and shows that there is one SAC, two SPAs and three Ramsar sites within 20 km of the site.

Table 8.4: Biodiversity / nature conservation features within 5 km of Capenhurst

Features	Notable Types / Examples
1 Ramsar site	Mersey Estuary
2 SSSIs	Mersey Estuary and Hallwood Farm Marl Pit
2 RSPB Reserves	Dee Estuary (Burton Mere Wetlands) and Mersey Estuary
4 LNRs	Stanney Wood and Whitby Park are directly to the east within Ellesmere Port
UK BAP priority habitats	Lowland meadow; coastal and floodplain grazing marsh; mudflat; deciduous woodland; intertidal substrate foreshore; fens; traditional orchard; wood pasture and parkland
5 Ancient woodland areas	5 distinct areas.
30+ LWSs	See text below.

There are locally designated nature conservation sites south of the site, including an LWS directly to the southeast (opposite a local road), four LWSs over 400 m to the south / southwest and another over 400 m to the east (opposite a railway). Hallwood Farm Marl Pit SSSI is over 1.5 km to the northwest, and there are two LNRs within the urban area of Ellesmere Port, over 2 km to the east. The Dee Estuary (SSSI, SPA and Ramsar site) is 7 km away and therefore just outside of the study area.

The UK BAP priority habitats in proximity to the site's boundaries are deciduous woodland and traditional orchard; there are three of the latter between 600 m and 1 km from the site (two east, one south). There are small areas of deciduous woodland within the site, and approximately 10 more within 1 km.

There is currently no survey information available to this SEA for the Capenhurst site's habitat interest, other than the above.

Protected species have been found close to (but not within) the Capenhurst site[108] and it does not contain any designated habitats. However it has some potential for protected species. The UUK part of the Capenhurst site contains some deciduous woodland, which is a UK BAP habitat. There is no woodland on the CNS part of the site. There are locally designated nature conservation sites south of the site, including an LWS directly to the southeast (opposite a local road), four LWSs over 400 m to the south / southwest and another over 400 m to the east (opposite a railway).

[107] Natural England (2013). *Natural Areas: 26 Urban Mersey Basin*. http://www.naturalareas.naturalengland.org.uk/Science/natural/NA_Details.asp?N=&R=2&NA_Id=26

[108] Nuclear Decommissioning Authority (2010). *Strategic Environmental Assessment: Site Specific Baseline: Capenhurst*.

While climate change and regional / national development pressure are predicted to adversely affect biodiversity more generally, it is considered reasonable to assume that existing valued habitats will change, but still remain valuable as sites for nature conservation generally.

8.6.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on nature conservation, including any potential loss of woodland habitat, and the potential for encountering protected species during construction. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures (e.g. fencing, compensatory habitat, species translocation) required to avoid or minimise any significant impacts.

8.6.3 Assessment of Potential Negative Effects

Interim ILW storage would not require any discharges to air or water.

Although there are potentially other areas of land available, it is possible that cumulative development across the Capenhurst site would put pressure on the deciduous woodland. Despite mitigation, during construction, there remains potential for noise, dust and lighting to disturb protected species. A minor negative effect is predicted.

Transport movements are anticipated to be so low as to cause no significant effects upon nature conservation locally.

During operation, there would be little activity associated with the site, and no significant effects are likely. The very infrequent RPV movements expected are unlikely to affect habitats or species.

During decommissioning, as with construction, there would be the potential for noise, dust and lighting to disturb protected species and so a minor negative effect is predicted.

Extended operation if required, assuming it would be within 40 – 100 years, is expected to be similar to the operational period, with no significant effect.

Table 8.5: Summary SEA Assessment for Biodiversity, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

8.6.4 Measures Envisaged to Mitigate and Monitor Effects on Biodiversity

During construction and decommissioning, details of the biodiversity interests to be protected should be set out within the CEMP and monitored throughout the construction and decommissioning phases.

Capenhurst has an environmental management system (EMS) certificated to ISO 14001: 2004. It is envisaged that this could be amended to include the interim ILW store. Aspects

related to biodiversity could be included within the EMS, which would help ensure that biodiversity is monitored for the site.

8.6.5 Opportunities for Potential Benefits and Enhancements

There may be potential for a site wide biodiversity action plan, with measures to manage and improve biodiversity at or (where permitted and feasible) in the near vicinity of the site. Benefits would most likely not be applicable until the operational period.

Table 8.6: Summary SEA Assessment for Biodiversity, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**+**	**+**	**+**

8.7 Population

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the number or types of jobs available in local economies, and levels of deprivation in surrounding areas'. No significant potential effects upon other aspects of population were anticipated during the scoping stage.

8.7.1 Baseline overview

The settlements in the near vicinity include Great Sutton and South Wirral, within 500 m to the east, which are contiguous with Ellesmere Port; the small village of Capenhurst, approximately 150m to the southwest of the site; Ledsham village, located directly adjacent to the west; and a number villages within 5km to the north, west and south, including Burton, Puddington and Saughall.

The site is situated within an LSOA which includes rural area to the southeast and has low deprivation across economic and related issues (i.e. domains) of the Indices of Multiple Deprivation (IMD). However, access to services is poor as measured by the sub-domain 'geographical barriers', whereby the area is within the 10% most deprived LSOAs in England[109]. However, the LSOA also includes a large rural area to the southeast of the site, and therefore this data may or may not be indicative of Capenhurst Village and nearby residents specifically.

Areas (as broken down into LSOAs) surrounding the site perform very similarly with regard to deprivation. LSOAs further away in central Ellesmere Port, west Chester and North Wales show pockets of economic deprivation.

The Capenhurst site is estimated to provide over 1,500 jobs and contribute approximately £2 million to the local economy. There is a technology park directly adjacent to the site to the south, which contains a number of local businesses. There is no known allocated or designated employment land within the near vicinity of the site, however it is surrounded by towns in England and Wales (e.g. Connah's Quay) which have significant employment centres and there is a technology park adjacent to the site.

[109] DCLG – Department of Communities and Local Government (2011). *English indices of deprivation 2010*. Available from: https://www.gov.uk/government/publications/english-indices-of-deprivation-2010

8.7.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on local communities, including any businesses. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures to manage transport effects, for example.

8.7.3 Assessment of Potential Negative Effects

No negative effects considered likely. The site is already subject to on-going development, and this additional construction project is unlikely to alter community perception of the area to an extent which could harm local investment or employment to a significant degree.

There are potential medium-term and long-term employment opportunities from the interim ILW store, although this is not anticipated to generate many jobs (not more than 100 full-time equivalent employees maximum during construction and 10 full-time equivalents during operation).

Table 8.7: Summary SEA Assessment for Population

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

8.7.4 Measures Envisaged to Mitigate and Monitor Effects on Population

No measures have been identified.

8.7.5 Opportunities for Potential Benefits and Enhancements

There are potential short-term, medium-term and long-term employment opportunities from the interim ILW store, although this is not anticipated to generate many jobs (circa 100 full-time equivalents in the short-term and 10 in the medium to long-term). .

Table 8.8: Summary SEA Assessment for, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**+**	**+**	**+**

8.8 Health and Well-Being

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the health, safety and well-being of local

communities'. No significant potential effects upon other aspects of health, including workers / employees, healthcare infrastructure / provision or recreation, were anticipated during the scoping stage.

8.8.1 Baseline Overview

As for 'Population', the site is situated within an LSOA which is largely rural and extends to the south, and has low deprivation across health, disability and related issues (i.e. domains) of the IMD. It is amongst the 40% least deprived nationally for health and disability, 50% least deprived for crime and 50% least deprived for living environment. LSOAs surrounding the site perform similarly, with crime rates higher to the east. There are also pockets of deprivation in health, community safety and physical environment across the border in Wales[110].

A residential development in the region of 1,500 dwellings is proposed at Sutton New Hall Farm, on the opposite side of the railway to the northeast of Capenhurst. The development will include around 400m² of retail floor space for a local shop, a new primary school, a community building, a new linear park, playing fields and other public open space, and new allotments, in addition to new accesses, streets and other related infrastructure.[111] The application to develop the site on Sutton New Hall Farm was approved in December 2013, however the planning application for the development itself is still awaiting approval.

8.8.2 Pre-existing and Committed Mitigation and Management

Environmental discharges which could affect health and well-being are discussed in Sections 8.5, 8.9, 8.10, 8.11 and 8.12. Potential exposure to radiation is and will in future be managed, regulated and monitored to ALARP/ALARA.

Chapter 5 should be referred to for further information about pre-existing mitigation common to all nuclear installations.

There are playing fields which abut the south-west boundary of the Capenhurst site. These are currently owned by URENCO UK and leased to the Capenhurst Sports Club who are responsible for the maintenance and upkeep of the playing fields.

8.8.3 Assessment of Potential Negative Effects

Potential exposure would be in the form of low levels of direct radiation (no discharges are anticipated from the interim ILW store). The main potential for receiving an increased radiation dose would lie with the site workforce, as the public would receive no practically measurable increase in radiation does and all emissions of radioactivity will be managed to ALARP / ALARA.

During operation, it is anticipated that there will be a slight increase in transport movements (likely to be infrequent RPV deliveries and very few personnel / maintenance transport requirements) which will generate minor increases in transport emissions. The scale of these emission increases is not anticipated to be significant.

[110] Statistics for Wales (2011). *Welsh Index of Multiple Deprivation*. Available from: http://wales.gov.uk/docs/statistics/2011/110831wimd11summaryen.pdf

[111] Chester West and Chester Council, 2014. Available from: http://pa.cheshirewestandchester.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=MT0TQKTE6V000

Disruption from construction traffic, noise and dust may cause some disturbance and inconvenience during construction to local residents, but this would be temporary and is unlikely to affect any determinants of health[112] significantly.

The EA has noted that there is some radioactive and non-radioactive (VOCs) contamination of the ground at the site for which the best future management options are currently being investigated. Although it is not possible to predict likely effects or mitigations until the investigations are complete, interim ILW storage would not affect the existing problem, and is considered unlikely to significantly affect future management or remediation. Suitable testing of ground conditions, compliance with legislation and mitigation planning, would ensure no significant risk of significant effects to health during construction or decommissioning.

Medium-term and long-term employment opportunities can lead indirectly to significant benefits to people's health and well-being. However, interim ILW storage is not anticipated to generate many jobs (circa 10 full-time equivalent), and thus the benefit is neutral.

Table 8.9: Summary SEA Assessment for Health and Well-Being, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

8.8.4 Measures Envisaged to Mitigate and Monitor Effects on Health and Wellbeing

A future EIA would account for the potential cumulative effects across different environmental topics on health and well-being, including for example, recreation and amenity.

8.8.5 Opportunities for Potential Benefits and Enhancements

Interim ILW storage is expected to generate a relatively small number of jobs and (circa 10 full-time equivalents). It is therefore unlikely to significantly benefit health and well-being in the community.

Table 8.10: Summary SEA Assessment for Health & Well-Being, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

[112] 'Determinants' of health and well-being can be defined as key factors which together determine how health a person or community is likely to be. They include factors such as health social networks, mental health and well-being, physical environment (e.g. housing, local area), employment opportunity and access to services.

8.9 Noise and Vibration

8.9.1 Baseline Overview

There are a number of potentially sensitive receptors to noise and vibration in the vicinity of the site. The residents of Capenhurst village are directly to the south, and there are farms, isolated dwellings and villages in all directions. Within 1 km of the site there are two schools, two places of worship and a nursing home, the last of which is next to the site.

A recent baseline report notes that,

"*There is limited data relating to noise and vibration levels near the site. However, there are one or two enquires per year relating to noise levels from the combined site".*[113]

This is primarily due to ongoing construction activities.

No baseline vibration issues have been identified for this site.

Plans for the site indicate a number of construction projects over the next 10 years or so. However, the nature of potential new noise sources on-site is unknown. Likewise, the precise change in construction / HGV traffic to/from the site over the years is unknown, and would fluctuate as certain projects reach completion whilst others commence construction.

8.9.2 Pre-existing and Committed Mitigation and Management

A future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on noise and vibration. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures to manage transport effects, for example. It is expected that the EIA and CEMP could include such measures as:

- traffic management;
- limiting working hours; and
- monitoring of potential impacts of vibration, and frequency of vibration-generating activities.

It is also expected that Capenhurst's EMS will consider and deal with noise generation and management of this impact during operation.

8.9.3 Assessment of Potential Negative Effects

During construction, it is anticipated that some residual noise and vibration will be generated despite the adoption of mitigation measures. This would constitute a minor negative effect. Whilst it is not possible to guarantee a neutral effect at this stage of assessment (SEA), project-level EIA may identify measures to avoid or fully mitigate any negative effect.

During operation, the activities associated with interim ILW storage will be largely passive. Ventilation and energy supply units may generate low-level hums or ventilation noise, however these potential impacts would be assessed and mitigated as part of EIA and storage design. A neutral effect is therefore predicted.

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113 Nuclear Decommissioning Authority (2010). *Strategic Environmental Assessment: Site Specific Baseline: Capenhurst*.

Decommissioning carries the same risks of negative noise impacts as the construction process.

Table 8.11: Summary SEA Assessment for Noise & Vibration, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	–	0	–	0

8.9.4 Measures Envisaged to Mitigate and Monitor Noise

CNS's EMS could be amended (if required / appropriate) to include the SDP interim ILW store. Provision of additional noise monitoring may be incorporated if there is substantial uncertainty about potential impacts. This would be determined by a future EIA.

The EMS or CEMP could provide an effective way to monitor noise and vibration from multiple construction projects.

8.9.5 Opportunities for Potential Benefits and Enhancements

No opportunities for benefits or enhancements have been identified.

Table 8.12: Summary SEA Assessment for Noise & Vibration, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	0	0	0

8.10 Geology and Soils

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate Interim ILW storage sites is limited to: 'soil quality, variety, extent and/or compaction levels'. No significant potential effects upon geological conservation or land stability were anticipated during the scoping stage.

8.10.1 Baseline Overview

The main soil type on the site is loamy / clayey soils. The general geological makeup of the site is drift-covered Sherwood sandstone. There are no Grade 1 or 2 soils estimated to be within or adjacent to the site, though small patches of Grade 2 soils occur in the general area. The site and immediately surrounding area are shown to be Grade 3 soil.

The Environment Agency has advised that there is some radioactive and non-radioactive (VOCs) contamination in the ground at the site for which the best future management options are currently being investigated.

8.10.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on geology and soils. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any contaminated land issues, for example, and maximising the remediation and reuse of soils. It is expected that the EIA and CEMP could include such measures as:

- maximising reuse of soils on-site, if appropriate;
- dust suppression and wetting down of exposed soils to prevent their erosion;
- spill and other potential pollution prevention;
- appropriate temporary storage of healthy soils to prevent their degradation, prior to a suitable reuse; and/or
- measures to test and remediate potentially contaminated soils.

Early soil testing (Land Quality Assessment (LQA) and land characterisation studies) would enable consideration of on-site remediation and potential re-use of existing soil that would be excavated or moved to allow for the construction of the interim ILW store. The CEMP should include measures for the storage of materials during construction and should include emergency procedures in the event of the release of pollutants during construction.

8.10.3 Assessment of Potential Negative Effects

Capenhurst is a very constrained site, and is known to have a surplus of soils on-site as a result of previous construction projects. During construction, it is anticipated that soil may need to be removed from site. Soil on the site may be negatively affected through compaction, degradation and pollution etc. It is considered unlikely that an off-site construction compound would be required, thus not affecting soils off-site. A minor negative effect is predicted at this stage.

The EMS and the CEMP would address contaminated land issues. In addition, as part of an EIA, it would be necessary for land characterisation and a LQA to be undertaken to establish any remedial measures required to ensure that land is suitable for its proposed use.

During operation, interim ILW storage is unlikely to affect soils because no discharges are anticipated.

Decommissioning carries risks of negative impacts on soils (compaction, degradation, pollution etc.) but these would be managed at the time through appropriate environmental management processes. As with construction, on-site remediation and /or off site transport and disposal may be required. Therefore, a minor negative effect is envisaged.

Table 8.13: Summary SEA Assessment for Geology & Soils, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

8.10.4 Measures Envisaged to Mitigate and Monitor Effects on Soils

CNS's EMS and the CEMP would address contaminated land issues, and to be an effective way to monitor progress in dealing with historic contaminated land issues.

8.10.5 Opportunities for Potential Benefits and Enhancements

Should contaminated soils be discovered at the site of the interim ILW store, there is the potential for remediation of these soils, and reuse elsewhere, such that the baseline is improved.

Table 8.14: Summary SEA Assessment for Geology & Soils, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**0**	**0**	**0**

8.11 Water

8.11.1 Baseline Overview

Rivacre Brook originates from an area close to the southern boundary of the site and flows northwards through Ellesmere Port into the Mersey Estuary approximately 4.5 km to the northeast. The site has a single outfall into a discharge ditch, which then meets Rivacre Brook over 1 km to the east within the residential area of the town.

The Environment Agency monitoring data available for 2011 indicates that authorised discharges to the Rivacre Brook from the UUK site as a whole include fluorides, arsenic, cadmium, chromium, copper, lead, nickel and zinc. Authorised discharges include arsenic, chromium, copper, lead, mercury, nickel, zinc, fluorides and cadmium.

The Environment Agency has advised in response to the Scoping Report that there has been a history of copper discharge limit exceedences under URENCO UK Ltd's permit, which URENCO UK Ltd continues to address. Exceedences of minor limits associated with pH, aluminium, suspended solids and fluoride discharges made under URENCO UK Ltd's permit also occurred during 2013.

Rivacre Brook is a heavily modified water body, and is of 'bad' ecological potential, but good chemical quality for its entire length. This failure in ecological quality is due to poor diversity of macro-invertebrates, which in turn may be due to high levels of phosphates[114] which do not arise from site operations..

Regarding water resources, the site is within a catchment zone assessed as 'water not available' for abstraction from surface waters and 'restricted water available' from groundwater[115]. The site does not hold an abstraction licence. The site lies within a groundwater vulnerability zone of a major aquifer with intermediate vulnerability.

[114] Environment Agency webpage 'What's in your backyard?": http://maps.environment-agency.gov.uk/wiyby/wiybyController?extraClause=NAME~%27Rivacre%20Brook%27

[115] Environment Agency (2013). *Lower Mersey and Alt abstraction licensing strategy*. Available from: http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/LIT_7881_35d3ed.pdf

8.11.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on the water environment. This would have to comply with a number of statutory requirements, as well as guidelines on the protection of surface and groundwater. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any pollution prevention measures, for example. It is expected that the EIA and CEMP could include such measures as:

- measures to properly store potentially polluting substances;
- measures to intercept and attenuate any site runoff;
- measures to prevent the pollution of groundwater due to creation of pathways from contaminated land; and
- minimisation of water consumption.

8.11.3 Assessment of Potential Negative Effects

Legislative requirements with regard to discharges will be complied with and construction will be managed through the CEMP to avoid run-off into watercourses (refer to Section 8.10). Therefore no significant effect upon the water environment is predicted. Any modifications to water bodies would need to be compliant with Water Framework Directive objectives. No likely modifications have been identified based upon current information and water consumption from the proposed interim ILW store is anticipated to be minimal (refer to Table 4.1 for assumptions on the operational use of water).

Table 8.15: Summary SEA Assessment for Water Environment, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

8.11.4 Measures Envisaged to Mitigate and Monitor Effects on Water Environment

It is envisaged that CNS's EMS would be used to monitor pollutants to any discharge points, and ensure they are minimised.

8.11.5 Opportunities for Potential Benefits and Enhancements

Should contaminated soils be discovered at the site of the interim ILW store, there is the potential for remediation of these soils, which could remove a potential hazard to water quality.

Table 8.16: Summary SEA Assessment for Water Environment, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**0**	**0**	**0**

8.12 Air Quality

8.12.1 Baseline Overview

UUK has an Environmental Permit for the discharge of gaseous effluent from 21 discharge points across the site. Point source chemical emissions to air produced during enrichment operations at the UUK site are relatively low hazard and are primarily limited to inorganic Hydrogen Fluoride compounds, e.g. (HCFCs and HFCs), released through the enrichment plant Gaseous Effluent Vent Systems (GEVS).[116]

The latest Environment Agency monitoring data available for 2012 indicates that these emissions have remained within their respective limits for all records available, although the actual limits and discharge values are not known[117]. There are no Air Quality Management Areas (AQMAs) in near proximity to the site.

8.12.2 Pre-existing and Committed Mitigation and Management

Details of the anticipated pre-existing mitigation are set out in Section 5.9. The EIA process, use of a CEMP and application of environmental permitting requirements would limit potential effects upon air quality during construction and operation.

It is also expected that Capenhurst's EMS will further consider and deal with the minimisation of air emissions during operation.

8.12.3 Assessment of Potential Negative Effects

Legislative requirements will be complied with and the site construction will be managed to avoid cumulative impacts on air quality that breach air quality objectives. As a result, no significant effect upon air quality is predicted. This applies to both the construction and decommissioning periods.

During construction, there will be traffic movements associated with the transport of plant and construction workers to and from the site. This could result in air emissions. Given the relatively short-term period over which construction will take place, this would constitute a minor negative effect.

During operation, there will be some traffic movements associated with the transport of ILW / RPVs and staff travelling to and from the site which could result in air emissions. Given the volume of traffic predicted, this effect is considered to be minor.

[116] URENCO, 2013. *URENCO Capenhurst Site: Integrated Waste Strategy*. Available from: file:///C:/Users/plummed/Downloads/uuk_iwsrpt_201213_1.pdf

[117] Environment Agency, Food Standards Agency, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2013). *Radioactivity in Food and the Environment, 2012*. Available from: http://www.food.gov.uk/science/research/radiologicalresearch/radiosurv/rife/radioactivity-report2011/#.UlOVzlDYjpU

Table 8.17: Summary SEA Assessment for Air Quality, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

8.12.4 Measures Envisaged to Mitigate and Monitor Air Quality

It is envisaged that CNS's EMS, together with the requirements of any permitting, would mean that air quality is monitored and managed as required.

A site-wide transport plan would be beneficial for managing emissions associated with potential cumulative transport requirements across construction projects, combined with staff transport.

8.12.5 Opportunities for Potential Benefits and Enhancements

No benefits or enhancements, nor opportunities for further enhancement have been identified at this stage.

Table 8.18: Summary SEA Assessment for Air Quality, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

8.13 Climate Change and Energy Use

8.13.1 Baseline Overview

Data on energy consumption for the CNS site shows a steady decline in usage per unit of output between 2005 and 2007.

The site is envisaged to remain a nuclear-licensed site for at least 100 years, and the current end state agreed within the NDA stakeholder engagement process is for the site to remain as a licensed nuclear facility for the foreseeable future.

8.13.2 Pre-existing and Committed Mitigation and Management

Refer to 5.4 on the assumed measures to address climate change and energy use for all sites.

CNS's EMS would help to ensure that energy use is minimised through operation. Energy may be required for climate control such as fans and dehumidifiers.

8.13.3 Assessment of Potential Negative Effects

During construction, use of materials with high embodied carbon content such as steel and concrete, as well as fuel consumption of construction plant would increase greenhouse gas emissions. A minor negative effect is predicted.

During operation, an ILW store would generate some greenhouse gas emissions. As these are anticipated to be relatively small, a minor negative effect is predicted.

During decommissioning, the use of plant and processes (such as demolition and recycling) would be likely to increase greenhouse gas emissions. A minor negative effect is predicted.

Extended operation, if required, is expected to be similar to the operational period, with minor significant effect.

Table 8.19: Summary SEA Assessment for Climate Change and Energy Use, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	-	-	-

8.13.4 Measures Envisaged to Mitigate and Monitor Climate Change and Energy Use

It is envisaged that CNS's EMS could be amended to include the interim ILW store, and include climate change mitigation and energy usage considerations.

The use of recycled materials and locally sourced materials would help to minimise consumption of greenhouse gas emissions. The use of sustainably sourced biofuels would help to reduce overall greenhouse gas emissions from fuel.

The EIA and design of the interim ILW store should take account of the full lifecycle. Choosing materials with lower embedded carbon where possible and recycled material.

8.13.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 8.20: Summary SEA Assessment for Climate Change and Energy Usage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	**0**	**0**	**0**

8.14 Coastal Change and Flood Risk

8.14.1 Baseline Overview

The Capenhurst site and key components of the road network around it are outside of the main flood risk areas. The site is not currently at risk of coastal change, being approximately 4.5 km from the nearest estuary.

8.14.2 Pre-existing and Committed Mitigation and Management

A flood risk assessment (FRA) required as part of planning would address the potential impacts on flood risk, taking into account the predicted effects of climate change. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures required to avoid or minimise significant impacts.

8.14.3 Assessment of Potential Negative Effects

No significant negative effects to coastal change and flood risk is considered likely.

Table 8.21: Summary SEA Assessment for Coastal Change and Flood Risk, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

8.14.4 Measures Envisaged to Mitigate and Monitor Coastal Change and Flood Risk

It is envisaged that CNS's EMS could be amended to include the interim ILW store, and include coastal change and flood risk considerations. It is recommended that the standards of drainage are periodically reviewed to ensure they meet the requirements of the time.

8.14.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 8.22: Summary SEA Assessment for Coastal Change and Flood Risk, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

8.15 Transportation

8.15.1 Baseline Overview

The site is surrounded by minor roads, but with several A Roads just a short distance away. Southwards, they connect into the A41, A540 and A5117 towards the M56 and M53. Northwards, they connect into the A550 and then directly onto the M53.

There is currently no information available to this SEA for the residency profile of CNS's staff and thus travel to work patterns.

To the east of the site is Capenhurst Rail Station. Cycle routes and footpaths are addressed under the SEA category 'Health and Well-Being'.

8.15.2 Pre-existing and Committed Mitigation and Management

Refer to Section 5.7 for information on pre-existing transport management and mitigation assumed for all sites.

8.15.3 Assessment of Potential Negative Effects

There is currently stockpiled soil at the Capenhurst site. This may have to be transported to an alternative location before construction can commence. This would generate a minor negative effect.

During construction, the use of heavy vehicles may result in increased deterioration of the carriageway and other highway infrastructure. This would constitute a minor negative effect.

During operation, minor adaptations to the local transport infrastructure may be required, for example bridge reinforcement. As there is already radiological transport taking place through the village and the interim ILW store is anticipated to generate very few additional journeys (refer to Table 4.1), a neutral effect is predicted during operation.

During decommissioning, heavy vehicles may contribute to increased deterioration of the carriageway and other highway infrastructure. This would constitute a minor negative effect.

Extended operation, if required, is expected to be similar to the operational period, with no significant effect.

Table 8.23: Summary SEA Assessment for Transportation Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

8.15.4 Measures Envisaged to Mitigate and Monitor Transportation

If feasible any adaptations to highways should be coordinated to planned highway maintenance or improvements to minimise the risk of abortive work or increased disruption.

The transport of the RPVs should be planned in conjunction with the relevant local authorities, local community and other stakeholders to minimise disruption to the local road network. A Transport Management Plan is recommended to ensure that agreed routes are adhered to and to set out the appropriate frequency and timing of deliveries.

Transport planning would minimise transport effects and disruption of local traffic.

Continued implementation and updates of a site transport plan would help to encourage sustainable transport choices for employees.

An effective supply chain management should be used to reduce the number of vehicle movement required to and from the site.

8.15.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 8.24: Summary SEA Assessment for Transportation, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

8.16 Waste Management

The scope of this SEA is waste associated with the interim storage of RPVs. Waste associated with other activities as part of the SDP are outside the scope of the assessment within this Environmental Report.

8.16.1 Baseline Overview

Waste from the Capenhurst site has come from decommissioning activities as well as operations.

Following a successful audit by LLWR, CNS made its first disposal of radioactive waste in December 2013 disposing of a total of 12.8m3 of waste. Radioactive waste disposals are expected to continue throughout 2014.

With regards to non-radioactive wastes CNS generated a total of 60.78 tonnes of hazardous and non-hazardous waste throughout 2013 with 63% of this being recycled, 36% sent to landfill and 1% recovered[118].

8.16.2 Pre-existing and Committed Mitigation and Management

Refer to Section 5.4 for information on requirements of waste legislation as pre-existing mitigation. The implementation of CNS's EMS is further anticipated to further establish good practice regarding waste management and minimisation.

8.16.3 Assessment of Potential Negative Effects

It is understood that there is currently excess material (mostly soil) on the site that may not be required, depending upon the final design. A minor negative effect is predicted.

No additional significant volumes of waste are anticipated to be produced from operation of the interim ILW store.

During construction and decommissioning, increased volumes of waste may arise. However, it is anticipated that much of the material generated during decommissioning would be steel and concrete which could be widely recycled and re-used. A minor negative effect is predicted prior to appropriate mitigation.

Extended operation, if required, is expected to have similar effects to the operational period. Over time there is likely to be an increase in the level of maintenance required and

[118] This information has been provided by CNS Ltd.

construction waste generated as some of the infrastructure begins to degrade, however given the overall timescales involved, no significant effect is predicted.

Table 8.25: Summary SEA Assessment for Waste Management, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	0	-	0

8.16.4 Measures Envisaged to Mitigate and Monitor Waste Management

It is envisaged that CNS's EMS could be amended to include the interim ILW store, and include Waste Management considerations.

The specification of materials with a high recycled content in the design would help to minimise use of raw materials. Where possible, existing material on site should be re-used, provided it is suitable for use and in accordance with environmental permitting regulations.

Prior to construction, site investigations will be required to include land quality assessment and site characterisation to identify if any historic chemical or radiological contamination is present, and if present, mitigation measures to ensure the site is suitable for use.

8.16.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 8.26: Summary SEA Assessment for Waste Management, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	0	0	0

8.17 Land Use and Materials

8.17.1 Baseline Overview

Most of the URENCO/CNS Capenhurst site is an existing, industrial site. The surrounding area to the south and west of the site is predominantly mixed agricultural land with areas of improved pasture, arable farming and market gardens interspersed with residential development. To the east is Ellesmere Port, including Great Sutton, a large residential area.

The site is envisaged to remain an active nuclear-licensed site for at least 100 years, and the current end state agreed within the NDA stakeholder engagement process is for the site to remain as a licensed nuclear facility for the foreseeable future.

8.17.2 Pre-existing and Committed Mitigation and Management

No site-specific mitigation is identified.

8.17.3 Assessment of Potential Negative Effects

No significant negative effects to land use and materials are considered likely since it is predicted that the proposed interim ILW store would be contained within the existing licensed site.

Table 8.27: Summary SEA Assessment for Land Use and Materials, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

8.17.4 Measures Envisaged to Mitigate and Monitor Land Use and Materials

No further measures have been identified.

8.17.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 8.28: Summary SEA Assessment for Land Use and Materials, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

8.18 Cultural Heritage

8.18.1 Baseline Overview

Within 1 km of site, there are eight Grade II Listed Buildings. To the south of the site lies the Church of the Holy Trinity and the Old Pinfold in Capenhurst village. To the west are Court Farmhouse and Barn, and the northern barn to Holly Bank farm. The majority of Capenhurst village to the south is also designated as a Conservation Area, as is essentially all of Ledsham to the west.

There are no known records of archaeological finds at or in near proximity to the site. Heritage interest on or in near proximity of the site includes potential remnants of the World War II Royal Ordnance Small Arms Ammunitions Factory, Capenhurst Train Station's 19th Century origins, and signs of Medieval activity at Capenhurst[119].

[119] English Heritage (2012). *PastScape*. Available from: http://www.pastscape.org.uk/default.aspx

8.18.2 Pre-existing and Committed Mitigation and Management

Section 5.6 identifies pre-existing mitigation anticipated for all sites. No site specific pre-existing mitigation has been identified.

8.18.3 Assessment of Potential Negative Effects

Despite mitigation, during construction and decommissioning, traffic vibration and dust may affect historic structures although the effect is likely to be minor.

During operation, the height of the SDP interim ILW store has potential to affect the setting of buildings within Capenhurst and/or the character of the area. However, given the height of existing buildings on the site the effects are likely to be minor. It is considered unlikely that the low numbers of vehicle movements associated with the ILW delivery would lead to vibration effects upon buildings but there may be a risk. Therefore a minor negative effect is predicted. There would be little activity associated with the site, and no significant effects are likely.

Extended operation, if required, is expected to be similar to the operational period, with a minor negative effect.

Table 8.29: Summary SEA Assessment for Cultural Heritage, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	-	-	-

8.18.4 Measures Envisaged to Mitigate and Monitor Cultural Heritage (Quality and Visual Amenity)

It is envisaged that a future EIA would identify features of value and propose measures for their protection during construction and operation of the ILW store, in addition to taking into account the potential for cumulative effects on cultural heritage sites.

8.18.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 8.30: Summary SEA Assessment for Cultural Heritage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	0	0	0

8.19 Landscape and Townscape

8.19.1 Baseline Overview

Capenhurst is a medium-sized, mainly industrial site which is undergoing periodic development. The site sits within the Wirral National Character Area, which is described as

"generally separated from the industrial/residential development of the Merseyside Conurbation, which includes Birkenhead, Bebington and Bromborough, by a dramatic sandstone ridge", and

"based upon the formal landscapes of former large country estates, rural areas, natural coastal scenery and wooded sandstone ridges". [120]

The site is flat and surrounded by narrow country roads. The site is largely industrial and urban, with some amenity grassland and mature trees. Surrounding the site are playing fields, dwellings, amenity grassland, agricultural fields and woodland areas.

Due to tree cover, views into the site are largely obscured, but there are intermittent views into the site from the north.

8.19.2 Pre-existing and Committed Mitigation and Management

Section 5.6 sets out pre-existing mitigation anticipated for the proposed interim ILW store, regardless of site. No site specific pre-existing mitigation has been identified.

8.19.3 Assessment of Potential Negative Effects

Despite mitigation, during construction plant and traffic may be visible, particularly if tall plant such as cranes are in use. A minor negative effect is predicted.

During operation, there would be little activity associated with the site, and no significant effects are likely. Very infrequent RPV movements are unlikely to affect landscape and townscape.

During decommissioning, it is likewise expected that plant and traffic may be visible, particularly if tall plant such as cranes are in use.

Extended operation, if required, is expected to be similar to the operational period, with no significant effect.

Table 8.31: Summary SEA Assessment for Landscape and Townscape, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

8.19.4 Measures Envisaged to Mitigate and Monitor Landscape and Townscape (Quality and Visual Amenity)

A project-level landscape and visual impact assessment may be needed to determine whether there is a need for a long-term landscape management plan to screen the development. It should be noted that the proposed SDP interim ILW store is relatively modest in terms of building height and massing against the backdrop of the existing development at the UUK site.

[120] Natural England (2004). *Thames Basin Heaths*. Available from: http://www.naturalengland.org.uk/Images/jca129_tcm6-5326.pdf

8.19.5 Opportunities for Potential Benefits and Enhancements

The implementation of recommendations from the landscape and visual impact assessment may improve landscape, albeit on a small scale once established after construction and during extended operations, if appropriately managed.

Table 8.32: Summary SEA Assessment for Landscape and Townscape, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**+**	**0**	**+**

9 Assessment Results: Sellafield (NDA)

9.1 Site Background

NDA Sellafield is situated in west Cumbria, on the coast of the Irish Sea, covering approximately 276 hectares. The site was originally constructed in 1942 as Royal Ordnance Factory Sellafield, producing explosives to supply the military during World War II. The site was adapted for nuclear sector work after the war ended, with the construction of new facilities in 1947. It began producing nuclear power in 1956, and the nuclear power station began being decommissioned in 2003.

From the 1990s onwards Sellafield began constructing a comprehensive suite of waste management facilities to treat and dispose of the waste arisings from the commercial and decommissioning operations of reprocessing. In 1990 the Magnox Encapsulation Plant (MEP) became operational and still deals with the encapsulation of ILW, this is along with the Waste Encapsulation Plant (WEP) which became operational in 1996.

In 2002 the new High Level Waste Vitrification plant started active commissioning. This plant was commissioned to convert the high-level waste into a solid form for permanent safe long-term storage. The plant has been owned by the NDA since 2005. The NDA oversee the operations and decommissioning work at Sellafield. In 2011/12 the Windscale Advanced Gas-cooled Reactor became the first nuclear powered reactor to be decommissioned in the UK.

Figure 9-1 on the following page provides a map of the site, indicating also the approximate maximum size of an interim ILW storage site (3,150m^2) and the likely construction and RPV transport routes (see Section 9.4). It should be noted that the particular location for the proposed interim ILW store has not been specified and Figure 9-1 is intended to provide context only in terms of the size of footprint within the context of the licensed site. The exact location would be determined following detailed investigations should the candidate site be selected for the interim ILW storage.

9.2 Evolution of the Baseline

The NDA and Sellafield Limited have several strategies and plans applying to the long-term management of the site. The combined picture is that Sellafield will continue some of its existing operations, build 'new generation' nuclear power infrastructure, and simultaneously be subject to decommissioning, including land and groundwater remediation of historic contamination. Some of the proposed new building work to take place at Sellafield is to facilitate decommissioning of the site. The land and groundwater remediation programme is an extensive piece of work which stretches out over the next 110 years. Ultimately the programme will result with the clean-up of the Sellafield site to the agreed end-state as stated in the Nuclear Decommissioning Authority (NDA) Strategy[121].

It is estimated that the eventual decommissioning of Sellafield will result in the generation of 1,260 m^3 of HLW, 282,000 m^3 of ILW, and 503,000 m^3 of LLW (of which a proportion will be diverted from LLWR through the use of decontamination and material recovery techniques). It is intended that this waste will eventually be retrieved and stored temporarily until a

[121] http://www.sellafieldsites.com/solution/

national off-site repository is established, or for LLW, until it is disposed of at the LLW repository at Drigg, as appropriate[122].

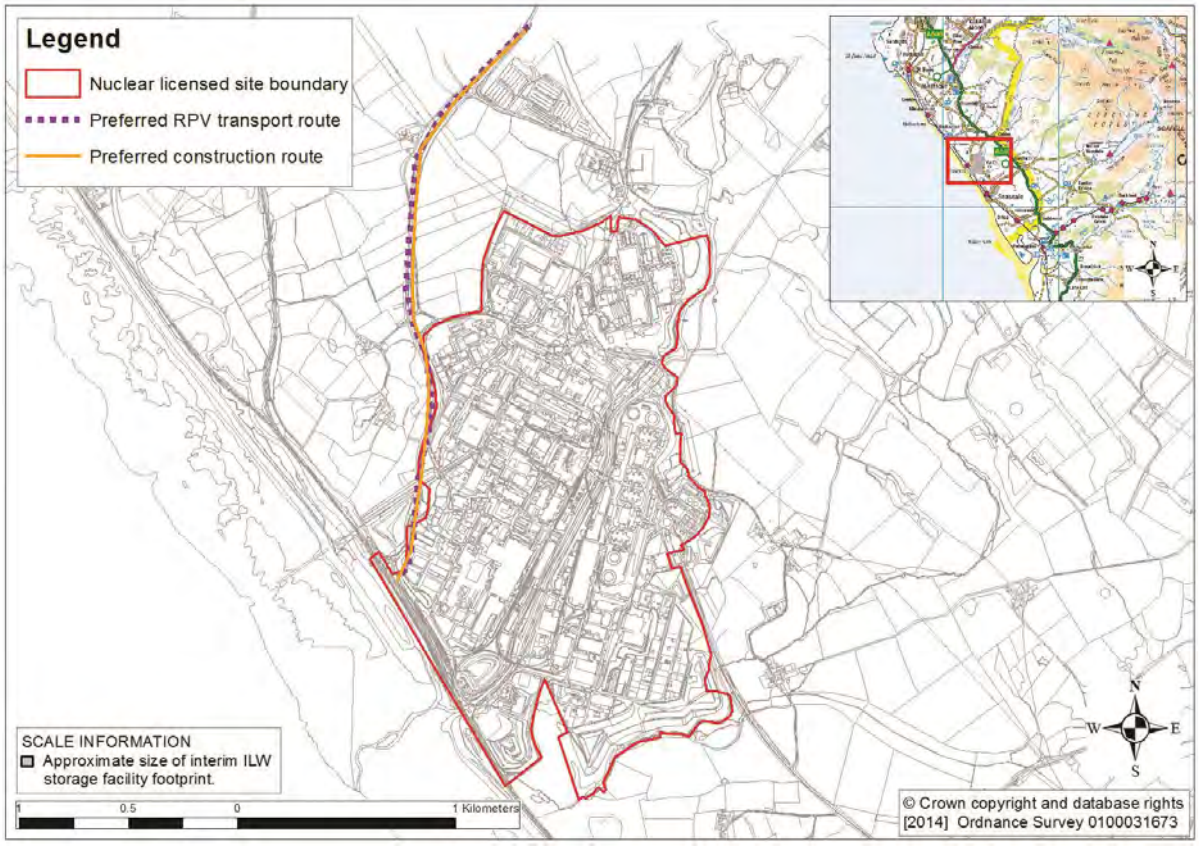

Figure 9-1: Map of Sellafield (NDA) indicating nuclear-licensed boundary and likely construction and RPV transport routes

NuGen is currently pursuing an application through the National Infrastructure Planning process for a new nuclear power station at Moorside to the north of Sellafield.

Trend data available for radiological discharges from Sellafield shows a general trend of declining discharge and dose from the site, with some fluctuation due to changes in industrial processes and abatement regimes and monitoring methods in recent years. Plans for the site do not indicate any significant changes in operational radiological discharges in the future, although there are clear uncertainties linked to decommissioning (including the clean-up of contaminated land) and the processing of legacy materials from the site.

Climate change in the region is projected to lead to the following impacts: increased scarcity of water resources and more frequent droughts; greater intensity of rainfall and frequency of intense rainfall events, leading to increased flood risk; sea level rise and more frequent storm surges, causing coastal erosion and flood risk; sea level rise causing habitat degradation; increased risk of the spread of invasive species and plant diseases.[123]

There are a few SEA baseline assumptions for Sellafield, including that the terrestrial nature conservation sites and notable habitats around Sellafield are not predicted to change in area / boundary significantly into the long-term. Coastal habitats outside of the defended area at

[122] NDA, Sellafield Limited and Nuclear Management Partners (2011). Sellafield Plan. Available from: http://www.sellafieldsites.com/publications/sellafieldplan/Sellafield_Plan.pdf

[123] ClimateUK (2012). *Summary of Climate Change Risks for North West England*. Available from: http://climatechangenorthwest.co.uk/sites/default/files/00112a%20CCRA%20NW%20Pack.pdf

Sellafield will be predicted to gradually move inland with natural erosive processes. The 'hold the line' coastal management policy at Sellafield is assumed to lead to the maintenance and/or replacement of coastal defences, as required to implement this policy effectively and protect the site.

Population projections for Copeland are for an approximately 1% increase between 2011 and 2021. Without the influence of major new developments, the age profile is expected to change significantly, with a notable increase in people aged 65 and over, and a decline in the working-age population[124]. Settlements in the vicinity of Sellafield are not expected to grow significantly. However, the proposed NuGen Moorside power station may alter the projection and/or growth of settlements somewhat, due to both short-term construction workers and long-term employment. The proposals are at an early stage and therefore it is not possible to identify the scale of that impact.

9.3 Local Planning Context

The adopted Local Plan for the area is the Copeland Local Plan 2001-2016, which was adopted in June 2006[125]. As a document which itself has accounted for international and national plans and programmes, it implements at a local level objectives consistent with those laid out in Annex 3.

There are specific policies for Sellafield, which:

- identify the site as a hazardous installation (with associated safeguarding zone);
- require that proposals within the site contribute towards a long-term strategy for the site's future management;
- set out the need to reduce radioactive waste discharges over time from the site, and
- identify the requirement for green travel planning due to the impact of traffic over a wide area.

The policies will only support long-term storage or disposal of radioactive waste in the Borough if such proposals meet certain environmental and socio-economic criteria, including being shown as the Best Practicable Environmental Option and commanding community support.

Seascale is identified in the adopted Local Plan as appropriate for small-scale development.

The emerging replacement Local Plan (including 'main modifications' from the iterative plan development process) is at a draft stage[126], and it includes policies for nuclear sector development at Sellafield, nearby Moorside to the north, and Drigg to the south. These policies state that Moorside has been selected as the location for a new nuclear power station, while Sellafield is supported both as a centre of research and development in nuclear decommissioning, and in new nuclear fuel reprocessing within existing site boundaries. Also, policy includes acceptance in principle of any major nuclear energy-related expansion. Such development must be accompanied by appropriate contributions to mitigate any detrimental impacts of development.

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124 NHS Cumbria et al. (2012). *Copeland Health & Well Being Profile 2012*. http://www.cumbria.nhs.uk/YourHealth/PublicHealthInformation/Copeland-Health-Wellbeing-Profile-2012.pdf

125 Copeland Borough Council (2006). *Copeland Local Plan 2001 – 2016.* Accessed from: http://www.copeland.gov.uk/attachments/csdmp-ldflocalplan2001-2016fullpdf

126 Copeland Borough Council (2012). *Copeland Local Development Framework. Core Strategy and Development Management Policies DPD (Pre-submission Draft.* Accessed from: http://www.copeland.gov.uk/attachments/core-strategy-and-development-management-policies

The Cumbria Local Transport Plan 2011 – 2026[127] proposes to seek improvements to the A595, which is the main medium and long-distance road route to the site, by working with the Department for Transport and the nuclear industry.

9.4 Proposals

NDA has confirmed that an interim ILW store at the site could be located within the existing nuclear-licensed boundary.

During both construction and operation, the transport route is likely to be from Junction 40 of the M6, along the A66 and then on to the A595.

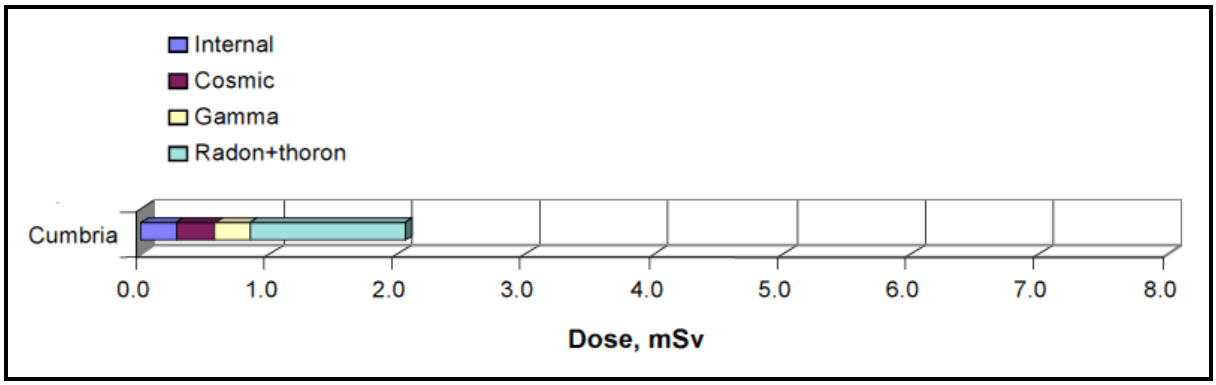
It is currently assumed that during construction, HGVs would be able to access the site via either the main gate or the north gate. However, any deliveries wider or longer than a standard articulated lorry would be likely to have to enter Sellafield via the "Station Gate". This route was used for road deliveries associated with the Evaporator D Project, although it should be noted that exceptionally large deliveries came via the sea on a barge.

During operation, the RPV transport route is expected to exit the A595 (from the north) and then take the Northern Road, entering Sellafield via the "Station Gate". These transport proposals are currently assumptions and further work would establish the most appropriate gates for the vehicle movements concerned.

9.5 Radiological Discharges and Exposures

9.5.1 Baseline overview

Ionising radiation exposure from **natural sources** in the vicinity of Sellafield is estimated to be less than 2 mSv per year, given county-level data available[128]. Figure 9-2 below presents an excerpt from the 2005 review of ionising radiation exposure of the UK by the HPA, illustrating the average annual doses to residents from different natural background sources.



NOTE: "internal" refers to radiation originating from terrestrial sources which, via the food chain, end up in our bodies, and "gamma" radiation is received externally from mainly terrestrial sources (rocks, soil and building materials such as stone).
Source: extract of figures in HPA, 2005, p.78[129]

Figure 9-2: Annual exposure to natural background radiation in Cumbria

[127] Cumbria County Council. *3rd Cumbria Local Transport Plan (2011-2026)*. Available from: http://www.cumbria.gov.uk/roads-transport/public-transport-road-safety/transport/transportplan/3rdcumbriatransportplan.asp

[128] Health Protection Agency (2005). *Ionising Radiation Exposure of the UK Population: 2005 Review*. Available from: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947389360

[129] Health Protection Agency (2005). *Ionising Radiation Exposure of the UK Population: 2005 Review*. Available from: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947389360

Activities at Sellafield which can result in radiological discharges comprise:

- Gaseous emissions to air;
- Discharge of treated liquid waste to the Irish Sea;
- Discharge of liquid waste to the Ehen Estuary; and
- The current and/or planned removal of a historic legacy of radioactive waste and/or decontamination of land.

Table 9.1 below summarises the discharges of emissions to air and water from Sellafield relative to the permitted levels authorised by the Environment Agency. It can be seen that in 2012, emissions were well within their respective limits.

Table 9.1: Radiological discharges at Sellafield (2012)

Discharge	Discharge Limit (annual equivalent)	Discharges during 2012	
		Measured annual discharge	% of Annual Limit
Air: alpha	880 MBq	98.6 MBq	11
Air: beta	42 GBq	1 GBq	2.4
Air: tritium	1100 TBq	102 TBq	9.3
Air: carbon-14	3.3 TBq	0.378 TBq	11
Air: krypton-85	44000 TBq	38500 TBq	8.8
Air: strontium-90	710 MBq	32.5 MBq	4.6
Air: ruthenium-106[2]	23 GBq	702 MBq	3.1
Air: antimony-125	30 GBq	545 MBq	1.8
Air: iodine-129	70 GBq	7.82 GBq	11
Air: iodine-131[2]	37 GBq	240 MBq	<1
Air: caesium-137	5.8 GBq	141 MBq	2.4
Air: radon-222[2]	500 MBq	42.6 GBq	8.5
Air: plutonium alpha	190 MBq	19.8 MBq	10
Air: plutonium-241	3 GBq	239 MBq	8
Air: americium-241 and curium-242	120 MBq	14.9 MBq	12
Water (sea pipelines): alpha	1 TBq	142 GBq	14
Water (sea pipelines): beta	220 TBq	9.49 TBq	4.3
Water (sea pipelines): tritium	20000 TBq	1050 TBq	5.3
Water (sea pipelines): carbon-14	21 TBq	4.09 TBq	19
Water (sea pipelines): cobalt-60	3.6 TBq	53.5 TBq	1.5
Water (sea pipelines): strontium-90[2]	45 TBq	1.19 TBq	2.6
Water (sea pipelines): Zirconium-95 + Niobium-95[2]	2.8 TBq	103 GBq	3.7
Water (sea pipelines): Technetium-99	10 TBq	924 GBq	9.2
Water (sea pipelines): Ruthenium-106[2]	51 TBq	645 GBq	1.3
Water (sea pipelines): Iodine-129	2 TBq	214 GBq	11
Water (sea pipelines): Caesium-134	1.6 TBq	55.5 GBq	3.5
Water (sea pipelines): Caesium-137	34 TBq	3.58 TBq	11
Water (sea pipelines): Cerium-144	4 TBq	246 GBq	6.2
Water (sea pipelines): Neptunium-237[2]	730 GBq	35.3 GBq	4.8
Water (sea pipelines): Plutonium alpha	700 GBq	140 GBq	20
Water (sea pipelines): Plutonium-241	25 TBq	3.01 TBq	12
Water (sea pipelines): Americium-241	300 GBq	17.8 GBq	5.9

Discharge	Discharge Limit (annual equivalent)	Discharges during 2012	
		Measured annual discharge	% of Annual Limit
Water (sea pipelines): Curium-243+244[2]	50 GBq	18.4 GBq	3.7
Water (sea pipelines): Uranium	2000kg	339 kg	17
Water (factory sewer): alpha	300 MBq	128 MBq	43
Water (factory sewer): beta	6.1 GBq	4.1 GBq	67
Water (factory sewer): tritium	68 GBq	10.8 GBq	16

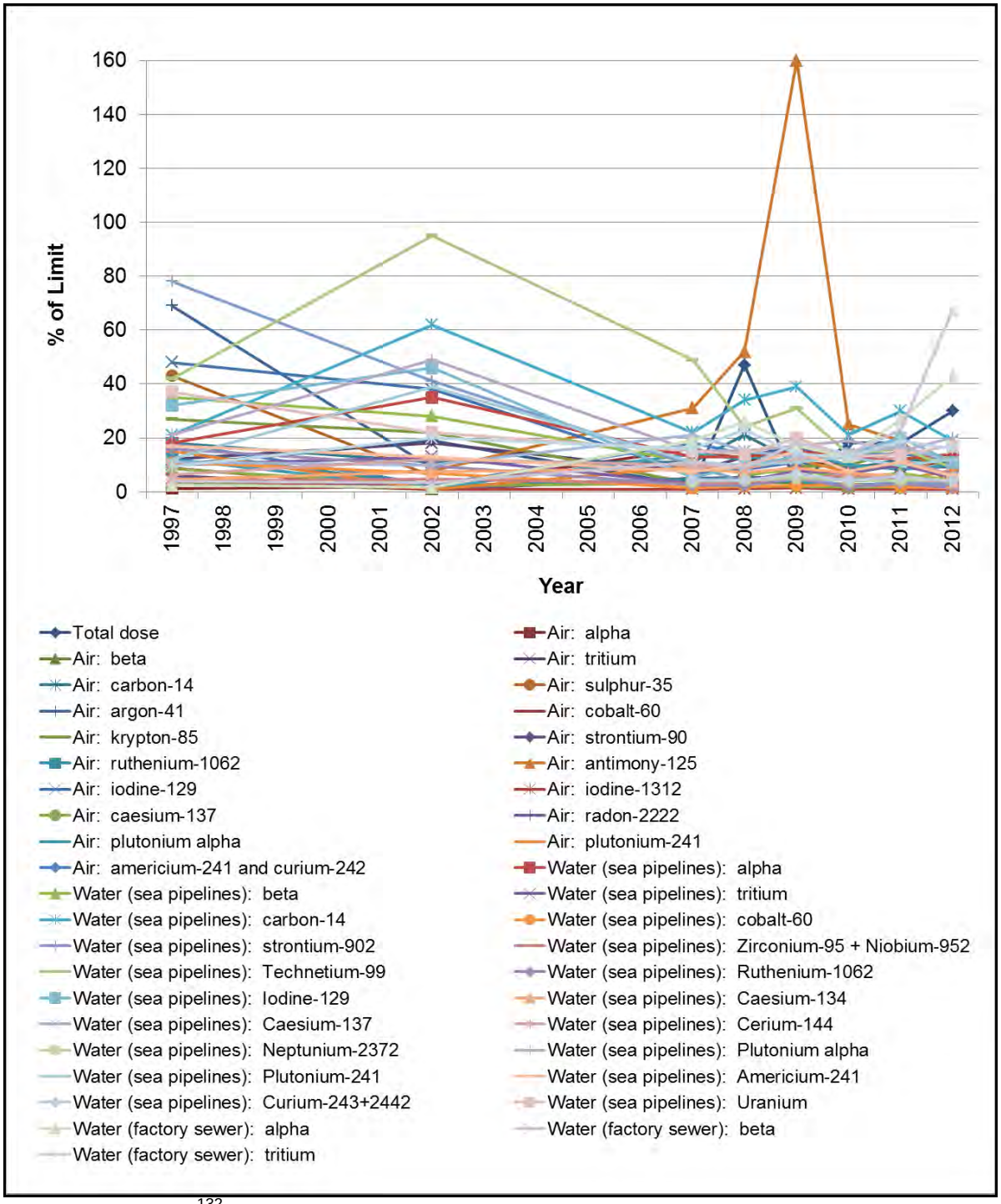
According to the 2012 RIFE report[130], the total dose from all pathways and sources of radiation at Sellafield, Whitehaven and LLWR was 0.30 mSv, which is approximately 30% of the legal dose limit.

The 2012 RIFE report notes that decommissioning activities at Sellafield may result in brief periods of increased radiological discharges; however, these would then be expected to return to current or lower levels[131].

Figure 9-3 on the following page shows the available RIFE report radiological discharge and monitoring data for the years 1997, 2002 and each of the past five years from 2007 to 2012 (note that the specific discharges requiring monitoring at the site have changed over time, and hence data for every discharge is not available for every year.) The data shows the annual public dose has remained well within the statutory limit of 1 mSv. Discharges have also remained within their permit limits over the past 15 years, with the exception of antimony-125 in 2009, when discharges breached the annual limit by 60%. Notwithstanding this, the dose from this discharge of antimony-125 was less than 0.005 mSv, and total dose from the site was also well within limits that year. As a result of this, the Environmental Agency agreed with Sellafield's proposal to increase the discharge limit (accounting for the fact that Sellafield was using the Best Practicable Means to reduce discharges), and the increase came into force from 1st April 2010.

130 Environment Agency, Food Standards Agency, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2013). *Radioactivity in Food and the Environment, 2012*. Available from: http://www.food.gov.uk/science/research/radiologicalresearch/radiosurv/rife/radioactivity-report2011/#.UlOVzIDYjpU

131 Environment Agency, Food Standards Agency, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2012). Radioactivity in Food and the Environment, 2011. Available from: http://www.food.gov.uk/science/research/radiologicalresearch/radiosurv/rife/radioactivity-report2011/#.UlOVzIDYjpU



Source: RIFE reports[132]

Figure 9-3: Radiological discharges and dose over time at Sellafield (NDA)

Plans for the site do not indicate any significant increases in operational radiological discharges in the future, although as new facilities are commissioned, applications for any new discharge points would have to be made under the environmental permitting regime. However, given historic land contamination at the site and future decommissioning, it can be assumed that there is potential for slight increases in radioactive waste emissions in future years as a result of any on-site remediation. Interim ILW storage would not have any

[132] RIFE reports 1 through 18: http://sepa.org.uk/radioactive_substances/publications/rife_reports.aspx

gaseous, liquid or solid discharges, and therefore would have no effect on this aspect of the baseline.

9.5.2 Pre-existing and Committed Mitigation and Management

Section 5.4 provides details of the regulation and management of radiological discharges and exposures for nuclear sites.

Sellafield Ltd's 'nuclear safety case' is the key pre-existing, committed mitigation for the management and minimisation of radiological discharges in order to reduce risk to ALARP / ALARA. This is supported by regulation of the receipt of radioactive waste onto nuclear sites and the disposal of radioactive waste on or from nuclear sites by the Environment Agency[133] (refer to Section 5.4 for details of the regulation of nuclear sites and the need to review the nuclear safety case to reflect any proposed alteration of activities).

An on-site and off-site emergency plan must be prepared for licensed nuclear facilities and kept up-to-date under The Radiation Emergency Preparedness & Public Information Regulations (REPPIR) 2001[134].

The off-site emergency plans are prepared and updated by the relevant local authority. These plans are reviewed every three years or less, as required, to ensure that all emergency services involved in an emergency are aware of their roles and have the sufficient preparedness to act at any time. The size of the emergency planning area differs site by site in the UK, with due consideration given to individual factors associated with each site. The current emergency planning distance for Sellafield is understood to cover a radial distance of 1km[135].

Under REPPIR, the addition of any new operation (e.g. the interim ILW store) would require the off-site emergency plan to be reviewed.

An on-site emergency plan is also required by REPPIR, which is prepared by the site operator. Sellafield Ltd maintains an on-site emergency plan which describes the site's arrangements for dealing with an accident or emergency, and ensures that necessary actions will always be implemented to prevent any member of the public or site staff from being exposed to a significant health risk as a consequence of a nuclear accident at the site.

9.5.3 Assessment of Potential Negative Effects

Radiological exposures from implementing interim ILW storage are predicted to be limited to small levels of direct irradiation exposure from RPV sources within shielded containers (see further below). SDP has confirmed that there will be no radiological discharges to air, soil or water directly from the operation of the interim ILW store.

During construction, there is some potential for discovering historic radioactive contamination in the ground during site preparation and construction phases but this would be carefully managed in accordance with legislation and best practice including full risk assessment and mitigation measures implemented to minimise potential exposure to humans (see Section 5.3). With required controls, it is considered that any potential for

[133] For more information, see Environment Agency (2013). *Nuclear*. http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/sectors/32517.aspx, and also HSE (accessed 2013). *ONR: How we regulate*. http://www.hse.gov.uk/nuclear/regulation-and-licensing.htm

[134] The Radiation Emergency Preparedness and Public Information Regulations (REPPIR), 2001. Available from: http://www.legislation.gov.uk/uksi/2001/2975/contents/made

[135] http://www.onr.org.uk/depz.htm

increased exposure to radiation would be limited to site workers. Significant effects to site workers' health are unlikely given construction good practice and stringent health and safety requirements.

During operation, the risk of exposure is mainly limited to direct radiation to workers and is subject to regulation and will be managed to ALARP / ALARA. The very low maximum external dose target of 0.5 mSv/hr at the external walls of the interim store will ensure that local communities experience no practically measurable increased dose from the interim ILW store.

During transport from Rosyth and Devonport to Sellafield, direct radiation from the RPV would be through a shielded container, designed to ALARP / ALARA levels of potential exposure (see Section 5.3). Shielding will reduce the levels of direct radiation to very low levels outside of the RPV vehicle, which would present no significant risk of exposing members of the public to high levels of radiation. The very low frequency of transport (one to three movements per year) is taken into account in this assessment.

Emergency scenarios and preparedness would be planned for, and will ensure that under any incident scenario it would be very unlikely that people could be exposed to levels of radiation significantly above background levels, and in the 'worst case', they would be unlikely to be exposed to levels of radiation which would adversely affect their health.

The assumption is that it is highly unlikely that degradation of the waste package will occur necessitating repackaging before the end of interim storage. However, it is assumed that repackaging will be required at the end of interim storage due to the likely evolution of regulations, policy and standards. This would involve no radioactive discharges and the discarded packaging would not be radioactive.

Given the pre-existing and committed mitigation above, the likely effects across the phases of implementation of interim ILW storage at Sellafield are envisaged to be negligible for all four stages (Construction, Operation, Decommissioning and Extended Operation Stages), as summarised in Table 9.2 below.

Under normal operation there would be no discharges to air, water or soil from the interim ILW store. Direct radiological emissions from the store will be managed to ALARP / ALARA standards and will be significantly small as to make them practically unmeasurable at the site boundary. Therefore, there will be no increase in the effective dose to the public locally relative to current levels.

Table 9.2: Summary SEA Assessment for Radiological Discharges and Exposures, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

9.5.4 Measures Envisaged to Mitigate and Monitor Radiological Safety

No additional measures have been identified. The pre-existing mitigation set out in Section 5.6 and Section 7.5.2 means that risks are reduced to ALARP/ALARA and there is an established monitoring regime associated with nuclear installations (refer to Section 5.6).

9.5.5 Opportunities for Potential Benefits and Enhancements

No opportunities for potential benefits or further enhancement have been identified for radiological discharges.

Table 9.3: Summary SEA Assessment for Radiological Discharges and Exposures, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

9.6 Biodiversity and Nature Conservation

9.6.1 Baseline overview

The NDA Sellafield site is located in the West Cumbria Coastal Plain Natural Area, which is *"a largely rural landscape … situated between the high fells of the Lake District and the Irish Sea",* where there are valuable coastal habitats along its western edge[136]. Habitats include coastal tarns, basin mires, wet grasslands, rivers and lagoons.

Table 9.4 below lists the key biodiversity features within 5 km of Sellafield. Figure A2-8 also provides a wider radius around the site, and shows that there are four Special Areas of Conservation (SAC), no Special Protection Areas (SPA) and no Ramsar sites within 20 km of the site.

Table 9.4: Biodiversity / Nature Conservation Features within 5 km of Sellafield

Features	Notable Types / Examples
1 SAC	Drigg Coast
1 Marine Conservation Zone	Cumbria Coast Marine Conservation Zone. See text below.
5 SSSIs	See text below
1 NNR	Hallsenna Moor NNR
UK BAP priority habitats	Maritime cliffs and slopes; coastal sand dune; coastal and floodplain grazing marsh; lowland meadow; purple moor grass and rush pasture; blanket bog; reedbed; lowland heathland; upland healthland; fens; deciduous woodland; traditional orchard
10+ Ancient woodland areas	More than 10 distinct areas

The Cumbria Coast Marine Conservation Zone was designated in November 2013 and extends from south of Whitehaven, around the cliffs at St Bees Head, to the mouth of the Ravenglass Estuary, covering the coastline adjacent to the Sellafield location. The total area of the site is approximately 18 km^2. The surrounding area is particularly important for seabirds with an estimated 10,000 breeding seabirds thought to be present.

136 Natural England (2013). *Natural Areas: 11 West Cumbria Coastal Plain*. Available from: http://www.naturalareas.naturalengland.org.uk/SCIENCE/NATURAL/NA_DETAILS.ASP?NA_ID=11&S=&R=2

Designated nature conservation near to the site's boundaries include Low Church Moss SSSI approximately 1.2 km northwest, and Drigg Coast SAC and SSSI approximately 2.7 km south of the site.

The UK BAP priority habitats in proximity to the site's boundaries are deciduous woodland, intertidal substrate foreshore, and coastal / floodplain grazing marsh. Deciduous woodland borders approximately 30% of the site boundary to the north, east, west and southwest, and is within the site in some of these areas. There is an ancient woodland site approximately 400 m to the north, and coastal / floodplain grazing march 700 m to the west. Immediately south of the site is a railway line, followed by the foreshore.

The River Ehen meets the River Calder just to the south of the site. It is noteworthy that upstream areas of the River Ehen are designated as an SAC mainly for freshwater pearl mussels, though it also qualifies by supporting salmon, showing the importance of its connection with the sea at Sellafield (past which salmon migrate). Also, the site has a main abstraction from Wast Water (a lake approximately 11 km east), which is designated as an SAC.

South of the site is a habitat managed by the Amphibian and Reptile Conservation Trust for natterjack toads, which are protected by European legislation.

9.6.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) subject to scoping and a construction environmental management plan (CEMP) would address any likely significant impacts on nature conservation, including any potential loss of woodland habitat, and the potential for encountering protected species during construction. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures (e.g. fencing, compensatory habitat, species translocation) required to avoid or minimise any significant impacts.

9.6.3 Assessment of Potential Negative Effects

Interim ILW storage would not require any discharges to air, water or soil.

Despite mitigation, during construction, there remains potential for noise, dust and lighting to have an effect on ecological receptors. A minor negative effect is predicted.

Transport movements are anticipated to be so low as to cause no significant effects upon nature conservation locally.

During operation, there would be little activity associated with the interim ILW store, and no significant effects are likely. The very infrequent RPV movements expected are unlikely to affect habitats or species.

During decommissioning, as with construction, there would be the potential for noise, dust and lighting to have an effect on ecological receptors and so a minor negative effect is predicted.

Extended operation if required, assuming it would be within 40 – 100 years, is expected to be similar to the operational period, with no significant effect.

Table 9.5: Summary SEA Assessment for Biodiversity, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

9.6.4 Measures Envisaged to Mitigate and Monitor Effects on Biodiversity

Sellafield has an environmental management system (EMS) in compliance with ISO14001:2004. It is envisaged that this could be amended to include the interim ILW store, and include biodiversity considerations.

EMS could prove to be an effective way to monitor biodiversity on-site.

9.6.5 Opportunities for Potential Benefits and Enhancements

The implementation of ecological mitigation could be used to help to improve local biodiversity.

There may be potential to create a site-wide biodiversity action plan, with measures to manage and improve biodiversity at or (where permitted and feasible) in the near vicinity of the site.

Benefits would most likely not be applicable until the operational period.

Table 9.6: Summary SEA Assessment for Biodiversity, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	**+**	**+**	**+**

9.7 Population

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the number or types of jobs available in local economies, and levels of deprivation in surrounding areas'. No significant potential effects upon other aspects of population were anticipated during the scoping stage.

9.7.1 Baseline overview

The site is located over 1 km north of the village of Seascale and nearly 3 km west of Gosforth. Both are small villages which are predominantly surrounded by farmland.

The site crosses the boundary between two LSOAs, both of which have low deprivation across economic and related issues (i.e. domains) of the IMD. However, access to services

is poor as measured by the sub-domain 'geographical barriers', whereby the area is within the 10% most deprived LSOAs in England[137].

Areas (as broken down into LSOAs) more widely around the site perform very similarly with regard to deprivation, except that LSOAs to the north between Thornhill and Nethertown have relatively high deprivation across all economic and access to services categories.

Sellafield employs approximately 10,000 personnel and is estimated to spend more than £800 million each year in the supply chain, with almost 30% retained within West Cumbria[138].

9.7.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on local communities, including any businesses. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures to manage transport effects, for example.

9.7.3 Assessment of Potential Negative Effects

No negative effects considered likely. The site is already subject to on-going development, and this additional construction project is unlikely to alter community perception of the area to an extent which could harm local investment or employment to a significant degree.

There are potential medium-term and long-term employment opportunities from the interim ILW store, although this is not anticipated to generate many jobs (not more than 100 full-time equivalent employees maximum during construction and 10 full-time equivalents during operation).

Table 9.7: Summary SEA Assessment for Population

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

9.7.4 Measures Envisaged to Mitigate and Monitor Effects on Population

No measures have been identified.

9.7.5 Opportunities for Potential Benefits and Enhancements

There are potential short-term, medium-term and long-term employment opportunities from the interim ILW store, although this is not anticipated to generate many jobs (circa 100 full-time equivalents in the short-term and 10 in the medium to long-term).

[137] Department for Communities and Local Government (2011). *A plain English guide to the Localism Act.* Available from: http://www.local.gov.uk/localism-act

[138] NDA, Sellafield Limited and Nuclear Management Partners (2011). *Sellafield Plan*. Available from: http://www.sellafieldsites.com/publications/sellafieldplan/Sellafield_Plan.pdf

Table 9.8: Summary SEA Assessment for Population, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	+	+	+	+

9.8 Health and Well-Being

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the health, safety and well-being of local communities'. No significant potential effects upon other aspects of health, including workers / employees, healthcare infrastructure / provision or recreation, were anticipated during the scoping stage.

9.8.1 Baseline Overview

Both of the LSOAs in the vicinity of Sellafield have low deprivation across health, disability and related issues (i.e. domains) of the IMD. It is amongst the 50% least deprived nationally (thus about average) for health and disability, 10% least deprived for crime (in fact, one LSOA can be noted to have the 6th lowest crime of all LSOAs in the country out of over 32,000) and 50% least deprived for living environment. LSOAs surrounding the site generally perform similarly, but with crime rates higher to the north, in the area between Thornhill and Nethertown[139].

9.8.2 Pre-existing and Committed Mitigation and Management

Environmental discharges which could affect health and well-being are discussed in Sections 8.5, 8.9, 8.10, 8.11 and 8.12. Potential exposure to radiation is and will in future be managed, regulated and monitored to ALARP/ALARA.

Chapter 5 should be referred to for further information about pre-existing mitigation common to all nuclear installations.

9.8.3 Assessment of Potential Negative Effects

Potential exposure would be in the form of low levels of direct radiation (no discharges are anticipated from the interim ILW store). The main potential for receiving an increased radiation dose would lie with the site workforce, as the public would receive no practically measurable increase in radiation does and all emissions of radioactivity will be managed to ALARP / ALARA.

During operation, it is anticipated that there will be a slight increase in transport movements (likely to be infrequent RPV deliveries and very few personnel / maintenance transport requirements) which will generate minor increases in transport emissions. The scale of these emission increases is not anticipated to be significant.

Disruption from construction traffic, noise and dust may cause some disturbance and inconvenience during construction to local residents, particularly those using the two areas of Registered Common Lane located in close proximity to the site. However, any

[139] Department for Communities and Local Government (2011). *A plain English guide to the Localism Act.* Available from: http://www.local.gov.uk/localism-act

disturbance would be temporary and is unlikely to affect any determinants of health[140] significantly.

The EA notes that it is important that any new development of interim ILW storage does not cause Sellafield Ltd. to be distracted from making progress with the major hazard and risk reductions programmes at the site, noting that progress to date has been slower than planned as detailed in the recent National Audit Office report. Although it is not possible to determine the nature of any potential conflicts without a specific site being selected, interim ILW storage would not affect the existing hazards / risks, and is considered unlikely to significantly affect future management or remediation. Suitable testing of ground conditions, compliance with legislation and mitigation planning, would ensure no significant risk of significant effects to health during construction or decommissioning.

Medium-term and long-term employment opportunities can lead indirectly to significant benefits to people's health and well-being. However, interim ILW storage is not anticipated to generate many jobs (circa 10 full-time equivalent), and thus the benefit is neutral.

Table 9.9: Summary SEA Assessment for Health and Well-Being, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

9.8.4 Measures Envisaged to Mitigate and Monitor Effects on Health and Wellbeing

A future EIA would account for the potential cumulative effects across different environmental topics on health and well-being, including for example, recreation and amenity.

9.8.5 Opportunities for Potential Benefits and Enhancements

Interim ILW storage is expected to generate a relatively small number of jobs and (circa 10 full-time equivalents). It is therefore unlikely to significantly benefit health and well-being in the community.

Table 9.10: Summary SEA Assessment for Health & Well-Being, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

[140] 'Determinants' of health and well-being can be defined as key factors which together determine how health a person or community is likely to be. They include factors such as health social networks, mental health and well-being, physical environment (e.g. housing, local area), employment opportunity and access to services.

9.9 Noise and Vibration

9.9.1 Baseline Overview

Potential noise-sensitive receptors within 1 km of the site include small clusters of properties, and isolated farmhouses, but there is no substantial residential area. There is a place of worship to the northeast.

In 2005, noise surveys were carried out at a number of receptors located around the site perimeter, and the results found that noise levels from the site were so low that for several of the locations, the noise readings were dominated by local sources such as farm animals, machinery or passing traffic. The follow-on noise assessment indicated that noise levels around the installation are unlikely to be a cause of public concern. Also, a number of noise surveys carried out throughout the year, and associated reports have concluded that there has been no significant change in the noise levels from the site since then[141].

Although noise is generally low, there have been complaints about Sellafield due to sudden noise relating to steam releases from plant. Sellafield Ltd has engaged with the local community and is attempting to minimise disturbance[142].

No baseline vibration issues have been identified for this site.

9.9.2 Pre-existing and Committed Mitigation and Management

A future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on noise and vibration. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures to manage transport effects, for example. It is expected that the EIA and CEMP could include such measures as:

- traffic management;
- limiting working hours; and
- monitoring of potential impacts of vibration, and frequency of vibration-generating activities.

It is also expected that Sellafield's EMS will consider and deal with noise generation and management of this impact during operation.

9.9.3 Assessment of Potential Negative Effects

During construction, it is anticipated that some residual noise and vibration will be generated despite the adoption of mitigation measures. This would constitute a minor negative effect. Whilst it is not possible to guarantee a neutral effect at this stage of assessment (SEA), project-level EIA may identify measures to avoid or fully mitigate any negative effect.

During operation, the activities associated with interim ILW storage will be largely passive. Ventilation and energy supply units may generate low-level hums or ventilation noise, however these potential impacts would be assessed and mitigated as part of EIA and storage design. A neutral effect is therefore predicted.

[141] NDA, Sellafield Limited and Nuclear Management Partners (2011). *Sellafield Plan*. Available from: http://www.sellafieldsites.com/publications/sellafieldplan/Sellafield_Plan.pdf

[142] NDA, Sellafield Limited and Nuclear Management Partners (2011). *Sellafield Plan*. Available from: http://www.sellafieldsites.com/publications/sellafieldplan/Sellafield_Plan.pdf

Decommissioning carries the same risks of negative noise impacts as the construction process.

Table 9.11: Summary SEA Assessment for Noise & Vibration, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	–	0	–	0

9.9.4 Measures Envisaged to Mitigate and Monitor Noise

Sellafield Ltd's EMS could be amended (if required / appropriate) to include the SDP interim ILW store. Provision of additional noise monitoring may be incorporated if there is substantial uncertainty about potential impacts. This would be determined by a future EIA.

The EMS or CEMP could provide an effective way to monitor noise and vibration from multiple construction projects.

9.9.5 Opportunities for Potential Benefits and Enhancements

No opportunities for benefits or enhancements have been identified.

Table 9.12: Summary SEA Assessment for Noise & Vibration, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	0	0	0

9.10 Geology and Soils

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'soil quality, variety, extent and/or compaction levels'. No significant potential effects upon geological conservation or land stability were anticipated during the scoping stage.

9.10.1 Baseline Overview

The main soil type within 1 km of the site is loamy with low to moderate fertility. Agricultural land around the site is estimated to be of Grade 3 soil quality, and thus potentially 'best and most versatile'.

The Sellafield site has an estimated 1,600 m^3 of soil contaminated with radioactive material. Contamination is mainly located in the centre of the Sellafield site[142].

9.10.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on geology and soils. EIA would inform both construction and design, while a CEMP would help ensure that the

relevant on-site measures are carried out appropriately. This would include any contaminated land issues, for example, and maximising the remediation and reuse of soils. It is expected that the EIA and CEMP could include such measures as:

- maximising reuse of soils on-site, if appropriate;
- dust suppression and wetting down of exposed soils to prevent their erosion;
- spill and other potential pollution prevention;
- appropriate temporary storage of healthy soils to prevent their degradation, prior to a suitable reuse; and/or
- measures to test and remediate potentially contaminated soils.

Early soil testing (Land Quality Assessment (LQA) and land characterisation studies) would enable consideration of on-site remediation and potential re-use of existing soil that would be excavated or moved to allow for the construction of the interim ILW store. The CEMP should include measures for the storage of materials during construction and should include emergency procedures in the event of the release of pollutants during construction.

9.10.3 Assessment of Potential Negative Effects

There is a legacy of contaminated land and groundwater under the site. This could be disturbed during construction and may require on-site remediation or off-site transport and disposal depending upon the nature of potential contaminants and time and space available. In each case soil may be negatively affected through compaction, degradation and pollution etc. A minor negative effect is predicted.

The EMS and the CEMP would address contaminated land issues. In addition, as part of an EIA, it would be necessary for land characterisation and a LQA to be undertaken to establish any remedial measures required to ensure that land is suitable for its proposed use.

During operation, interim ILW storage is unlikely to affect soils because no discharges are anticipated.

Decommissioning carries risks of negative impacts on soils (compaction, degradation, pollution etc.) but these would be managed at the time through appropriate environmental management processes. As with construction, on-site remediation and /or off site transport and disposal may be required. Therefore, a minor negative effect is envisaged.

Table 9.13: Summary SEA Assessment for Geology & Soils, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

9.10.4 Measures Envisaged to Mitigate and Monitor Effects on Soils

Sellafield Ltd's EMS and the CEMP would address contaminated land issues, and to be an effective way to monitor progress in dealing with historic contaminated land issues.

9.10.5 Opportunities for Potential Benefits and Enhancements

Should contaminated soils be discovered at the site of the interim ILW store, there is the potential for remediation of these soils, and reuse elsewhere, such that the baseline is improved.

Table 9.14: Summary SEA Assessment for Geology & Soils, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**0**	**0**	**0**

9.11 Water

9.11.1 Baseline Overview

Within 5 km of the site are several watercourses. These include Ponsonby Tarn Lake, New Mlil Beck, the River Ehen, the River Calder and the Irish Sea,

The River Calder runs through the Sellafield Licensed site and has a catchment area of approximately 45 km^2. The New Mill Beck also runs through the site and the River Ehen flows adjacent to the site. These flow predominantly south-westwards to the sea. The Sellafield site has two licensed discharges, one into the Ehen Estuary and another into the Irish Sea.

Water quality in these watercourses is 'good' in terms of ecological quality / potential, with some local tributaries of 'moderate' quality. Good chemical quality has also been found in locations where it has been assessed.

The latest Environment Agency monitoring data available for 2011 indicates that authorised non-radiological discharges to the sea include ammonia, arsenic, cadmium, chromium, lead, mercury, organic carbon, zinc, chlorides, halogenated organic compounds, nitrogen, phosphorus and nickel. These have all remained within their respective limits for all records available (zero notifiable releases). Historic discharges to the estuary (data up until 2006) include chlorides, halogenated organic compounds, copper and zinc, and again no notifiable releases have been identified.[143]

The site also overlies an aquifer in the underlying sandstone geology which is known to be contaminated to the southwest due to the migration of pollutants from the site.[144]

Regarding water resource / quantity, the site is within the West Cumbria Aquifer groundwater management unit, which is described as having 'water available' for future, further abstraction. However, the surface water management units at the site are currently over-licensed, showing that water may only be available at high flows.[145] The site has a main abstraction from Wast Water (a lake approximately 11 km to the east), which is assessed as 'no water available' at low flows for new abstraction. Abstractions for the site also come from the Rivers Calder and Ehen.

[143] Environment Agency (2013). *Interactive Maps.* Available from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

[144] Sellafield Ltd. and NDA (2012). *SEA: Site Specific Baseline: Sellafield*.

[145] Environment Agency (2007). *The Derwent, West Cumbria and Duddon Catchment Abstraction Management Strategy*. http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/genw0407blxi-e-e.pdf

In 2011, approximately six million cubic meters of water were abstracted from the above sources. The net amount of water used by the Sellafield site was 3.16 million m^3.[100]

9.11.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on the water environment. This would have to comply with a number of statutory requirements, as well as guidelines on the protection of surface and groundwater. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any pollution prevention measures, for example. It is expected that the EIA and CEMP could include such measures as:

- measures to properly store potentially polluting substances;
- measures to intercept and attenuate any site runoff;
- measures to prevent the pollution of groundwater due to creation of pathways from contaminated land; and
- minimisation of water consumption.

9.11.3 Assessment of Potential Negative Effects

Legislative requirements with regard to discharges will be complied with and construction will be managed through the CEMP to avoid run-off into watercourses (refer to Section 8.10), no significant effect upon the water environment is predicted. Any modifications to water bodies would need to be compliant with Water Framework Directive objectives. No likely modifications have been identified based upon current information and water consumption from the proposed interim ILW store is anticipated to be minimal (refer to Table 4.1 for assumptions on the operational use of water).

Table 9.15: Summary SEA Assessment for Water Environment, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

9.11.4 Measures Envisaged to Mitigate and Monitor Effects on Water Environment

It is envisaged that Sellafield Ltd's EMS would be used to monitor pollutants to any discharge points, and ensure they are minimised.

9.11.5 Opportunities for Potential Benefits and Enhancements

Should contaminated soils be discovered at the site of the interim ILW store, there is the potential for remediation of these soils, which could remove a potential hazard to water quality.

Table 9.16: Summary SEA Assessment for Water Environment, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**0**	**0**	**0**

9.12 Air Quality

9.12.1 Baseline Overview

Non-radioactive emissions at Sellafield occur through the use of plant and vehicles. The latest Environment Agency monitoring data available for 2011 indicates that emissions of nitrogen oxides, dust and carbon monoxide have remained within their respective limits for all records available.[146] There are no Air Quality Management Areas in near proximity to the site.

9.12.2 Pre-existing and Committed Mitigation and Management

Details of the anticipated pre-existing mitigation are set out in Section 5.9. The EIA process, use of a CEMP and application of environmental permitting requirements would limit potential effects upon air quality during construction and operation.

It is also expected that Capenhurst's EMS will further consider and deal with the minimisation of air emissions during operation.

9.12.3 Assessment of Potential Negative Effects

Legislative requirements will be complied with and the site construction will be managed to avoid cumulative impacts on air quality that breach air quality objectives. As a result, no significant effect upon air quality is predicted. This applies to both the construction and decommissioning periods.

During construction, there will be traffic movements associated with the transport of plant and construction workers to and from the site. This could result in air emissions. Given the relatively short-term period over which construction will take place, this would constitute a minor negative effect.

During operation, there will be some traffic movements associated with the transport of ILW / RPVs and staff travelling to and from the site which could result in air emissions. Given the volume of traffic predicted, this effect is considered to be minor.

Table 9.17: Summary SEA Assessment for Air Quality, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

[146] Environment Agency (2013). *Interactive Maps.* Available from: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

9.12.4 Measures Envisaged to Mitigate and Monitor Air Quality

It is envisaged that Sellafield Ltd's EMS, together with the requirements of any permitting, would mean that air quality is monitored and managed as required.

A site-wide transport plan would be beneficial for managing emissions associated with potential cumulative transport requirements across construction projects, combined with staff transport.

9.12.5 Opportunities for Potential Benefits and Enhancements

No benefits or enhancements, nor opportunities for further enhancement have been identified at this stage.

Table 9.18: Summary SEA Assessment for Air Quality, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

9.13 Climate Change and Energy Use

9.13.1 Baseline Overview

In 2011, the Sellafield nuclear-licensed site used 281,000 MWh of energy and produced 281,000 tonnes of CO_2e (carbon dioxide and equivalents). This was an increase from 2010.[144]

9.13.2 Pre-existing and Committed Mitigation and Management

Refer to 5.4 on the assumed measures to address climate change and energy use for all sites.

Sellafield Ltd's EMS would help to ensure that energy use is minimised through operation.

9.13.3 Assessment of Potential Negative Effects

During construction, use of materials with high embodied carbon content such as steel and concrete, as well as fuel consumption of construction plant would increase greenhouse gas emissions. A minor negative effect is predicted.

During operation, an ILW store would generate some greenhouse gas emissions. As these are anticipated to be relatively small, a minor negative effect is predicted.

During decommissioning, the use of plant and processes (such as demolition and recycling) would be likely to increase greenhouse gas emissions. A minor negative effect is predicted.

Extended operation, if required, is expected to be similar to the operational period, with minor significant effect.

Table 9.19: Summary SEA Assessment for Climate Change and Energy Use, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	-	-	-

9.13.4 Measures Envisaged to Mitigate and Monitor Climate Change and Energy Use

It is envisaged that Sellafield Ltd's EMS this could be amended to include the interim ILW store, and include climate change mitigation and energy usage considerations.

The use of recycled materials and locally sourced materials would help to minimise consumption of greenhouse gas emissions. The use of sustainably sourced biofuels would help to reduce overall greenhouse gas emissions from fuel.

The EIA and design of the interim ILW store should take account of the full lifecycle. Choosing materials with lower embedded carbon where possible and recycled material.

9.13.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 9.20: Summary SEA Assessment for Climate Change and Energy Usage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	**0**	**0**	**0**

9.14 Coastal Change and Flood Risk

9.14.1 Baseline Overview

The site is located along the Irish Sea coastline, but is protected from coastal flooding by cliffs and a railway embankment, the site being 5 m to 50 m above ordnance datum (AOD). The risk of flooding from the River Calder which runs through the Sellafield site is negligible, and the only modelled flood risk zones are outside of the developed part of the site. However, the flood risk zones indicate that an extreme flood could sever access to the site from the north (local roads and the A595).

The Environment Agency policy for coastal erosion in this area is to hold the existing defence line, and thus maintain and, when necessary, replace existing defences (see maps in Annex 2). Currently there is revetment defence, and without it, the southern end of the Sellafield site could be affected by coastal erosion in the next 100 years.[100]

9.14.2 Pre-existing and Committed Mitigation and Management

A flood risk assessment (FRA), if required as part of planning, would address the potential impacts on flood risk, taking into account the predicted effects of climate change. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures required to avoid or minimise significant impacts.

There are coastal erosion defences in place and a policy to 'hold the line'. It is assumed that this policy would continue to be in place and maintained throughout the proposed life of the project.

9.14.3 Assessment of Potential Negative Effects

No significant negative effects to coastal change and flood risk are considered likely.

The EA policy for coastal erosion in the area is to hold the existing defence line, and thus maintain and, when necessary, replace existing defences. Currently there is a revetment defence and without it the southern end of the Sellafield site could be affected by coastal erosion in the next 100 years. In the event of extended operation at the Sellafield site studies should be undertaken to assess the suitability and integrity of the existing flood defence and to determine if additional measures are required to protect the site for the extended operation period.

Table 9.21: Summary SEA Assessment for Coastal Change and Flood Risk, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

9.14.4 Measures Envisaged to Mitigate and Monitor Coastal Change and Flood Risk

It is envisaged that Sellafield Ltd's EMS this could be amended to include the interim ILW store, and include coastal change and flood risk considerations. It is recommended that the standards of drainage are periodically reviewed to ensure they meet the requirements of the time.

9.14.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 9.22: Summary SEA Assessment for Coastal Change and Flood Risk, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	**0**	**0**	**0**

9.15 Transportation

9.15.1 Baseline Overview

The M6 is the nearest motorway, within a minimum 85 km (52 mile) drive mainly along the A595, either north or south, and then east. Southbound, the A595 connects to the A5092 and A590 before joining the M6. Northbound, access to the M6 from the A595 can be had via the A66. The site is also served by Sellafield train station, adjacent to the west. Cycle routes and footpaths are addressed under the SEA category 'Health and Well-Being'.

Approximately 80% of Sellafield employees live locally in Allerdale and Copeland, with a further 4% in neighbouring Barrow-in-Furness and Carlisle. Commuting is largely along the main A595.

9.15.2 Pre-existing and Committed Mitigation and Management

Refer to Section 5.7 for information on pre-existing transport management and mitigation assumed for all sites.

9.15.3 Assessment of Potential Negative Effects

There is well known, localised, peak time traffic congestion along the A595 between Whitehaven and Sellafield. Construction traffic, and the transport and delivery of materials during both construction and operation, should be managed to avoid vehicle movements during the identified congestion times to prevent negative impacts. Given the number of additional activities taking place in parallel, such as construction of a proposed new nuclear power station, there is potential for minor cumulative effects on local traffic arising are construction of the ILW store.

During construction, the use of heavy vehicles may result in increased deterioration of the carriageway and other highway infrastructure. This would constitute a minor negative effect.

During operation, it is anticipated that minor adaptations to the local transport infrastructure may be required. However it is considered that these adaptations would be so minor as to be inconsequential in terms of transport. As the interim ILW store is anticipated to generate very few additional journeys (refer to Table 4.1**: Assumptions about Implementing Interim**) a neutral effect is predicted for operation.

During decommissioning, heavy vehicles may contribute to increased deterioration of the carriageway and other highway infrastructure. This would constitute a minor negative effect.

Extended operation, if required, is expected to be similar to the operational period, with no significant effect.

Table 9.23: Summary SEA Assessment for Transportation Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

9.15.4 Measures Envisaged to Mitigate and Monitor Transportation

If feasible adaptations to highway should be coordinated to planned highway maintenance or improvements to minimise the risk of abortive work or increased disruption.

The transport of the RPVs should be planned in conjunction with the relevant local authorities, local community and other stakeholders to minimise disruption to the local road network. Development of a Transport Management Plan is recommended to ensure that agreed routes are adhered to and to set out the appropriate frequency and timing of deliveries.

Transport planning would minimise transport effects and disruption to local traffic.

Continued implementation and updates of a site transport plan would help to encourage sustainable transport choices for employees.

An effective supply chain management should be used to reduce the number of vehicle movement required to and from the site.

Although the general assumption is that transport would be via road, there may be potential to use rail or sea as an alternative method of transport for the RPVs at Sellafield or for construction plant. This would require transport investigation and appraisal. If shown to be appropriate, such an alternative mode of transport would help to mitigate congestion on local roads.

9.15.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 9.24: Summary SEA Assessment for Transportation, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	**0**	**0**	**0**

9.16 Waste Management

The scope of this SEA is waste associated with the interim storage of RPVs. Waste associated with other activities as part of the SDP are outside the scope of the assessment within this Environmental Report.

9.16.1 Baseline Overview

Sellafield is host to the only high-level waste (HLW) storage in the UK, and also provides storage for ILW.[147] As of 2012, the radioactive waste for disposal (in packaged volume) included 1,780 m^3 of HLW, 74,900 m^3 of ILW and 4,030 m^3 of LLW in storage.

In 2011, the site produced 2,600 tonnes of non-hazardous waste, of which approximately 16% was reused or recycled, and 116 tonnes of hazards waste, of which 38% was reused or recycled. Approximately 40 tonnes of inert waste was disposed of by landfill.

[147] NDA (2012). *An Overview of NDA Higher Activity Waste*. https://www.nda.gov.uk/documents/upload/An-overview-of-NDA-higher-activity-waste-February-2012.pdf

There are no known non-radiological waste management sites within a 1 km radius of the site.

9.16.2 Pre-existing and Committed Mitigation and Management

Refer to Section 5.4 for information on requirements of waste legislation as pre-existing mitigation. The implementation of Sellafield Ltd's EMS is further anticipated to further establish good practice regarding waste management and minimisation.

9.16.3 Assessment of Potential Negative Effects

No additional significant volumes of waste are anticipated to be produced from operation of the interim ILW store.

During construction and decommissioning, increased volumes of waste may arise. However, it is anticipated that much of the material generated during decommissioning would be steel and concrete which could be widely recycled and re-used. A minor negative effect is predicted prior to appropriate mitigation.

Extended operation, if required, is expected to have similar effects to the operational period. Over time there is likely to be an increase in the level of maintenance required and construction waste generated as some of the infrastructure begins to degrade, however given the overall timescales involved, no significant effect is predicted.

Table 9.25: Summary SEA Assessment for Waste Management, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	0	-	0

9.16.4 Measures Envisaged to Mitigate and Monitor Waste Management

It is envisaged that Sellafield Ltd's EMS could be amended to include the interim ILW store, and include Waste Management considerations.

The specification of materials with a high recycled content in the design would help to minimise use of raw materials. Where possible, existing material on site should be re-used, provided it is suitable for use and in accordance with environmental permitting regulations.

Prior to construction, site investigations will be required to include land quality assessment and site characterisation to identify if any historic chemical or radiological contamination is present, and if present, mitigation measures to ensure the site is suitable for use.

9.16.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 9.26: Summary SEA Assessment for Waste Management, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	**0**	**0**	**0**

9.17 Land Use and Materials

9.17.1 Baseline Overview

The site is entirely developed or previously developed land, with several demolished structures. There is both a short- and long-term programme for further decommissioning and structure demolition, which includes demolition of further structures by 2018.[100] The adjacent and surrounding land uses are shoreline, grassland and arable farming.

9.17.2 Pre-existing and Committed Mitigation and Management

No site-specific mitigation is identified.

9.17.3 Assessment of Potential Negative Effects

No significant negative effects to land use and materials are considered likely since it is predicted that the proposed interim ILW store would be contained within the existing licensed site.

Table 9.27: Summary SEA Assessment for Land Use and Materials, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

9.17.4 Measures Envisaged to Mitigate and Monitor Land Use and Materials

No further measures have been identified.

9.17.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 9.28: Summary SEA Assessment for Land Use and Materials, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

9.18 Cultural Heritage

9.18.1 Baseline Overview

There is a Scheduled Monument approximately 250 m to the south of the site: 'Stone circle NW of Seascale How Farm', which is a ring of stones approximately 30 m in diameter which may date back to the Bronze Age.[148] There are additional Scheduled Monuments further away, including one over 1.7 km to the northwest and four 2 km to the northeast.

There are five Listed Buildings within 1 km, including one Grade II* building, around 1 km to the northwest.

In terms of on-site archaeology, it is considered likely that any pre-industrial remains will have been destroyed during construction of the Sellafield site.

9.18.2 Pre-existing and Committed Mitigation and Management

Section 5.6 identifies pre-existing mitigation anticipated for all sites. No site specific pre-existing mitigation has been identified.

9.18.3 Assessment of Potential Negative Effects

No significant effect is predicted upon the Scheduled Monument south of the site.

Despite mitigation, during construction and decommissioning, traffic vibration and dust may affect historic structures. This may include cumulative effects from other infrastructure projects, including the proposed new nuclear power station. The effect is considered likely to be minor.

No significant effect is anticipated during operation since the scale of the surrounding Sellafield plant already affects the settings of heritage features within the local area. It is feasible that there may be a negative effect during extended operation if other parts of the site have been decommissioned over that timescale.

It is considered unlikely that the low numbers of vehicle movements associated with the ILW delivery would lead to vibration effects upon buildings.

Table 9.29: Summary SEA Assessment for Cultural Heritage, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**-**

9.18.4 Measures Envisaged to Mitigate and Monitor Cultural Heritage (Quality and Visual Amenity)

It is envisaged that a future EIA would identify features of value and propose measures for their protection during construction and operation of the ILW store, in addition to taking into account the potential for cumulative effects on cultural heritage sites.

148 VisitCumbria (2013). *Grey Croft Stone Circle*. Available from: http://www.visitcumbria.com/wc/grey-croft-stone-circle/

9.18.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 9.30: Summary SEA Assessment for Cultural Heritage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

9.19 Landscape and Townscape

9.19.1 Baseline Overview

Sellafield is a large, mainly industrial site which is undergoing periodic development. The Sellafield site falls within the West Cumbria Coastal Plain and Cumbria High Fells. It is an area of coastline mudflats, shingle and pebble beaches with localised sections of dunes, sandy beaches and sandstone cliffs. Parts of the site can be seen from Seascale, the Cumbria Coastal Way and publicly accessible viewpoints (Sellafield Limited and NDA, 2012). The area is of national importance for its extensive mineralisation and the resultant mining heritage.

There are no Areas of Outstanding Natural Beauty in proximity; however the boundary of the Lake District National Park is 11 km to the northeast. There are open views of the site from the National Park, including Scafell approximately 15 km to the east.

9.19.2 Pre-existing and Committed Mitigation and Management

Section 5.6 sets out pre-existing mitigation anticipated for the proposed interim ILW store, regardless of site. No site specific pre-existing mitigation has been identified.

9.19.3 Assessment of Potential Negative Effects

Parts of the site can be seen from Seascale, the Cumbria Coastal Way and publicly accessible viewpoints and there are open views of the site from the Lake District National Park. Two preferred locations for the interim ILW store have been identified within the existing Sellafield Site that are anticipated to only have a limited visual impact.

Despite mitigation, during construction plant and traffic may be visible, particularly if tall plant such as cranes are in use. There may be a cumulative effect due to other construction projects in the vicinity including the proposed new nuclear power station. However, this would be within the context of the existing Sellafield site and on-going site work and, therefore, a minor negative effect is predicted.

During operation, there would be little activity associated with the site, and no significant effects are likely. Although there are open views of the Sellafield plant, the addition of the proposed ILW interim store is unlikely to have a significant effect over and above the baseline effect of the existing plant. Very infrequent RPV movements are unlikely to affect landscape and townscape.

During decommissioning, it is likewise expected that plant and traffic may be visible, particularly if tall plant such as cranes are in use.

During extended operation, it is feasible that there would be an effect on landscape character if other parts of the site have been decommissioned, although this is uncertain.

Table 9.31: Summary SEA Assessment for Landscape and Townscape, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	0	-	-

9.19.4 Measures Envisaged to Mitigate and Monitor Landscape and Townscape (Quality and Visual Amenity)

A project-level landscape and visual impact assessment may be needed to determine whether there is a need for a long-term landscape management plan to screen the development.

9.19.5 Opportunities for Potential Benefits and Enhancements

The implementation of recommendations from the landscape and visual impact assessment may improve landscape, albeit on a small scale once established after construction and during extended operations, if appropriately managed.

Table 9.32: Summary SEA Assessment for Landscape and Townscape, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	+	0	+

10 Assessment Results: Chapelcross (NDA)

10.1 Site Background

NDA Chapelcross site is situated close to the village of Creca approximately 2 km north of the town of Annan in Dumfries and Galloway, South West Scotland. The location is a rural area which was originally an RAF airfield converted for use as a Magnox nuclear power station in 1955. The site is approximately 5 km from the northern coast of the Solway Firth. The site is an inland location at the top of the valley of the River Annan (to the west); the nuclear-licensed site covers approximately 92 hectares. The maps in Annex 2 show the environmental and cultural setting of the site.

Figure 10-1 below provides a map of the site, indicating also the approximate maximum size of an interim ILW storage site (3,150m^2) and the likely construction and RPV transport routes (see section 10.4). It should be noted that the particular location for the proposed interim ILW store has not been specified and Figure 10-1 is intended to provide context only in terms of the size of footprint within the context of the licensed site. The exact location would be determined following detailed investigations should the candidate site be selected for the interim ILW storage.

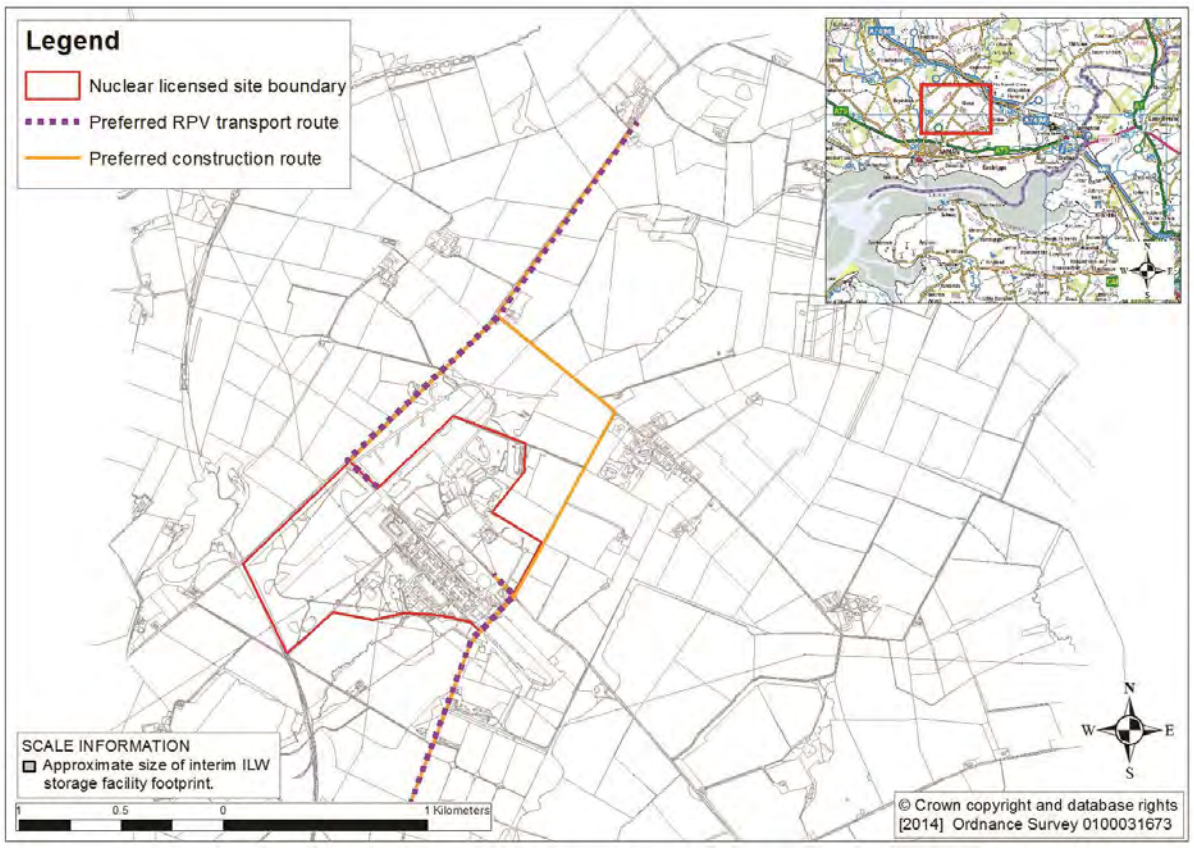


Figure 10-1: Map of Chapelcross (NDA) indicating nuclear-licensed boundary and likely construction and RPV transport routes

10.2 Evolution of the Baseline

The NDA has produced a decommissioning strategy for the Chapelcross Magnox site. The cooling towers were demolished in 2007, and the reactors were defueled in early 2013.

Between now and 2017, Magnox (as the Site Licensed Company) will focus on demolition, removal of buildings and high hazard reduction works in preparation for the Interim Care and Maintenance phase, a semi-quiescent state with a much reduced maintenance schedule. Decommissioning of remaining non-reactor facilities will recommence in 2023, and continue until the full Care and Maintenance phase commences in 2028. In addition to the four reactor buildings, an ILW store will remain on the site during the Care and Maintenance phase. This ILW store would be used to allow ILW to decay. Under current plans the ILW store would be demolished during the Final Site Clearance[149]. Final site clearance (i.e. decommissioning of the reactors) is scheduled to commence at the end of the Care and Maintenance phase (2089), with all remaining structures on the site cleared by 2095.[150]

The planned end state for the site is defined in the NDA Strategy Document 2011, which states that *"…contamination will be reduced to meet the requirements of the relevant regulatory regime for the next planned use of the site and the current use of adjacent land. Where the next planned use no longer requires a nuclear site licence, radioactive contamination will be reduced to meet the criteria for de-licensing, with any remaining radioactive substances being subject to the relevant environmental permitting regime. The physical, state designated land will be made suitable for the next planned use of the site; structures and infrastructure will be made safe or removed where necessary, having first explored opportunities for their re-use."*

Trend data available for radiological discharges from Chapelcross shows a similar total dose between 2004 and 2012, at very low levels. Given historic land contamination at the site and continuing decommissioning and remediation, it can be assumed that there is potential for periodic but slight increases in emissions in future years as a result of the various phases of remediation on-site.

Climate change in the region is projected to lead to the following impacts: increased scarcity of water resources and more frequent droughts; increased intensity of rainfall and frequency of intense rainfall events, leading to increased flood risk, particularly in the winter months, but also 'flash' floods in summer; coastal retreat in the wider area, combined with land use change; and increased risk of the spread of invasive species[151].

Population projections for Dumfries and Galloway show an approximate 1% decrease between 2008 and 2033. The age profile is expected to change significantly, with a notable increase in people aged 65 and over, and a decline in the working-age population[152]. Settlements in the vicinity of Chapelcross are not expected to grow significantly.

10.3 Local Planning Context

The adopted local plan for the area around the site is the Annandale and Eskdale Local Plan, which was adopted in October 2006[153]. As a document which has itself accounted for international and national plans and programmes, it implements local level objectives consistent with those laid out in Annex 3.

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[149] NDA 2008/09 Lifetime Plan, Chapelcross Site Summary, p5.

[150] Magnox (2013). *SEA Site Specific Baseline: Chapelcross Site*. http://www.magnoxsites.co.uk/UserFiles/File/publications/environmental%20reports/ChapelcrossSEABaselineV2formatted.pdf

[151] Adaption Scotland. *Adapting to Climate Change.* Available from: http://www.adaptationscotland.org.uk/Upload/Documents/IntrotoadaptationforpublicsectorFINAL_2.pdf

[152] Democratic Working Group Webpage: http://www.dumgal.gov.uk/commplan/index.aspx?articleid=10865

[153] Dumfries and Galloway Council (2006). *Annandale and Eskdale Local Plan.* Available from: http://www.dumgal.gov.uk/index.aspx?articleid=3738

There is no specific policy for the Chapelcross site, although the end of its operation is noted as a lost source of employment opportunity.

Creca is shown in the Local Plan as a 'small building group', which is only suitable for limited housing development subject to a range of criteria.

The Dumfries and Galloway Local Transport Strategy 2011 – 2026[154] focuses on the scope for promoting sustainable travel in the area of Annan.

The four Local Plans that cover the former District Council areas within Dumfries and Galloway are due to be replaced by a single Local Development Plan (LDP) which is expected to be adopted in autumn 2014. Policy ED4: Chapelcross of the Dumfries and Galloway Proposed LDP (January 2013)[155] encourages business and industrial development proposals at Chapelcross. Any proposals brought forward should be developed in accordance with the Chapelcross masterplan (which has been adopted as supplementary planning guidance) and priority will be given to the reuse of brownfield land. Three parts of the site are identified on the LDP Proposals Maps for business and industry development:

- CPC.B&I1 Chapelcross North (19.43 hectares)
- CPC.B&I2 Chapelcross South (7.13 hectares)
- CPC.B&I3 Chapelcross West (32.37 hectares)

The Chapelcross site is located within a coastal plateau landscape as identified in the Landscape Character Assessment (LCA) for Dumfries and Galloway (Scottish Natural Heritage Review No. 94, 1998)[156]. The coastal plateau is fairly flat with a gentle incline towards the Solway, and views are generally open with some long views over the estuary to the Cumbrian Mountains. Land cover is predominantly improved pasture with some arable fields and rougher pasture in hummocky areas. Fields are generally large and rectilinear with hedgerow boundaries. The main visual horizons are formed by shelterbelts and the edges of small plantations.

With regard to the Chapelcross power station site specifically, the LCA states that any development is likely to be obtrusive with little opportunity for screening. Any designs for development of the site should therefore seek to create structures which in their orientation and design can become landmarks in the landscape.

10.4 Proposals

During both construction and operation, access to the site would be via a series of minor roads which connect to the A75 trunk road, which runs to the south of the site and connects to Junction 22 of the A74(M), and the B722, which connects with the A74(M) at Junction 20.

10.5 Radiological Discharges and Exposures

10.5.1 Baseline overview

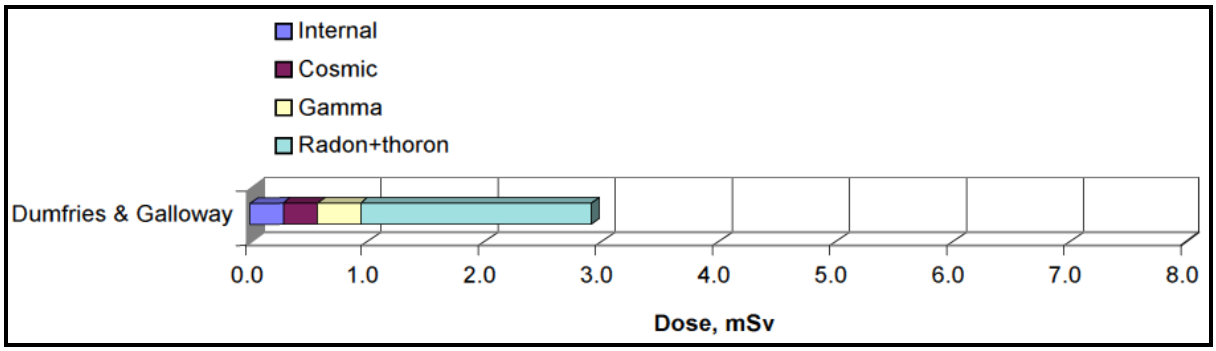
Ionising radiation exposure from **natural sources** in the vicinity of Chapelcross is estimated to be less than 3 mSv per year, given county-level data available[157]. Figure 10-2 below illustrates the average annual doses to residents from different natural background sources.

[154] http://www.dumgal.gov.uk/CHttpHandler.ashx?id=8209&p=0

[155] http://www.dumgal.gov.uk/CHttpHandler.ashx?id=11287

[156] http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/lca/

[157] Health Protection Agency (2005). *Ionising Radiation Exposure of the UK Population: 2005 Review*. Available from:



NOTE: "internal" refers to radiation originating from terrestrial sources which, via the food chain, end up in our bodies, and "gamma" radiation is received externally from mainly terrestrial sources (rocks, soil and building materials such as stone). Source: extract of figures in HPA, 2005, p.78.

Figure 10-2: Annual exposure to natural background radiation in Dumfries and Galloway

Activities at Chapelcross which result in radiological discharges comprise the emission of radioactive gasses, and the discharge of liquid waste to the Solway Firth.

Table 10.1 below summarises the discharges of emissions to air from Chapelcross relative to the permitted levels authorised by the Scottish Environment Protection Agency (SEPA). It can be seen that in 2012, emissions were well within their respective limits.

Table 10.1: Radiological discharges at Chapelcross (2012) [158]

Discharge	Discharge Limit (annual equivalent)	Discharges during 2012	
		Measured annual discharge	% of Annual Limit
Air: tritium	5000 TBq	60.5 TBq	1.2
Air: sulphur-35	50 GBq	Nil	Nil
Air: argon-41	4500 TBq	Nil	Nil
Water: alpha	100 GBq	7.71 MBq	<1
Water: beta[I]	25 TBq	5.99 GBq	<1
Water: tritium	5.5 TBq	3.17 GBq	<1

According to the RIFE report for 2012 (published in 2013)[159], the radiation total dose from all pathways and sources of radiation at Chapelcross was 0.011 mSv, which is just over 1% of the legal dose limit.

The RIFE report notes that electricity generation at Chapelcross ceased in 2004, and the station has been preparing for decommissioning. It states:

"Defuelling of the reactors began in 2008 and was completed during 2013. The major hazards on the site will now be decommissioned early, by 2017" (Environment Agency *et al.*, 2012, p.128)[158.]

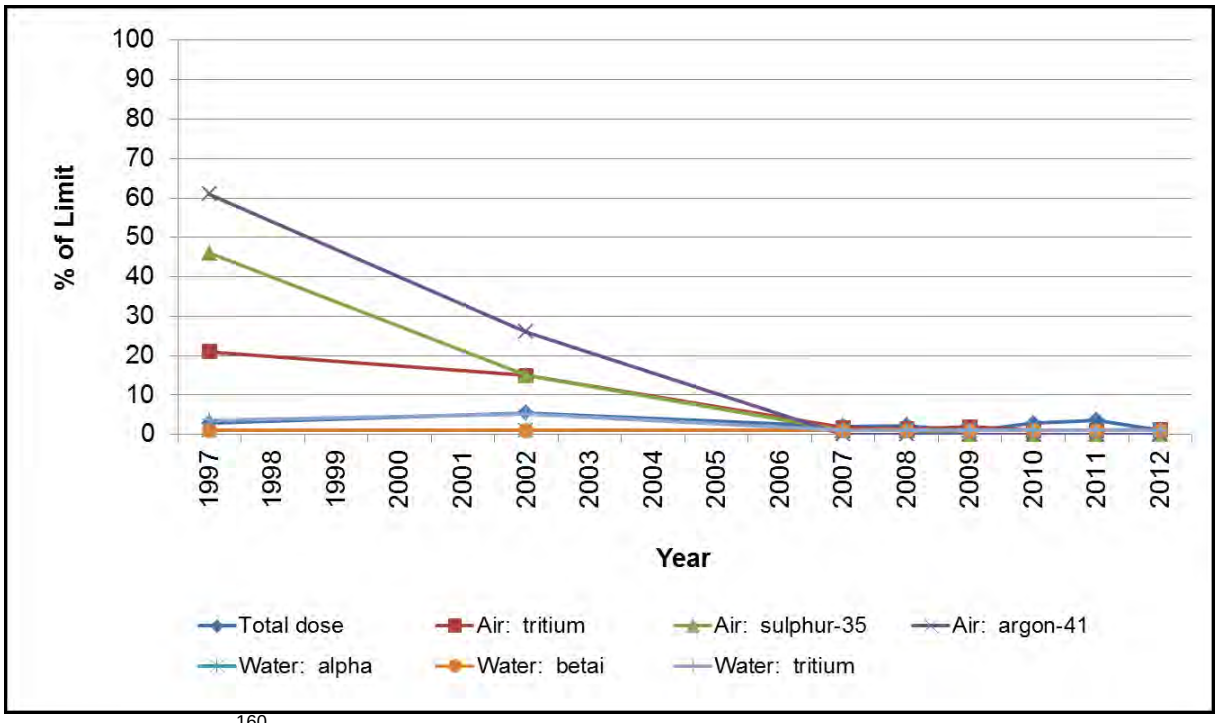
Figure 10-3 below shows the available RIFE report radiological discharge and monitoring data for the years 1997, 2002 and each of the past five years from 2007 to 2012. (Note: the

http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947389360

158 Environment Agency, Food Standards Agency, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2013). *Radioactivity in Food and the Environment, 2012.* Available from: http://www.food.gov.uk/science/research/radiologicalresearch/radiosurv/rife/radioactivity-report2011/#.UlOVzlDYjpU

159 Environment Agency, Food Standards Agency, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2013). *Radioactivity in Food and the Environment, 2012.* Available from: http://www.food.gov.uk/science/research/radiologicalresearch/radiosurv/rife/radioactivity-report2011/#.UlOVzlDYjpU

specific discharges requiring monitoring at the site have changed over time, and hence data for each discharge is not available for every year.) The data shows the discharges and dose to the public have remained well within their respective limits over the past 15 years.



Source: RIFE reports[160]

Figure 10-3: Radiological discharges and dose over time at Chapelcross (NDA)

10.5.2 Pre-existing and Committed Mitigation and Management

Section 5.4 provides details of the regulation and management of radiological discharges and exposures for nuclear sites.

Magnox's 'nuclear safety case' is the key pre-existing, committed mitigation for the management and minimisation of radiological discharges, in order to reduce risk to ALARP / ALARA. This is supported by regulation of the receipt of radioactive waste onto nuclear sites and the disposal of radioactive waste on or from nuclear sites by the Scottish Environment Protection Agency (SEPA)[161] (refer to Section 5.4 for details of the regulation of nuclear sites and the need to review the nuclear safety case to reflect any proposed alteration of activities).

An emergency plan is prepared for licensed nuclear facilities and is regularly kept up-to-date by local authorities under The Radiation Emergency Preparedness & Public Information Regulations (REPPIR). These plans are reviewed every three years or as required to ensure that all emergency services involved in an emergency are aware of their roles and have the sufficient preparedness to act at any time. The size of the emergency planning area differs site by site in the UK, with due consideration given to individual factors associated with each site. The current emergency planning distance for Chapelcross is understood to cover a

[160] RIFE reports 1 through 18: http://sepa.org.uk/radioactive_substances/publications/rife_reports.aspx

[161] For more information, see Environment Agency (2013). *Nuclear*. http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/sectors/32517.aspx, and also HSE (accessed 2013). *ONR: How we regulate*. http://www.hse.gov.uk/nuclear/regulation-and-licensing.htm

radial distance of 2km[162]. In line with other Magnox sites, it is intended that a case will be made to remove the off-site emergency plan in the near future. Under REPPIR, the potential addition of an interim ILW store would require that position to be reviewed.

As described in Section 5.3, Magnox maintains an on-site emergency plan in accordance with the Civil Contingencies Act 2004 and associated Regulations. This plan describes the site's arrangements for dealing with an accident or emergency, and ensures that necessary actions will always be implemented to prevent any member of the public or site staff from being exposed to a significant health risk as a consequence of a nuclear accident at the site. It is required that the plan, and any subsequent changes, are approved by the ONR.

10.5.3 Assessment of Potential Negative Effects

Radiological exposures from implementing interim ILW storage are predicted to be limited to small levels of direct irradiation exposure from RPV sources within shielded containers (see further below). SDP has confirmed that there will be no radiological discharges to air, soil or water directly from the operation of the interim ILW store.

During construction, there is some potential for discovering historic radioactive contamination in the ground during site preparation and construction phases but this would be carefully managed in accordance with legislation and best practice including: full risk assessment and mitigation measures implemented to minimise potential exposure to humans (see Section 5.4). With required controls, it is considered that any potential for increased exposure to radiation would be limited to site workers. Significant effects to site workers' health are unlikely given construction good practice and stringent health and safety requirements.

During operation, the risk of exposure is mainly limited to direct radiation to workers and is subject to regulation and will be managed to ALARP / ALARA. The very low maximum external dose target of 0.5 mSv/hr at the external walls of the interim store will ensure that local communities experience no practically measurable increases in dosage.

During transport from Rosyth and Devonport to Chapelcross, direct radiation from the RPV would be through a shielded container, designed to ALARP / ALARA levels of potential exposure (see Section 5.4). Shielding will reduce the levels of direct radiation to very low levels outside of the RPV vehicle, which would present no significant risk of exposing members of the public to high levels of radiation. The very low frequency of transport (one to three movements per year) is taken into account in this assessment.

Emergency scenarios and preparedness would be planned for, and will ensure that under any incident scenario it would be very unlikely that people could be exposed to levels of radiation significantly above background levels, and in the 'worst case', they would be unlikely to be exposed to levels of radiation which would adversely affect their health.

The assumption is that it is highly unlikely that degradation of the waste package will occur necessitating repackaging before the end of interim storage. However, it is assumed that repackaging will be required at the end of interim storage due to the likely evolution of regulations, policy and standards. This would involve no radioactive discharges and the discarded packaging would not be radioactive.

Given the pre-existing and committed mitigation above, the likely effects across the phases of implementation of interim ILW storage at Chapelcross are envisaged to be negligible for

[162] http://www.onr.org.uk/depz.htm

all four stages (Construction, Operation, Decommissioning and Extended Operation Stages), as summarised in Table 8.2 below.

Under normal operation there would be no discharges to air, water or soil from the interim ILW store. Direct radiological emissions from the store will be managed to ALARP / ALARA standards and will be significantly small as to make them practically unmeasurable at the site boundary. Therefore, there will be no increase in the effective dose to the public locally relative to current levels.

Table 10.2: Summary SEA Assessment for Radiological Discharges and Exposures, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

10.5.4 Measures Envisaged to Mitigate and Monitor Radiological Safety

No additional measures have been identified. The pre-existing mitigation set out in Section 5.4 and Section 7.5.2 means that risks are reduced to ALARP/ALARA and there is an established monitoring regime associated with nuclear installations (refer to Section 5.4).

10.5.5 Opportunities for Potential Benefits and Enhancements

No opportunities for potential benefits or further enhancement have been identified for radiological discharges.

Table 10.3: Summary SEA Assessment for Radiological Discharges, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	0	0	0

10.6 Biodiversity and Nature Conservation

10.6.1 Baseline overview

Chapelcross site is situated in the Solway Tweed River basin, between the Rivers Annan and Kirtle Water, but in the River Annan valley. The River Annan is over 1 km west of the site, and flows from the montane uplands through woodland, farmland and lowlands.

Table 10.4 below lists the key biodiversity features within 5 km of Chapelcross. Figure A2-10 also provides a wider radius around the site, and shows that there are two Special Areas of Conservation (SAC), one Special Protection Area (SPA) and one Ramsar site within 20 km of the site.

Table 10.4: Biodiversity / Nature Conservation Features within 5 km of Chapelcross

Features	Notable Types / Examples
Ramsar site	Upper Solway Flats and Marshes
SPA	Upper Solway Flats and Marshes
SAC	Solway Firth
SAC	South Solway Mosses
SSSI	Upper Solway Flats and Marshes
1 IBA	Upper Solway Flats and Marshes
UK BAP priority habitats	Intertidal substrate foreshore

There are no designated nature conservation sites or known BAP priority habitats within 2 km of the site. A number of sites are located in the wider area. The site has an effluent pipeline which discharges directly to the European designated Solway Firth SAC, approximately 5 km to the south.

Within the site, small numbers of protected species have been recorded. Also, peregrine are known to regularly breed at the site[163].

10.6.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on nature conservation, including the potential for encountering protected species during construction. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures (e.g. fencing, compensatory habitat, species translocation) required to avoid or minimise any significant impacts.

10.6.3 Assessment of Potential Negative Effects

Interim ILW storage would not require any discharges to air or water.

The site does not support any notable habitats. Despite mitigation, during construction, there remains potential for noise, dust and lighting to have an effect on ecological receptors, such as protected or priority species. A minor negative effect is predicted.

Transport movements are anticipated to be so low as to cause no significant effects upon nature conservation locally.

During operation, there would be little activity associated with the interim ILW store, and no significant effects are likely. The very infrequent RPV movements expected are unlikely to affect habitats or species.

During decommissioning, as with construction, there would be the potential for noise, dust and lighting to have an effect on ecological receptors and so a minor negative effect is predicted.

Extended operation if required, assuming it would be within 40 – 100 years, is expected to be similar to the operational period, with no significant effect.

163 NDA (2010). *Strategic Environmental Assessment: Site Specific Baseline Chapelcross*. Available from: http://www.nda.gov.uk/documents/upload/Strategic-Environmental-Assessment-Site-Specific-Baseline-Chapelcross-May-2010.pdf

Table 10.5: Summary SEA Assessment for Biodiversity, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

10.6.4 Measures Envisaged to Mitigate and Monitor Effects on Biodiversity

No further measures other than those identified in Section 10.6.2 above have been identified.

10.6.5 Opportunities for Potential Benefits and Enhancements

The implementation of ecological mitigation could be used to help to improve local biodiversity. Benefits would most likely not be applicable until the operational period.

Table 10.6: Summary SEA Assessment for Biodiversity, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	0	**+**	**+**	**+**

10.7 Population

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the number or types of jobs available in local economies, and levels of deprivation in surrounding areas'. No significant potential effects upon other aspects of population were anticipated during the scoping stage.

10.7.1 Baseline overview

The largest residential settlement within 5 km is Annan, south of the site. A number of smaller settlements surround the site including the hamlet of Creca, immediately east of the site, as well as smaller hamlets such as West Bretton to the north and Blackhills to the south.

The Scottish Index of Multiple Deprivation (SIMD) shows that the area within which the site sits, which covers much of the surrounding rural area, experiences low levels of deprivation across economic and related issues. However, access to services is poor as measured by the domain 'geographic access', whereby the area is within the 20% most deprived in Scotland[164].

Areas surrounding the site vary with regard to deprivation, with a highly economically deprived area in the north of Annan (south of the site) and slightly lower overall economic

[164] Scottish Neighbourhood Statistics (2012). *Scottish Index of Multiple Deprivation*. Available from: http://www.sns.gov.uk/Simd/Simd.aspx

performance to the north and west. The area to the north of the site (Boreland and Ecclefechan) is listed as being amongst the 30% most deprived for education.

10.7.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on local communities, including any businesses. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures to manage transport effects, for example.

10.7.3 Assessment of Potential Negative Effects

No negative effects considered likely. The site is already subject to on-going development, and this additional construction project is unlikely to alter community perception of the area to an extent which could harm local investment or employment to a significant degree.

There are potential medium-term and long-term employment opportunities from the interim ILW store, although this is not anticipated to generate many jobs (not more than 100 full-time equivalent employees maximum during construction and 10 full-time equivalents during operation).

Table 10.7: Summary SEA Assessment for Population

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

10.7.4 Measures Envisaged to Mitigate and Monitor Effects on Population

No measures have been identified.

10.7.5 Opportunities for Potential Benefits and Enhancements

There are potential short-term, medium-term and long-term employment opportunities from the interim ILW store, although this is not anticipated to generate many jobs (circa 100 full-time equivalents in the short-term and 10 in the medium to long-term).

Table 10.8: Summary SEA Assessment for Population, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**+**	**+**	**+**

10.8 Health and Well-Being

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'the health, safety and well-being of local communities'. No significant potential effects upon other aspects of health, including workers / employees, healthcare infrastructure / provision or recreation, were anticipated during the scoping stage.

10.8.1 Baseline Overview

The Scottish Index of Multiple Deprivation shows low deprivation levels for health and crime in the vicinity of Chapelcross. The area is amongst the 40% least deprived nationally for health and the same for crime.[164]

10.8.2 Pre-existing and Committed Mitigation and Management

Environmental discharges which could affect health and well-being are discussed in Sections 8.5, 8.9, 8.10, 8.11 and 8.12. Potential exposure to radiation is and will in future be managed, regulated and monitored to ALARP/ALARA.

Chapter 5 should be referred to for further information about pre-existing mitigation common to all nuclear installations.

10.8.3 Assessment of Potential Negative Effects

Potential exposure would be in the form of low levels of direct radiation (no discharges are anticipated from the interim ILW store). The main potential for receiving an increased radiation dose would lie with the site workforce, as the public would receive no practically measurable increase in radiation does and all emissions of radioactivity will be managed to ALARP / ALARA.

During operation, it is anticipated that there will be a slight increase in transport movements (likely to be infrequent RPV deliveries and very few personnel / maintenance transport requirements) which will generate minor increases in transport emissions. The scale of these emission increases is not anticipated to be significant.

Disruption from construction traffic, noise and dust may cause some disturbance and inconvenience during construction to local residents, but this would be temporary and is unlikely to affect any determinants of health[165] significantly.

SEPA has noted that given the aim of decommissioning and clean-up of the Chapelcross site could be to allow a future industrial or nuclear use for the site, or alternatively to clean it up to the extent that what remains represents 'no danger', two alternative planned future uses for the site are being proposed: a continued nuclear operation and a use with no nuclear operations. SEPA has noted that if the site has no nuclear use, they would require the site to be returned to a satisfactory state to take due account of the land and groundwater contamination referred to in Section 10.10.1.

Interim ILW storage would not affect the existing hazards / risks, and is considered unlikely to significantly affect future management or remediation. Suitable testing of ground

[165] 'Determinants' of health and well-being can be defined as key factors which together determine how health a person or community is likely to be. They include factors such as health social networks, mental health and well-being, physical environment (e.g. housing, local area), employment opportunity and access to services.

conditions, compliance with legislation and mitigation planning, would ensure no significant risk of significant effects to health during construction or decommissioning.

Medium-term and long-term employment opportunities can lead indirectly to significant benefits to people's health and well-being. However, interim ILW storage is not anticipated to generate many jobs (circa 10 full-time equivalent), and thus the benefit is neutral.

Table 10.9: Summary SEA Assessment for Health and Well-Being, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

10.8.4 Measures Envisaged to Mitigate and Monitor Effects on Health and Wellbeing

A future EIA would account for the potential cumulative effects across different environmental topics on health and well-being, including for example, recreation and amenity.

10.8.5 Opportunities for Potential Benefits and Enhancements

Interim ILW storage is expected to generate a relatively small number of jobs and (circa 10 full-time equivalents). It is therefore unlikely to significantly benefit health and well-being in the community.

Table 10.10: Summary SEA Assessment for Health & Well-Being, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

10.9 Noise and Vibration

10.9.1 Baseline Overview

Potential noise-sensitive receptors include relatively isolated dwellings or small groups of dwellings and the hamlet of Creca, which consists of approximately 15 residential properties.

10.9.2 Pre-existing and Committed Mitigation and Management

A future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on noise and vibration. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any measures to manage transport effects, for example. It is expected that the EIA and CEMP could include such measures as:

- traffic management;
- limiting working hours; and
- monitoring of potential impacts of vibration, and frequency of vibration-generating activities.

It is also expected that Chapelcross' EMS will consider and deal with noise generation and management of this impact during operation.

10.9.3 Assessment of Potential Negative Effects

During construction, it is anticipated that some residual noise and vibration will be generated despite the adoption of mitigation measures. This would constitute a minor negative effect. Whilst it is not possible to guarantee a neutral effect at this stage of assessment (SEA), project-level EIA may identify measures to avoid or fully mitigate any negative effect.

During operation, the activities associated with interim ILW storage will be largely passive. Ventilation and energy supply units may generate low-level hums or ventilation noise, however these potential impacts would be assessed and mitigated as part of EIA and storage design. A neutral effect is therefore predicted.

Decommissioning carries the same risks of negative noise impacts as the construction process.

Table 10.11: Summary SEA Assessment for Noise & Vibration, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**–**	**0**	**–**	**0**

10.9.4 Measures Envisaged to Mitigate and Monitor Noise

NDA's EMS could be amended (if required / appropriate) to include the SDP interim ILW store. Provision of additional noise monitoring may be incorporated if there is substantial uncertainty about potential impacts. This would be determined by a future EIA.

The EMS or CEMP could provide an effective way to monitor noise and vibration from multiple construction projects.

10.9.5 Opportunities for Potential Benefits and Enhancements

No opportunities for benefits or enhancements have been identified.

Table 10.12: Summary SEA Assessment for Noise & Vibration, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

10.10 Geology and Soils

As shown in Table 3.4 of Section 3.4.2, the scope of this topic for the SEA of candidate interim ILW storage sites is limited to: 'soil quality, variety, extent and/or compaction levels'. No significant potential effects upon geological conservation or land stability were anticipated during the scoping stage.

10.10.1 Baseline Overview

Soil surrounding the site is classified as lowland brown earth soils of high agricultural value.

Due to the nature of historical activities at Chapelcross, there is radioactive and non-radioactive land contamination present. Land and groundwater throughout the site has varying levels of tritium contamination as a result of fall-out from authorised discharges to air, as well as historic spills and storage of radioactive material and leakage from the effluent pipe, prior to the start of decommissioning. Non-radioactive contamination, e.g. asbestos mainly results from historically acceptable practices of disposing of both liquid and sludge waste in the ground. Contamination has been detected in groundwater outside of the site. There is also a high water table on-site, which has a high pH and contamination of shallow groundwater[166].

10.10.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on geology and soils. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any contaminated land issues, for example, and maximising the remediation and reuse of soils. It is expected that the EIA and CEMP could include such measures as:

- maximising reuse of soils on-site, if appropriate;
- dust suppression and wetting down of exposed soils to prevent their erosion;
- spill and other potential pollution prevention;
- appropriate temporary storage of healthy soils to prevent their degradation, prior to a suitable reuse; and/or
- measures to test and remediate potentially contaminated soils.

Early soil testing (Land Quality Assessment (LQA) and land characterisation studies) would enable consideration of on-site remediation and potential re-use of existing soil that would be excavated or moved to allow for the construction of the interim ILW store. The CEMP should include measures for the storage of materials during construction and should include emergency procedures in the event of the release of pollutants during construction.

10.10.3 Assessment of Potential Negative Effects

Historic radioactive and non-radioactive land contamination is present at the Chapelcross site. This could be disturbed during construction and may require on-site remediation or off-site transport and disposal depending upon the nature of potential contaminants and time

166 Magnox (2014). *Strategic Environmental Assessment: Site Specific Baseline Chapelcross Site*. http://www.magnoxsites.co.uk/wp-content/uploads/2014/10/Chapelcross-SEA-FINAL.pdf

and space available. In each case soil may be negatively affected through compaction, degradation and pollution etc. A minor negative effect is predicted.

The EMS and the CEMP would address contaminated land issues. In addition, as part of an EIA, it would be necessary for land characterisation and a LQA to be undertaken to establish any remedial measures required to ensure that land is suitable for its proposed use.

During operation, interim ILW storage is unlikely to affect soils because no discharges are anticipated.

Decommissioning carries risks of negative impacts on soils (compaction, degradation, pollution etc.). These would be managed through appropriate environmental management processes. As with construction, on-site remediation and /or off site transport and disposal may be required. Therefore, a minor negative effect is envisaged.

Table 10.13: Summary SEA Assessment for Geology & Soils, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	–	0	–	0

10.10.4 Measures Envisaged to Mitigate and Monitor Effects on Soils

NDA's EMS and the CEMP would address contaminated land issues, and to be an effective way to monitor progress in dealing with historic contaminated land issues.

10.10.5 Opportunities for Potential Benefits and Enhancements

Should contaminated soils be discovered at the site of the interim ILW store, there is the potential for remediation of these soils, and reuse elsewhere, such that the baseline is improved.

Table 10.14: Summary SEA Assessment for Geology & Soils, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	+	0	0	0

10.11 Water

10.11.1 Baseline Overview

The site is in the catchment of the River Annan. The river is 1 km to the west, whilst Kirtle Water (river) is approximately 2.5 km northeast, and the Solway Firth is approximately 5 km to the south of the site. Running through the site, although culverted, is Gullielands Burn. Dornock Burn flows approximately 2.5 km to the east of the site.

The ecological and chemical status of Gullielands Burn is not known. The Solway Firth is of 'moderate' ecological status, and assessed as 'pass' for chemical quality.

The site is located on Solway bedrock and localised sand and gravel aquifers, and is a drinking water protected zone.

The site has had a licensed effluent discharge to the Solway Firth via a 6 km pipeline. Discharges are made at high tide. Radioactivity levels are projected to decrease upon the completion of the defuelling and the dispatch of all the spent fuel to Sellafield.[168]

Due to the nature of historical activities at Chapelcross, there is radioactive and non-radioactive land contamination present. Land and groundwater throughout the site has varying levels of tritium contamination as a result of fall-out from authorised discharges to air, as well as historic spills and storage of radioactive material and leakage from the effluent pipe, prior to the start of decommissioning

SEPA does not have an assessed status of water availability for the River Annan; however, groundwater has been indicated as showing long-term stability at present[167] (SEPA, 2007). Although the infrastructure remains, surface water abstraction has stopped since closure of the power station.

10.11.2 Pre-existing and Committed Mitigation and Management

Future Environmental Impact Assessment (EIA) and a construction environmental management plan (CEMP) would address the potential impacts on the water environment. This would have to comply with a number of statutory requirements, as well as guidelines on the protection of surface and groundwater. EIA would inform both construction and design, while a CEMP would help ensure that the relevant on-site measures are carried out appropriately. This would include any pollution prevention measures, for example. It is expected that the EIA and CEMP could include such measures as:

- measures to properly store potentially polluting substances;
- measures to intercept and attenuate any site runoff;
- measures to prevent the pollution of groundwater due to creation of pathways from contaminated land; and
- minimisation of water consumption.

10.11.3 Assessment of Potential Negative Effects

Legislative requirements with regard to discharges will be complied with, and construction will be managed through, the CEMP to avoid run-off into watercourses (refer to Section 10.10). Therefore no significant effect upon the water environment is predicted. Any modifications to water bodies would need to be compliant with Water Framework Directive objectives. No likely modifications have been identified based upon current information and water consumption from the proposed interim ILW store is anticipated to be minimal (refer to Table 4.1 for assumptions on the operational use of water).

[167] SEPA (2007). *The Annan Catchment Co-ordination Project*. Available from: https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&ved=0CEkQFjAF&url=http%3A%2F%2Fwww.sepa.org.uk%2Fwater%2Fwater_publications%2Fidoc.ashx%3Fdocid%3De882b6cb-d5df-418b-b2cf-1ca12e296523%26version%3D-1&ei=bW5vUrf6GNep4AOTi4CIDg&usg=AFQjCNHRK7ZppqmOHJIYp1UNd0Lv2wjB-w

Table 10.15: Summary SEA Assessment for Water Environment, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

10.11.4 Measures Envisaged to Mitigate and Monitor Effects on Water Environment

It is envisaged that NDA's EMS would be used to monitor pollutants to any discharge points, and ensure they are minimised.

10.11.5 Opportunities for Potential Benefits and Enhancements

Should contaminated soils be discovered at the site of the interim ILW store, there is the potential for remediation of these soils, which could remove a potential hazard to water quality.

Table 10.16: Summary SEA Assessment for Water Environment, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**+**	**0**	**0**	**0**

10.12 Air Quality

10.12.1 Baseline Overview

Current sources of non-radiological emissions at Chapelcross include vehicles and diesel generators, with emissions including oxides of nitrogen, oxides of sulphur, ozone and dust / particulates. These sources run only intermittently, and due to the rural nature of the site, average levels of these pollutants are likely to be low. There are no AQMAs in proximity to the site.[168]

10.12.2 Pre-existing and Committed Mitigation and Management

Details of the anticipated pre-existing mitigation are set out in Section 5.49. The EIA process, use of a CEMP and application of environmental permitting requirements would limit potential effects upon air quality during construction and operation.

It is also expected that Chapelcross' EMS will further consider and deal with the minimisation of air emissions during operation.

10.12.3 Assessment of Potential Negative Effects

Legislative requirements will be complied with and the site construction will be managed to avoid cumulative impacts on air quality that breach air quality objectives. As a result, no

significant effect upon air quality is predicted. This applies to both the construction and decommissioning periods.

During construction, there will be traffic movements associated with the transport of plant and construction workers to and from the site. This could result in air emissions. Given the relatively short-term period over which construction will take place, this would constitute a minor negative effect.

During operation, there will be some traffic movements associated with the transport of ILW / RPVs and staff travelling to and from the site which could result in air emissions. Given the volume of traffic predicted, this effect is considered to be minor.

Table 10.17: Summary SEA Assessment for Air Quality, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

10.12.4 Measures Envisaged to Mitigate and Monitor Air Quality

It is envisaged that NDA's EMS, together with the requirements of any permitting, would mean that air quality is monitored and managed as required.

A site-wide transport plan would be beneficial for managing emissions associated with potential cumulative transport requirements across construction projects, combined with staff transport.

10.12.5 Opportunities for Potential Benefits and Enhancements

No benefits or enhancements, nor opportunities for further enhancement have been identified at this stage.

Table 10.18: Summary SEA Assessment for Air Quality, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

10.13 Climate Change and Energy Use

10.13.1 Baseline Overview

In 2011 24,752 MWh of energy was used at the site, reducing to 24,188 MWh in 2012 (Magnox, 2013). [168]

Direct CO_2 and other greenhouse gas emissions generated in 2011 were 4,200 tonnes, and 4,500 tonnes in 2012. The majority of direct CO_2 emissions (around 99%) are from diesel used for the steam heating system.

[168] Magnox, 2014. *Chappelcross Site: Strategic Environmental Assessment Site Specific Baseline.* Available from: http://magnoxsites.co.uk/wp-content/uploads/2014/02/Chapelcross-SEA.pdf

Indirect CO_2 and other greenhouse gas emissions generated was 0.0046 tonnes in 2011 decreasing to 0.0041 tonnes in 2012.

10.13.2 Pre-existing and Committed Mitigation and Management

Refer to 5.5 on the assumed measures to address climate change and energy use for all sites.

NDA's EMS would help to ensure that energy use is minimised through operation. Energy may be required for climate control such as fans and dehumidifiers.

10.13.3 Assessment of Potential Negative Effects

During construction, use of materials with high embodied carbon content such as steel and concrete, as well as fuel consumption of construction plant would increase greenhouse gas emissions. A minor negative effect is predicted

During operation, an ILW store would generate some greenhouse gas emissions. As these are anticipated to be relatively small, a minor negative effect is predicted.

During decommissioning, the use of plant and processes (such as demolition and recycling) would be likely to increase greenhouse gas emissions. A minor negative effect is predicted.

Extended operation, if required, is expected to be similar to the operational period, with minor significant effect.

Table 10.19: Summary SEA Assessment for Climate Change and Energy Use, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	-	-	-

10.13.4 Measures Envisaged to Mitigate and Monitor Climate Change and Energy Use

It is envisaged that NDA's EMS this could be amended to include the interim ILW store, and include climate change mitigation and energy usage considerations.

The use of recycled materials and locally sourced materials would help to minimise consumption of greenhouse gas emissions. The use of sustainably sourced biofuels would help to reduce overall greenhouse gas emissions from fuel.

The EIA and design of the interim ILW store should take account of the full lifecycle. Choosing materials with lower embedded carbon where possible and recycled material.

10.13.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 10.20: Summary SEA Assessment for Climate Change and Energy Usage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

10.14 Coastal Change and Flood Risk

10.14.1 Baseline Overview

The Chapelcross site does not fall within any relevant coastal erosion or flood risk areas.

10.14.2 Pre-existing and Committed Mitigation and Management

A flood risk assessment (FRA) if required as part of planning would address the potential impacts on flood risk, if deemed relevant.

10.14.3 Assessment of Potential Negative Effects

No significant effects relating to coastal erosion and flood risk are considered likely for this site.

Table 10.21: Summary SEA Assessment for Coastal Change and Flood Risk, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

10.14.4 Measures Envisaged to Mitigate and Monitor Coastal Change and Flood Risk

It is recommended that the standards of drainage are periodically reviewed to ensure they meet the requirements of the time, taking account of potential climate change.

10.14.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 10.22: Summary SEA Assessment for Coastal Change and Flood Risk, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

10.15 Transportation

10.15.1 Baseline Overview

The A74(M) motorway is 2.7 km to the north of the site (as the crow flies). The main roads connecting into the motorway are the B722 if connecting to the north, and minor roads to the B6357 eastwards through Hollee. Cycle routes and footpaths are addressed under the SEA category 'Health and Well-Being'.

10.15.2 Pre-existing and Committed Mitigation and Management

Refer to Section 5.7 for information on pre-existing transport management and mitigation assumed for all sites.

10.15.3 Assessment of Potential Negative Effects

During construction, the use of heavy vehicles may result in increased deterioration of the carriageway and other highway infrastructure. This would constitute a minor negative effect.

During operation, it is anticipated that minor adaptations to the local transport infrastructure may be required. However it is considered that these adaptations would be so minor as to be inconsequential in terms of transport. As the interim ILW store is anticipated to generate very few additional journeys (refer to Table 4.1**: Assumptions about Implementing Interim**) a neutral effect is predicted for operation.

Additional transport movements may be required to and from this site during operation to provide services such as water and sewerage, as mains connections will have been removed following decommissioning of the Chapelcross Nuclear Site. These movements would be relatively few in number.

If feasible, deliveries and construction traffic should be routed to avoid residential areas in order to minimise disruption to local traffic. Construction traffic management would help to mitigate negative effects through arranging key deliveries to take place outside of peak traffic periods.

During decommissioning, heavy vehicles may contribute to increased deterioration of the carriageway and other highway infrastructure. This would constitute a minor negative effect.

Extended operation, if required, is expected to be similar to the operational period, with no significant effect.

Table 10.23: Summary SEA Assessment for Transportation Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

10.15.4 Measures Envisaged to Mitigate and Monitor Transportation

If feasible adaptations to highway should be coordinated to planned highway maintenance or improvements to minimise the risk of abortive work or increased disruption.

The transport of the RPVs should be planned in conjunction with the relevant local authorities, local community and other stakeholders to minimise disruption to the local road network. A Transport Management Plan is recommended to ensure that agreed routes are adhered to and to set out the appropriate frequency and timing of deliveries.

Transport planning would minimise transport effects and disruption to local traffic.

Continued implementation and updates of a site transport plan would help to encourage sustainable transport choices for employees.

An effective supply chain management should be used to reduce the number of vehicle movement required to and from the site.

10.15.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 10.24: Summary SEA Assessment for Transportation, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

10.16 Waste Management

The scope of this SEA is waste associated with the interim storage of RPVs. Waste associated with other activities as part of the SDP are outside the scope of the assessment within this Environmental Report.

10.16.1 Baseline Overview

In 2011 the site produced 488.9m^3 of LLW (Low-Level Waste) from routine operational activities. Of this total, 211.5 m^3 of metal was recycled, 140.88 m^3 was treated and 136.5 m^3 was disposed of to the LLWR (Low-Level Waste Repository).[169]

In addition, the site produced 23.1 tonnes of inert waste and 291.2 tonnes of non-hazardous waste from operational activities in 2011, of which 100% and 67% was reused or recycled respectively.

In 2012 the LLW produced at the site from routine operational activities decreased to 198.7 m3. Of this total, 99.36 m^3 was treated and 99.36 m^3 was disposed of to the LLWR.

The site also produced a further 637.5 m3 of LLW from routine decommissioning activities in 2012. Of this total, 130 m^3 of metal was recycled, 188.6 m3 was treated and 318.8 m^3 was disposed of to the LLWR.

In 2012 the site produced 47.6 tonnes of inert waste and 347.5 tonnes of non-hazardous waste from operational activities, of which 100% and 90% was reused or recycled respectively. A further 6.5 tonnes of inert waste and 60.2 tonnes of non-hazardous waste

[169] Magnox (2013). *Strategic Environmental Assessment: Site Specific Baseline Chapelcross Site*. http://www.magnoxsites.com/UserFiles/File/publications/environmental%20reports/ChapelcrossSEABaselineV2formatted.pdf

was produced from decommissioning activities, of which 100% of this total was reused or recycled.

10.16.2 Pre-existing and Committed Mitigation and Management

Refer to Section 5.4 for information on requirements of waste legislation as pre-existing mitigation. The implementation of NDA's EMS is further anticipated to further establish good practice regarding waste management and minimisation.

10.16.3 Assessment of Potential Negative Effects

No additional significant volumes of waste are anticipated to be produced from operation of the interim ILW store.

During construction and decommissioning, increased volumes of waste may arise. However, it is anticipated that much of the material generated during decommissioning would be steel and concrete which could be widely recycled and re-used. A minor negative effect is predicted prior to appropriate mitigation.

Extended operation, if required, is expected to have similar effects to the operational period. Over time there is likely to be an increase in the level of maintenance required and construction waste generated as some of the infrastructure begins to degrade, however given the overall timescales involved, no significant effect is predicted.

Table 10.25: Summary SEA Assessment for Waste Management, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	-	0	-	0

10.16.4 Measures Envisaged to Mitigate and Monitor Waste Management

It is envisaged that NDA's EMS could be amended to include the interim ILW store, and include Waste Management considerations.

The specification of materials with a high recycled content in the design would help to minimise use of raw materials. Where possible, existing material on site should be re-used, provided it is suitable for use and in accordance with environmental permitting regulations.

Prior to construction, site investigations will be required to include land quality assessment and site characterisation to identify if any historic chemical or radiological contamination is present, and if present, mitigation measures to ensure the site is suitable for use.

10.16.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 10.26: Summary SEA Assessment for Waste Management, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation

Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

10.17 Land Use and Materials

10.17.1 Baseline Overview

The total NDA estate covers 188 hectares, with the area outside of the nuclear-licensed site (the 'North Site') incorporating the former RAF airfield. The site has disused power plant structure, administrative and office buildings, access roads, areas of hardstanding, multiple aircraft hangars, miscellaneous airfield buildings, and grassy areas (including over reclaimed land). Inert rubble produced from the demolition of the cooling towers was used to infill the subsurface voids resulting from the removal of these structures, and further demolition activities will likely lead to similar reuse of materials on- or off-site as infill material, or similar[111].

The surrounding area is rural in nature and is used primarily for agricultural purposes. Notable land features in proximity to the site include woodland, and the route of the disused railway that alongside which the effluent discharge pipeline runs[111].

10.17.2 Pre-existing and Committed Mitigation and Management

No site-specific mitigation is identified.

10.17.3 Assessment of Potential Negative Effects

No significant negative effects to land use and materials are considered likely since it is predicted that the proposed interim ILW store would be contained within the existing licensed site.

Table 10.27: Summary SEA Assessment for Land Use and Materials, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

10.17.4 Measures Envisaged to Mitigate and Monitor Land Use and Materials

No further measures have been identified.

10.17.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

Table 10.28: Summary SEA Assessment for Land Use and Materials, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation

Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

10.18 Cultural Heritage

10.18.1 Baseline Overview

There are no Scheduled Monuments in proximity to the site. There are scattered Listed Buildings in the area, including one listed as Outertown, approximately 600 m to the south.

Kinmount, approximately 5.5 km to the west, is on the Register of Landscapes, Parks and Gardens of Special Historic Interest.

No known sites of archaeological interest are present on the site, and remnants from the WWII era are likely to have been destroyed during station construction (although may be intact in the wider airfield).[170]

10.18.2 Pre-existing and Committed Mitigation and Management

Section 5.6 identifies pre-existing mitigation anticipated for all sites. No site specific pre-existing mitigation has been identified.

10.18.3 Assessment of Potential Negative Effects

No significant effect on cultural heritage is considered likely for this site due to the distances to known assets and because the proposed interim ILW store is likely to be located on previously developed land.

Table 10.29: Summary SEA Assessment for Cultural Heritage, Negative Effects

	Construction	**Operation**	**Decommissioning**	**Extended Operation**
Effect with pre-existing / committed mitigation	**0**	**0**	**0**	**0**

10.18.4 Measures Envisaged to Mitigate and Monitor Cultural Heritage (Quality and Visual Amenity)

It is envisaged that a future EIA would identify features of value and propose measures for their protection during construction and operation of the ILW store, in addition to taking into account the potential for cumulative effects on cultural heritage sites.

10.18.5 Opportunities for Potential Benefits and Enhancements

No opportunities for further enhancement have been identified at this stage.

[170] Magnox (2013). *Strategic Environmental Assessment: Site Specific Baseline Chapelcross Site*. http://www.magnoxsites.com/UserFiles/File/publications/environmental%20reports/ChapelcrossSEABaselineV2formatted.pdf

Table 10.30: Summary SEA Assessment for Cultural Heritage, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**0**	**0**	**0**

10.19 Landscape and Townscape

10.19.1 Baseline Overview

NDA's Chapelcross site is currently a partly industrial, partly unused site undergoing gradual decommissioning. The site is located inland, within a broad, gently undulating lowland plain encompassing the Solway Firth. The surrounding area contains several copses and small areas of woodland that are visually important within the local landscape. The site contains several prominent structures that are visible at medium to long distances, including venting stacks on top of existing reactor buildings which are approximately 50 m high and thus visible from surrounding areas. These will be decommissioned in due course.

10.19.2 Pre-existing and Committed Mitigation and Management

Section 5.6 sets out pre-existing mitigation anticipated for the proposed interim ILW store, regardless of site. No site specific pre-existing mitigation has been identified.

10.19.3 Assessment of Potential Negative Effects

Despite mitigation, during construction plant and traffic may be visible, particularly if tall plant such as cranes are in use. A minor negative effect is predicted.

During operation, there would be little activity associated with the site, and no significant effects are likely. Very infrequent RPV movements are unlikely to affect landscape and townscape.

During decommissioning, it is likewise expected that plant and traffic may be visible, particularly if tall plant such as cranes are in use.

Extended operation, if required, is expected to be similar to the operational period, with no significant effect.

Table 10.31: Summary SEA Assessment for Landscape and Townscape, Negative Effects

	Construction	Operation	Decommissioning	Extended Operation
Effect with pre-existing / committed mitigation	**-**	**0**	**-**	**0**

10.19.4 Measures Envisaged to Mitigate and Monitor Landscape and Townscape (Quality and Visual Amenity)

A project-level landscape and visual impact assessment may be needed to determine whether there is a need for a long-term landscape management plan to screen the development.

10.19.5 Opportunities for Potential Benefits and Enhancements

The implementation of recommendations from the landscape and visual impact assessment may improve landscape, albeit on a small scale once established after construction and during extended operations, if appropriately managed.

Table 10.32: Summary SEA Assessment for Landscape and Townscape, Positive Effects

	Construction	Operation	Decommissioning	Extended Operation
Potential Benefits and Enhancements	**0**	**+**	**0**	**+**

11 Summary and Conclusions

11.1 Summary of the Assessment

Table 11.1 and Table 11.2 present a summary of the results of the SEA for each of the candidate interim ILW storage sites, considering the pre-existing and committed mitigation adopted. It can be seen that there are few differences in baseline conditions between the candidate sites. These represent potential constraints with locating the ILW store at each particular site but are not considered major discriminating factors in site selection.

Where potential significant effects have been identified, they are expected to be at worst slightly negative, and at best slightly positive. Most of the potential for negative effects occurs during construction and decommissioning, where effects would generally be temporary. Given the nature of the candidate sites as either former or existing operational developments, any permanent effects from landtake for interim ILW storage would be limited, and could be compensated for through relatively standard mitigation (e.g. compensatory habitat and appropriate drainage / management of rainwater run-off, where appropriate).

Table 11.1: Summary of the Candidate Interim ILW storage Site Assessments

Key Note: full descriptions of effects for each SEA topic are at Annex 4 of the Environmental report	
0	No (neutral effects) on the environment
–	Minor negative effects on the environment. **Note:** no major negative effects have been identified during the SEA

Assessment Questions	**Site**	**Summary Assessment**			
Will the SDP Proposals…		***Construction***	***Operation***	***De-commissioning***	***Extended Operation***
A. Radiological Discharges / Exposures					
Ensure that the exposure of people and the environment to radiation and radioactivity is as low as reasonably achievable.					
Lead to an increase in the risks to people and/or the environment from actual or potential exposures to radiation or radioactivity?	Aldermaston	**0**	**0**	**0**	**0**
	Burghfield	**0**	**0**	**0**	**0**
	Capenhurst	**0**	**0**	**0**	**0**
	Sellafield	**0**	**0**	**0**	**0**
	Chapelcross	**0**	**0**	**0**	**0**
B. Biodiversity and Nature Conservation					
Protect and enhance habitats, species and ecosystems.					
Affect habitats, including designated nature conservation sites (accounting also for designating species) and non-designated habitat?	Aldermaston	**–**	**0**	**–**	**0**
	Burghfield	**0**	**0**	**0**	**0**
	Capenhurst	**–**	**0**	**–**	**0**
	Sellafield	**0**	**0**	**0**	**0**
	Chapelcross	**0**	**0**	**0**	**0**

Assessment Questions	Site	Summary Assessment			
Will the SDP Proposals…		***Construction***	***Operation***	***De-commissioning***	**Extended Operation**
Affect animals or plants outside of designated sites, including protected species and fisheries?	Aldermaston	–	0	–	0
	Burghfield	–	0	–	0
	Capenhurst	–	0	–	0
	Sellafield	–	0	–	0
	Chapelcross	–	0	–	0
C. Population					
Promote a strong, diverse and stable economy with opportunities for all; minimise disturbance to local communities and maximise positive social impacts.					
Affect the number or types of jobs available in local economies, and levels of deprivation in surrounding areas?	Aldermaston	0	0	0	0
	Burghfield	0	0	0	0
	Capenhurst	0	0	0	0
	Sellafield	0	0	0	0
	Chapelcross	0	0	0	0
D. Health and Wellbeing					
Protect and enhance health, safety and wellbeing of workers and communities; minimise any health risks associated with interim ILW storage and transport.					
Affect the health, safety and well-being of local communities?	Aldermaston	0	0	0	0
	Burghfield	0	0	0	0
	Capenhurst	0	0	0	0
	Sellafield	0	0	0	0
	Chapelcross	0	0	0	0
E. Noise and Vibration					
Minimise disturbance and stress to people, wildlife and historic buildings caused by noise and vibration.					
Significantly increase levels of noise and vibration?	Aldermaston	–	0	–	0
	Burghfield	–	0	–	0
	Capenhurst	–	0	–	0
	Sellafield	–	0	–	0
	Chapelcross	–	0	–	0
F. Geology and Soils					
Minimise threats to the extent and quality of soils and geological resources.					
Affect soil quality, variety, extent and/or compaction levels?	Aldermaston	–	0	–	0
	Burghfield	–	0	–	0
	Capenhurst	–	0	–	0
	Sellafield	–	0	–	0
	Chapelcross	–	0	–	0
G. Water					
Maximise water efficiency, protect and enhance water quality.					
Affect water availability as a resource for abstraction or other use?	Aldermaston	0	0	0	0
	Burghfield	0	0	0	0

Assessment Questions	Site	Summary Assessment			
Will the SDP Proposals…		***Construction***	***Operation***	***De-commissioning***	***Extended Operation***
	Capenhurst	**0**	**0**	**0**	**0**
	Sellafield	**0**	**0**	**0**	**0**
	Chapelcross	**0**	**0**	**0**	**0**
Affect the quality of surface or sea water?	Aldermaston	**0**	**0**	**0**	**0**
	Burghfield	**0**	**0**	**0**	**0**
	Capenhurst	**0**	**0**	**0**	**0**
	Sellafield	**0**	**0**	**0**	**0**
	Chapelcross	**0**	**0**	**0**	**0**
Affect the quality of groundwater?	Aldermaston	**0**	**0**	**0**	**0**
	Burghfield	**0**	**0**	**0**	**0**
	Capenhurst	**0**	**0**	**0**	**0**
	Sellafield	**0**	**0**	**0**	**0**
	Chapelcross	**0**	**0**	**0**	**0**
Affect hydrology / geomorphology, including the distribution and quality of freshwater or marine sediments?	Aldermaston	**0**	**0**	**0**	**0**
	Burghfield	**0**	**0**	**0**	**0**
	Capenhurst	**0**	**0**	**0**	**0**
	Sellafield	**0**	**0**	**0**	**0**
	Chapelcross	**0**	**0**	**0**	**0**
H. Air					
Minimise emissions of pollutant gases and particulates and enhance air quality					
Affect air quality?	Aldermaston	**0**	**0**	**0**	**0**
	Burghfield	**0**	**0**	**0**	**0**
	Capenhurst	**0**	**0**	**0**	**0**
	Sellafield	**0**	**0**	**0**	**0**
	Chapelcross	**0**	**0**	**0**	**0**
I. Climate Change and Energy Use					
Reduce energy consumption, minimise greenhouse gas emissions					
Affect the amount of carbon dioxide and other greenhouse gases emitted?	Aldermaston	**–**	**–**	**–**	**–**
	Burghfield	**–**	**–**	**–**	**–**
	Capenhurst	**–**	**–**	**–**	**–**
	Sellafield	**–**	**–**	**–**	**–**
	Chapelcross	**–**	**–**	**–**	**–**
J. Coastal Change and Flood Risk					
Minimise the risks from coastal change and flooding to people, property and communities.					
Affect levels or the extent of flood risk?	Aldermaston	**0**	**0**	**0**	**0**
	Burghfield	**0**	**0**	**0**	**0**
	Capenhurst	**0**	**0**	**0**	**0**
	Sellafield	**0**	**0**	**0**	**0**

Assessment Questions	Site	Summary Assessment			
Will the SDP Proposals…		***Construction***	***Operation***	***De-commissioning***	**Extended Operation**
	Chapelcross	**0**	**0**	**0**	**0**
Be at risk of flooding from any source?	Aldermaston	**0**	**0**	**0**	**0**
	Burghfield	**0**	**0**	**0**	**–**
	Capenhurst	**0**	**0**	**0**	**0**
	Sellafield	**0**	**0**	**0**	**0**
	Chapelcross	**0**	**0**	**0**	**0**
K. Material Assets (Transport)					
Minimise the detrimental impacts on travel and transport within communities, whilst maximising positive effects.					
Affect transport infrastructure, such as through increased heavy loads and possible damage?	Aldermaston	**0**	**0**	**0**	**0**
	Burghfield	**0**	**0**	**0**	**0**
	Capenhurst	**0**	**0**	**0**	**0**
	Sellafield	**0**	**0**	**0**	**0**
	Chapelcross	**0**	**0**	**0**	**0**
Increase or decrease traffic congestion between and around SDP sites?	Aldermaston	**–**	**0**	**–**	**0**
	Burghfield	**–**	**0**	**–**	**0**
	Capenhurst	**–**	**0**	**–**	**0**
	Sellafield	**–**	**0**	**–**	**0**
	Chapelcross	**–**	**0**	**–**	**0**
L. Material Assets (Waste Management)					
Minimise waste arisings, promote reuse, recovery and recycling and minimise the impact of wastes on the environment and communities.					
Increase the amount of radioactive waste to be disposed of?	Aldermaston	**–**	**0**	**0**	**0**
	Burghfield	**–**	**0**	**0**	**0**
	Capenhurst	**–**	**0**	**0**	**0**
	Sellafield	**–**	**0**	**0**	**0**
	Chapelcross	**–**	**0**	**0**	**0**
Affect the amount of hazardous waste to be disposed of?	Aldermaston	**–**	**0**	**0**	**0**
	Burghfield	**–**	**0**	**0**	**0**
	Capenhurst	**–**	**0**	**0**	**0**
	Sellafield	**–**	**0**	**0**	**0**
	Chapelcross	**–**	**0**	**0**	**0**
Affect the amount of non-hazardous wastes produced?	Aldermaston	**–**	**0**	**–**	**0**
	Burghfield	**–**	**0**	**–**	**0**
	Capenhurst	**–**	**0**	**–**	**0**
	Sellafield	**–**	**0**	**–**	**0**
	Chapelcross	**–**	**0**	**–**	**0**
Affect the capacity of existing waste management systems, both nationally and locally?	Aldermaston	**–**	**0**	**–**	**0**
	Burghfield	**–**	**0**	**–**	**0**

Assessment Questions	Site	Summary Assessment			
Will the SDP Proposals…		***Construction***	***Operation***	***De-commissioning***	**Extended Operation**
	Capenhurst	–	0	–	0
	Sellafield	–	0	–	0
	Chapelcross	–	0	–	0
M. Land Use and Materials					
Contribute to the sustainable use of land and natural and material assets.					
Affect any existing or proposed redevelopment/regeneration programmes?	Aldermaston	0	0	0	0
	Burghfield	0	0	0	0
	Capenhurst	0	0	0	0
	Sellafield	0	0	0	0
	Chapelcross	0	0	0	0
Lead to the loss of undeveloped land or green spaces?	Aldermaston	0	0	0	0
	Burghfield	0	0	0	0
	Capenhurst	0	0	0	0
	Sellafield	0	0	0	0
	Chapelcross	0	0	0	0
Increase the burden on limited natural resources such as aggregates or wood (but excluding water or fossil fuels)?	Aldermaston	0	0	0	0
	Burghfield	0	0	0	0
	Capenhurst	0	0	0	0
	Sellafield	0	0	0	0
	Chapelcross	0	0	0	0
N. Cultural Heritage					
Protect and where appropriate enhance the historic environment including cultural heritage resources, historic buildings and archaeological features.					
Affect designated or locally important archaeological features?	Aldermaston	–	0	0	0
	Burghfield	–	0	0	0
	Capenhurst	0	0	0	0
	Sellafield	0	0	0	0
	Chapelcross	0	0	0	0
Affect the fabric and setting of historic buildings, structures or spaces?	Aldermaston	0	–	0	–
	Burghfield	0	0	0	0
	Capenhurst	–	–	–	–
	Sellafield	–	0	–	–
	Chapelcross	0	0	0	0
Affect the historic landscape, including its distinctive context and character?	Aldermaston	0	0	0	0
	Burghfield	0	0	0	0
	Capenhurst	0	0	0	0
	Sellafield	0	0	0	0
	Chapelcross	0	0	0	0

Assessment Questions	Site	Summary Assessment			
Will the SDP Proposals…		*Construction*	*Operation*	*De-commissioning*	Extended Operation
O. Landscape and Townscape					
Protect and enhance landscape and townscape quality and visual amenity.					
Affect landscapes?	Aldermaston	0	0	0	0
	Burghfield	0	0	0	0
	Capenhurst	0	0	0	0
	Sellafield	0	0	0	0
	Chapelcross	–	0	–	0
Have significant visual impacts?	Aldermaston	–	0	–	0
	Burghfield	–	0	–	0
	Capenhurst	–	0	–	0
	Sellafield	–	0	–	0
	Chapelcross	–	0	–	0

11.2 Summary of Envisaged Further Mitigation and Monitoring

As a result of the assessment, potential mitigation and monitoring has been identified in Sections 6 to 10 to address uncertainties in the assessment (e.g. neutral or other assessed effects which could change significantly should circumstances or assumptions change), and the potential significant adverse effects identified. A summary is provided in Table 11.2 below.

It should be noted that the first stage in mitigation of an impact is avoidance, e.g. positioning the store in a more appropriate location on the site. Further mitigation measures will only be considered appropriate in situations where an impact cannot be avoided.

Table 11.2: Summary of Envisaged Further Mitigation and Monitoring

Assessment Category	Site	Summary Assessment				Further Mitigation or Monitoring Needed?	Further Mitigation or Monitoring Envisaged
		Construction	*Operation*	*De-commissioning*	Extended Operation		
A. Radiological Discharges / Exposures	Aldermaston	0	0	0	0	No - existing statutory reporting, associated monitoring and other monitoring regimes (e.g. RIFE) are adequate.	N/A
	Burghfield	0	0	0	0		
	Capenhurst	0	0	0	0		
	Sellafield	0	0	0	0		
	Chapelcross	0	0	0	0		

Assessment Category	Site	Summary Assessment				Further Mitigation or Monitoring Needed?	Further Mitigation or Monitoring Envisaged
		Construction	*Operation*	*De-commissioning*	Extended Operation		
B. Biodiversity and Nature Conservation	Aldermaston	–	0	–	0	Yes - potential for negative effects to habitats, which could be worse than predicted.	Use of AWE's existing EMS and BAP reporting / management to ensure mitigation is implemented, and consider any relevant habitat / species monitoring (including links with EIA).
	Burghfield	–	0	–	0	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
	Capenhurst	–	0	–	0	Yes - potential for negative effects to habitats, which could be worse than predicted.	Use of CNS's existing EMS to consider any relevant habitat / species monitoring.
	Sellafield	–	0	–	0	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
	Chapelcross	–	0	–	0		
C. Population	Aldermaston	0	0	0	0	No - positive effects only, and unlikely to vary significantly.	N/A
	Burghfield	0	0	0	0		
	Capenhurst	0	0	0	0		
	Sellafield	0	0	0	0		
	Chapelcross	0	0	0	0		
D. Health and Wellbeing	Aldermaston	0	0	0	0	No - see other topics, as relevant (e.g. radiological discharges / exposures, noise and vibration, air quality).	N/A
	Burghfield	0	0	0	0		
	Capenhurst	0	0	0	0		
	Sellafield	0	0	0	0		
	Chapelcross	0	0	0	0		
E. Noise and Vibration	Aldermaston	–	0	–	0	Yes - potential for negative effects, including in combination with other potential noise sources.	Use of existing EMS to ensure mitigation is implemented, and consider any relevant noise monitoring (including links with EIA).
	Burghfield	–	0	–	0		
	Capenhurst	–	0	–	0		
	Sellafield	–	0	–	0		

Assessment Category	Site	Summary Assessment				Further Mitigation or Monitoring Needed?	Further Mitigation or Monitoring Envisaged
		Construction	*Operation*	*De-commissioning*	Extended Operation		
	Chapelcross	–	0	–	0		Given the lack of an operational EMS, a system for noise complaints / reporting and response should be developed for the site.
F. Geology and Soils	Aldermaston	–	0	–	0	Yes - some uncertainty in the assessment which requires monitoring, as there is a recognised need to ensure implementation of interim ILW storage does not interfere with the management or remediation of any site's historic contamination issues.	EMSs will be effective at monitoring wider site progress in dealing with historic contamination issues.
	Burghfield	–	0	–	0		
	Capenhurst	–	0	–	0		
	Sellafield	–	0	–	0		
	Chapelcross	–	0	–	0		Magnox has an on-going Environmental Management Plan for decommissioning, which addresses legacy issues of contamination and proposed remediation. This will be an effective monitoring measure.
G. Water	Aldermaston	0	0	0	0	Yes - need to monitor operation to ensure appropriate storage and handling of chemicals or potentially hazardous substances (spill risk).	Use of existing EMS to ensure mitigation is implemented, and consider any relevant water quality / usage monitoring.
	Burghfield	0	0	0	0		
	Capenhurst	0	0	0	0		
	Sellafield	0	0	0	0		
	Chapelcross	0	0	0	0		Given the lack of an existing operational EMS, a new site Environmental Management Plan would be recommended which records and monitors the transfer and storage of potentially hazardous substances on-site.

Assessment Category	Site	Summary Assessment				Further Mitigation or Monitoring Needed?	Further Mitigation or Monitoring Envisaged
		Construction	*Operation*	*De-commissioning*	Extended Operation		
H. Air	Aldermaston	0	0	0	0	No - whilst there is some potential for cumulative construction transport emissions, AWE has a Code of Construction Practice which requires a construction traffic management plan. The fundamental approach is all construction movements are scheduled outside of local traffic peaks.	N/A
	Burghfield	0	0	0	0	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
	Capenhurst	0	0	0	0	Yes - some uncertainty in the assessment which requires further consideration of potential cumulative transport impacts on emissions.	A site-wide transport plan would be beneficial for managing emissions associated with potential cumulative transport requirements across construction projects, combined with staff transport.
	Sellafield	0	0	0	0		
	Chapelcross	0	0	0	0	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
I. Climate Change and Energy Use	Aldermaston	–	–	–	–	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
	Burghfield	–	–	–	–		
	Capenhurst	–	–	–	–		
	Sellafield	–	–	–	–		
	Chapelcross	–	–	–	–		
J. Coastal Change and Flood Risk	Aldermaston	0	0	0	0	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
	Burghfield	0	0	0	–		
	Capenhurst	0	0	0	0		
	Sellafield	0	0	0	0		
	Chapelcross	0	0	0	0		

Assessment Category	Site	Summary Assessment				Further Mitigation or Monitoring Needed?	Further Mitigation or Monitoring Envisaged
		Construction	*Operation*	*De-commissioning*	Extended Operation		
K. Transportation	Aldermaston	–	0	–	0	See above for 'air quality'.	See above for 'air quality'.
	Burghfield	–	0	–	0		
	Capenhurst	–	0	–	0		
	Sellafield	–	0	–	0		
	Chapelcross	–	0	–	0		
L. Waste Management	Aldermaston	–	0	–	0	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
	Burghfield	–	0	–	0		
	Capenhurst	–	0	–	0		
	Sellafield	–	0	–	0		
	Chapelcross	–	0	–	0		
M. Land Use and Materials	Aldermaston	0	0	0	0	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
	Burghfield	0	0	0	0		
	Capenhurst	0	0	0	0		
	Sellafield	0	0	0	0		
	Chapelcross	0	0	0	0		
N. Cultural Heritage	Aldermaston	–	–	0	–	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
	Burghfield	–	0	0	0		
	Capenhurst	–	–	–	–		
	Sellafield	–	0	–	–		
	Chapelcross	0	0	0	0		
O. Landscape and Townscape	Aldermaston	–	0	–	0	No - standard considerations in EIA and CEMP will minimise negative effects.	N/A
	Burghfield	–	0	–	0		
	Capenhurst	–	0	–	0		
	Sellafield	–	0	–	0		
	Chapelcross	–	0	–	0		

11.3 Summary of Opportunities for Positive Effects

As discussed in the methodology of Section 3.4.3, the assessment has presented potential benefits separately. This is because in general there is more certainty about the potential negative effects for the proposed interim ILW store, whereas the potential positive effects largely depend upon optional measures for enhancement and are suggested rather than committed. They may also be based on a generalise baseline for the site, and location-specific opportunities may not present themselves at the project (e.g. design) level.

Table 11.3 below presents a summary of the potential benefits at each candidate ILW storage site by SEA objective and assessment question.

Table 11.3: Summary of the Candidate Interim ILW storage Site Assessments – Positive Effects

Assessment Questions	Site	Positive Effects				Explanation
Will the SDP Proposals…		*Construction*	*Operation*	*De-commissioning*	*Extended Operation*	
A. Radiological Discharges / Exposures						
Ensure that the exposure of people and the environment to radiation and radioactivity is as low as reasonably achievable.						
Lead to an increase in the risks to people and/or the environment from actual or potential exposures to radiation or radioactivity?	Aldermaston	0	0	0	0	No further opportunities were identified over and above the existing regulatory regime to protect people from radiological hazards.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
B. Biodiversity and Nature Conservation						
Protect and enhance habitats, species and ecosystems.						
Affect habitats, including designated nature conservation sites (accounting also for designating species) and non-designated habitat?	Aldermaston	0	+	+	+	It was identified that site operators could implement measures to improve local habitat and biodiversity, if feasible and appropriate. The secure nature of the sites provides opportunities to manage suitable areas for wildlife value, which would be protected from disturbance.
	Burghfield	0	+	+	+	
	Capenhurst	0	+	+	+	
	Sellafield	0	+	+	+	
	Chapelcross	0	+	+	+	
Affect animals or plants outside of designated sites, including protected species and fisheries?	Aldermaston	0	+	+	+	
	Burghfield	0	+	+	+	
	Capenhurst	0	+	+	+	
	Sellafield	0	+	+	+	
	Chapelcross	0	+	+	+	
C. Population						
Promote a strong, diverse and stable economy with opportunities for all; minimise disturbance to local communities and maximise positive social impacts.						
Affect the number or types of jobs available in local economies, and levels of deprivation in surrounding areas?	Aldermaston	+	+	+	+	Low levels of potential job creation are associated with all stages of the interim ILW project lifecycle.
	Burghfield	+	+	+	+	
	Capenhurst	+	+	+	+	
	Sellafield	+	+	+	+	
	Chapelcross	+	+	+	+	
D. Health and Wellbeing						
Protect and enhance health, safety and wellbeing of workers and communities; minimise any health risks associated with interim ILW storage and transport.						
Affect the health, safety and well-being of local communities?	Aldermaston	0	0	0	0	The potential benefits in terms of job creation is not anticipated to be great enough to influence the wellbeing of the local communities.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
E. Noise and Vibration						
Minimise disturbance and stress to people, wildlife and historic buildings caused by noise and vibration.						
Significantly increase levels of noise and vibration?	Aldermaston	0	0	0	0	No opportunities for beneficial effects were identified.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	

Assessment Questions	Site	Positive Effects				Explanation
Will the SDP Proposals…		*Construction*	*Operation*	*De-commissioning*	Extended Operation	
F. Geology and Soils						
Minimise threats to the extent and quality of soils and geological resources.						
Affect soil quality, variety, extent and/or compaction levels?	Aldermaston	+	0	0	0	Site remediation, which may be required during the construction stage, would be positive for soils in the event contaminated land is remediated.
	Burghfield	+	0	0	0	
	Capenhurst	+	0	0	0	
	Sellafield	+	0	0	0	
	Chapelcross	+	0	0	0	
G. Water						
Maximise water efficiency, protect and enhance water quality.						
Affect water availability as a resource for abstraction or other use?	Aldermaston	0	0	0	0	Only potential beneficial effects upon groundwater have been identified where the potential remediation of historic contaminated land may lead to improvements in water quality.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Affect the quality of surface or sea water?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Affect the quality of groundwater?	Aldermaston	+	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	+	0	0	0	
	Chapelcross	0	0	0	0	
Affect hydrology / geomorphology, including the distribution and quality of freshwater or marine sediments?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
H. Air						
Minimise emissions of pollutant gases and particulates and enhance air quality						
Affect air quality?	Aldermaston	0	0	0	0	No opportunities for beneficial effects were identified.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
I. Climate Change and Energy Use						
Reduce energy consumption, minimise greenhouse gas emissions						
Affect the amount of carbon dioxide and other greenhouse gases emitted?	Aldermaston	0	0	0	0	No opportunities for beneficial effects were identified.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	

Assessment Questions	Site	Positive Effects				Explanation
Will the SDP Proposals…		*Construction*	*Operation*	*De-commissioning*	Extended Operation	
J. Coastal Change and Flood Risk						
Minimise the risks from coastal change and flooding to people, property and communities.						
Affect levels or the extent of flood risk?	Aldermaston	0	0	0	0	No opportunities for beneficial effects were identified.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Be at risk of flooding from any source?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
K. Transportation						
Minimise the detrimental impacts on travel and transport within communities, whilst maximising positive effects.						
Affect transport infrastructure, such as through increased heavy loads and possible damage?	Aldermaston	0	0	0	0	No opportunities for beneficial effects were identified.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Increase or decrease traffic congestion between and around SDP sites?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
L. Waste Management)						
Minimise waste arisings, promote reuse, recovery and recycling and minimise the impact of wastes on the environment and communities.						
Increase the amount of radioactive waste to be disposed of?	Aldermaston	0	0	0	0	No opportunities for beneficial effects were identified.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Affect the amount of hazardous waste to be disposed of?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Affect the amount of non-hazardous wastes produced?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Affect the capacity of existing waste management systems, both nationally and locally?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	

Assessment Questions	Site	Positive Effects				Explanation
Will the SDP Proposals…		*Construction*	*Operation*	*De-commissioning*	Extended Operation	
	Chapelcross	0	0	0	0	
M. Land Use and Materials						
Contribute to the sustainable use of land and natural and material assets.						
Affect any existing or proposed redevelopment/regeneration programmes?	Aldermaston	0	0	0	0	No opportunities for beneficial effects were identified.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Lead to the loss of undeveloped land or green spaces?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Increase the burden on limited natural resources such as aggregates or wood (but excluding water or fossil fuels)?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
N. Cultural Heritage						
Protect and where appropriate enhance the historic environment including cultural heritage resources, historic buildings and archaeological features.						
Affect designated or locally important archaeological features?	Aldermaston	0	0	0	0	No opportunities for beneficial effects were identified.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Affect the fabric and setting of historic buildings, structures or spaces?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
Affect the historic landscape, including its distinctive context and character?	Aldermaston	0	0	0	0	
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	0	0	0	
O. Landscape and Townscape						
Protect and enhance landscape and townscape quality and visual amenity.						
Affect landscapes?	Aldermaston	0	0	0	0	It was identified that landscape and visual assessment as part of an EIA may lead to landscape enhancements that could have local beneficial effects.
	Burghfield	0	0	0	0	
	Capenhurst	0	0	0	0	
	Sellafield	0	0	0	0	
	Chapelcross	0	+	0	+	
Have significant visual impacts?	Aldermaston	0	+	0	+	
	Burghfield	0	+	0	+	
	Capenhurst	0	+	0	+	

Assessment Questions	Site	Positive Effects				Explanation
Will the SDP Proposals…		***Construction***	***Operation***	***De-commissioning***	**Extended Operation**	
	Sellafield	**0**	**+**	**0**	**+**	
	Chapelcross	**0**	**+**	**0**	**+**	

11.4 Comparison with the 2010/11 SDP SEA Results

The SEA Environmental Report for the wider Submarine Dismantling Project was published in October 2011. It assessed all of the stages of the SDP as set out in Figure 2-2 of Section 2.3, however without knowledge of the candidate sites for interim ILW storage as set out in this report. It therefore was based on some generic assumptions about interim ILW storage, and it was also focused on comparing different high-level options such as 'use of a greenfield site' versus 'use of an existing nuclear-licensed site'. Of relevance to interim ILW storage, the 2010/11 SEA assessed the following:

- Stage II Option 3: Interim ILW Store;
- Stage V Option 2: RPV Transport to Interim ILW Store; and
- Stage VII Option 3: Decommission Interim ILW Store.

Table 11.4 below summarises the differences in the results for SEA of interim ILW storage between the 2011 SEA and the assessment of candidate interim ILW storage sites carried out and summarised in Sections 6 to 10 of this report. It should be noted that the 2011 SEA included a possible option for a different type of storage with a much bigger interim ILW store (11,600 m^2 facility – this was discounted in favour of RPV storage, as mentioned in Section 1.2 and throughout this report), which may have influenced some of the differences set out below.

Table 11.4: Explanation of Differences with the 2011 SDP SEA Environmental Report

Assessment Category	Site	Overall, Broad Potential for Effects				2010/11 SDP SEA: Summary of Interim ILW storage Effects Assessed		Differences and Explanation
		Construction	***Operation***	***Decommissioning***	**Extended Operation**			
A. Radiological Discharges / Exposures	Aldermaston	**0**	**0**	**0**	**0**	**0**	Not assessed as own topic, but relevant extracts from other topics include: Stage II: safeguards in place to prevent an incident, as well as to prevent a release in the event of an unplanned	**Consistent**. The previous SEA did not address this as a standalone topic, and therefore this SEA better clarifies the reasons effects are
	Burghfield	**0**	**0**	**0**	**0**			

Assessment Category	Site	Overall, Broad Potential for Effects				2010/11 SDP SEA: Summary of Interim ILW storage Effects Assessed		Differences and Explanation
		Construction	*Operation*	*Decommissioning*	Extended Operation			
	Capenhurst	0	0	0	0		incident. Concerns around fear of radiation / image of community. Stage V: public would not be expected to receive any radioactive dose. Minimal possibility of discharge from a breach to the container should an incident occur. Stage VII: very low risk of exposure of workers during decommissioning, if contaminated land.	likely to be neutral.
	Sellafield	0	0	0	0			
	Chapelcross	0	0	0	0			
B. Biodiversity and Nature Conservation	Aldermaston	–	0/+	–/+	0/+	–/+	Stage II: landtake, construction & mobilisation of contaminants, indirect construction effects on the marine designated marine/terrestrial sites Stage V: neutral effect. Stage VII: negative effects during decommissioning, but potential positive effects from site restoration / habitat creation.	**Generally consistent**. However, construction controls are likely to prevent any significant effects on designated terrestrial or marine sites such as the Cumbria Coast Marine Conservation Zone, especially relative to their reasons for designation. Negative effects limited to very localised issues.
	Burghfield	–	0/+	–/+	0/+			
	Capenhurst	–	0/+	–/+	0/+			
	Sellafield	–	0/+	–/+	0/+			
	Chapelcross	–	0/+	–/+	0/+			
C. Population	Aldermaston	+	+	+	+	–/+	Stage II: short-term negative effect of construction, but positive for employment. Stage V & VII: positive for employment, and possible negative effect on attractiveness of area depending upon perception.	**Less negative.** The previous SEA indicated high uncertainty about potential negative effects. Given the history / nature of the site alternatives and their likely future uses, this SEA does not consider a significant negative effect on the local economy a possibility.
	Burghfield	+	+	+	+			
	Capenhurst	+	+	+	+			
	Sellafield	+	+	+	+			
	Chapelcross	+	+	+	+			
D. Health and Wellbeing	Aldermaston	0	0	0	0	–/+	Stage II: CEMP would enable avoidance of	**Less negative.** During

Assessment Category	Site	Overall, Broad Potential for Effects				2010/11 SDP SEA: Summary of Interim ILW storage Effects Assessed		Differences and Explanation
		Construction	*Operation*	*Decommissioning*	Extended Operation			
	Burghfield	0	0	0	0		significant effects. Stage V: potential for public perception issues / anxiety recognised, but significant effects unlikely. Stage VII: negative effects associated with traffic, noise, vibration or air quality	decommissioning, site measures / "EMP" are likely to control the combined impacts of traffic, noise, vibration and emissions, such that people's health would not be significantly affected.
	Capenhurst	0	0	0	0			
	Sellafield	0	0	0	0			
	Chapelcross	0	0	0	0			
E. Noise and Vibration	Aldermaston	–	0	–	0	–/+	Stage II: construction noise / vibration Stage V: neutral effect Stage VII: decommissioning activities causing noise / vibration, but long-term positive effect due to clearing the site and removing potentially noisy activities.	**Less positive.** The interim ILW store will not be significantly noisy during operation, and therefore removing the interim ILW store will not lead to significant benefits.
	Burghfield	–	0	–	0			
	Capenhurst	–	0	–	0			
	Sellafield	–	0	–	0			
	Chapelcross	–	0	–	0			
F. Geology and Soils	Aldermaston	–/+	0	–	0	0/+	Stage II: soil loss recognised, but not qualified as a negative effect. Stage V: neutral effect. Stage VII: potential benefit, as assumed soil would be restored to the same quality as prior to development.	**Less positive.** Soil impacts have been recognised as a potential negative effect within this SEA, while still recognising the potential benefits of any soil remediation on-site. Restoration of the site of a facility at decommissioning is not a net positive effect of implementing interim ILW storage, but rather neutral.
	Burghfield	–/+	0	–	0			
	Capenhurst	–/+	0	–	0			
	Sellafield	–/+	0	–	0			
	Chapelcross	–/+	0	–	0			
G. Water	Aldermaston	0/+	0	0	0	–/+	Stage II: water consumption and potential discharges during construction - negative effect. Stage V: neutral effect.	**Inconsistent and overall less negative.** With mitigation, construction activities
	Burghfield	0	0	0	0			

Assessment Category	Site	Overall, Broad Potential for Effects				2010/11 SDP SEA: Summary of Interim ILW storage Effects Assessed		Differences and Explanation
		Construction	*Operation*	*Decommissioning*	Extended Operation			
	Capenhurst	**0**	**0**	**0**	**0**		Stage VII: adverse effect due to water requirement, but also a potential benefit, as assumed site restoration would return run-off / flow of water to a better state	should not significantly affect water resources. Facility operation would not significantly affect water runoff, and therefore restoration of the site would not lead to a net benefit.
	Sellafield	**0/+**	**0**	**0**	**0**			
	Chapelcross	**0**	**0**	**0**	**0**			
H. Air	Aldermaston	**0**	**0**	**0**	**0**	**–/+**	Stage II: emissions from construction and transport during operation - negative effect. Stage V: neutral / negligible effect. Stage VII: decommissioning activities causing dust / emissions, but long-term positive effect due to end of operational sources of emissions.	**Inconsistent and overall less negative.** With mitigation, construction activities should not significantly affect air quality. Interim ILW store operation would not significantly affect air quality, and therefore restoration of the site would not lead to a net benefit.
	Burghfield	**0**	**0**	**0**	**0**			
	Capenhurst	**0**	**0**	**0**	**0**			
	Sellafield	**0**	**0**	**0**	**0**			
	Chapelcross	**0**	**0**	**0**	**0**			
I. Climate Change and Energy Use	Aldermaston	**–**	**–**	**–**	**–**	**–/+**	Stage II: negative effect - direct and indirect emissions, and energy use. Stage V: neutral effect - emissions not significant. Stage VII: decommissioning activities causing energy use / emissions, but long-term positive effect due to end of operational sources of emissions.	**Less positive.** Ending operation was (in 2011) considered a positive effect. However, this SEA notes that 'not emitting greenhouse gas emissions' is at best neutral, and the activities of decommissioning would lead to an increase in emissions.
	Burghfield	**–**	**–**	**–**	**–**			
	Capenhurst	**–**	**–**	**–**	**–**			
	Sellafield	**–**	**–**	**–**	**–**			
	Chapelcross	**–**	**–**	**–**	**–**			
J. Coastal Change and Flood Risk	Aldermaston	**0**	**0**	**0**	**0**	**0**	Stage II: neutral effect. Stage V: neutral effect. Stage VII: neutral effect.	**Inconsistent and overall less positive.** Knowledge of existing flood risk at Burghfield, the ability to assist in mitigating this risk, and the uncertain risks of increased flood risk with climate
	Burghfield	**0**	**0/+**	**0**	**–**			
	Capenhurst	**0**	**0**	**0**	**0**			
	Sellafield	**0**	**0**	**0**	**0**			

Assessment Category	Site	Overall, Broad Potential for Effects				2010/11 SDP SEA: Summary of Interim ILW storage Effects Assessed		Differences and Explanation
		Construction	*Operation*	*Decommissioning*	Extended Operation			
	Chapelcross	**0**	**0**	**0**	**0**			change in 100 years, have been accounted for.
K. Transportation	Aldermaston	**–**	**0/+**	**–**	**0**	**–/+**	Stage II: potential negative effects of cosntruction traffic. Stage V: neutral / negligible effect. Stage VII: decommissioning activities causing increased traffic, but long-term positive effect due to end of operational transport.	**Less positive.** Ending operation was (in 2011) considered a positive effect. However, this SEA notes that 'not generating traffic' is at best neutral, and the activities of decommissioning would lead to an increase in traffic.
	Burghfield	**–**	**0/+**	**–**	**0**			
	Capenhurst	**–**	**0/+**	**–**	**0**			
	Sellafield	**–**	**0/+**	**–**	**0**			
	Chapelcross	**–**	**0/+**	**–**	**0**			
L. Waste Management	Aldermaston	**–**	**0**	**–**	**0**	**–/+**	Stage II: construction waste arisings - negative effect. Stage V: neutral / negligible effect. Stage VII: potential negative effect of waste arisings from decommissioning, but positive effect of possible reuse / recycling of materials.	**Less positive.** Reuse / recycling of waste was (in 2011) considered a positive effect. However, this SEA notes that 'not generating waste for landfill' is at best neutral, and some waste would still likely end up in landfill.
	Burghfield	**–**	**0**	**–**	**0**			
	Capenhurst	**–**	**0**	**–**	**0**			
	Sellafield	**–**	**0**	**–**	**0**			
	Chapelcross	**–**	**0**	**–**	**0**			
M. Land Use and Materials	Aldermaston	**0**	**0**	**0**	**0**	**0/+**	Stage II: reuse of previously developed land considered a positive effect. Stage V: neutral effect. Stage VII: neutral effect.	**Less positive.** Reuse of previously developed land was (in 2011) considered a positive effect. However, this SEA notes that 'not building on greenfield land' is at best neutral.
	Burghfield	**0**	**0**	**0**	**0**			
	Capenhurst	**0**	**0**	**0**	**0**			
	Sellafield	**0**	**0**	**0**	**0**			
	Chapelcross	**0**	**0**	**0**	**0**			
N. Cultural Heritage	Aldermaston	**–**	**–**	**0**	**–/+**	**–/+**	Stage II: risk of impacts on archaeology or historic buildings. Stage V: neutral effect. Stage VII: potential negative effect from decommissioning works, but positive effect due to end of operational impacts.	**Less positive.** Ending operation was (in 2011) considered a positive effect. However, this SEA notes that 'not affecting cultural heritage' is at best neutral. Net enhancements are plausible at Aldermaston.
	Burghfield	**–**	**0**	**0**	**0**			
	Capenhurst	**–**	**–**	**–**	**–**			
	Sellafield	**–**	**0**	**–**	**–**			
	Chapelcross	**0**	**0**	**0**	**0**			

Assessment Category	Site	Overall, Broad Potential for Effects				2010/11 SDP SEA: Summary of Interim ILW storage Effects Assessed		Differences and Explanation
		Construction	*Operation*	*Decommissioning*	Extended Operation			
O. Landscape and Townscape	Aldermaston	–	0/+	–	0/+	–/0	Stage II: negative effects from presence of construction and of facility. Potential positive effect recognised, but not scored. Stage V: neutral / negligible effect. Stage VII: return of site to original state considered a neutral effect.	**Less negative.** The potential positive effects previously not scored have been recognised by this SEA.
	Burghfield	–	0/+	–	0/+			
	Capenhurst	–	0/+	–	0/+			
	Sellafield	–	0/+	–	0/+			
	Chapelcross	–	0/+	–	0/+			

12 Next Steps

12.1 Consultation on the SEA

This Environmental Report forms part of the public consultation on the interim storage of ILW, taking place from Monday 14th November 2014 to Friday 20th February 2014. This is a national consultation, with local events taking place around Aldermaston, Burghfield, Capenhurst, Sellafield and Chapelcross, as well as nationally. MOD would like to hear your views on the SDP proposals and the Environmental Report. More information on how to provide your comments and the documents available alongside this report can be found in Section 1.6.

This Environmental Report has also been provided to the statutory and non-statutory consultees which are listed in Table 3.2 of Section 3.2.

The candidate interim ILW storage sites and the Environmental Report will be reviewed in light of the views expressed during the consultation. The SEA outcomes may then be updated or revised accordingly. Feedback received on the SEA will be documented in the SDP's Post-Consultation Report.

12.2 Next Steps in the SDP and SEA

The SEA outcomes and views expressed during consultation will be applied during the decision-making process for interim ILW storage site selection. The SEA outcomes are one of a number of factors being taken into account in the comparison of the candidate interim ILW storage sites. While the SEA is important, other factors may have an equal or greater influence on site selection, including a separate, more detailed consideration of nuclear site safety. More information on this process can be found at: https://www.gov.uk/government/publications/submarine-dismantling-project-interim-storage-of-intermediate-level-radioactive-waste.

After the public consultation, responses will be considered and the analyses will be completed. The SDP will publish a summary of the comments received while retaining the comments received in full, for any interested parties to review.

The Business Case Review Note and supporting documents will then be prepared, bringing together all the information and arguments and recommending an interim ILW storage Site. After approval, feedback will be given to stakeholders and the wider public. MOD will publish a Post-Adoption Report, setting out how the SEA and consultation responses have been taken into account in decision-making.

More information is given in the SDP's Approach to Decision Making and Approach to Public & Stakeholder Engagement reports.

Glossary

Term	Definition
Afloat Storage	Where submarines that have been taken out of service are prepared for long-term storage in a water-filled basin i.e. a large dock where several vessels can be stored.
ALARA	As Low as Reasonably Achievable. A principle to ensure residual risk is as low as reasonably achievable. In this SEA the terms ALARA and ALARP are used interchangeably.
ALARP	As Low As Reasonably Practicable. A principal that risks should be reduced to be as low as reasonably practicable. Reasonably practicable involves weighing a risk against the trouble, time and money needed to control it. The term is at the heart of the British health and safety system and a key part of the general duties of the Health and Safety at Work Act 1974. See www.hse.gov.uk/comah/alarp.htm
AQMA	Air Quality Management Area. Each UK local authority carries out a review and assessment of air quality in their area.
Astute class Submarine	The latest class of nuclear-powered fleet submarines in service with the Royal Navy.
Authorisation	Authorisations allow specific defence-related nuclear activity to take place. Such 'Authorised' sites are not subject to the Nuclear Installations Act (unlike civil nuclear sites) and so activities are not formally 'Licensed.' Instead, Authorisations are granted by the Defence Nuclear Safety Regulator.
AWE	Atomic Weapons Establishment.
BAT	Best Available Technique. A term relating to regulations on limiting pollutant discharges. BAT is required to be considered under EC Directive 96/61 in order to avoid or reduce emissions that result from certain installations and reduce the impact on the environment as a whole.
BAT	Biodiversity Action Plan.
BPEO	Best Practicable Environmental Option. A set of procedures adopted by Great Britain with the goal of managing waste and other environmental concerns. BPEO has been defined as *"the outcome of a systematic consultative and decision making procedure which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes for a given set of objectives, the option that provides the most benefits or the least damage to the environment , as a whole, at acceptable cost, in the long-term as well as the short-mediumterm"* (see link below). http://www.environment-agency.gov.uk/research/policy/32949.aspx
Cadw	The historic environment service of the Welsh Government, responsible for conserving, protecting and presenting the built heritage of Wales.
CBO	Community Based Organisation.
CEMP	Construction Environmental Management Plan. A management plan required for any construction project, which sets out ways to mitigate environmental impacts.
CNS	Capenhurst Nuclear Services.
CoRWM	Committee on Radioactive Waste Management: This independent committee provides scrutiny and advice to Government on the long-term management of radioactive waste, including storage and disposal. See http://corwm.decc.gov.uk/ for more details.
DDLP	De-Fuel, De-Equip and Lay-Up Preparation. The process at the end of a submarines operational life where it is de-equipped, defuelled, and prepared for afloat storage.
DE	Defence Estates. MOD organisation, now renamed the Defence Infrastructure Organisation, responsible for management of the Defence Estate.
DE & S	Defence Equipment & Support. A MOD organisation that equips and supports the UK‟s armed forces for current and future operations. See www.mod.uk/DefenceInternet/MicroSite/DES
DECC	Department of Energy and Climate Change (DECC). DECC was created in 2008 bringing together energy policy previously with DEFRA and other departments. The NDA is responsible for implementing geological disposal of radioactive waste on behalf of DECC. See www.decc.gov.uk
Defra	Department for Environment, Food and Rural Affairs. A government department

	responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the United Kingdom. See www.defra.gov.uk
Defuel	The removal of spent (used) nuclear fuel from the submarine's reactor after it has left service. Submarines will be defuelled before they become part of SDP and are dismantled.
DfT	Department for Transport. The government department responsible for the English transport network and a limited number of transport matters in Scotland, Wales and Northern Ireland which are not devolved. The DfT seeks to ensure safer transport and this applies to the transport of hazardous materials. See www.dft.gov.uk
DIO	Defence Infrastructure Organisation. The DIO, previously Defence Estates, manages the military estate, including accommodation for Service personnel and their families, on behalf of the MOD. See http://www.mod.uk/defenceinternet/microsite/dio/
DNSR	Defence Nuclear Safety Regulator. MOD internal regulator responsible for managing the safety of the MOD nuclear programme where external regulators do not. It develops MOD nuclear safety policy and regulatory standards under delegated authority.
Dreadnought Submarine	The Royal Navy's first nuclear powered submarine, entered service in 1963, followed by two improved units in 1966 and 1967.
DSA	Disposal Services Authority. The DSA is an MOD organisation responsible for the disposal of surplus MOD assets, including ships for recycling. See www.edisposals.com
DSM	Director Submarines – Rear Admiral responsible for delivering the MOD nuclear submarine programme, of which the SDP is part.
EA	Environment Agency. The environmental regulator for England and Wales. The Agency's role is the enforcement of specified laws and regulations aimed at protecting the environment, in the context of sustainable development, predominantly by authorising and controlling radioactive discharges and waste disposal to air, water (surface water, groundwater) and land. The Environment Agency also regulates nuclear sites under the Environmental Permitting Regulations and issues consents for non-radioactive discharges. See www.environment-agency-gov.uk
EIA	Environmental Impact Assessment. A legal requirement under EU Directive 2014/52/EU for certain types of project, including various categories of radioactive waste management project. It requires information on the environmental impacts of a project proposal to be submitted by the developer and evaluated by the relevant competent authority (the planning authority, HSE or other regulators concerned).
EMS	Environmental Management Systems. The management of an organization's environmental programs in a comprehensive, systematic, planned and documented manner.
GDF	Geological Disposal Facility. The government's proposed long-term, below ground facility for disposing of the UK's Higher-Activity Nuclear Waste (HLW and ILW). The site for the GDF has not yet been identified. For more details see http://mrws.decc.gov.uk/en/mrws/cms/home/What_is_geolog/What_is_geolog.aspx.
Greenfield	Also referred to as Undeveloped Land. This term refers to land that has not previously been developed (such as farmland), or which has been used but has reverted back to a largely 'natural' state (such as disused quarries).
HAW	Higher Activity Waste. A term that covers both ILW and HLW. HAW is used since both ILW and High Level Waste will be required to be safely stored until a UK Geological Disposal Facility is available.
Hazard	A property or situation that in certain circumstances could lead to harm.
Hazardous Waste	Anything in the list of hazardous wastes in The Hazardous Waste (England and Wales) Regulations 2005. http://www.legislation.gov.uk/uksi/2005/895/schedule/1/made In Scotland, Special Waste is essentially any waste with hazardous properties which may render it harmful to human health or the environment. Elsewhere in the UK and the EC, it is referred to as being Hazardous waste.

Hex Tails	Depleted uranium hexafluoride (UF6).
HPA	Health Protection Agency. An independent UK organisation set up in 2003 by the government to protect the public from threats to their health from infectious diseases and environmental hazards.
HRA	Habitats Regulation Assessment. This is a statutory assessment, required by the EC Habitats Directive (92/43/EEC) and transposing Regulations, which is carried out on any plan or project that has the potential to affect a European-designated wildlife site. Because Rosyth and Devonport are close to such designated sites, a plan-level HRA has been undertaken for the SDP.
HSE	Health & Safety Executive. The HSE is an independent regulator that acts in the public interest to reduce work-related death and serious injury across workplaces in Great Britain. See www.hse.gov.uk
IAEA	International Atomic Energy Agency. An international organisation that works for the safe, secure and peaceful uses of nuclear science and technology. See www.iaea.org
ILW	Intermediate Level Waste. Radioactive wastes with a radiological activity above 4 GigaBecquerels (GBq) per tonne of alpha, or 12 GBq/tonne of beta-gamma decay, but which does not generate enough heat to require it to be cooled during storage. By contrast, nuclear fuels are generally much more active, and have to be kept cool. The majority of ILW from submarines is metal within the RPV.
Initial Dismantling	The process where radioactive waste is removed from the laid-up submarines. This work has to take place on a site with an appropriate nuclear site Licence, issued by the ONR.
Interim Storage	ILW is stored for an „interim" period until a disposal route is available. Interim stores are designed for 100 years to provide safe and secure protection for waste packages. There are currently over twenty such sites in the UK.
Licence/ Licensed Site	A Nuclear Licence allows specific nuclear activities to take place at a specific site. Such 'Licensed' sites are subject to the Nuclear Installations Act (1965), with licenses being granted by the Office for Nuclear Regulation (previously the Nuclear Installations Inspectorate). Nuclear power stations and other civil activities are licensed in this way.
LLW	Low Level Waste. This is defined as radioactive waste that has below 4 gigabecquerels per tonne (GBq/te) of alpha activity and below 12 GBq/te of beta/gamma activity. It covers a variety of materials which arise principally as lightly contaminated miscellaneous scrap and redundant equipment. LLW is managed in accordance with the UK's LLW Strategy and with disposal to licensed facilities such as the LLW Repository in Cumbria.
LSOA	Lower Layer Super Output Area.
LNR	Local Nature Reserve. Areas with wildlife or geological features that are of special interest locally.
LUSM/ LTB	Laid-Up Submarine / Long-term Berthing. LUSM's are prepared for safe LTB, which is the placement of the submarine into long-term afloat storage prior to dismantling.
LWS	Local Wildlife Site. A locally designated non-statutorily protected wildlife site.
MCZ	Marine Conservation Zone. Zones which protect areas that are important to conserving the diversity of nationally rare or threatened habitats and/or species and those places containing habitats and/or species that are representative of the biodiversity in our seas.
MGBC	Main Gate Business Case. The approvals document utilised in the MOD to seek approval to proceed from the Assessment of options phase into the implementation phase (Demonstration and Manufacture) (see **CADMID**).
MOD	Ministry of Defence.
MRWS	Managing Radioactive Waste Safely. The UK Government's approach to managing the nation's radioactive wastes, irrespective of where they come from and their level of activity. For more details see http://mrws.decc.gov.uk/
NDA	Nuclear Decommissioning Authority. The NDA is a non-departmental public body created through the Energy Act 2004. Its purpose is to deliver the decommissioning and clean-up of the UK"s civil nuclear legacy in a safe and cost-effective manner.
NGO	Non-Governmental Organisation. In its broadest sense, a Non-Governmental Organisation is one that is not directly part of the structure of Government such as Friends of the Earth.
NNR	National Nature Reserve. These reserves manage some of England's most pristine

	habitats, as well as providing areas for research.
NRW	Natural Resource Wales. The principal advisor to the Welsh Government on the environment, enabling the sustainable development of Wales' natural resources for the benefit of people, the economy and wildlife.
ONR	Office for Nuclear Regulation. The ONR, an agency within the HSE, seeks to protect people and society from the hazards of the nuclear industry, by ensuring compliance with relevant legislation and by influencing the nuclear industry to create and maintain a good health, safety and security culture. See http://www.hse.gov.uk/nuclear/
Opportunity	A project management term that refers to an uncertain event that, should it occur, would have a positive effect on the achievement of one or more project (or business) goals.
Packaged Waste Storage	RPV removal and size reduction for storage as packaged waste. The option for removing the radioactive materials from the submarine whereby the RPV is removed, cut-up and packaged in appropriate containers for transport, interim storage and ultimately, disposal in the proposed GDF.
Ramsar	A wetland of international importance, designated under the Ramsar Convention. In the United Kingdom, Ramsar Sites are protected in the same way as European sites (e.g. Special Protected Areas and Special Areas of Conservation).
RC/RC Separation	Reactor Compartment. This is the central 'slice' of the submarine which contains the nuclear reactor, housed within the RPV, and the primary circuit, which transfers heat to the boiler. RC Separation refers to the option for removing the radioactive materials from the submarine whereby the complete RC is separated from the rest of the submarine and then stored intact.
Regulators	The regulators who authorise and monitor nuclear activities to ensure they comply with these standards and principles include: • Office of Nuclear Regulation (ONR) – an agency of the Health and Safety Executive • Environment Agency (EA) / Scottish Environment Protection Agency (SEPA) • Department of Transport (DfT) (for the transport of radioactive materials) • Defence Nuclear Safety Regulator (DNSR)
Risk	The chance that someone or something that is valued will be adversely affected by a hazard, where a hazard is the potential for harm that might arise, for example, from ionising radiation.
RPV/RPV Removal	Reactor Pressure Vessel. The self-contained metal pressure vessel inside the RC which contains the nuclear fuel. RPV Removal and Storage is the option for removing the radioactive materials from the submarine whereby the whole RPV is stored intact.
RWMD	Radioactive Waste Management Directorate of the NDA. Formerly known as Nirex. See http://www.nda.gov.uk/aboutus/geological-disposal/rwmd-work/index.cfm
SAC	Special Area of Conservation. Strictly protected sites designated under the EC habitats directive.
SAP	Safety Assessment Principles. The assessment of safety cases for nuclear facilities that may be operated by potential licenses, existing licensees, or other duty-holders.
SDP	Submarine Dismantling Project. The Submarine Dismantling Project (formerly ISOLUS – Interim Storage of Laid-Up Submarines), was established in 2000 following a study by the MOD, which concluded that the radioactive waste from the submarines should be stored on land. The aim of the SDP is to deliver a safe, secure, environmentally responsible and cost-effective solution for dismantling 27 of the UK's defuelled nuclear powered submarines including past and current classes.
SEA	Strategic Environmental Assessment. A type of assessment undertaken on certain public plans and programmes, to assess the potential environmental effects that they may have, and to identify ways to avoid or minimise damaging impacts and enhance positive ones. SEA gives the public the opportunity to see what those impacts might mean for them and comment on them before decisions are made, so that they can help shape the approach taken.
SEPA	Scottish Environment Protection Agency. The environmental regulator for Scotland. The agency's role is the enforcement of specified laws and regulations aimed at protecting the environment, in the context of sustainable development, predominantly by authorising and controlling radioactive discharges and waste disposal to air, water (surface water, groundwater) and land. SEPA also regulates nuclear sites under the Pollution Prevention

	and Control Regulations and issues consents for non-radioactive discharges.
Ship Recycling	This is the process whereby the hull of the submarine (which forms the bulk of the vessel) is dismantled. It will be very similar to the way in which surface ships are disposed of.
Size Reduction	The term used by the nuclear industry to refer to the process of cutting-up radioactive waste into smaller pieces so that it can be packaged into containers. Size reduction is an established process in the civil nuclear industry.
SPA	Special Protection Areas. Strictly protected sites classified in accordance with Article 4 of the EC Birds Directive. They are classified from rare and vulnerable birds and to regularly occurring migratory species.
SSSI	Site of Special Scientific Interest. The main national conservation site protection measure in Britain designated under the Wildlife and Countryside Act 1981 (part 2).
TAG	Technical Assessment Guidelines. Guidelines intended to give additional guidance to ONR specialist inspectors beyond that in the SAPs.
Technical Options Study	A study conducted in 2008 to identify features of the three Initial Dismantling options that would impact on their implementation. The outputs were used to inform the MPOS study (see below), particularly the criteria to be utilised. The details are contained in 'SDP Technical Options Study: Options Report'.
UK BAP	UK Biodiversity Action Plan. Describes the biological resources of the UK and provides detailed plans for conservation of these resources.
UUK	Urenco UK Ltd.
Vanguard class Submarine	A class of nuclear-powered ballistic missile submarines, carrying long-range missiles with nuclear warheads, in service with the Royal Navy.
VOC	Volatile Organic Compounds.
VLLW	Very low level waste. Government policy defines very low level radioactive waste (VLLW), as either: **Low Volume VLLW** - radioactive waste which can be safely disposed of to an **unspecified** destination with municipal, commercial or industrial waste ("dustbin" disposal), each 0.1m3 of waste containing less than 400 kilobecquerels (kBq) of total activity or single items containing less than 40 kBq of total activity. or **High Volume VLLW** - radioactive waste with maximum concentrations of four megabecquerels per tonne (MBq/te) of total activity which can be disposed of to ***specified*** landfill sites. The main difference between the two definitions of very low level waste is the need to control the total volumes of VLLW. The maximum activity levels associated with VLLW can be found at the link below. http://www.environment-agency.gov.uk/static/documents/Business/LLW_guidance_note_on_brand.pdf
Waste Hierarchy	A hierarchical approach to minimise the amounts of waste requiring disposal. The hierarchy consists of non-creation where practicable; minimisation of arisings where the creation of waste is unavoidable; recycling and reuse; and, only then, disposal. The Waste Management Hierarchy was first introduced in the EU Waste Framework Directive for non-radioactive waste and is an integral part of the development of integrated waste strategies at nuclear and non-nuclear sites (see section 4.2.2 of the SDP Consultation Document).

Annex 1: Statutory and Governmental Department Comments on Interim ILW storage and the SEA Scope

Previous SDP SEA, 2010 – 2011

During the 2010/11 public consultation, a number of comments were received from statutory bodies, other Governmental departments, councils, industry bodies, non-governmental organisations (NGOs) /community voluntary organisations (CVOs) and the public relating to the previous SEA. Both these, and comments on the wider SDP consultation, have been summarised in the MOD SDP Post-Consultation Report (July 2012) and in the MOD *Response to Consultation* (March 2013)[4].

The comments received from statutory consultees and other Governmental departments at the time specifically about interim ILW storage were as follows:

- Several respondents reiterated the need for further assessment and public engagement on the assessment of interim ILW storage sites, once individual locations became known. *This is the subject of this SEA.*
- The Environment Agency and NHS respondents supported the use of shared Intermediate Level Waste (ILW) storage facilities where practically possible rather than the development of a bespoke MOD facility.
- Natural England commented that alternatives to the planned GDF should be explored in greater detail for SDP, given the inherent uncertainties. *The SDP programme assumes eventual GDF availability; however, the facility will have a 100-year design life to accommodate potential delays in GDF delivery*.
- The Northern Ireland Environment Agency commented that should Northern Ireland be considered as a potential location for interim ILW storage, any location-specific issues should be addressed in the Environmental Report. *No sites in Northern Ireland are being considered for SDP interim ILW storage*.
- The Health Protection Agency commented on the need to minimise the exposure of both workers and the general public to radiation during ILW transportation.

Interim ILW storage SEA Scoping Report, February 2014

As described in Section 3.2, the scoping stage for this SEA was completed in late 2013 and early 2014, with consultation on the scoping report in February and March 2014. The table below provides the feedback received from the consultation on the SEA's scope, MOD's response and any actions for the SEA which have been carried out as a result of each comment.

Consultee	Comment	Response
Environment Agency	**Q1: Do you have any comments on the proposed alternative options outlined for the SDP?** We have been engaged with the MOD and other regulators (Office for Nuclear Regulation, Scottish Environment Protection Agency and Defence Nuclear Safety Regulator) in providing advice and guidance to the planning for the SDP. The options outlined in the SEA Scoping Report are familiar to us and we agree with the proposal for interim storage of ILW on an existing nuclear licensed site. We are supportive of co-located storage of ILW providing that all aspects of protecting the environment are considered in the future SEA.	Noted. The SEA aims to consider all aspects of the environment for which significant effects are possible / not scoped out.
Environment Agency	**Q2: Are there additional plans, programmes or environmental protection objectives which should be considered in the SEA?** It is important that MOD and the operators of the shortlisted sites fully assess the impacts of interim ILW storage over the lengthy lifetime of this stage of the SDP ie up to the point where a permanent disposal option is available and can receive SDP ILW. Section 5 of the SEA Scoping Report addresses the baseline information and local context for each of the four options in England. It is important that the eventual SEA examines the interactions between MOD's impact and that of the historical baseline for each site as well as current and future plans for the site(s) ie cumulative impacts. We have commented on each site individually:	–Noted. The SEA has considered such interactions and potential for cumulative impacts where reasonably foreseeable.
	AWE Aldermaston: Section 5.3 adequately addresses the key environmental issues for the site. Our view is that interim storage of submarine ILW at AWE Aldermaston would have minimal environmental impact at this site. It would however be of benefit for the SEA to view SDP against the major developments which have already taken place and which are planned for this site over the next 10 or so years and also to consider storage of ILW in relation to the existing and future plans for managing nuclear weapon programme ILW.	Noted.
	AWE Burghfield: The comment above for AWE Aldermaston applies equally to AWE Burghfield. A future SEA should also address existing flood management measures in greater detail. Since a large area of the Burghfield site was flooded in 2007, AWE has planned improvement to flood management measures. Some of these have been delivered whilst others, including the provision of sacrificial land south of the site to hold up flood water have yet to be delivered. If AWE Burghfield were selected for SDP interim ILW storage, it is likely that the size of the nuclear licensed site would need to increase. The existing nuclear licensed site covers the current and developing Warhead Assembly Facilities and is not large enough to include an interim ILW store. Depending on the location of a potential store, there will be a need for thorough land characterisation due to the historical activities undertaken on this site as a conventional ordnance establishment. The presence of several conventional contaminants would need to be determined and a waste plan developed for their management.	The SEA has taken account of the history of flooding and historic activities at Burghfield, and proposed and potential management measures.
	Over the last 4-5 years, both AWE sites have experienced challenges to limits for suspended solids and pH in their aqueous discharges. These have usually been as a result of high rainfall at a time when major construction activities were being undertaken, particularly during major concrete works. At AWE Aldermaston regular exceedance of pH limits in one or two site ponds has occurred caused by major algal blooms during periods of very sunny weather.	The SEA has taken account of the history of water environment issues at AWE Aldermaston and Burghfield.

Consultee	Comment	Response
	Capenhurst Nuclear Services, Capenhurst: we suggest that Section 5.5 is improved as detailed in our response to question 3 below. Our view is that interim storage of submarine ILW at this site is likely to have minimal environmental impact at this site. It would however be of benefit for the SEA to view SDP in relation to the major developments which have already taken place and which are planned for this site over the next 10 or so years.	Noted. The SEA has considered such interactions and potential for cumulative impacts.
Environment Agency	Sellafield Ltd, Sellafield: we suggest that Section 5.6 is improved as detailed in our response to question 3.It would be of benefit for the SEA to view SDP in relation to the major developments which have already taken place and which are planned for this site over the coming years. Our view is that specific interim storage of submarine ILW at this site is likely to have minimal environmental impact. However, it is important to us that any new development of interim ILW storage does not cause Sellafield Ltd to be distracted from making progress with the major hazard and risk reductions programmes at Sellafield, noting that progress to date has been slower than planned as detailed in the recent National Audit Office report , for example. For this site, the assessment of nearby protected sites has not considered the newly designated Cumbria Coast Marine Conservation Zone. Public bodies must take account of these new designations when decision making. There is potential that a marine plan may be in place for that coast by the time permissions are sought. The project will need to consider the requirements of the plan when making their application and where it is not in place, they should consider the Marine Policy Statement.	The SEA has considered the potential impact on hazard and risk reduction programmes, and also on potentially sensitive environmental features. The SEA has taken account of the history of the Cumbria Coast Marine Conservation Zone.
	Q3: Do you agree with the baseline information? AWE Aldermaston and AWE Burghfield: Sections 5.3 and 5.4adequately address the baseline information.	Noted.
	Capenhurst: Section 5.5: Throughout section 5.5 and annex 2, the site is referred to as both the “CNS site” and the “Capenhurst site” and the size of the CNS site is quoted as 70 hectares. We understand the actual situation to be as follows: The Capenhurst nuclear-licensed site (total area around 80 hectares) is owned by Urenco UK Ltd (UUK), apart from a small fraction which is owned by the NDA and leased to UUK. CNS is a tenant on the nuclear-licensed site and is contracted by NDA to undertake work to manage and address NDA’s nuclear liabilities. We suggest that these key facts are checked with Urenco UK, CNS and NDA. Table 5-5. “Capenhurst (leased from NDA)” should read “Capenhurst (CNS)” and “Capenhurst (CNS) limited” should read “Capenhurst (Urenco UK Ltd)”. Table 5-5 title and Figure 5-9 should be made consistent with the above.	Noted. These have been reviewed and incorporated as appropriate into the SEA.

Consultee	Comment	Response
	It should also be noted that the Capenhurst site liquid radioactive discharges and limits quoted cover the total site discharges. CNS are permitted (with lower limits) to transfer liquid radioactive to Urenco UK Ltd, prior to discharge to the environment. In summary this means that CNS's actual liquid discharges are lower than the site total discharges that are quoted. Section 5.5.4: We understand that the Urban Mersey Basin is not an official designation. Consequently, it appears to us that it is given too much prominence when compared to the Natura designations in the same section.	Noted. , and will reflect the additional data as appropriate. We note that Urban Mersey Basin is not an official designation. However the scoping exercise identified more potential to affect this habitat. Relevance to likely impacts on biodiversity and relative importance has been noted more clearly in the Environmental Report.
Environment Agency	Section 5.5.8: It is worth noting that there is some radioactive and non-radioactive (VOCs) contamination in the ground at the site for which the best future management options are currently being investigated. Section 5.5.9: Whilst associated with discharges made under Urenco UK Ltd's permit, there has been a history of copper discharge limit exceedances that Urenco UK Ltd continues to address. Exceedances of minor limits associated with pH, aluminium and suspended solids discharges made under Urenco UK Ltd's permit also occurred during 2013. Section 5.5.10: We can make further information available, if required, regarding limits and discharges. Whilst associated with discharges made under Urenco UK Ltd's permit, minor fluoride limit exceedances occurred during 2013. Section 5.5.11 & 14: We have more up to date information that can be made available, if required. This information relates to Urenco UK Ltd's requirement to submit such information under the EPR10 installations permit. Section 5.5.18: An integrated waste strategy has just been published for the Capenhurst site. Other aspects to which we draw attention are: CNS takes in NDA's Magnox Depleted Uranium for storage and also stores hex tails for NDA; the Tails Management Facility is under construction; the site has top tier COMAH status; and off site emergency plans.	Noted.
	Sellafield: Section 5.6: Section 5.6.1: This section lacks background to what Sellafield does and it consequently appears that Sellafield simply generated nuclear power using reactors that are now shutdown. A more accurate description should refer to Sellafield's past military background and also provide a summary of what Sellafield currently does i.e. receipt and storage of spent fuels and nuclear materials, reprocessing of spent nuclear fuel – Magnox and Oxide; processing of backlog liquid wastes; solid waste retrieval, processing and storage; decommissioning of nuclear reactors and redundant plant; and research and development. Table 5.7: The legend for the table is incorrect and should read "2012" instead of "2011". For the water (sea-pipeline) uranium discharges, the units should be stated as "kg" (i.e. the limit is 2000kg and discharges in 2012 were 339kg). Section 5.6.8: The 1600m3 volume of contaminated soil relates to High Activity Waste (ILW) contaminated soil. There are substantially greater volumes of Low Level Waste/Very Low Level Wastes (see UK national radioactive waste inventory 2013) for detail.	Noted. These have been reviewed and incorporated as appropriate into the SEA.

Consultee	Comment	Response
	Q4: Do you agree with the updated SEA objectives and assessment questions? It is important that the full remit of the Water Framework Directive is considered. Some of the text suggests that impacts on ecological status will be considered with regard to water quality only.	Noted..
	Q5: Do you have any further suggestions regarding the proposed approach to the SEA? We suggest that the Marine Management Organisation is added to the list of consultees.	Noted. The list of consultees has been updated for consultation on the Environmental Report.
Scottish Environment Protection Agency	As required under Section 12 (6) of the Regulations, we have considered the document submitted and, subject to our detailed comments in Annex 1 of this letter, we are generally content with the scope and level of detail proposed to be included in the Environmental Report (ER).	Noted.
	General comments Generally, the scoping report provides clear and detailed information on the proposed scope and level of detail of the assessment and covers most of the aspects we would wish to see addressed at this stage.	Noted.
	However, whilst the scoping report understandably focuses on radioactive waste issues we consider that environmental issues relevant to the management of other controlled and hazardous wastes arising from the Submarine Dismantling Project (SDP) are also relevant but have potentially been excluded from the assessment. There are potentially significant environmental effects arising from management of these wastes and as such these should also be considered in the assessment; we comment in more detail on this below. Please note, our site specific comments below cover only the Chapelcross site where SEPA has regulatory responsibilities.	Noted. Reference to the Scottish Government Higher Activity Waste policy has been made clear.
	1. Do you have any comments on the proposed alternative options outlined for the SDP? **We are generally content with the alternatives and the approach proposed for the assessment.** Figure 2.2 states that the transport of all 27 Reactor Pressure Vessels (RPVs) from the Rosyth and Devonport sites to the interim Intermediate Level Radioactive Waste (ILW) and from the ILW store to the final disposal facility falls within the scope of the SEA. We agree with this approach, but would highlight that submarine ILW is not included in the scope of the Scottish Government Higher Activity Waste policy; this point should be made clear in the SEA Environmental Report.	Noted. Reference to the Scottish Government Higher-Activity Waste policy has been strengthened.
	We note that one of the key assumptions in Section 2.5 of the Scoping Report is that the aim of decommissioning and clean up of the Chapelcross site could be to allow a future industrial or nuclear use for the site. However, if this is not practicable, Section 5.7.18 states that the radioactive contamination will be cleaned up to the extent that what remains represents 'no danger' which can be interpreted as posing a risk less than one in a million per year. Thus, two alternative planned future uses for the site are being proposed; one where the next planned use may be a continued nuclear operation and the other where the next use does not include nuclear operations.	Noted.

Consultee	Comment	Response
	It should be noted that if the site has no nuclear use we would require the site to be returned to a satisfactory state to take due account of the land and groundwater contamination referred to in Section 5.7.8. This is an important consideration for the SEA because the environmental effects associated with decommissioning to a satisfactory state and not to a future industrial or nuclear use could be much greater. Specifically, the environmental effect may be greater in the extent of land and groundwater clean up required e.g. in the amount of radioactive waste that needs to be managed. Thus, we would recommend that the SEA should assess the environmental effects associated with future site uses where (i) a nuclear option is proposed and (ii) a nuclear option is not proposed.	Noted. The assessment has considered both potential scenarios, and at SEA level, a 'worst case' of future nuclear use has been taken into account. It is not practical or necessary at SEA level to assess both scenarios separately.
Scottish Environment Protection Agency	It should be noted that should Chapelcross be chosen as the interim ILW storage site, we would expect the ILW store to be decommissioned and cleaned up to the same standard as the Chapelcross site. This means that the site and the store should not be subject to further SEPA controls for any foreseeable future uses of the site.	Noted.
	We note that one of the key assumptions for this proposal (Table 2.1) has changed significantly in that the estimated footprint for the interim ILW facility is now 1840m2 which is more than double the original estimate of 760m2. It would be useful for the ER to clarify how this increase in footprint has arisen.	Noted. SDP has confirmed the increased footprint results from the evolution of design assumptions.
	2. Are there any additional plans, programmes or environmental protection objectives which should be considered in the SEA? No further suggestions.	Noted.
	3. Do you agree with the baseline information? Chapter 5 sets out the state of the environment at each of the alternative interim ILW storage sites which have been down-selected, and provides good baseline information. Generally, we are content that this covers the key issues, but we do have the following comments:	Noted.
	Section 5.7.3 – For clarification, in the sentence that starts "Table 5.9 below summarises…" the reference in the Table is to emissions for 2012 not 2009 as stated in the text.	Noted.
	Section 5.7.9 Water – Reference is made to licensed abstraction from the River Annan. For clarification it should be noted that the abstraction activity from the River Annan has been surrendered and is no longer authorised.	Noted. The baseline has been updated, where appropriate.
	Section 5.7.11 and 5.7.12 Climate Change and Energy – Given the long-term nature of the ILW store, it is important that full cognisance of projected climate change is factored into site choice and site design. Potential factors such as flood risk, coastal erosion, drought and increased storm intensity will all require to be considered as part of the site selection and design process in order to ensure that the facilities are resilient throughout their operational period. We note and welcome that the section on water scopes flood risk into the assessment and that the proposed SEA objective for climate change explicitly incorporates resilience.	Noted. The assessment stage has considered these factors to the extent appropriate within SEA, and not later project-level design.
	Section 5.7.14 Waste Management – The scoping report focuses almost entirely on radioactive waste and makes little reference to management of controlled wastes more generally. Decommissioning of the ILW store may generate significant waste streams and may also include contaminants and hazardous substances typically associated with shipbreaking that have the potential to have significant environmental effects. We recommend that	Noted. The SEA has considered these issues at an appropriate level at this stage.

Consultee	Comment	Response
	the impacts associated with all waste generated during construction and decommissioning the ILW store should be factored into the assessment.	
	Section 5.8 Table 5.11 – Previous infill using cooling tower waste material resulted in problems with high pH in the groundwater which required remediation at the Chapelcross site – this factor should be given consideration in the baseline constraints and issues for this site.	Noted. The baseline and assessment has been updated, where appropriate.
Scottish Environment Protection Agency	Annex 5 page 113 – We recommend that under the "Potential Pathways for Effects from interim ILW storage" an additional pathway that should be considered is the mobilisation of radioactive contamination during site decommissioning and clean up for land, buildings, groundwater etc. This could be significant if buildings are removed and contamination is no longer contained; this is especially the case for "mobile" radioactive waste such as tritium.	Noted. We have added this as a potential pathway and considered this during the assessment.
	4. Do you agree with the updated SEA objectives and assessment questions? We are content with the proposed SEA objectives and assessment questions. We would recommend that the Key Environmental Protection Objectives in Annex 3 for Transport (page 99) include reference to the proximity principle.	Noted .We have added this to the review of key environmental protection objectives.
	5. Do you have any further suggestions regarding the proposed approach to the SEA? No further suggestions.	Noted.
Scottish Natural Heritage	**1. Do you have any comments on the proposed alternative options outlined for the SDP?** The methodology for the assessment of the proposed alternatives is a reasonable approach. We consider that this will give a meaningful assessment of the potential environmental impact arising from the project.	Noted.
	We note that you have concluded that a Plan level HRA is not required. However, we would suggest that the alternative candidate sites to the plan are also screened as part of an updated HRA. If there is no connectivity or pathway between a proposal and a Natura site such proposals could be screened out as having no likely significant effect and the reason for this set out in the HRA record.	MOD has conducted HRA screening of the candidate sites, as requested.
	2. Are there additional plans, programmes or environmental protection objectives which should be considered in the SEA? One additional plan for consideration is The Dumfries and Galloway Local Development Plan. It is currently at examination and is expected to be adopted in the autumn of 2014. The draft Local Development Plan contains several policies which are very relevant to the Chapelcross site. It is unclear what all the baseline information sources are that have been used but a potential source to help with data for Scottish baseline evidence is the Landscape Character Assessment for Dumfries and Galloway. http://www.snh.org.uk/publications/online/LCA/dumfriesgalloway.asp	Noted. Reference to LDP and baseline from the LCA have been added.
	3. Do you agree with the baseline information? See above	Noted.

Consultee	Comment	Response
	4. Do you agree with the updated SEA objectives and assessment questions? We agree that most of the updated SEA objectives and assessment questions seem reasonable. Perhaps the landscape questions could be made more specific such as Will the proposals affect the landscape character and scenic value of the area? Will the proposals affect landscape diversity and local distinctiveness	Noted.The assessment questions have been updated to reflect this suggestion. However, we have not added landscape diversity or local distinctiveness, as these factors are unlikely to change significantly given existing nuclear-licensed sites.
Scottish Natural Heritage	**5. Do you have any further suggestions regarding the proposed approach to SEA?** No further suggestions	Noted.
Historic Scotland	**1. Scope of assessment and level of detail** Overall, the scoping report is clear and provides a succinct overview of the approach to your assessment. We have considered your specific questions (page 5) and I can confirm that we do not have any detailed comments to make.	Noted.
	2. Consultation period for the Environmental Report We are content with the consultation period of 12 weeks and the next steps set out within section 7 of the report. None of the comments contained in this letter should be construed as constituting a legal interpretation of the requirements of the SEA legislation. They are intended rather as helpful advice, as part of Historic Scotland's commitment to capacity-building in SEA.	Noted.
Scottish Directorate for Local Gov't and Communities	With reference to the scoping report you submitted to the SEA Gateway on 14 February 2014. In accordance with Regulation 12(6) of the Environmental Assessment of Plans and Programmes Regulations 2004, the Consultation bodies have now considered the scoping report you submitted. The individual responses from the Consultation Bodies to your report are attached to this letter. As the Consultation Bodies have now expressed their views on the scope and level of the report, you should refer to the 2004 Regulations to consider what your next step should be.	Noted.
Natural Resources Wales	We note that the previous SEA consultation in 2011 was limited due to lack of information on specific storage sites, and that further assessment would be required when/if such information became available. We welcome, therefore, this revised Scoping Report consultation which includes information on a number of potential storage sites. We note that one of these sites, Capenhurst in Cheshire, is relatively near the Welsh border. We do not however, feel that there are any additional significant environmental effects or issues pertinent to Wales associated with this, or any of the other locations, that have not already been adequately covered in the Scoping Report. Therefore, we have no additional comments to make at this time.	Noted.
	We look forward to continuing to work with the Ministry of Defence on the continued development of this programme and its assessments. With this in mind, and given the proximity of the Capenhurst site to the River Dee and Bala Lake Special Area of Conservation (SAC) and The Dee Estuary SAC, Special Protection Area (SPA) and Ramsar Site, we would welcome further consultation on the Habitats Regulations Appraisal (HRA) screening of the candidate sites, at the appropriate time.	MOD has conducted HRA screening of the candidate sites, as requested.

Consultee	Comment	Response
Department of the Environment Northern Ireland	Question 1 - We have no comments to make. Question 2 - We have no additional plans, programmes or environmental protection objectives that are specific to Northern Ireland that we recommend should be considered in the SEA. Question 3 - We are generally content with the baseline information provided. Question 4 - We are content with the updated SEA objectives and assessment questions. Question 5 - We agree with the SEA objective to ensure that radiological discharges to people and the environment remain as low as reasonable achievable.	Noted.
Public Health England - Centre for Radiation, Chemical & Environmental Hazards (PHE-CRCE)	**Question 1:** The SEA seeks to identify a single site for storage of the RPVs. An option should be presented which allows the creation of multiple smaller ILW stores for the RPVs that can be considered on an equal footing with a single larger store. For example, having two facilities could minimise the transport distances RPVs from Devonport and Rosyth are required to travel and hence the risks and nuisances potentially incurred by the intervening populations. This type of option might be excluded from further consideration by the scores obtained from other criteria but this should be demonstrated. Table 2.1: Key Project Assumptions for SDP interim ILW storage identifies a building footprint for the storage of ILW. Although a decision on whether size reduction facilities are required and therefore where such facilities should be sited has yet to be considered it would be prudent to have sufficient space available at ILW temporary storage sites for the reduction to take place before onward shipment to the GDF. This option, which would minimise the transport hazard, would then not be automatically excluded in any subsequent consultations on size reduction facilities.	Comment welcomed. The option for more than one site is not favoured due to the longer-term requirements to manage security and maintenance of the facility. However we will ensure that this potential alternative is given more consideration as part of the SEA and explain any reasons for not taking the alternative forward within our reporting.
	Question 2: PHE-CRCE does not have any comments on Question 2	N/A
	Question 3: PHE-CRCE does not have any comments on Question 3	N/A
	Question 4: Table 6.1: Assumptions about implementing interim ILW storage includes the transport of RPVs to a size reduction facility. There is no indication that such a facility could be adjacent to the ILW store.Annex 4: Rationale for Amendment of the SEA Objectives and Guiding questions. PHE-CRCE supports the creation of a separate category identifying radiological discharges and exposures. However, PHE-CRCE suggests that the category title should be changed from 'Radiological Discharges' to 'Radiological Discharges and Exposures' with the qualifying statement changed to read: "Ensure that the exposure of people and the environment to	These suggestions are welcomed and have been taken forward into the assessment stage of the SEA, where appropriate. The criteria have not been updated, as they reflect in part a connection with the 2010/11 SDP SEA, and maintain some consistency, and they are only intended as 'guideline' criteria. The suggestions made by PHE are very specific and highly technical, and the substantive

Consultee	Comment	Response
	radiation and radioactivity is as low as reasonably achievable." The question should also be changed to read: "Will the SDP Proposals lead to an increase in the risks to people and/or the environment from actual or potential exposures to radiation or radioactivity?" This phrasing will allow concerns over the transporting of radioactive material to be addressed including the consequences of potential transport accidents as well as any possible routine discharges from the waste store and potential accident risks due, for example, to fire. Greater clarity is required over the expected character and extent of any assessment into both the projected operational impact of transporting waste and running the facility, and potential accidents on route to the site or following emplacement. For example, accidents are briefly mentioned in Annex 5 under 'Radiological Discharges' but not in Annex 4 introducing the separate category of 'Radiological Discharge'. How such assessments of risk relate to the Health Impact Assessment should also be clarified. Annex 6: Guideline Assessment Criteria by SEA Category. The 'Radiological Discharges' category should be renamed 'Radiological Discharges and Exposures'. It is not clear how the guidance assessment criteria may be combined or used in a way that may be compared between categories. In addition, the major negative category for radiation exposures has two test conditions related respectively to routine operations and an accident event where the accident event in particular is unspecified making it unclear what potential events are to be considered. Within the major negative category under 'Radiological Discharges' criteria the test for routine operations would exceed the dose criteria source constraint for the operation of new sites and if met would not simply be a major negative but would preclude the option entirely from further consideration. PHE-CRCE suggests that, instead of applying a test that would preclude the option, a more stringent threshold is applied. For example, although the project envisages that storage of the waste will be temporary, the waste may be held under minimal supervision for some decades and the source constraint of 0.15 mSv advised by PHE-CRCE for permanent disposal could be adopted for screening purposes. The second test option considers the consequences of an unspecified accidental event but does not provide any quantification of the potential level of risk that should not be exceeded. It is suggested that the option is rephrased as 'Option results in a risk exceeding 1:100,000'	issues are already accommodated within the existing criteria.

Consultee	Comment	Response
Public Health England - Centre for Radiation, Chemical & Environmental Hazards (PHE-CRCE)	Question5: PHE-CRCE does not have any comments on Question 5	Noted.

Annex 2: Maps of Alternative Sites and Key Environmental Features

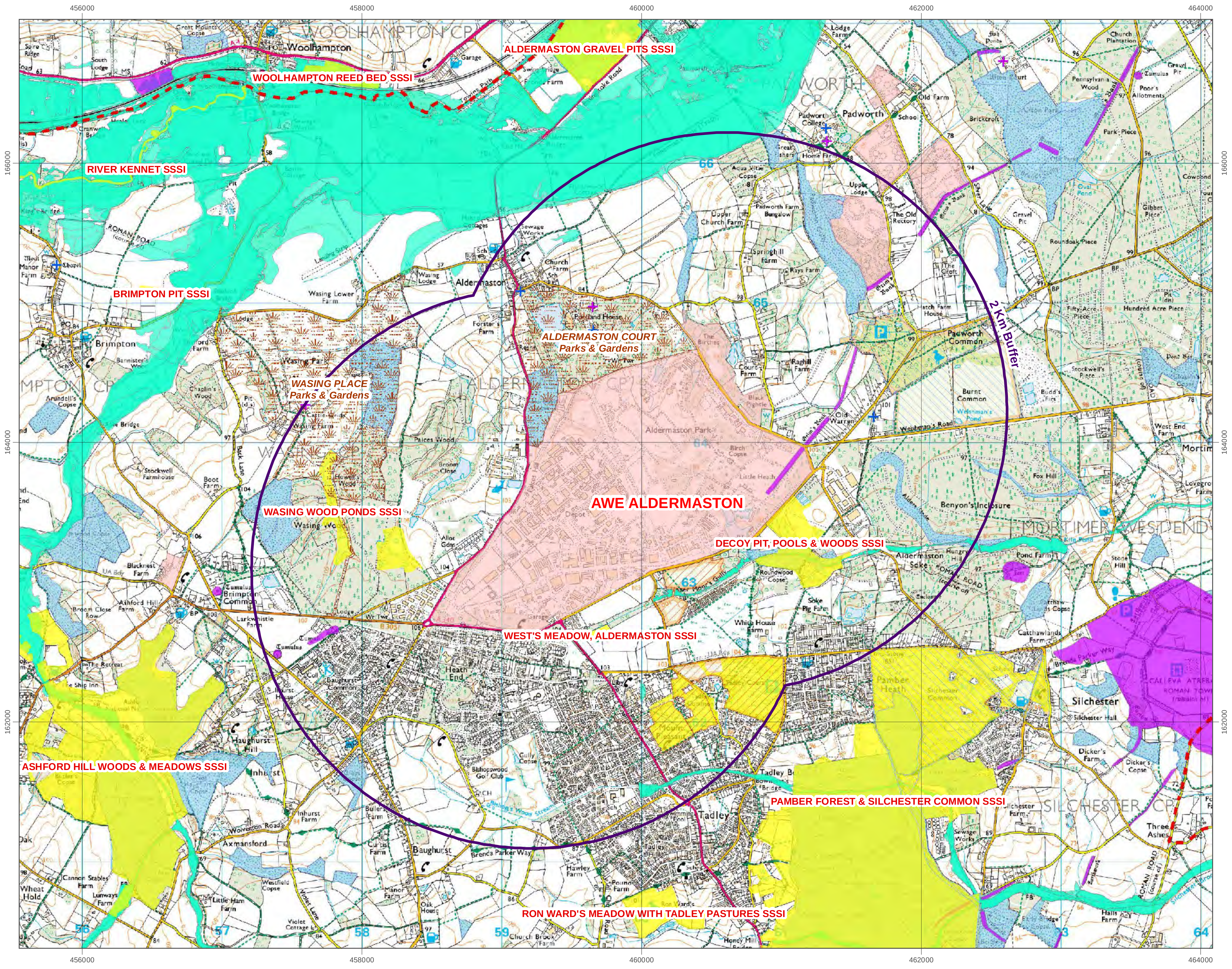


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FIGURE A2-1

AWE ALDERMASTON

READING

AWE Aldermaston Environmental Designations (Map 1)

- Listed Buildings Grade I
- Listed Buildings Grade II*
- National Cycle Route
- Open Country
- Registered Common Land
- Registered Parks and Gardens
- Sites of Special Scientific Interest
- Scheduled Monuments
- Flood Risk
- Ancient Woodland
- MoD Boundary

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FIGURE A2-2
AWE ALDERMASTON

READING

AWE Aldermaston Environmental Designations (Map 2)

HACKPEN HILL SAC
CHILTERNS BEECHWOODS SAC
Chilterns AONB
North Wessex Downs AONB
RAF FAIRFORD
HARTSLOCK WOOD SAC
RIVER LAMBOURN SAC
DENISON LINES
KENNET & LAMBOURN FLOODPLAIN SAC
AWE BURGHFIELD
KENNET VALLEY ALDERWOODS SAC
HAZEBROUCK BARRACKS
AWE ALDERMASTON
THAMES BASIN HEATHS SPA
ASHFORD HILL NNR
CASTLE BOTTOM NNR
10 Km Buffer
BRAMLEY TRAINING AREA
20 Km Buffer
RAF ODIHAM
CHILCOMB RANGE
Surrey Hills AONB
SOUTH DOWNS National Park
THURSLEY, ASH, PIRBRIGHT & CHOBHAM SAC
EAST HAMPSHIRE HANGERS SAC

Registered Parks and Gardens
National Parks
Special Area of Conservation
Special Protection Area
National Nature Reserves
MoD Boundary
Areas of Outstanding Natural Beauty

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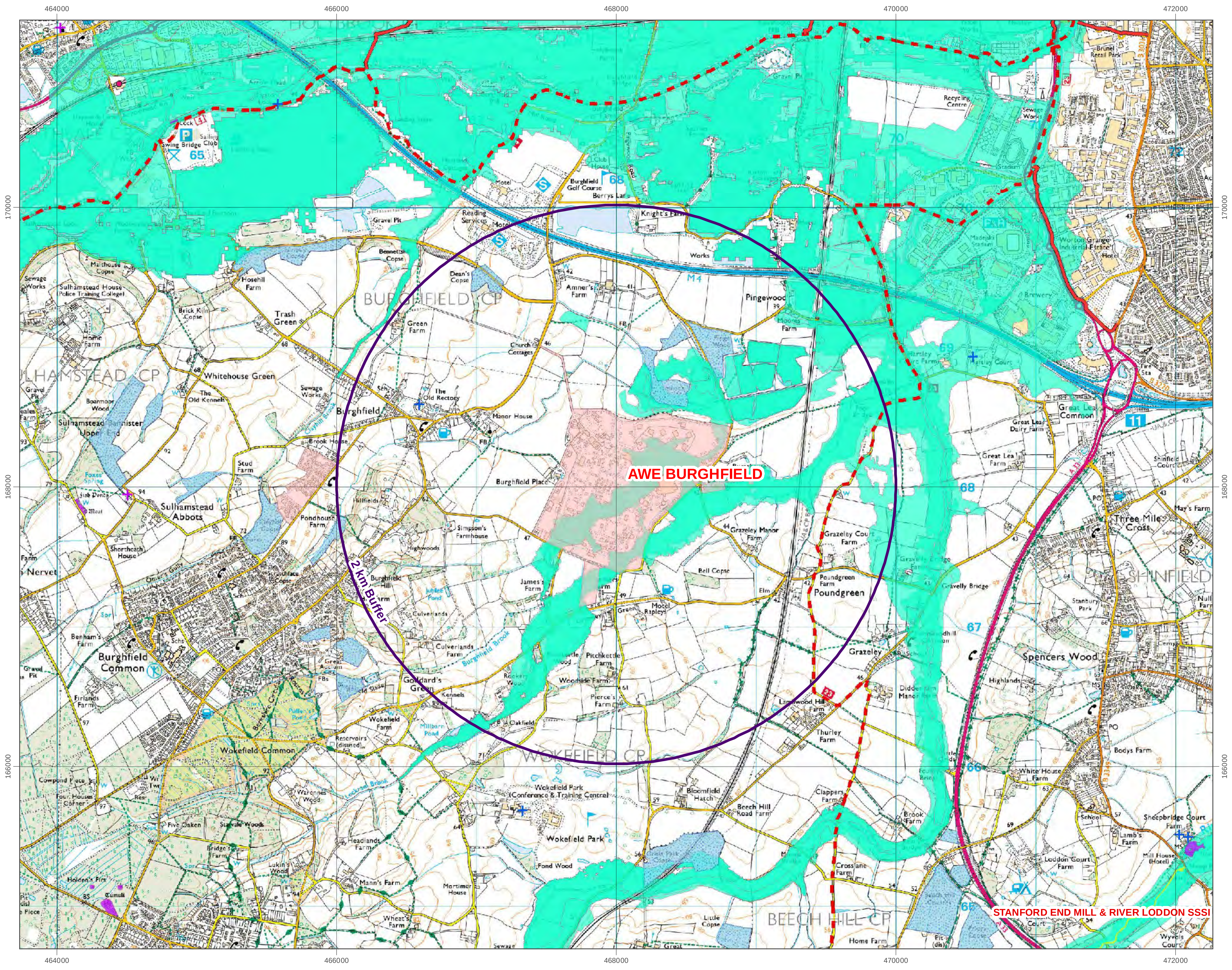

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FIGURE A2-3

AWE BURGHFIELD

READING

AWE Burghfield Environmental Designations (Map 1)

- Listed Buildings Grade I
- Listed Buildings Grade II*
- National Cycle Network Links
- National Cycle Route
- Open Country
- Registered Common Land
- Sites of Special Scientific Interest
- Scheduled Monuments
- Ancient Woodland
- Flood Risk
- MoD Boundary

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FIGURE A2-4

AWE BURGHFIELD

READING

AWE Burghfield Environmental Designations (Map 2)

Chilterns AONB
North Wessex Downs AONB
HARTSLOCK WOOD SAC
RAF FAIRFORD
RIVER LAMBOURN SAC
DENISON LINES
KENNET VALLEY ALDERWOODS SAC
KENNET & LAMBOURN FLOODPLAIN SAC
AWE BURGHFIELD
AWE ALDERMASTON
10 Km Buffer
20 Km Buffer
BRAMLEY TRAINING AREA
RAF ODIHAM
HAZEBROUCK BARRACKS
WEST MINLEY FARM
BURNHAM BEECHES SAC
BURNHAM BEECHES NNR
CHILTERNS BEECHWOODS SAC
WINDSOR FOREST & GREAT PARK SAC
THAMES BASIN HEATHS SPA
RMA SANDHURST
THURSLEY, ASH, PIRBRIGHT & CHOBHAM SAC
PIRBRIGHT RANGES
ASH RANGES
Surrey Hills AONB

Special Area of Conservation
Special Protection Area
National Nature Reserves
Areas of Outstanding Natural Beauty
MoD Boundary

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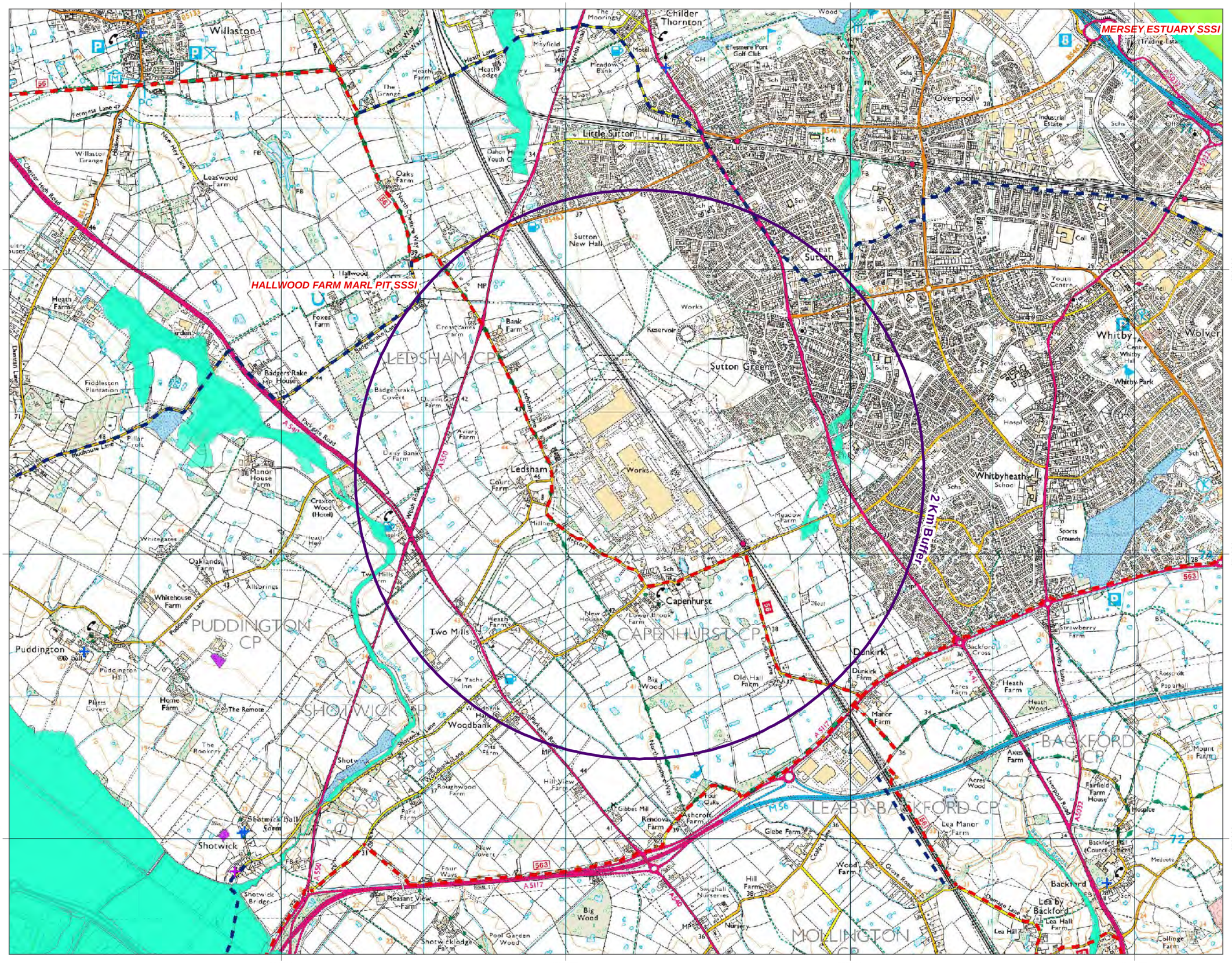

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FIGURE A2-5

CAPENHURST SITE

CHESHIRE

Capenhurst Site Environmental Designations (Map 1)

- Listed Buildings Grade I
- Listed Buildings Grade II*
- Regional Cycle Route
- National Cycle Route
- Ancient Woodland
- Sites of Special Scientific Interest
- Scheduled Monuments
- Flood Risk
- MoD Boundary

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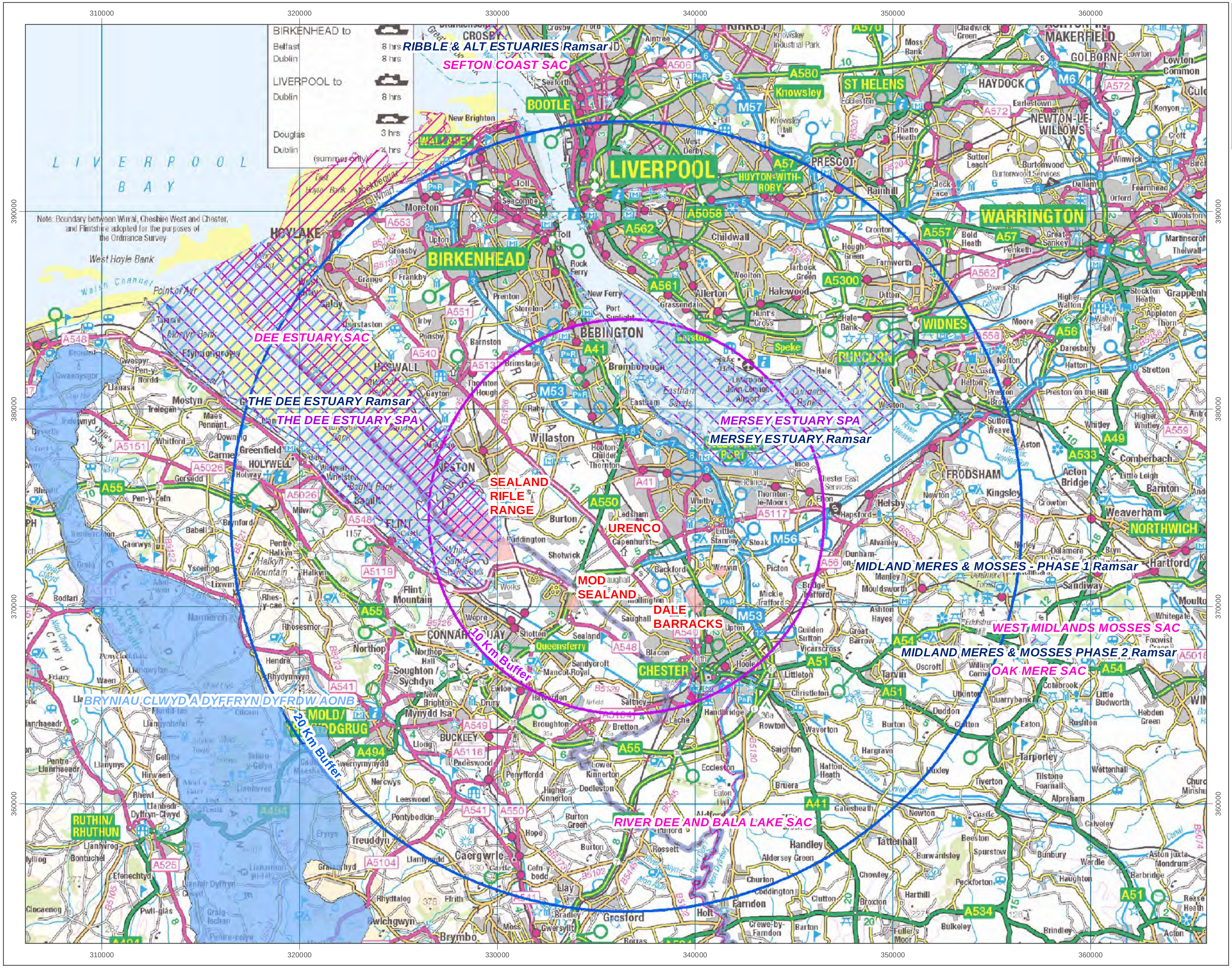

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FIGURE A2-6

CAPENHURST SITE

CHESHIRE

Capenhurst Site Environmental Designations (Map 2)

- Ramsar
- Special Area of Conservation
- Special Protection Area
- Areas of Outstanding Natural Beauty
- MoD Boundary

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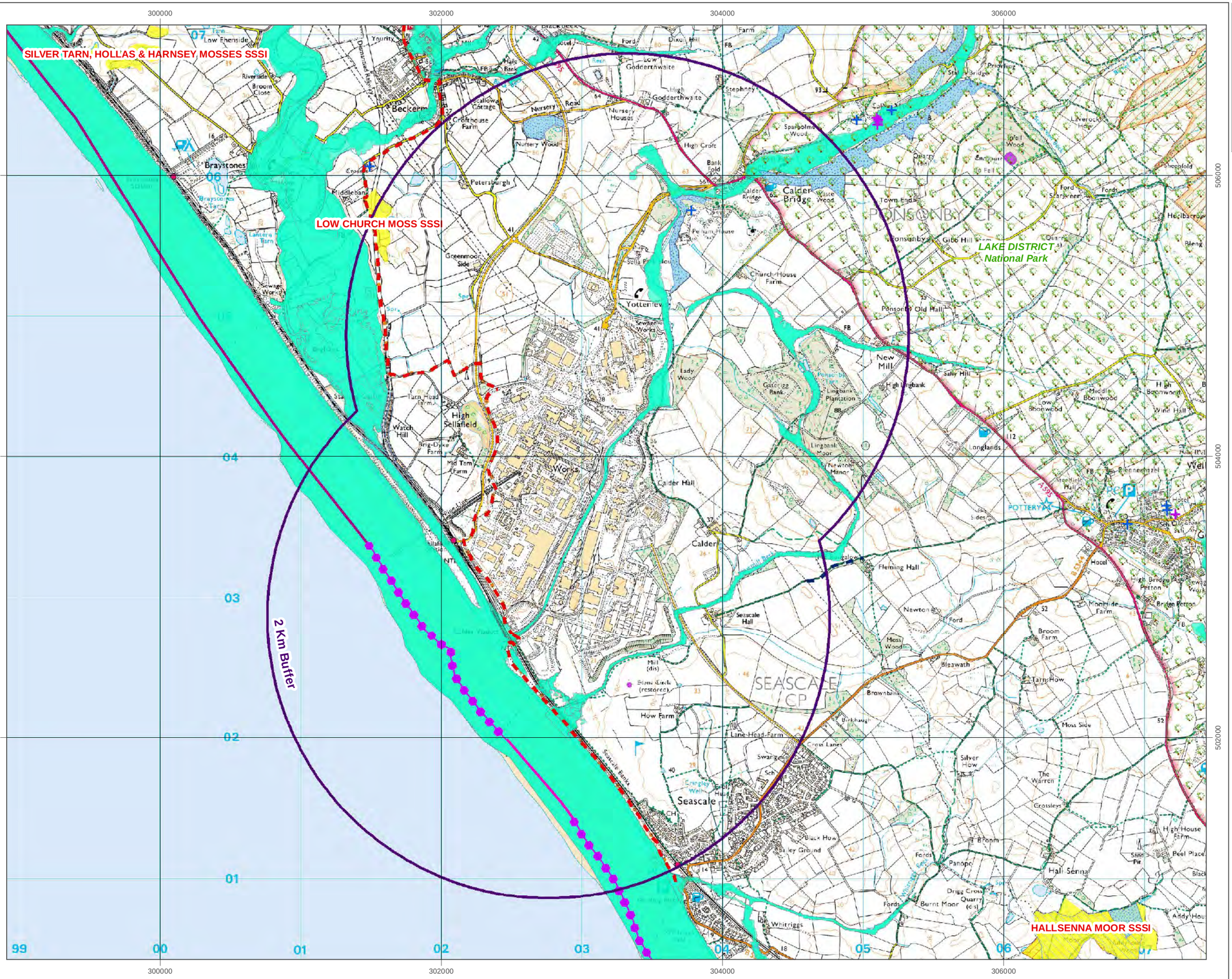

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FIGURE A2-7

SELLAFIELD (NUCLEAR DECOMMISSIONING AUTHORITY SITE)

CUMBRIA

Sellafield Environmental Designations (Map 1)

- Listed Buildings Grade I
- Listed Buildings Grade II*
- Regional Cycle Route
- National Cycle Route
- National Parks
- Ancient Woodland
- Open Country
- Registered Common Land
- Sites of Special Scientific Interest
- Scheduled Monuments
- Flood Risk
- MoD Boundary

Erosion Management Policy

- Hold the Existing Defence Line
- Managed Realignment
- No Active Intervention

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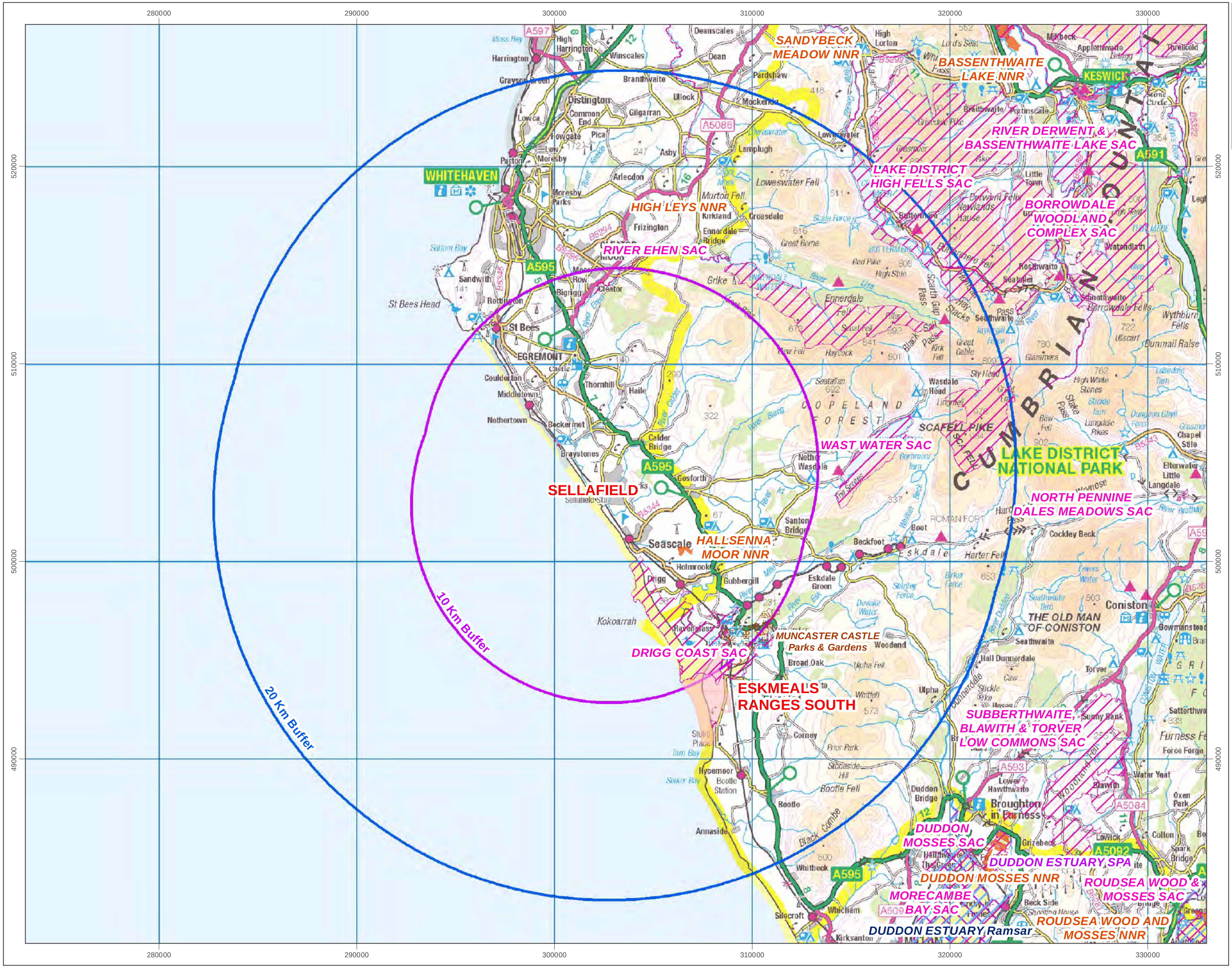

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FIGURE A2-8

SELLAFIELD (NUCLEAR DECOMMISSIONING AUTHORITY SITE)

CUMBRIA

Sellafield Environmental Designations (Map 2)

- Registered Parks and Gardens
- Ramsar
- Special Area of Conservation
- Special Protection Area
- National Nature Reserves
- MoD Boundary

Scale 1:175,000

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FIGURE A2-9

CHAPELCROSS POWER STATION

DUMFRIES AND GALLOWAY

Chapelcross Power Station Environmental Designations (Map 1)

- Listed Buildings Grade A
- Listed Buildings Grade B
- National Cycle Route
- Scheduled Monuments
- Ancient Woodland
- Flood Risk

Scale 1:25,000

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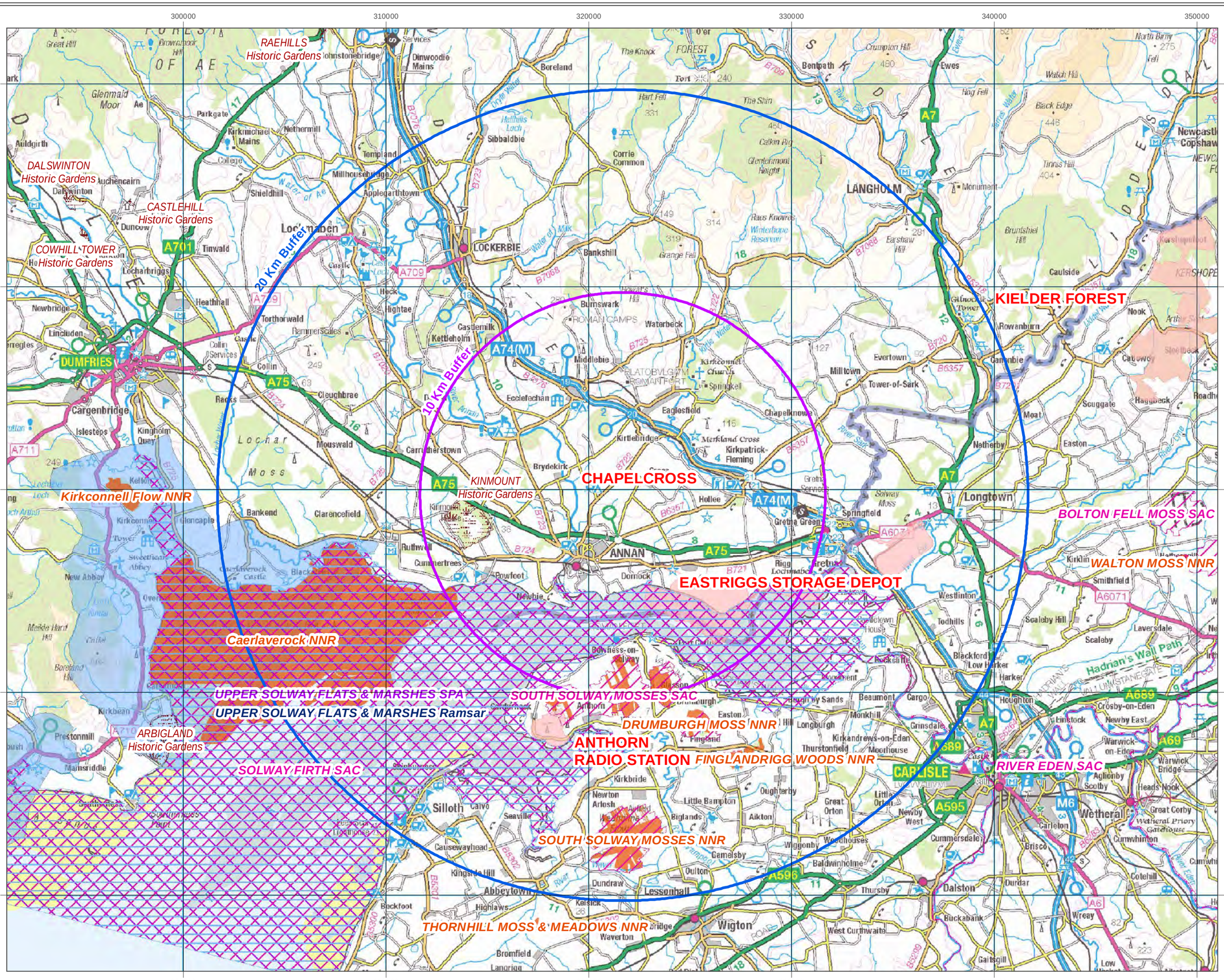

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FIGURE A2-10

CHAPELCROSS POWER STATION

DUMFRIES AND GALLOWAY

Chapelcross Power Station Environmental Designations (Map 2)

- Historic Gardens
- Ramsar
- Special Area of Conservation
- Special Protection Area
- National Nature Reserves
- National Scenic Areas
- MoD Boundary

Scale 1:175,000

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Annex 3: Key Environmental Protection Objectives

From the review of international and national plans and programmes carried out for the 2010/11 SEA, a number of key environmental protection objectives have been identified. These are summarised below, structured around the environmental categories taken from SEA Directive Annex I issues. Entries in bold and italic are new entries based on the National Planning Policy Framework (NPPF) for England[171].

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
Radiological Discharges and Exposures	See 'Health and Well-Being' below.
Biodiversity and Nature Conservation	**International** • To protect international/European protected wildlife areas (including SACs, SPAs and Ramsar sites). • To contribute to the conservation of global biodiversity. • To ensure that the conservation and enhancement of natural heritage including wetland conservation is reflected in land use planning. • To protect and enhance the ecosystems and the biological diversity of the maritime areas. • To ensure the conservation of biodiversity in order to continue to harness the derived health and wellbeing benefits for the population. • To identify where operators are financially liable for threats of, or actual damage to, the environment under the "polluter pays" principle. • To anticipate, prevent and act on causes of significant reduction or loss of biodiversity. **National** • To conserve and enhance biological diversity within the UK, ***providing net gains in biodiversity where possible***. • ***To recognise the benefits of ecosystem services.*** • To ensure that the quality of habitats and biodiversity is enhanced or at least conserved, ***establishing coherent ecological networks that are more resilient to current and future pressures*** • To take account of key priority habitats and species in decision-making. • To protect of the network of nationally protected wildlife areas (including SSSIs). • To protect marine biodiversity with UK jurisdiction, both within and beyond UK territorial waters. **MOD** • To conserve, and where appropriate, enhance biodiversity as part of estate ownership, to contribute to the UK commitment to halt the loss of biodiversity by 2010 and onwards, whilst ensuring the provision of defence capabilities. • To achieve this aim the MOD will be an exemplar in the management of designated sites where compatible with military requirements; ensure natural environment requirements and best practice are fully integrated into estate management practices; and contribute, as appropriate, to the UK BAP and County biodiversity strategies.

171 The Scottish and Welsh national planning policy has not changed since the previous SEA.

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)

Population	**International**
	• To grant public rights to information, public participation and access to justice.
	• To undertake appropriate consultation with consultation bodies and the public during the SEA process.
	• To achieve economic development and reduction of inequalities whilst adhering to the principles of social and environmental justice and sustainable development.
	• To promote full employment, quality and productivity at work and promoting inclusion by addressing disparities in access to labour markets.
	• To promote the economic development of disadvantaged areas within the European Union.
	National
	• To create strong, prosperous communities and deliver better public services.
	• To narrow the gap between deprived neighbourhoods and the rest of the country.
	• To achieve economic development and reduction of inequalities whilst adhering to the principles of social and environmental justice and sustainable development.
	• To create places shaped by their communities where people are proud to live.
	• To raise the productivity of the UK economy, maximise job opportunities, improve economic performance and reduce the gap in economic growth rates between regions.
	• To deliver sustainable development; build prosperous communities; promote regeneration; and tackle deprivation.
	• To ensure more and better jobs as a result of sustainable economic development.
	• To promote the vitality and viability of town and other centres as important places for communities.
	• To develop and support successful, thriving, safer and inclusive urban and rural communities.
	• To create inclusive and locally distinctive rural communities whilst continuing to protect the open countryside for the benefit of all.
	• To raise the quality of life and the environment in rural areas.
	MOD
	• The delivery of Defence capability will contribute to the creation of more sustainable UK communities, and an environment in which people can fulfil their potential.
	• To deliver this aim the MOD will:
	  ○ Help build the skills of young people.
	  ○ Create a workforce that is drawn from the breadth of society and ensure that the unique contribution of every individual in that workplace is respected and valued.
	  ○ Provide a safe and healthy workplace.
	  ○ Manage the social impacts of Defence activities on UK communities (civilian and Armed Forces).

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
	• To improve effectiveness within the context of practicality, achievability and value for money on an ongoing basis. • To provide economic, environmental and social justification for any decision to procure new facilities as opposed to the re-use of existing facilities. • Ensure that procurement strategies take full account of economic, environmental and social impacts.
Health and Wellbeing	**International** • To ensure children have safe water and clean air. • To ensure that measures to improve the health and wellbeing of the population are appropriately supported. • To preserve, protect and improve the quality of the environment and to protect human health. • To promote good health throughout the lifespan of the population. • Support Dynamic Health Systems and New Technologies. • To reduce inequities in health. **National** • To minimise work-related injuries and ill-health. • To ensure workers and the public are protected from ionising radiation. • To reduce and where possible avoid the effects and causes of statutory nuisance and to comply with all relevant UK environmental legislation. **MOD** • In addition to the MOD SD Action Plan targets detailed above in Population, the Secretary of State's policy statement requires the department to avoid work-related fatalities and minimise work-related injuries and ill-health. • To comply with the letter and the spirit of UK environmental law applicable to ionising radiations so far as is reasonably practicable, regardless of any Crown or Defence Exemptions. • To reduce exposure of the workforce, members of the public and the environment to levels of radiation which are as low as reasonably practicable (ALARP). • To justify the use of ionising radiations before their introduction and to reduce exposure of the workforce, members of the public and the environment to levels which are as low as reasonably practicable (ALARP).
Health (Noise and Vibration)	**International** • To prevent critical health effects as a result of high levels of noise in and around dwellings. • To promote transport systems that do not generate noise levels which may have negative effects on human health. • To avoid, prevent or reduce the harmful effects including annoyance due to exposure to environmental noise. **National** • To minimise the adverse impact of noise without placing unreasonable

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
	restrictions on development or adding unduly to the costs and administrative burdens of business. • To ensure noise reduction occurs where there may be adverse impacts of noise on human health or protected species. • To incorporate noise reduction measures in the construction of rail guided transport systems. **MOD** • To reduce and, where possible, avoid the effects and causes of statutory nuisance and to comply with all relevant UK environmental legislation. • MOD establishments are not allowed to create excessive noise liable to cause a nuisance as part of activities not directly connected with the operation of equipment, training of personnel or other military operations. • To make every effort to keep the disturbance to the public caused by the noise generated by military activity to a minimum. Where possible, activities generating substantial noise will be kept at a distance from residential areas, and night time activity will be limited to achieving training objectives which cannot be met during the day.
Soil and Geology	**International** • To ensure that soil resources are protected and that expansion of organic farmland and adoption of sustainable farming techniques can be facilitated. • To protect soil on the basis of the principles of: preservation of soil functions; prevention of soil degradation; mitigation of its effects; and restoration of degraded soils. • To take precautionary measures where soil function may be affected. • To identify areas at risk of erosion, organic matter decline, salinisation, compaction and landslides. • To limit the introduction of dangerous substances into the soil, to avoid accumulation in soil that would hamper soil functions and create a risk to human health and the environment. **National** • To ensure development takes a strategic approach to the conservation, enhancement and restoration of geology and, where appropriate, incorporate design features to beneficial geological features. • To ensure contaminated land is identified and remediated, where appropriate. • To protect and preserve the environment and guard against pollution to land. • To preserve, where possible, the best and most versatile agricultural land. **MOD** • To establish a complete picture of risks associated with land quality across the Defence Estate and have in place robust mechanisms for managing those risks to an acceptable level. • To maintain a Corporate EMS based on ISO 14001 across the Estate. • To maintain a view of the impacts of MOD activities and the impact of land quality on MOD activities.

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
Water	**International** • To ensure that the chemical and ecological quality of freshwater and marine environments is, as a minimum, conserved. • To enhance the quality of freshwater and marine environments. • To ensure sustainable use of water resources and reduced pollution and physical impacts. • To facilitate the integrated management of both the coastal zone and River Basin Districts to ensure sustainable use and protection of resources. • To encourage the sustainable use of water resources and protect aquatic ecology, drinking water, and bathing waters. • To provide information to the public on bathing water quality. • To protect the environment from the adverse effects of urban waste water discharges and discharges from industrial processes. • To prevent the pollution of groundwater. • To protect the marine environment across Europe. • To protect the health of European water consumers. **National** • To protect the water environment in a way that allows it to adjust flexibly to changing climate. • To reduce pressure on the environment caused by water taken for human use; promote water use efficiency; and protect vital water supply infrastructure. • To improve the coastal environment particularly in urbanised or despoiled areas. • To improve quality of the UK water environment and the ecology which it supports. • To prevent pollution of the maritime area covered by the OSPAR Convention from ionising radiation. **MOD** • To ensure all MOD sites become more water efficient to comply with Government and MOD targets. • To conduct activities in accordance with government policy and to comply with the letter and spirit of environmental law. • To support the aims and objectives of the UK Marine Bill, with exceptions negotiated solely to support operational capability or retain classified information.
Air	**International** • To promote cleaner transport technologies and manage the demand for transport to prevent detrimental effects to human health from air pollution. • To ensure that air quality is enhanced or at least maintained and ensure that measures are adopted to support continued air quality standards. • To monitor and reduce trans-boundary atmospheric pollution. • To ensure that information on ambient air quality is made available to the public. • To maintain air quality where it is good and improving it in other cases.

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
	• To attain levels of air quality that do not give rise to significant negative impacts on and risks to human health and the environment. **National** • To align with the principles of sustainable development and the importance of controlling and minimising pollution. • To protect and preserve the environment and guard against pollution to air. **MOD** • To comply with the provisions of relevant environmental legislation and work towards reducing the Department's contributions to, and impacts of, air pollution. .Crown exemption remains for smoke, but for training and operational purposes only. • To ensure all establishments operating prescribed processes (that would require an Environmental Permit) comply with the letter and spirit of the statutory requirements. • To minimise gaseous and particulate emissions, particularly where they include heavy metals or other substances on the Red List of substances considered particularly harmful in water. • To ensure vehicles comply with emission limits. • To ensure vessels in harbour or close to shore comply with Clean Air legislation. • To eliminate all sources of fluorinated greenhouse gasses and ozone-depleting substances as soon as is technically and economically feasible.
Climate Change and Energy Use	**International** • To prevent "dangerous" human interference with the climate system, namely through reductions in the emissions of greenhouse gases. • To promote renewable energy sources. • To promote sustainable development with regards to: energy development, efficiency and consumption, transportation, industrial development, terrestrial and marine resource development and land use. • To reduce emissions of carbon dioxide and combat the serious threat of climate change. • To help transform Europe into a low-carbon economy and increase its energy security. • To ensure that energy efficiency measures are put in place and, where possible, renewables are employed to contribute to appropriate Climate Change targets. **National** • To improve carbon management and help the transition towards a low carbon economy. • To promote climate change risk management in all aspects of business to ensure future resilience for communities, businesses and the environment. • To pursue new development in places that are resilient to climate change; and in ways that are consistent with social cohesion and inclusion. • To conserve and enhance biodiversity, recognising that the

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
	distribution of habitats and species will be affected by climate change. • To reduce energy consumption, minimise detrimental effects on the climate from greenhouse gases and maximise resilience to climate change. **MOD** • To be a leader amongst UK Government departments and Defence departments in EU and NATO States in the sustained reduction of CO2 and other GHG emissions, and to ensure the continued delivery of Defence capability in a changing climate. • To ensure that the emissions of the GHGs that result from defence activities are continually reduced, such that Defence will eventually not be a significant contributor to the causes of climate change. • To agree and implement an effective process to enable Defence activities to continually adapt to a changing climate, such that Defence capability is not compromised and any potential benefits from the future climate are realised. • To reduce dependency on fossil fuels by ensuring that military equipment, estate and services are energy efficient and use low or zero-carbon energy sources, where practicable.
Coastal Change and Flood Risk	**International** • To reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. **National** • To reduce the threat of flooding to people and their property; avoid inappropriate development in areas at risk of flooding; and sustainably manage risks from flooding and coastal erosion. • To ensure that policies and decisions in coastal areas are based on an understanding of coastal change over time. • To prevent new development from being put at risk from coastal change. **MOD** • None identified.
Material assets (Transport)	**International** • To promote renewable energy usage in transport systems. • To promote healthy and sustainable transport alternatives. • To improve the quality and effectiveness of transport in Europe. **National** • To reduce transport's emissions of CO_2 and other greenhouse gases, with the desired outcome of minimising climate change. • To reduce the risk of death, injury or illness arising from transport, and promote travel modes that are beneficial to health. • To promote greater equality of transport opportunity for all citizens. • To improve journey time reliability on the strategic road network. • To improve experiences of travel and reduce barriers to travel by different modes of transport. • To support national economic competitiveness and growth, by delivering reliable and efficient transport networks. • To ensure radioactive material is safely transported.

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
	MOD • To continually reduce emissions from air, road and rail business admin travel by MOD personnel. • To reduce the use of marine, land and aviation fuels as much as reasonably practicable, without impacting on operational capability, while at the same time assessing the viability of alternatives to these fuels. • To develop a Defence Travel Emissions Strategy with targets and actions for all modes of transport. • The development of a Defence Travel Emissions Strategy in 2009 will bring with it targets and actions for modes of business transport other than road transport.
Material assets (Waste Management)	**International** • To ensure that waste reduction is at the forefront of waste management and where disposal is unavoidable ensure a high level of protection for the environment and human health. • To adopt waste management principles such as the "polluter pays principle" and the "waste hierarchy". • To protect human health and the environment against harmful effects caused by the collection, transport, treatment, storage and tipping of waste. • To help Europe become a recycling society that seeks to avoid waste and uses waste as a resource. • To achieve and maintain a high level of nuclear safety through the enhancement of national measures and technical cooperation. • To establish and maintain effective defences against radiological hazards in nuclear installations in order to protect people and the environment, etc. • To prevent nuclear accidents and limit their consequences. **National** • To decouple waste growth (in all sectors) from economic growth and put more emphasis on waste prevention and re-use. • To increase diversion from landfill of municipal and non-municipal waste and secure better integration of treatment for all waste. • To increase recycling of resources and recovery of energy from residual waste using a mix of technologies. • To ensure waste is disposed of as near as possible to the place of production. • To ensure the layout and design of new development should support sustainable waste management. **MOD** • To recover and recycle more waste than is sent to landfill by 2012. • To become a zero waste to landfill organisation by 2020. • The production of all waste streams (both hazardous and non-hazardous waste) from all units and/or establishments must be reduced and minimised. • To manage waste in accordance with the waste hierarchy, prioritising waste reduction and re-use.

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
Material assets (Land Use and Materials)	**International** • To adopt a sustainable approach to land use though consideration of: economic development, social inclusion, environmental protection and prudent use of resources. **National** • To improve housing affordability in the market sector and ensure appropriate social housing availability. • To promote and enhance existing centres, by focusing development in such centres and encouraging a wide range of services in a good environment, accessible to all. • To encourage well-designed and greener homes, linked to good schools, transport and healthcare. • To promote development of previously developed land. • To achieve a sustainably built and managed central government estate that minimises carbon emissions, waste and water consumption and increases energy efficiency. • To achieve sustainably built and managed properties and roads throughout the public sector. • To implement government supply-chains and public services that are increasingly low carbon, low waste and water efficient, which respect biodiversity and deliver wider sustainable development goals. • To adopt an integrated approach to sustainable development which includes: economic development; social inclusion; environmental protection; and prudent use of resources. • To engage in positive planning and proactive management of development, rather than simply regulation and control. • To have a planning system that is transparent, accessible and accountable. • To promote more sustainable patterns of development. • To raise the quality of life and the environment in rural areas. **MOD** • To procure, use and dispose of its estate, equipment, goods and services in a way that meets Government sustainable development objectives and targets, whilst ensuring the continued effective delivery of Defence capability. • To become a national leader in sustainable procurement. • To embed Sustainable Procurement in all aspects of MOD acquisition and throughout the Defence supply chain. • To deliver sustainable defence buildings through the application of Office of Government Commerce (OGC) minimum procurement standards, including the application of BREEAM standards or equivalent. • To improve effectiveness within the context of practicality, achievability and value for money, on an ongoing basis. • To provide economic, environmental and social justification for any decision to procure new facilities as opposed to the re-use of existing facilities. • To ensure that procurement strategies take full account of economic, environmental and social impacts.

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
Cultural heritage, including architectural and archaeological heritage	**International** • To identify, protect and preserving potential sites of World Heritage. • To protect and sustain the historic environment for the benefit of current and future generations • To identify and protect important heritage features. • To collect and disseminate scientific information on cultural and archaeological heritage to aid conservation and public awareness. **National** • To ***sustain and enhance heritage assets***, ***including in particular*** Listed Buildings, Scheduled Monuments and buildings within Conservation Areas. • To protect and promote stewardship of the historic environment, ***recognising wider social, economic and environmental benefits brought by conservation***. • To promote positive planning and management to bring about sensible solutions to the treatment of sites with archaeological remains and to reduce the areas of potential conflict between development and preservation. • To adopt a presumption in favour of the physical preservation of nationally important archaeological remains and their settings, whether scheduled or not. • To protect shipwreck features of historical, archaeological or artistic importance. • To safeguard internationally and nationally-designated historically or culturally significant sites. **MOD** • To conserve and enhance the historic environment for the benefit of future generations and to reflect the ethos and heritage of the MOD. • To promote the sustainable use of the historic environment, in recognition of its importance as an integral part of cultural heritage and the role it plays in supporting defence capability. • Adopt the Department for Culture Media and Sport's Protocol for the Care of the Historic Government Estate. Where responsibility for management of historic property is transferred to the private sector, for example through PPP/PFI arrangements, the Protocol standards will be incorporated into contractual arrangements.
Landscape and Townscape	**International** • Ensure that development is 'appropriate' particularly in relation to protected landscapes. • To protect, manage and plan landscapes throughout Europe. **National** • To ***improve*** public access to the countryside and the coast. • To retain attractive landscapes, ***and maintain the character of the undeveloped coast, particularly in designated areas (National Parks, Areas of Outstanding Natural Beauty and Heritage Coasts).*** • To enhance landscapes near to where people live. • To improve damaged and derelict land around towns.

SDP SEA Category	Summary Objectives and Policy Messages (Text in *bold+italic* = new entries from the NPPF.)
	• To retain land in agricultural, forestry and related uses. **MOD** • To promote the objectives of statutory designated areas (National Parks and Areas of Outstanding Natural Beauty) wherever possible. • Reasonable measures should be undertaken in respect of landscape designations to mitigate the impacts of any development proposals on landscape character. • Management of sites should seek to maintain the character of the landscape by safeguarding and, where practicable, enhancing or developing significant landscape features.

Annex 4: Guideline Assessment Criteria by SEA Category

This Annex presents guideline assessment criteria for identifying the 'likely significant effects' of interim ILW storage and transport at any of the candidate sites. These have been developed from those which were applied during the 2010/11 SDP SEA and presented in the 2011 Environmental Report[2].

As compared to the 2011 Environmental Report, the "++" and "– –" categories have been changed from "significant" positive or negative to "major" positive or negative. This is in order to take advantage of evolving knowledge and practice in the field of SEA, and ensure that only neutral or negligible effects receive a null assessment score. Also, it is proposed that the use of the "?" assessment score will be avoided wherever possible, and where not possible, limited. Instead, the best estimate / prediction of potential effects will be presented, and any uncertainties explained.

The scoring criteria should not be viewed as definitive or prescriptive; as guidelines, they are illustrative of the way in which factors will be considered as part of the assessment process. We are currently inviting comments on this Scoping Report and the criteria held within this Annex.

Radiological Discharges and Exposures

Table A4-1 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on levels of radiological discharges and exposures. As this is a brand new category, these were drawn from the criteria used for health and well-being within the 2010/11 SEA.

Table A4-1: Guideline assessment criteria for Radiological Discharges/Exposures

Effect	Description	Illustrative Guidance
++	Major positive	• Option leads to cessation in radiological discharges/exposures which results in a significant reduction in the effective dose to the public from current levels • Option significantly decreases the risk of accidental discharge of radiological contaminants
+	Minor positive	• Option leads to a reduction in radiological discharges/exposures, so that the effective dose to the representative group that is most exposed decreases below current levels
0	No (neutral effects)	• Option sees radiological discharges/exposures largely unchanged, such that there is no significant change to the effective dose to the representative group that is most exposed
–	Minor negative	• Option causes radiological discharges/exposures to increase, so that the effective dose to the representative group that is most exposed increases above current levels but remains within statutory limits
– –	Major negative	• Option causes radiological discharges/exposures to increase significantly, so that the effective dose to the representative group that is most exposed equals or exceeds the statutory limit of 0.5 mSv per year from a single site, and/ or 0.3 mSv per year from a single operational source (e.g. a single facility) • Option significantly increases the risk of accidental discharge of radiological contaminants

Biodiversity and Nature Conservation

Table A4-2 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on biodiversity and nature conservation.

Table A4-2: Guideline assessment criteria for Biodiversity and Nature Conservation

Effect	Description	Illustrative Guidance
++	Major positive	• Option has a particularly valuable positive effect on European or national designated sites and/or protected species (e.g. fully supports conservation objectives on-site or increase in population of species which is under threat) • Option has a strong positive effect on local biodiversity (e.g. through removal of all existing disturbance/pollutant emissions, or creation of new habitats leading to improvement to ecosystem structure and function) • Option creates a new BAP habitat area of substantial size and interest
+	Minor positive	• Option has a noticeable positive effect on European or national designated sites and/or protected species (e.g. supports one of the conservation objectives on-site or some increase in population of designating or protected species). • Option has a positive net effect on local biodiversity (e.g. through reduction in disturbance/pollutant emissions, or some habitat creation leading to improvement to ecosystem structure and function) • Option enhances areas of wildlife interest
0	No (neutral effects)	• Option does not have any significant effects on European, nationally or locally valued habitats and/or populations of notable species
–	Minor negative	• Option has a noticeable negative effect on European or national designated sites and/or protected species (e.g. effect which does not prevent the reaching of one of the conservation objectives on-site or some decrease in population of designating or protected species) • Option has a negative effect on local biodiversity (e.g. through a minor increase in disturbance/pollutant emissions, or some loss of habitat) • Option leads to deterioration in areas of wildlife interest
– –	Major negative	• Option has a particularly notable effect on European or national designated sites and/or protected species (e.g. prevents reaching a conservation objective on-site or a decrease in populations of designating or protected species which may reduce their distribution more widely) • Option has strong negative effects on local biodiversity (e.g. through considerable loss of habitat) • Option leads to loss of an entire area of wildlife interest

Population

Table A4-3 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on population.

Table A4-3: Guideline assessment criteria for Population

Effect	Description	Illustrative Guidance
++	Major positive	• Option generates in excess of 100 full-time equivalent employment opportunities per annum, a large proportion of which will benefit the local community
+	Minor positive	• Option generates some full-time equivalent employment opportunities per annum which may benefit the local community
0	No (neutral effects)	• Option does not affect any local employment opportunities/increase local unemployment rates
–	Minor negative	• Option leads to a minor increase in local unemployment (e.g. due to the cessation of some activities or rationalisation of activities on sites)
– –	Major negative	• Option leads to a significant increase in local unemployment (e.g. due to the closure of sites)

Health and Well-Being

Table A4-4 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on health and well-being.

Table A4-4: Guideline assessment criteria for Health and Well-Being

Effect	Description	Illustrative Guidance
++	Major positive	• Option has a strong positive effect on local communities and sensitive social groups through improvements to environmental quality and/or a significant reduction in accident risk
+	Minor positive	• Option has a positive effect on local communities and sensitive social groups through improvements to environmental quality and/ or a reduction in accident risk
0	No (neutral effects)	• The health of local communities and sensitive social groups will generally remain as it would be without interim ILW storage
–	Minor negative	• Option has a negative effect on local communities and sensitive social groups through deterioration in environmental quality and/ or a potential slight increase in accident risk
– –	Major negative	• Option has a strong negative effect on local communities and sensitive groups through deterioration in environmental quality and/or a likely notable increase in accident risk

Noise and Vibration

Table A4-5 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on noise and vibration.

Table A4-5: Guideline assessment criteria for Noise and Vibration

Effect	Description	Illustrative Guidance
++	Major positive	• Option causes a decrease in noise levels experienced by many local residents against baseline levels • Option causes the number of noise complaints concerning transport or site activities to be greatly decreased (known problem resolved)
+	Minor positive	• Option causes a decrease in noise levels experienced by a few local residents against baseline levels • Option causes the number of noise complaints received concerning transport or site activities to be somewhat decreased (potential problem avoided or resolved)
0	No (neutral effects)	• Option does not significantly alter noise from current levels and will have no observable effects on local communities.
–	Minor negative	• Option causes an increase in noise levels experienced by a few local residents against baseline levels • Option causes the number of noise complaints received concerning transport or site activities to be somewhat increased (potential problem created – some people might complain)
– –	Major negative	• Option causes an increase in noise levels experienced by many local residents against baseline levels • Option causes the number of noise complaints concerning transport or site activities to be greatly increased (potentially leading to statutory nuisance / legal action)

Geology and Soils

Table A4-6 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on geology and soils.

Table A4-6: Guideline assessment criteria for Geology and Soils

Effect	Description	Illustrative Guidance
++	Major positive	• Option restores and improves soil quality to conditions beyond current levels and removes all soil contamination so that soil functions and processes would be greatly improved • Option restores soils to a site where they had previously been lost, and thus leads to an increase in the versatility of the site so that there are more potential opportunities for different (e.g. agricultural or wildlife conservation) uses
+	Minor positive	• Option causes minor improvements in soil quality compared to prior to the development and removes some soil contamination so that soil functions and processes would be improved
0	No (neutral effects)	• No or negligible change in soil quantity or quality, such that soil function and processes will not be affected • Option would not significantly affect land contamination

Effect	Description	Illustrative Guidance
–	Minor negative	• Option leads to an increase in pollutant discharges to soil, however these would be less than permitted limits, such that there will be minor increases in land contamination • Option causes small amount of loss of soil, or loss in soil function and processes which affects small areas
– –	Major negative	• Option leads to a statutory limit being reached or exceeded in relation to pollution to land, such that there would be a major increase in land contamination • Option causes considerable loss of soils, or considerable loss in soil function and processes

Water

Table A4-7 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on the water environment.

Table A4-7: Guideline assessment criteria for Water

Effect	Description	Illustrative Guidance
++	Major positive	• Option leads to a reduction in water use compared to prior to development of an amount such that the risk of water shortages in the area is significantly decreased and abstraction is at least at a sustainable level • Option leads to a decrease in surface runoff and pollutant discharges of an amount such that the quality of that water receptors (including groundwater, surface water or sea water) will be significantly improved and all water targets (including those relevant to chemical and ecological condition) are reached and exceeded
+	Minor positive	• Option leads to a notable reduction in water use compared to prior to development • Option leads to a decrease in surface runoff and/or pollutant discharges of an amount such that the quality of water receptors may be improved to some noticeable level towards water targets
0	No (neutral effects)	• Option does not significantly affect water demand and abstraction levels will not be altered • Option does not change amount of surface runoff and/or pollutant discharges and the quality of water receptors will not be affected
–	Minor negative	• Option leads to a notable increase in water use compared to prior to development • Option leads to increases in surface runoff and/or pollutant discharges of an amount such that the quality of water receptors (including groundwater, surface water or sea water) may decline to some level away from water targets

Effect	Description	Illustrative Guidance
– –	Major negative	• Option leads to major increases in water use compared to prior to development such that the risk of water shortages in the area is increased and abstraction is beyond sustainable levels • Option leads to major increases in surface runoff and/or pollutant discharges of an amount such that the quality of water receptors (including groundwater, surface water or sea water) declines and some water targets are likely to be missed

Air

Table A4-8 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on air quality.

Table A4-8: Guideline assessment criteria for Air

Effect	Description	Illustrative Guidance
++	Major positive	• Option improves local air quality through a reduction in concentrations of pollutants from above the limits identified in the national air quality objectives, to below and within those limits
+	Minor positive	• Option improves local air quality through a reduction in concentrations of pollutants identified in the national air quality objectives
0	No (neutral effects)	• Option would not affect local air quality
–	Minor negative	• Option results in a decline in local air quality to a point near to limits identified in the national air quality objectives, such that other potential unforeseen contributors may in future make it a pollutant of concern in the area
– –	Major negative	• Option results in a decline in local air quality which is likely to include exceedance of air quality objectives

Climate Change and Energy Use

Table A4-9 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential contribution towards climate change.

Table A4-9: Guideline assessment criteria for Climate Change and Energy Use

Effect	Description	Illustrative Guidance
++	Major positive	• Option includes the creation (and maintenance / management) of a new carbon sink (e.g. woodland or wetland), absorbing carbon from the atmosphere
+	Minor positive	• Option reduces the carbon footprint of the site, such as through provision of on- or off-site renewables
0	No (neutral effects)	• Option would not lead to an overall change in energy consumption/efficiency or greenhouse gas emissions

Effect	Description	Illustrative Guidance
–	Minor negative	• Option increases the carbon footprint of the site, including through materials usage, additional energy and secondary resource demand, but in line with average industrial activities
– –	Major negative	• Option presents a major source of carbon emissions which 'stands out' against similar construction and industrial activities

Coastal Change and Flood Risk

Table A4-10 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on coastal change and flood risk.

Table A4-10: Guideline assessment criteria for Coastal Change and Flood Risk

Effect	Description	Illustrative Guidance
++	Major positive	• Option is unlikely to be affected by increases in flood risk and is likely to effectively remove existing flooding problems • Option removes existing flood problems for other properties / areas
+	Minor positive	• Option is unlikely to be affected by increases in flood risk and is likely to decrease risks of flood • Option reduced flood risk for other properties / areas
0	No (neutral effects)	• Option is unlikely to be affected by increases in flood risk and is unlikely to affect flood risk
–	Minor negative	• Option includes new buildings or infrastructure which are partly at risk of flooding • Option contributes towards flood risk elsewhere • Key transport connections are at risk of flooding, with no equivalent alternative
– –	Major negative	• Option includes buildings which are entirely within the floodplain • Option creates new flood risk

Material Assets (Transport)

Table A4-11 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on transport infrastructure.

Table A4-11: Guideline assessment criteria for Material Assets (Transport)

Effect	Description	Illustrative Guidance
++	Major positive	• Option incorporates enhancements to the existing transport network (e.g. junction capacity improvements) • Option results in a major decrease in total HGV movements from/to site • Option reduces traffic congestion at particular traffic hotspots

Effect	Description	Illustrative Guidance
+	Minor positive	• Option enhances maintenance of the existing local transport network (e.g. more frequent inspection and repair) • Option results in a minor decrease in total HGV movements from/to site • Option reduces traffic congestion, but not at any particular traffic hotspots
0	No (neutral effects)	• Option has no observable effects on existing local transport networks
–	Minor negative	• Option results in a minor increase in the number and frequency of HGV movements to/from the site (unmitigated potential damage to roads and source of congestion) • Option results in an increase in traffic congestion which results in driver delay, loss of pedestrian/cyclist amenity and/or severance
– –	Major negative	• Option results in a major increase in the number and frequency of HGV movements to/from the site • Option results in an increase in traffic congestion which results in a new congestion hotspot or substantially inhibits pedestrian or cyclist mobility

Material Assets (Waste Management)

Table A4-12 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on waste production. This SEA category will not assess management of RPVs as either positive or negative, as this is the subject of this SEA.

Table A4-12: Guideline assessment criteria for Material Assets (Waste Management)

Effect	Description	Illustrative Guidance
++	Major positive	• Option creates new waste management infrastructure which services wider waste management demands • Option will be sourced primarily from reused or recycled material from local sources, thus preventing that material from being disposed of to landfill
+	Minor positive	• Option increases capacity of existing waste management infrastructure • Option will be sourced from a proportion of reused or recycled material from local sources, thus preventing that material from being disposed of to landfill • Option prevents more material from going to landfill than it generates
0	No (neutral effects)	• Option would not create an increase in the volume of hazardous and non-recyclable wastes that require disposal • Option will have no effect on the capacity of waste management infrastructure

Effect	Description	Illustrative Guidance
–	Minor negative	• Option results in an increase in low-level radioactive waste being produced • Option increases volumes of hazardous and non-recyclable waste that would require disposal • Option may require the use of existing waste management systems which takes them to or near to capacity
– –	Major negative	• Option generates high volumes of low-level or greater radioactive waste for disposal • Option generates a high volume of hazardous and non-recyclable waste that would require disposal • Option requires the use of existing waste management systems which takes them over capacity

Land Use and Materials

Table A4-13 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on land use and materials.

Table A4-13: Guideline assessment criteria for Land Use and Materials

Effect	Description	Illustrative Guidance
++	Major positive	• Option delivers a regeneration project alongside new development
+	Minor positive	• Option contributes towards a regeneration project alongside new development
0	No (neutral effects)	• Option does not use any undeveloped land, but would redevelop a significant area of previously developed or derelict land • Option uses existing infrastructure in the majority (e.g. utilities and transport) • Option will be made of majority reused or recycled material, thus minimising the need for new primary resources
–	Minor negative	• Option inhibits (e.g. delays or causes additional expense to) planned redevelopment / regeneration of a site • Option would be partially on previously developed or derelict land, and partially undeveloped land • Option uses much existing infrastructure, but significant new infrastructure required • Option will be made partially of reused or recycled material, thus requiring a reduced amount of new primary resources
– –	Major negative	• Option prevents planned redevelopment / regeneration of a site • Option would lead to the development of undeveloped land, or land that has reverted to a 'wild' state • Option will undermine the attractiveness of the area, and leads to an effective planning blight in the area • Option cannot accommodate reused or recycled material in construction, thus requiring entirely new primary resources

Cultural Heritage

Table A4-14 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on cultural heritage.

Table A4-14: Guideline assessment criteria for Cultural Heritage

Effect	Description	Illustrative Guidance
++	Major positive	• Option includes an enhancement of a Scheduled Monument, Grade I or II* Listed Building (either its integrity or setting) • Option includes the prevention of the loss or severe deterioration of a Grade II Listed Building (e.g. such that it can be taken off of the 'buildings at risk' register) • Option includes large-scale enhancement of a Conservation Area or the historic landscape, or removal of a major deteriorating or uncharacteristic feature / aspect of a Conservation Area or the historic landscape
+	Minor positive	• Option includes an enhancement of a Grade II Listed Building, Conservation Area or Registered Park and Garden • Option includes some enhancement of a Conservation Area or the historic landscape, or removal of a minor deteriorating or uncharacteristic feature / aspect of a Conservation Area or the historic landscape
0	No (neutral effects)	• Option would not have any significant effect on any cultural heritage asset
–	Minor negative	• Option adversely affects the setting of a Grade II Listed Building, Conservation Area or Registered Park and Garden, (but preserves the integrity of the asset, as well as some heritage context) • Option causes deterioration to the historic landscape, though its key features remain intact • Option causes the at least partial loss of locally significant cultural heritage assets
– –	Major negative	• Option causes deterioration to a Scheduled Monument, Grade I or II* Listed Building (either its integrity or setting), or at least partial loss of a nationally significant cultural heritage asset • Option causes deterioration to the integrity of a Grade II Listed Building, Conservation Area or Registered Park and Garden, or the complete or near complete loss of its historic setting • Option causes the loss of key features of the historic landscape

Landscape and Townscape

Table A4-15 sets out guideline criteria proposed to be used during the assessment to help determine the relative significance of potential effects on landscape and townscape.

Table A4-15: Guideline assessment criteria for Landscape and Townscape

Effect	Description	Illustrative Guidance
++	Major positive	• Option makes a positive contribution to nationally designated landscapes • Option has a positive transformative effect on the attractiveness of local landscapes (e.g. through the replacement of poorly designed/derelict buildings with high-quality development) • Option removes a major detractor from a key view from a public space or opens up a new key view
+	Minor positive	• Option provides some improvement to the setting and attractiveness of local landscapes • Option removes minor detractors from a key view from a public space
0	No (neutral effects)	• Option would not have any effects on landscape or visual amenity
–	Minor negative	• Option harms the setting and attractiveness of local landscapes • Option creates minor detractors to a key view from a public space • Option negatively affects the visual amenity of local residents and communities
– –	Major negative	• Option harms a nationally designated landscape • Option fully degrades the attractiveness of a local landscape • Option creates a major detractor to a key view from a public space or removes / severely inhibits a key view • Option would severely affect the visual amenity of local residents or communities

Annex 5: SEA Quality Assurance Checklist

The UK Government's guidance on SEA[172] contains a quality assurance checklist to help ensure that the requirements of the SEA Regulations (England[173] or Wales[174]) and Act (Scotland), as originally set out by the European SEA Directive, are met. Those relevant to this stage have been highlighted below.

Quality Criterion	**Where Found in this Environmental Report**
Objectives and Context	
The plan's purpose and objectives are made clear.	Chapter 2.
Environmental issues, including international and EC objectives, are considered in developing objectives and targets.	Chapter 4 and Annex 3.
SEA objectives are clearly set out and linked to indicators and targets where appropriate.	Section 3.3 presents the SEA Objectives and Guide Questions.
Links to other related plans, programmes and policies are identified and explained.	Overall: Chapter 4 and Annex 3. Site specific: Sections 6.3, 7.3, 8.3, 9.3 and 10.3.
Scoping	
The environmental consultation bodies are consulted in appropriate ways and at appropriate times on the content and scope of the Scoping Report.	See Section 3.2.
The SEA focuses on significant issues.	See Section 3.3.
Technical, procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit.	Chapter 5 presents the main assumptions. Otherwise, stated throughout the report where appropriate.
Alternatives	
Realistic alternatives are considered for key issues, and the reasons for choosing them are documented.	See Section 2.4.

[172] Office of the Deputy Prime Minister, Scottish Executive, Welsh Assembly Government and Department of the Environment, Northern Ireland (2005). *A Practical Guide to the Strategic Environmental Assessment Directive: Practical guidance on applying European Directive 2001/42/EC "on the assessment of the effects of certain plans and programmes on the environment".* Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf

[173] *Environmental Assessment of Plans and Programmes Regulations 2004*, S.I. 2004 No. 1633. http://www.legislation.gov.uk/uksi/2004/1633/contents/made

[174] *The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004*. S.I. 2004 No.1656 (W.170). http://www.legislation.gov.uk/wsi/2004/1656/contents/made

Quality Criterion	Where Found in this Environmental Report
Alternatives include 'do minimum' and/or 'business as usual' scenarios wherever relevant.	Not relevant – this SEA is based on the requirement for interim ILW storage, given the adopted and wider SDP project. 'Do minimum' is therefore the baseline (i.e. 'do nothing').
The environmental effects (both negative and positive) of each alternative are identified and compared.	Chapters 6 – 10.
Inconsistencies between the alternatives and other relevant plans, programmes or policies are identified and explained.	Not relevant.
Reasons are given for selection or elimination of alternatives.	Not relevant. See Chapter 12.
Baseline Information	
Relevant aspects of the current state of the environment and their likely evolution without the plan are described.	Chapter 6 – 10. Sections X.2 ("X" standing for the main heading, 6 – 10) address the evolution of the baseline, while current status is described in sub-sections for each environmental category.
Characteristics of areas likely to be significantly affected are described, including areas wider than the physical boundary of the plan area where it is likely to be affected by the plan where practical.	
Difficulties such as deficiencies in information or methods are explained.	These are stated throughout the report where appropriate.
Prediction and Evaluation of Significant Environmental Effects	
Effects identified include the types listed in the Directive (biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage and landscape) as relevant; other likely environmental effects are also covered as appropriate.	Chapters 6 – 10.
Both positive and negative effects are considered, and the duration of effects (short, medium, or long tem) is addressed.	Chapters 6 – 10.
Likely secondary, cumulative and synergistic effects are identified where practicable.	Chapters 6 – 10.
Inter-relationships between effects are considered where practicable.	Chapters 6 – 10.
The prediction and evaluation of effects makes use of relevant accepted standards, regulations and thresholds.	Chapters 6 – 10.

Quality Criterion	Where Found in this Environmental Report
Methods used to evaluate the effects are described.	Section 3.3
Mitigation Measures	
Measures envisaged to prevent, reduce and offset any significant negative effects of implementing the plan or programme are indicated.	Chapters 6 – 10.
Issues to be taken into account in project consents are identified.	Chapter 5
Environmental Report	
Is clear and concise in its layout and presentation.	The layout of the Environmental Report is set out in Section 1.5.
Uses simple, clear language and avoids or explains technical terms.	The Environmental Report has been written in plain English as far as the technical nature of the report allows. A Non-Technical Summary (NTS) accompanies this Environmental Report.
Uses maps and other illustrations where appropriate.	Figures and tables have been used throughout the SEA Report where appropriate.
Explains the methodology used.	Chapter 3.
Explains who was consulted and what methods of consultation were used.	Section 3.2.
Identifies sources of information, including expert judgement and matters of opinion.	References to information sources are provided throughout the report where appropriate.
Contains a non-technical summary covering the overall approach to the SEA, the objectives of the plan, the main options considered, and any changes to the plan resulting from the SEA.	An NTS is provided as a stand-alone document.
Consultation	
The SEA is consulted on as an integral part of the plan-making process.	Consultation on the Scoping Report was in February – March 2014. Consultation on the Environmental Report will be undertaken in summer/autumn 2014.
Consultation Bodies and the public likely to be affected by, or having an interest in, the plan or programme are consulted in ways and at times which give them an early and effective opportunity within appropriate timeframes to express their opinions on the draft plan and Environmental Report.	Stakeholders have been engaged throughout the preparation of the Scoping Report. Consultation on the Environmental Report will be undertaken in summer/autumn 2014.

Quality Criterion	Where Found in this Environmental Report
Decision-making and Information on the Decision	
The Environmental Report and the opinions of those consulted are taken into account in finalising and adopting the plan or programme.	This will be included in the Post Adoption Statement (to be issued following consultation).
An explanation is given of how they have been taken into account.	This will be included in the Post Adoption Statement (to be issued following consultation).
Reasons are given for choosing the plan or programme as adopted, in the light of other reasonable alternatives considered.	This will be included in the Post Adoption Statement (to be issued following consultation).
Monitoring Measures	
Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SEA.	Chapters 6 – 10.
Monitoring is used, where appropriate, during implementation of the plan or programme to make good deficiencies in baseline information in the SEA.	Chapters 6 – 10.
Monitoring enables unforeseen negative effects to be identified at an early stage (these effects may include predictions which prove to be incorrect).	Chapters 6 – 10.
Proposals are made for action in response to significant negative effects.	Chapters 6 – 10.

Annex 6: Criteria and Screening Report

SUBMARINE DISMANTLING PROJECT

Intermediate Level Waste Storage Site Selection:

Provisional Criteria & Screening Report

Issue 1.0 – February 2014

Document Information

Project Name:	Submarine Dismantling Project		
Document Title:	Intermediate Level radioactive Waste Storage Site Selection: Provisional Criteria & Screening Report		
Issue Status:	Issue 1.0	**Deliverable Reference:**	
Produced By:	ISM Ash 1b Defence Equipment & Support MOD Abbey Wood Bristol BS34 8JH	**Level of Control:**	This Document is controlled to Level 1/2/3/4 iaw SDP PMP Document Quality Management Procedure. At each level the Document must be Approved and Authorised.

Document Authorisation

Owner:	######### SDP Dept. Head	**Peer Reviewer:**	If applicable
Author:	######### BMT Customer Friend Team	**Committee Endorsement:**	If applicable
Technical Checker:	######### SDP Approvals	**INSA / ISA:**	If applicable
Editorial Checker:	######### SDP Communications	**Authoriser**:	

Conditions of Use

Amendment History

Issue	Date	Details of Amendment	DCCF
0.1	June 2013	Concept draft	
0.2	July 2013	Development draft	
0.3	September 2013	Draft including site information	
1.0	February 2014	Updated for provisional release as part of Pre-engagement	

Distribution

Issue 1.0 Final Draft

SDP Virtual Team
SDP Scrutiny Meeting Members

Issue 1.0

SDP Virtual Team
SDP Scrutiny Meeting Members
SDP Advisory Group and Subgroup Members
SDP Consultation web pages

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Annex D: SDP ILW Storage Site Functional Requirement

Annex E: Information Received from MOD Site Owners

Annex F: Suitability Assessments

Enclosure 1: NDA Site Screening Report

1. About this document

1.1.1. This is an internal project technical report published for transparency purposes as part of the Submarine Dismantling Project (SDP) Intermediate Level radioactive Waste (ILW) Storage Site selection process. It describes the screening process used to arrive at a shortlist of sites to be taken forward as the basis for public consultation and detailed assessment. It also summarises the results of screening work to date.

1.1.2. This report is not intended to be a public consultation document. A formal Consultation Document will be issued as part of the public consultation, which is currently planned to start in late 2014 and conclude in early 2015. This will be the main opportunity for members of the public to comment on the MOD's decision process and assessment of the shortlisted sites.

1.1.3. Annex A contains a list of the SDP reports referred to in the text, which are available on the project's web pages and give more information on the project's decision-making process and proposed public and stakeholder engagement activities. A list of abbreviations is given at Annex B.

1.1.4. Anyone requiring further clarification of the proposed process or printed copies of documents may contact the project team at the following address.

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https://www.gov.uk/government/publications/submarine-dismantling-project-interim-storage-of-intermediate-level-radioactive-waste

2. Introduction

2.1. SDP Context

2.2. This section provides an overview of the programme context and decision making process.

2.2.1. The MOD's SDP is developing a solution for the dismantling of 27 Royal Navy nuclear submarines, once they have left Naval Service and have been defuelled, and the safe interim storage of the ILW arising. These include the eleven submarines currently stored afloat at Devonport and seven at Rosyth, as well as nine submarines that are still in service.

2.2.2. The first stage of SDP's decision-making addressed the questions of how and where the radioactive waste would be removed from the submarines, once they have been defuelled and laid-up, and where the ILW should be stored until a disposal route becomes available (the UK's Geological Disposal Facility planned for after 2040). The culmination of this work (which included a three-month public consultation) was the submission to the MOD's Investment Approvals Committee in December 2012 of a first 'Main Gate Business Case' recommending the optimum combination of answers to these three key questions.

2.2.3. The MOD formally announced on 22 March 2013 that the following decisions had been made: initial submarine dismantling will take place in situ at both Devonport and Rosyth; Reactor Pressure Vessels (RPVs) will be removed and stored intact; and a revised approach to selecting an ILW storage site will be taken forward. The MOD's Response to Consultation report explained how comments from stakeholders and the wider public influenced these decisions.

2.2.4. In this previous consultation, only the type of site, defined by ownership and whether it was local or remote to an initial dismantling site, was factored into the option assessment. Economic assessment conducted jointly with the Nuclear Decommissioning Authority (NDA) showed relatively little difference in the cost and performance results of each type. No recommendation about site type could therefore be made as part of the business case submission.

2.2.5. Now that Main Gate Business Case approval has been obtained, a further stage of analysis and public consultation is necessary to determine the ILW storage site.

2.2.6. The site screening and option assessment processes described below have been designed on the basis that the SDP's analysis must consider all potential storage sites, including NDA sites, on a 'level playing field'. Legal advice confirmed that such an approach would be the most robust in demonstrating a rational and transparent site selection process, and this was supported by consultation responses.

2.2.7. The MOD's decision-making will be consistent with the principles set out in its Nuclear Liability Strategy[1]. Specifically, the MOD will seek the optimum solution for the storage of ILW that protects people and the environment in a safe and cost effective manner that may include exploring opportunities for shared storage.

[1] MOD's Nuclear Liabilities Management Strategy, 2011.

2.3. SDP Decision Making

2.3.1. The main elements of the ILW Storage Site decision making process are shown on Figure 1 overleaf. More detail is provided in the SDP 'Approach to Decision Making' report.

2.3.2. The 'longlist' of potential storage sites (i.e. all UK nuclear Licensed or Authorised sites) is being screened down for detailed assessment (top line of Figure 1 flowchart) by:

- Establishing with site owners which of the sites on the longlist are actually *available* to the SDP; and then
- Checking these *available* sites against the project's screening criteria to confirm that they are actually *suitable* for MOD use for ILW storage.

2.3.3. Detailed assessment and consultation on the shortlisted sites will then identify a specific recommended storage site (middle line of Figure 1 flowchart).

2.3.4. A first Business Case Review Note will then be submitted to the MOD's Investment Approvals Committee (bottom line of Figure 1 flowchart), recommending a site for selection. Once approval has been obtained and contracts have been placed, the chosen contractor will prepare the site-specific store design and apply for planning consent and regulatory permits. RPV removal from the first submarine and construction of the store can start once these have been received.

2.4. Public and Stakeholder Engagement

2.4.1. The project's Public & Stakeholder Engagement (PSE) programme is described in its 'Approach to Public & Stakeholder Engagement' report. There are three main points in the decision-making process where structured PSE activities are envisaged:

- Pre-engagement: This is an important pre-requisite to Public Consultation and involves pre-engagement with Statutory Bodies, devolved administrations, local authorities, elected representatives and established site stakeholder groups on shortlisting, future PSE plans, and the scope of the Strategic Environmental Assessment (SEA).
- Public Consultation: This is the main engagement activity aimed at all stakeholders and the wider public and will involve review of and comment on the evidence base, including information from the detailed option assessment. Public Consultation feedback is considered fundamental to subsequent completion of the analysis.
- Post-approval: This will follow approval and announcement of the storage site decision. It includes briefings and publication of the MOD's 'Response to Consultation' and 'SEA Post-Adoption' reports which provide feedback on how comments have been taken into account in the decision-making process.

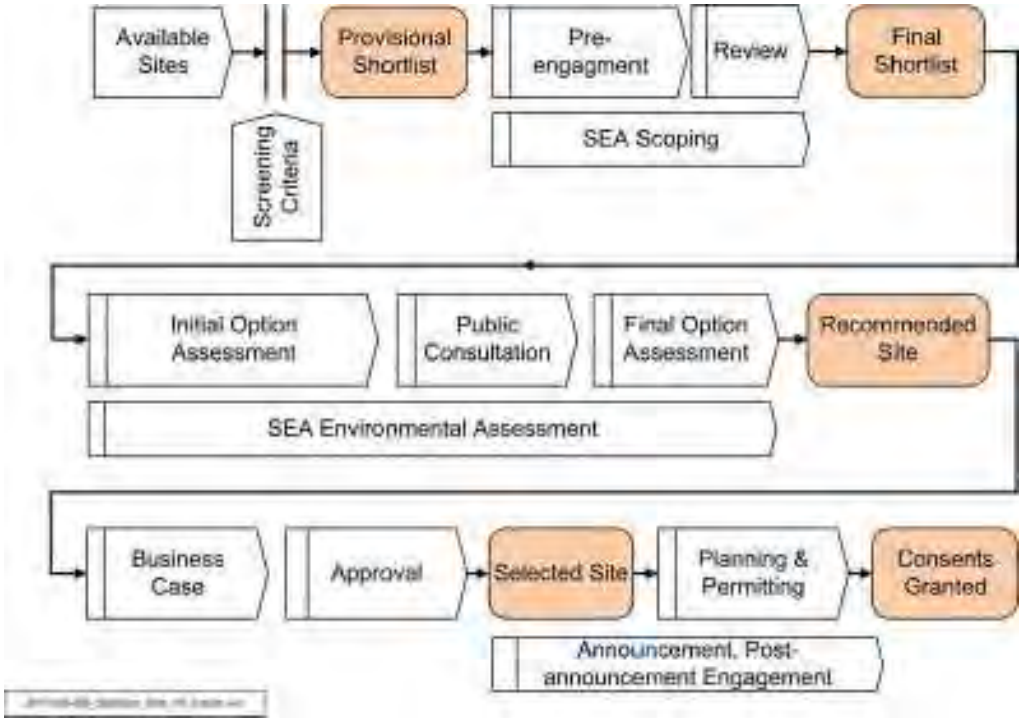


Figure 1: Storage Site Decision Making Process

2.5. Remainder of this Report

2.5.1. The remainder of this document – currently issued with provisional status - describes the screening process and results in more detail:

- The longlist of possible sites.
- The process used to determine *availability* and the results to date.
- The process used to determine *suitability* and the results to date.

2.5.2. The last two sections summarise the SDP's proposed approach to those aspects of screening which are yet to be completed.

3. Available Sites

3.1. The ILW Storage Site Longlist

3.1.1. Bulk ILW storage must be on a nuclear Licensed or Authorised site (see Annex C). The storage site could therefore be:

- An existing MOD or civil nuclear Licensed site; or
- An existing MOD nuclear Authorised site; or
- A non-nuclear greenfield or brownfield site which could be licensed.

3.1.2. Earlier assessments did not discount non-nuclear greenfield or brownfield sites but found that there would be major cost, schedule and project risk implications which would make them unsuitable. There were also environmental impacts to take into account, as well as the resultant extension of the UK nuclear footprint. The SDP team's view was that there were Licensed or Authorised sites which were likely to prove suitable, without the need to consider greenfield and brownfield sites, so the longlist was limited to existing UK nuclear Licensed and Authorised sites.

3.1.3. There have been transfers of ownership and other changes to the list of nuclear Licensed and Authorised sites since the SDP's assessment work began. Annex C is an updated list correct as at April 2013 (when the main screening activity started).

3.1.4. Work prior to the Main Gate Business Case submission suggested that some potential storage sites should be screened out as they could not meet the Functional Requirement as it was defined at the time. The Functional Requirement, however, has been refined since Main Gate Business Case approval. For instance, there is no longer a need to consider whether sites are suitable for storing complete Reactor Compartments. Although this early assessment work remains a useful input, the conclusions of this initial screening work have been set aside and screening restarted as described below.

3.2. Establishing Availability

3.2.1. As already noted, the current shortlisting process involves two main steps:

- Establish with site owners which of the sites on the longlist are actually *available* to the SDP; and then
- Check these *available* sites against the Project's screening criteria to confirm that they are actually *suitable* for MOD use for ILW storage.

3.2.2. It was anticipated that a site owner would only make a site *available* to the SDP if it met the project's Functional Requirement and if SDP ILW storage would not compromise the site's main purpose or approved decommissioning programme.

3.2.3. The process for establishing *availability* is equivalent for different types of site owner but inevitably differs in detail. For instance, commercial site owners do not need to publicly explain their decisions, whereas MOD and NDA site owners do. The MOD and NDA therefore declared the criteria they used and provided information on *unavailable* as well as *available* sites, whereas commercial site owners did not.

3.3. Available MOD Sites

3.3.1. The owners of the six longlisted MOD Licensed and Authorised sites (see below) were informed in 2012 about the storage site screening process. The Royal Dockyards at Devonport and Rosyth are commercially-owned, not MOD-owned (see Section 3.5).

- Her Majesty's Naval Bases (HMNB) at (Clyde) Coulport, (Clyde) Faslane and Devonport;
- Atomic Weapons Establishment (AWE) Aldermaston and Burghfield in Berkshire;
- Vulcan Naval Reactor Test Establishment (NRTE) in Caithness.

3.3.2. A 'Site Owner's Questionnaire' was sent in June 2013 through senior management to the head of each site. The Defence Infrastructure Organisation provided site owners with advice as required. To maintain a degree of separation, the SDP team responded to questions on context and process but did not carry out any of the site-specific analysis or advise on the correct response.

3.3.3. All MOD site owners used the following criteria set, circulated by the SDP team as part of a data gathering questionnaire, to establish *availability*.

- Spatial capacity
- Security
- Current wastes
- Planning & permits
- Tenure & lifetime plan
- Programme
- Future use
- Nuclear licensing
- Strategic impacts
- MOD operations

3.3.4. Responses were received in July 2013. After clarifications had been provided at a review meeting, positive responses were confirmed for four sites – two with significant caveats – as shown in alphabetic order in Table 1 below. A more detailed record of MOD owners' assessment of their sites' *availability* is included in Annex E.

Available		**SDP Comments**
AWE Aldermaston	Licensed	Both standalone and combined SDP/AWE store options are possible
AWE Burghfield	Licensed	No ILW currently stored on site, site licence extension required
Available (but with caveats)		
HMNB Clyde (Coulport)	Authorised	Caveats on topography and programme
HMNB Devonport	Authorised	Caveats on land disposal and programme
Not Available		
HMNB Clyde (Faslane)	Authorised	Insufficient space available within required timescales
NRTE Vulcan	Authorised	Insufficient space available within required timescales

Table 1: Available MOD Sites

3.3.5. The SDP team's subsequent assessment of the *available* MOD sites' *suitability* is covered in 4.3 below.

3.4. NDA Sites

3.4.1. The NDA was informed of the proposed decision making process and their sites' inclusion on the longlist in January 2013. The SDP then asked the NDA in May 2013 for its assessment of site *availability* and for the information needed to assess *suitability*.

3.4.2. The NDA conducted its assessment on the basis of the five criteria listed below, which relate to its strategic mission:

- Does the site meet the SDP ILW Functional Requirements?
- Are there any current NDA consultations ongoing concerning the site?
- When is the site due to enter quiescence[2]?
- Are there any effects on the NDA's Land and Property Management Strategy?
- Is there any effect on the co-generation sites (where there is another nuclear power generator on the same or an adjacent site)?

3.4.3. The NDA's Site Screening Report is at Enclosure 1 and describes the definition of the above criteria, NDA screening of each of its sites against them, and additional issues or caveats highlighted for the MOD to take into account in its assessment of site *suitability*.

3.4.4. On the basis of its Site Screening Report, the NDA put forward the following sites as potentially *available*:

NDA Site	Site Licensed Contractor
Chapelcross	Magnox
Dounreay	DSRL
Harwell	RSRL
Hinkley	Magnox
Sellafield	Sellafield Ltd.
Sizewell	Magnox

Table 2: Sites put forward by NDA as potentially available.

3.4.5. The SDP team's subsequent assessment of the *suitability* of these sites is covered in 4.4 below.

[2] Quiescence is an interim state prior to final decommissioning when activities on a nuclear site are mainly limited to maintenance and monitoring only.

3.5. Commercial Sites

3.5.1. The SDP advertised a 'Request for Information' and subsequent Contract Notice (including the Functional Requirement) to establish which owners of longlisted commercial sites might be interested in hosting an SDP ILW store. The Contract Notice was issued in July 2013 with a closing date of August 2013.

3.5.2. The owners of three sites responded to the Contract Notice expressing an interest in further discussions. After a briefing for interested parties in September 2013 and one-to-one follow-up meetings in October, Capenhurst Nuclear Services (CNS) confirmed that the Capenhurst site was *available* for further consideration by the SDP[3].

3.5.3. No other commercial sites were offered and confirmed by their owners as *available* and so no others will be considered by the SDP for its shortlist.

[3] Capenhurst Nuclear Services Limited, which put the site forward for consideration, is a wholly owned subsidiary of URENCO Ltd. It operates as a tenant of URENCO UK Ltd. which owns part of the site and currently leases the rest from NDA.

4. Suitable Sites

4.1. Suitability Criteria

4.1.1. *Available* sites were deemed *suitable* and added to the Provisional Shortlist if they satisfied the following criteria:

- The Functional Requirement can be met. The Functional Requirement has its own list of sub-criteria such as: store capacity, transport, package-handling ability, licensing, and security (see Annex D);
- The proposed solution is consistent with the SDP's Benchmark Programme assumptions and schedule deliverability, and any risks to programme are judged manageable;
- The proposed solution does not interfere to an unacceptable extent with MOD operations on the designated site;
- There are no legal, licensing or policy constraints that could be reasonably foreseen to result in a failure to obtain the necessary consents and permissions.

4.1.2. Sites were tested against these criteria on the basis of the information available to the SDP project team at the time. More detailed assessment, after pre-engagement is complete, may lead to one or more sites being removed from the shortlist.

4.2. Key Reviews & Workshops

4.2.1. *Suitability* was reviewed at separate screening meetings between project team technical and process specialists plus other MOD stakeholders and specialists as necessary. Compliance against each criterion was rated as '*Suitable*', '*Unsuitable*, or *'Deferred'*. The meaning of these terms is as follows:

- *Suitable* – consensus that no reason had been found in the course of selection (assuming effective risk management) as to why the site should not be passed on for detailed option assessment;
- *Unsuitable* – consensus that good reason had been found in the course of selection as to why the site should not be passed on for detailed option assessment;
- *Deferred* – consensus that significant doubt had been found in the course of selection as to whether the site should be passed on for detailed option assessment, and that the doubt could probably be resolved by seeking clarification.

4.2.2. All deferrals have now been resolved, so the provisional status of all sites is confirmed.

4.3. MOD Site Suitability

4.3.1. HMNB Clyde (Faslane) and NRTE Vulcan are *unavailable* and were not considered further by the SDP. The four remaining *available* MOD sites were reviewed against all the SDP screening criteria. Some key arguments are given below and Table 3 summarises the conclusions. Detailed checklist results are tabulated in Annex F.

4.3.2. AWE Aldermaston and Burghfield met these criteria and remain on the Provisional Shortlist as potential storage sites, noting however that an SDP store at Burghfield would require an extension of the nuclear Licensed site and that it does not currently have an ILW storage regime in place.

4.3.3. The key arguments affecting the suitability of HMNBs Clyde (Coulport) and Devonport were:

- HMNB Clyde (Coulport) would present a range of significant regulatory and planning issues and there are physical constraints (notably topography) associated with store build and access. These combined make it unlikely that the site could meet the SDP's programme and value for money objectives.
- HMNB Devonport has a number of parcels of land potentially available but these are all complicated by significant planning issues (such as listed buildings and planned land disposals) or operational constraints. These combined make it unlikely that the site could meet the SDP's programme and value for money objectives.

4.3.4. HMNBs Clyde (Coulport) and Devonport were therefore deemed *unsuitable* for the SDP's purposes.

Available and Suitable		
AWE Aldermaston	Licensed	Assessed as suitable.
AWE Burghfield	Licensed	Assessed as suitable.
Available but Unsuitable		
HMNB (Clyde) Coulport	Authorised	Unsuitable due to topography and programme risk associated with planning and regulation.
HMNB Devonport	Authorised	Unsuitable due to programme risk associated with operations, planning and regulation.

Table 3: MOD Site Suitability

4.4. NDA Site Suitability

4.4.1. The six NDA sites assessed by the NDA as potentially *available* were reviewed against all the SDP suitability criteria. The key arguments are given below and Table 4 summarises the conclusions. Detailed checklist results are tabulated in Annex F.

4.4.2. Chapelcross and Sellafield met these criteria and are provisionally shortlisted as potential storage sites. SDP has noted the NDA's advice that Sellafield is already managing a complex waste management programme and that there are factors such as quiescence[4] which would need to be taken into account during detailed option assessment for Chapelcross.

4.4.3. Hinkley and Sizewell were deemed *unsuitable* due to the programme risk posed by interactions with the NDA's own ILW consolidation and Fuel Element Debris dissolution strategies and uncertainties over land availability.

4.4.4. The NDA has ongoing ILW storage at Harwell but an additional SDP store would be inconsistent with plans for the future use of the site, which are now in an advanced state. The SDP team considers that this situation would create significant planning issues for an SDP ILW store, making it unlikely that the site could meet the SDP's programme and value for money objectives. Harwell was therefore deemed *unsuitable*.

4.4.5. Dounreay has a target date range for quiescence of 2022 to 2025, rather than a single date. As a result it did not automatically fail the NDA's availability criterion on quiescence. However, the SDP team considers that the likelihood of Dounreay achieving early quiescence and / or the SDP programme taking longer than its baseline assumption combine to create an unacceptable level of risk to its programme and value for money objectives. Dounreay was therefore deemed *unsuitable*.

Available and Suitable		
Chapelcross	Magnox	Assessed as suitable.
Sellafield	Sellafield Ltd.	Assessed as suitable.
Available but Unsuitable		
Dounreay	DSRL	Unsuitable on quiescence dates.
Harwell	RSRL	Unsuitable due to programme risk associated with planning and future land use.
Hinkley	Magnox	Unsuitable due to programme risk associated with NDA ILW consolidation plans and land availability.
Sizewell	Magnox	Unsuitable due to programme risk associated with NDA ILW consolidation plans and land availability.

Table 4: NDA Site Suitability

[4] See section 3.4.2.

4.5. Commercial Site Suitability

4.5.1. Commercially owned sites which have not been declared *available* were not considered further.

4.5.2. The one *available* commercial site - Capenhurst - was reviewed against all the screening criteria. It met these criteria and is retained into the next phase as a potential storage site.

Suitable		
Capenhurst	Capenhurst Nuclear Services	Assessed as suitable.
Available but Unsuitable		
N/A		

Table 5: Commercial Site Suitability

4.6. Provisional Shortlist

4.6.1. The Provisional Shortlist is therefore as follows:

Site	**Owner / Site License Company**
Aldermaston	MOD / AWE
Burghfield	MOD / AWE
Capenhurst	Various / Capenhurst Nuclear Services[5]
Chapelcross	NDA / Magnox
Sellafield	NDA / Sellafield Ltd.

Table 6: ILW Storage Site Provisional Shortlist

[5] Capenhurst Nuclear Services operates on the Capenhurst site under the nuclear license held by URENCO UK Ltd.

5. Pre-engagement and the Final Shortlist

5.1. Introduction

5.1.1. In this Provisional Issue of the Criteria & Screening Report, this section briefly describes the remaining parts of the process that will be followed to reach the Final Shortlist. The Final Issue will include a summary of feedback from Pre-engagement and any additional information and analysis results, and the Final Shortlist for Public Consultation.

5.2. Pre-engagement

5.2.1. Pre-engagement gives local authorities, elected representatives and site stakeholder groups, from potentially affected communities and elsewhere, an early opportunity to understand how the process is developing and, by commenting on published project documents, a chance to help shape the site comparison studies and the main Public Consultation.

5.2.2. To inform the Pre-engagement process, the MOD is publishing reports summarising the results of the ILW storage site selection process to date and setting out its plans for the remaining steps in the process. These reports include:

- Approach to Decision Making – an overview of the decision process for selection of an ILW storage site;
- Approach to Public and Stakeholder Engagement – an overview of how the MOD intends to engage the public and stakeholders as part of its decision making process.
- Provisional Criteria & Screening Report – this document – a description of the work done to date on ILW storage site screening;
- Strategic Environmental Assessment (SEA) Scoping Report – the proposed scope for updating the SDP's SEA, which has been issued to the relevant UK Statutory Bodies and Devolved Administrations for comment; and

5.3. Final Shortlist

5.3.1. After Pre-engagement feedback and the results of additional analysis have been considered, the project team will review any points arising and developments since the earlier screening workshops and confirm a Final Shortlist.

5.3.2. The Criteria & Screening Report will be finalised and placed in the public domain in parallel with an updated version of the Approach to PSE Report. Any significant changes to these documents or the shortlist will be fed back to local authorities, and to others who made comments.

5.3.3. In line with its PSE strategy, the SDP team will continue to engage with local authorities, established site stakeholder groups and elected representatives on the design and preparations for public consultation.

6. Future Option Assessments & Consultation

6.1.1. Assessment of site options will involve the following main activities.

- During Initial Assessment, the shortlisted sites are compared, primarily on the basis of whole life cost and operational effectiveness. Further assessment of a site may be halted at any point if it can be shown to fail an 'unacceptable performance' threshold test.
- SEA studies on the shortlisted sites are completed and the SEA Environmental Report issued.
- Public Consultation follows, including dissemination of a Public Consultation Document, plus events for communities associated with shortlisted sites, national stakeholders, and the wider public. Information is gathered for the 'Other Contributory Factors' analysis which complements the whole life cost and operational effectiveness analyses.
- After the Public Consultation, responses will be considered, the assessment criteria will be 'weighted', the analyses will be completed, and the data reports finalised. The SDP will publish a summary of the comments received while retaining the comments received in full, for any interested parties to review.
- The Business Case Review Note and supporting documents are prepared, bringing together all the information and arguments. A Recommended ILW Storage Site is identified. After approval, feedback is given to stakeholders and the wider public in conjunction with an announcement of MOD's selected site.

6.1.2. More detail on the project's plans for assessment and consultation is provided in the 'Approach to Decision Making' and 'Approach to Public and Stakeholder Engagement' reports.

Annex A: Key Project References

All references listed below are available from the www.gov.uk website. SDP reports can be found via two web pages:

https://www.gov.uk/government/publications/submarine-dismantling-project-interim-storage-of-intermediate-level-radioactive-waste for current ILW storage site selection consultation documents and supporting reports; and

https://www.gov.uk/government/consultations/consultation-on-the-submarine-dismantling-project for previous consultation documents and supporting reports.

Title	Reference/ Version	Date
SDP: (SDC) Consultation Document *Public Consultation Document supporting the 2011 Submarine Dismantling Consultation.*	Issue 1.0	October 2011
SDP: Strategic Environmental Assessment (SEA): Environmental Report *Report of potential environmental impacts. Includes Non-Technical Summary.*	Issue 1.0	October 2011
SDP: (SDC) Post Consultation Report *Follow up to 2011 Submarine Dismantling Consultation public consultation, summarising the comments made.*	Issue 1.0	July 2012
SDP: (SDC) MOD's Response to Consultation *Follow up to 2011 Submarine Dismantling Consultation, setting out MOD's decisions and how consultation had influenced them.*	Issue 1.0	March 2013
SDP: Strategic Environmental Assessment (SEA): Post-Adoption Report *Details how the findings of the SEA and subsequent consultation responses were used to inform MOD's decision-making.*	Issue 1.0	March 2013
SDP: ILW Storage Site Selection Approach to Decision Making *Overview of the ILW storage site decision making process.*	Issue 1.0	February 2014
SDP: ILW Storage Site Selection Approach to Public & Stakeholder Engagement *Overview of the public and stakeholder engagement activities during the ILW storage site selection process.*	Issue 1.0	February 2014
ILW Storage Site Selection Strategic Environmental Assessment Scoping Report *Proposed scope of the updated project SEA and subsequent Environmental Report.*	Issue 1.0	February 2014

Annex B: Abbreviations

DE&S	Defence Equipment and Support
ILW	Intermediate Level Waste
HMNB	Her Majesty's Naval Base
MOD	Ministry of Defence
NDA	Nuclear Decommissioning Authority
NRTE	Naval Reactor Test Establishment
PSE	Public & Stakeholder Engagement
RPV	Reactor Pressure Vessel
SDP	Submarine Dismantling Project
SEA	Strategic Environmental Assessment

Annex C: Longlist Sites

This list was last updated from the current list of licensees (downloadable from HSE's website[6]) in April 2013.

Site	Land Owner	Licensed/ Authorised[7]
HMNB Devonport	MOD	Authorised
Devonport Royal Dockyard	Babcock Marine	Licensed (with additional Authorised activities)
HMNB (Clyde) Faslane	MOD	Authorised
HMNB (Clyde) Coulport	MOD	Authorised
Rosyth Royal Dockyard	Babcock Marine	Licensed
AWE Aldermaston	MOD	Licensed
AWE Burghfield	MOD	Licensed
Barrow-in-Furness (Devonshire Dock Complex)	BAE Systems Marine	Licensed
Neptune Reactor, Fuel Production Plant, Derby	Rolls Royce Marine Power Operations	Licensed
DSRL Dounreay	NDA	Licensed
NRTE Vulcan	MOD, leased from NDA	Authorised
RSRL Harwell	NDA, leased from United Kingdom Atomic Energy Authority	Licensed
RSRL Winfrith	NDA	Licensed
Sellafield (Windscale & Calder)	NDA	Licensed
LLW Repository	NDA	Licensed
Capenhurst	URENCO, partially leased from NDA	Licensed
Springfields	NDA	Licensed
Magnox Reactor Sites	NDA	Licensed
EDF Reactor Sites	EDF Energy Nuclear Generation	Licensed
Hinkley 'C'	NNB Genco	Licensed
Other commercial sites	Various	Licensed

[6] See www.hse.gov.uk/nuclear/licensees/pubregister.pdf , including for details of other commercial sites

[7] A Nuclear Licence allows specific nuclear activities to take place at a specific site. Such 'Licensed' sites are subject to the Nuclear Installations Act (1965), with licences being granted by the Office for Nuclear Regulation. Authorisations allow specific defence-related nuclear activity to take place. Such 'Authorised' sites or activities are not subject to the Nuclear Installations Act (unlike civil nuclear sites) and so activities are not formally Licensed'. Instead, Authorisations are granted by the Defence Nuclear Safety Regulator. Where appropriate to the activity, Authorisation Conditions are equivalent to Licensing Conditions applied to civil nuclear work.

Annex D: SDP ILW Storage Site Functional Requirement

	Requirement	Comment
Storage Standard	In accordance with NDA Interim Storage Industry Guidance.	Store to fully meet requirements, whilst noting package may not be approved for GDF disposal.
Quantity	RPV type PWR 1: 23 off. RPV type PWR 2: 4 off.	
Package Dimensions	RPV type PWR 1: Length 5190 mm, Width 3180 mm, Height 3160 mm.	Based upon pre-concept transport container design.
	RPV type PWR 2: Length ~6000 mm, Width ~4000 mm, Height ~4000 mm.	Estimated. No current design.
Packaged Weight	RPV type PWR 1: 90,000 kg.	Assumes no internal grouting, and shielding only sufficient to meet transport regulation requirements.
	RPV type PWR2: 135,000 kg.	Estimated at 150% of PWR1.
Package Type	Type IP2.	
Package contact dose rate	<2 mSv/hr.	To meet Transport Regulation requirements.
Over-packing / re-containerisation contingency	Capacity for future extension of the store to allow for over-packing / re-containerisation and onward transport of the RPV to either a disposal or cut-up facility.	A 50% extension to the store would provide for either over-packing / re-containerisation or extension of the store to allow for delay to the Geological Disposal Facility (GDF), but not both.
Transport	Road.	Assumed too large for rail.
Drop withstand	0.3m.	Current assumption for transport.
Handling features	To be determined.	
Package Life	Fit for 40-100 years storage.	
Storage contingency	The potential to allow for extension of the size of store to cover delay to the GDF.	See over-packing above.
Receipt Rate	Three per annum	This is a maximum Initial peak rate – project assumption is then 1 RPV per annum after initial RPV(s) received.
Dispatch Rate	Empty store of RPVs in one year.	Assumes worst case of direct disposal to a dedicated area of the GDF, which is then closed.
Seismic qualification	As required.	
Security	As per Defence Manual of Security (JSP 440).	No access to non-UK Nationals.

Annex E: SDP Summary of Information Received from MOD Site Owners

Criterion	Aldermaston	Burghfield	Devonport	Coulport	Faslane	Vulcan
Spatial Capacity	Pass	Pass	Caveat (land availability)	Caveat (land availability)	Fail	Fail
Tenure & Lifetime Plan	Pass	Pass	Pass	Pass	Pass	Fail
Nuclear Licensing	Pass	NSL extend?	Pass	Pass	Pass	Pass
Security	Pass	Pass	Pass	Pass	Pass	Pass
Programme	Pass	Pass	Significant risk	Significant risk	Significant risk	Fail
Strategic Impacts	Benefit (if shared)	Pass	Pass (caveat)	Pass (caveat)	Pass (caveat)	Significant risk
Existing Waste Storage	ILW/ LLW/ VLLW	No	No	No	VLLW	LLW at Dounreay
Future Use	Pass	Pass	Significant risk	Pass	Pass	Significant risk
MOD Operations	Pass	Pass	Pass (caveat)	Pass (caveat)	Pass (caveat)	Significant risk
Planning & Permits	Pass	Pass	Significant risk	Significant risk	Significant risk	Significant risk
Additional Factors	Timescales need aligning	Wastes moved to Aldermaston	Policy, stakeholders	Policy, stakeholders	Policy, stakeholders	Policy, stakeholders
Conclusion	Available	Available (caveat)	Available (caveat)	Available (caveat)	Unavailable	Unavailable

Annex F: Suitability Assessments

Site	Functional Requirement				Programme				Constraints			
	Spatial & Access	Future Use	Nuclear License	Security	Decide Delay	Plan & Permits	Build	MOD Ops	Policy	Local Plans	Permits	Overall Logic
MOD												
Aldermaston.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	**Pass**
Burghfield	Pass	Pass	Pass	Pass	Pass	Caveat	Pass	Pass	Pass	Pass	Pass	**Pass**
Coulport	Caveat	Pass	Caveat	Pass	Pass	Fail	Fail	Pass	Pass	Pass	Pass	**Fail**
Devonport	Caveat	Caveat	Pass	Pass	Caveat	Fail	Pass	Pass	Pass	Caveat	Pass	**Fail**
NDA												
Chapelcross	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	**Pass**
Dounreay	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Pass	**Fail**
Harwell	Pass	Caveat	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Caveat	Pass	**Fail**
Hinkley	Caveat	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Pass	Pass	**Fail**
Sellafield	Pass	Pass	Pass	Pass	Pass	Pass	Caveat	Pass	Pass	Pass	Pass	**Pass**
Sizewell	Caveat	Pass	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Pass	Pass	**Fail**
Commercial												
Capenhurst	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	**Pass**

ENCLOSURE 1: NDA SITE SCREENING REPORT

1. NDA Submarine Dismantling Project Site Screening
ST/STY(13)0058
November 2013

Outline/Background

The Ministry of Defence (MoD) is currently going through an option assessment and consultation process regarding the dismantling and subsequent storage of Intermediate Level Waste (ILW) from their decommissioned nuclear 'Submarine Dismantling Project' (SDP). The recently published results of part of this assessment have outlined the locations for dismantling and the approach to dismantling that will take place.

The next stage of the MOD's assessment will identify a suitable location for the interim storage of the relatively small volumes of ILW that will arise during submarine dismantling. The ILW will consist of around 27 large shielded packages (the reactor pressure vessels). The initial assumption is that a purpose built, unshielded store will be required. The ILW will eventually be disposed of in the Geological Disposal Facility (GDF).

The MOD SDP team is currently shortlisting potential sites for interim storage and has asked the Nuclear Decommissioning Authority (NDA), along with MoD site owners and private nuclear site license holders, if any of their sites would be available for inclusion on the shortlist. We have an obligation to cooperate, in the UK taxpayer's best interest, with other government departments. It is therefore right and proper for us to assess each of our sites to see if they are available to be put forward for the shortlisting process.

The SDP team will consider those sites that are identified as available and undertake a further suitability assessment before running a public consultation in 2014 based on a shortlist of sites that are both available and suitable. The NDA's shortlisting is therefore the first step in a thorough assessment and consultation exercise being undertaken by the MoD to find a suitable site for storage. Before a final site is chosen there will be sufficient opportunity for all views to be heard from any potentially affected areas. If an NDA site is taken forwards into the shortlist then MOD will continue to work closely with NDA as the process progresses.

This paper outlines our approach considering which, if any, of our sites would be available to MOD for interim storage of their ILW. An assessment for each of our sites is then undertaken.

NDA Screening Tests

Our approach has been to define five screening criteria and apply these to each of our sites. The five screening criteria are described below:

1. Does the site meet the SDP ILW Functional Requirements?
2. Are there any current NDA consultations ongoing concerning the site?
3. When is the site due to enter quiescence?
4. Are there any effects on NDA's Land and Property Management Strategy?
5. Is there any effect on the co-generation sites

In addition to this there may be additional, site specific areas that are highlighted to MoD SDP.

By applying the screening criteria to each site, the basis on which sites are screened out can be clearly articulated. Any sites that were not screened out are therefore potentially available to the MOD and will be put forward for suitability testing and then shortlisting within the MOD's process.

Where the effect of a criterion on a site is of no concern then it is marked available. If the effect of a criterion is significant and unacceptable to us then it is marked unavailable. Where a criterion can be seen to have an effect but is not sufficient to mark a site unavailable it is marked as available but with areas that need to be addressed through the SDP suitability and shortlisting process, e.g. to assess the impact on SDP's programme and project risk.

The following sections describe the basis for the screening criteria.

Does the site meet the SDP ILW Functional Specification requirements?

The SDP functional specification outlines the requirements for the interim storage of the SDP ILW. It provides information such as the size, weight, dose rate, transport and access requirements, receipt rate, dispatch rate and security requirements. Where a site would not be able to meet these requirements the site will fail this screening criterion and not be available for onward shortlisting.

Are there any current NDA consultations ongoing concerning the site?

We consult widely on different aspects of our work, there is currently ongoing consultation regarding ILW Storage Consolidation and Fuel Element Debris (FED) Dissolution at Magnox sites in England.

Currently at the preferred options stage, opportunities have been identified to make a number of consolidating movements between sites that, if implemented, would provide an equitable distribution of responsibilities for ILW storage and FED dissolution, and in doing so provide potential savings of ~£90m to the UK taxpayer.

The preferred options centre on a south-east (SE) and south-west (SW) solution. The SW part of the preferred option is to move ILW from Oldbury to Berkely and FED from Oldbury to Hinkley for treatment. This would mean that there would be no ILW store or FED plant built at Oldbury. The SE part of the preferred option transfers FED from Sizewell to Dungeness. ILW from Dungeness is first moved to Bradwell and then, if that store becomes full, to Sizewell. This would mean that no store would be required at Dungeness and no FED plant would be required at Sizewell. These moves sit together as one integrated option that is equitable, changing one part of the option may jeopardise the whole option.

The decision regarding the option to be implemented, and approval of related investment in plant, is time sensitive and will be required early in FY 2014/15.

In the meantime, in order to screen sites for potential SDP ILW storage, we have worked on the basis that if, under the current preferred option there is not likely to be an ILW store present then the site is deemed probably not available to MOD, since ILW storage would be inconsistent with NDA's plans to move ILW storage away from the site. Where the preferred option currently states that there is likely to be an ILW store then we have stated that the site is potentially available.

It is important to note that NDA's strategic decision regarding Magnox consolidation will be made in order to maximize savings and maintain equity amongst the Magnox sites and will not be able to consider SDP implications. That decision will also need to take account of the plans that emerge from the successful bidder for the Magnox/RSRL competition. So inclusion in MOD's

shortlist of an NDA site that is currently deemed potentially available, but is the subject of ongoing NDA strategic decision making, carries programme risk for MOD, in that the site may subsequently become unavailable if the preferred option for the location of ILW stores and FED dissolution change.

When does the site enter a quiescence phase?

A number of our sites are heading towards an interim state where activity on the site will be minimal. During this phase it may be possible to have occasional imports of SDP ILW[8] but it would not be suitable to have any large scale building or commissioning works. The financial consequences of delaying the entry into these interim states are significant and far outweigh any potential national savings through collaboration with the MoD SDP process. Where commissioning of the store will not be completed by the time the site enters an interim/quiescence state then the site has been screened out and is not considered available for onward shortlisting.

The planning assumption SDP makes, and therefore we have made, is that the first package will be placed in the store in 2022. Arisings will be roughly once a year until all the packages are emplaced. The start date and rate for transfer to the GDF would be determined as part of GDF planning.

Are there any effects on NDA's Land and Property Management Strategy?

All sites within the NDA estate fit within the Land and Property Management Strategy. Certain aspects of the strategy will screen out certain sites as the building and operation of a store on the site would be counter to it. There may also be space constraints associated with the site that needs to be taken account of in the suitability/shortlisting process.

Is there any effect on the co-generation sites?

Where there is co-generation on sites within the NDA estate there may be ongoing discussions regarding different aspects of cooperation between the sites. No sites have been flagged as unavailable on this criterion but it should be taken account of when moving forward with the suitability/shortlisting process. The ILW consolidation consultation does consider co-generation sites and conversations are ongoing to see if a joint solution on ILW storage can be adopted.

This section, where appropriate, takes account of sites that may be affected by nuclear new build. Where we feel this has an effect on a certain site it will be flagged as an area in need of further investigation if the site is shortlisted.

[8] An assumption has been made that imports into a store on an occupied site in quiescence would be possible. Initial high level analysis around this has shown this to be an appropriate assumption at this stage in the process. If any sites that this effects are on the MoD SDP shortlist we would expect a more detailed assessment to be undertaken at that stage.

Individual site screening

The full screening process is shown in Appendix 1. The table below provides a summary of the availability of NDA sites. Where comments are identified these are used to either highlight the specific reasons for making a site not available, or highlight areas where we believe SDP may need to investigate further.

Site License Company	Site	Availability	Comments
Sellafield Ltd	Sellafield	Potentially Available	Sellafield is a complex sites with many and varied programmes. To date, implications to the Sellafield Programme of providing storage for SDP ILW have not been considered in detail, such work will be required if the site progresses into the MoD's shortlist. There may be an opportunity to co-locate SDP ILW in an existing store on Sellafield site rather than build a specific MoD store. Land near this site has been identified as a location for possible new nuclear build. Although not directly affecting the NDA programme we see this as an important potential programme risk to bring to the attention of the MoD.
Magnox Ltd	Berkeley	Probably Not Available	The site enters quiescence in 2021 – before the planned commissioning date for any new store.
	Bradwell	Probably Not Available	The site enters quiescence in 2015 – before the planned commissioning date for any new store.
	Chapelcross	Potentially Available	The site enters a period of interim quiescence in 2017, with reduced activity and personnel on site. This is not anticipated to have a significant impact the SDP process, but should be confirmed by MoD if the site is shortlisted. Initial studies have not highlighted any significant issues related to the site entering quiescence in 2028, however if this site is shortlisted it should be investigated further. The NDA is unsure on any implications/uncertainties there may be between MoD – SDP storage of ILW and the Scottish HAW Policy. Parts of the site have been designated an Enterprise zone, indications show that this would not cause space constraints for any potential store.

	Dungeness A	Probably Not Available	The site is currently part of the ILW Consolidation/FED Dissolution preferred option consultation. Under the preferred options this site would not have a store located on it. Importing SDP ILW on this site would foreclose this option and be inconsistent with the NDA not storing ILW on the site.
	Hinkley A	Potentially Available	This site is part of the ongoing ILW Consolidation/FED Dissolution preferred option consultation. Under the preferred options the site will have a store and so be available. However, the site carries significant risk for MoD SDP as the consultation is ongoing and there may be changes to the preferred option. Initial studies have not highlighted any significant issues related to the site entering quiescence in 2025, however if this site is shortlisted it should be investigated further. There may be logistical challenges associated with land availability due to current decommissioning activities. Discussions are ongoing regarding the consolidation of waste from co-generation sites. Land near this site has been identified as a location for possible new nuclear build. Although not directly affecting the NDA programme we see this as an important potential programme risk to bring to the attention of the MoD.
	Hunterston A	Probably Not Available	The site enters quiescence in 2022 – before the planned commissioning date for any new store.
	Oldbury	Probably Not Available	The site is currently part of the ILW Consolidation/FED Dissolution preferred option consultation. Under the preferred options this site would not have a store located on it. Importing SDP ILW on this site would foreclose this option and be inconsistent with the NDA not storing ILW on the site.

	Sizewell A	Potentially Available	This site is part of the ongoing ILW Consolidation/FED Dissolution preferred option consultation. Under the preferred options the site will have a store and so be available. However, the site carries significant risk for MoD SDP as the consultation is ongoing and there may be changes to the preferred option. Initial studies have not highlighted any significant issues related to the site entering quiescence in 2027, however if this site is shortlisted it should be investigated further. There may be logistical challenges associated with land availability due to current decommissioning activities. Discussions are ongoing regarding the consolidation of waste from co-generation sites. Land near this site has been identified as a location for possible new nuclear build. Although not directly affecting the NDA programme we see this as an important potential programme risk to bring to the attention of the MoD.
	Trawsfynydd	Probably Not Available	The site enters quiescence in 2016 – before the planned commissioning date for any new store.
	Wylfa	Probably Not Available	The site is still operational so waste plans not yet finalised. It is likely the volume of waste produced will be relatively small and could potentially be consolidated elsewhere. There would therefore be no store on site and it would be inconsistent to build a SDP store.

DSRL	Dounreay	Potentially Available	The entry date for quiescence of the site is scheduled to be between 2022 and 2025. Should the earlier part of the range be achieved this may cause programme challenges to the commissioning of an SDP store. If the later part of the date range is achieved then, similarly to other sites in quiescence during the import phase, it is unknown if quiescence will have a significant impact. When the site enters the interim end state the only task left will be emptying the store of the waste. No further decommissioning is required e.g. reactor buildings. The NDA is unsure on any implications/uncertainties there may be between MoD – SDP storage of ILW and the Scottish HAW Policy. It is noted that the site is a significant distance from either of the two identified dismantling sites for SDP. Rail travel would almost certainly have to be used for transport.
LLWR	LLWR	Probably Not Available	Storage of ILW would be inconsistent with the permitted land use. Land associated with LLWR is a strategic NDA asset.
RSRL	Harwell	Potentially Available?	Initial studies have not highlighted any significant issues related to the site entering quiescence in 2027, however if this site is shortlisted it should be investigated further. Sitting of a store for SDP ILW on Harwell site is inconsistent with the next planned use. The land at this site is not owned by the NDA but leased. It is seen as valuable and actively sort for uses outside of the nuclear industry such as light industry and housing. When the site enters the interim end state the only task left will be emptying the store of the waste. No further decommissioning is required e.g. reactor buildings.
	Winfrith	Probably Not Available	The site does not meet the functional specification as it is to be cleared to heath land by 2021.

Appendix 1 – Table outlining the SDP screening criteria/analysis

SLC	NDA SITE	Does the site meet the SDP ILW Functional Specification requirements?	Are there any current NDA consultations ongoing concerning the site?		When is the site due to enter quiescence?		Are there any effects on NDA's Land and Property Management Strategy?	Is there any effect on the co-generation sites?	Additional Comments
			ILW storage consolidation	FED Dissolution	Date	Comment			
Sellafield Ltd	Sellafield	Meets all aspects of the SDP ILW functional specification.	N/A	N/A	N/A	None	None	Land near this site has been identified as a possible location for nuclear new build. Although this does not directly affect the NDA programme, there may be an indirect effect. This should be taken into account when SDP undertake the suitability assessment and the subsequent consultation after shortlisting.	The NDA programme at the Sellafield Site is complex; it involves many activity streams, buildings and plant configurations that are not all fully defined. To date, implications to the Sellafield Programme of providing storage for SDP ILW have not been considered in detail, such work will be required if the site progresses into the MOD's shortlist. There may be an opportunity to co-locate SDP ILW in an existing store on Sellafield Site rather than build a specific MOD store. Further detailed investigation may reveal significant negative implications to the Sellafield programme that could prevent Sellafield from offering the ILW storage service to the MOD.
Magnox	Berkeley	Meets all aspects of the SDP ILW functional specification.	This site is part of the ongoing ILW Consolidation/FED Treatment preferred option consultation. Under the preferred options the site will have a store and so be available. However, the site carries significant risk for MoD – SDP as the consultation is ongoing and there may be changes to the preferred option		2021	Site due to enter quiescence before any potential store would be fully commissioned.	None	N/A	
	Bradwell	Meets all aspects of the SDP ILW functional specification.	This site is part of the ongoing ILW Consolidation/FED Treatment preferred option consultation. Under the preferred options the site will have a store and so be available. However, the site carries significant risk for MoD – SDP as the consultation is ongoing and there may be changes to the preferred option		2015	Site due to enter quiescence before any potential store would be fully commissioned	None	N/A	

SLC	NDA SITE	Does the site meet the SDP ILW Functional Specification requirements?	Are there any current NDA consultations ongoing concerning the site?		When is the site due to enter quiescence?		Are there any effects on NDA's Land and Property Management Strategy?	Is there any effect on the co-generation sites?	Additional Comments
			ILW storage consolidation	FED Dissolution	Date	Comment			
	Chapelcross	Meets all aspects of the SDP ILW functional specification.	N/A	N/A	Interim End State 2017 Final End State 2028	Site due to enter quiescence after any potential store would be fully commissioned however interim state may effects have not been fully investigated	Portion of the site has been defined as an Enterprise Zone by Scottish Enterprise and is allocated for commercial use within the Local Plans. The remaining land area still considered to be sufficient for any potential additional waste storage facility	N/A	Chapelcross is entering an interim quiescence state in 2017 where there is a reduced presence on site. We do not believe this will affect any ability for MoD to build a store but it has not been fully investigated. There are uncertainties regarding the interactions between MoD – SDP and Scottish HAW policy. An assumption was made at the beginning of the process that a site in a quiescent state would be able to import SDP ILW. There has been no work undertaken by us to understand the cost implications of this assumption.
	Dungeness A	Meets all aspects of the SDP ILW functional specification	The site is currently part of the ILW Consolidation/FED Treatment preferred option consultation. Under the preferred options this site would not have a store located on it. Importing SDP ILW on this site would foreclose this option and be inconsistent with the NDA not storing ILW on the site.		2027	Site due to enter quiescence after any potential store would be fully commissioned	Logistical requirements for current decommissioning programme may restrict land available for an additional waste storage facility	Ongoing discussions regarding consolidation of co-generation site waste	
	Hinkley A	Meets all aspects of the SDP ILW functional specification	This site is part of the ongoing ILW Consolidation/FED Treatment preferred option consultation. Under the preferred options the site will have a store and so be available. However, the site carries significant risk for MoD – SDP as the consultation is ongoing and there may be changes to the preferred option.		2025	Site due to enter quiescence after any potential store would be fully commissioned	Logistical requirements for current decommissioning programme may restrict land available for an additional waste storage facility	Ongoing discussions regarding consolidation of co-generation site waste. Land near this site has been identified as a possible location for nuclear new build. Although this does not directly affect the NDA programme, there may be an indirect effect. This should be taken into account when SDP undertake the suitability assessment and the subsequent consultation after shortlisting.	An assumption was made at the beginning of the process that a site in a quiescent state would be able to import SDP ILW. There has been no work undertaken by us to understand the cost implications of this assumption.

SLC	NDA SITE	Does the site meet the SDP ILW Functional Specification requirements?	Are there any current NDA consultations ongoing concerning the site?		When is the site due to enter quiescence?		Are there any effects on NDA's Land and Property Management Strategy?	Is there any effect on the co-generation sites?	Additional Comments
			ILW storage consolidation	FED Dissolution	Date	Comment			
	Hunterston A	Meets all aspects of the SDP ILW functional specification.	N/A	N/A	2022	Site due to enter quiescence before any potential store would be fully commissioned.	None	Ongoing discussions regarding consolidation of co-generation site waste	
	Oldbury	Meets all aspects of the SDP ILW functional specification.	The site is currently part of the ILW Consolidation/FED Treatment preferred option consultation. Under the preferred options this site would not have a store located on it. Importing SDP ILW on this site would foreclose this option and be inconsistent with the NDA not storing ILW on the site.		2027	Site due to enter quiescence after any potential store would be fully commissioned.	None	Land near this site has been identified as a possible location for nuclear new build. Although this does not directly affect the NDA programme, there may be an indirect effect. This should be taken into account when SDP undertake the suitability assessment and the subsequent consultation after shortlisting.	
	Sizewell A	Meets all aspects of the SDP ILW functional specification	This site is part of the ongoing ILW Consolidation/FED Treatment preferred option consultation. Under the preferred options the site will have a store and so be available. However, the site carries significant risk for MoD – SDP as the consultation is ongoing and there may be changes to the preferred option		2027	Site due to enter quiescence after any potential store would be fully commissioned.	Logistical requirements for current decommissioning programme may restrict land available for an additional waste storage facility	Ongoing discussions regarding consolidation of co-generation site waste Land near this site has been identified as a possible location for nuclear new build. Although this does not directly affect the NDA programme, there may be an indirect effect. This should be taken into account when SDP undertake the suitability assessment and the subsequent consultation after shortlisting.	An assumption was made at the beginning of the process that a site in a quiescent state would be able to import SDP ILW. There has been no work undertaken by us to understand the cost implications of this assumption
	Trawsfynydd	Meets all aspects of the SDP ILW functional specification.	No consolidation planned	N/A	2016	Site due to enter quiescence before any potential store would be fully commissioned.	Optioneering currently underway by Welsh Government to establish creditable commercial opportunities for the site. Remaining land area still considered to be sufficient for additional waste storage facility.	N/A	

SLC	NDA SITE	Does the site meet the SDP ILW Functional Specification requirements?	Are there any current NDA consultations ongoing concerning the site?		When is the site due to enter quiescence?		Are there any effects on NDA's Land and Property Management Strategy?	Is there any effect on the co-generation sites?	Additional Comments
			ILW storage consolidation	FED Dissolution	Date	Comment			
	Wylfa	Meets all aspects of the SDP ILW functional specification	While the plant is still operating the ILW Storage Consolidation consultation highlights that no options have been identified for consolidation of waste. Waste could be consolidated to or from the site in the future. There is little waste anticipated to be arising from this site. Storing SDP waste on this site would preclude future options available to the NDA for future ILW management	N/A	2025	Site due to enter quiescence after any potential store would be fully commissioned	Logistical requirements for current decommissioning programme may restrict land available for an additional waste storage facility.	Land near this site has been identified as a possible location for nuclear new build. Although this does not directly affect the NDA programme, there may be an indirect effect. This should be taken into account when SDP undertake the suitability assessment and the subsequent consultation after shortlisting.	
DSRL	Dounreay	Meets all aspects of the SDP ILW functional specification	N/A	N/A	2022 - 2025	Earliest possible quiescence date could cause SDP commissioning risk	When Dounreay enters interim end state the only task left will be emptying the store of the waste. No further decommissioning is required e.g. reactor buildings.	N/A	Dounreay has a date range for entering quiescence, the earlier date overlapping the date given for first SDP waste import. NDA is striving to meet the earlier date but accepts there is currently a range. There are uncertainties regarding the interactions between MoD – SDP and Scottish HAW policy. An assumption was made at the beginning of the process that a site in a quiescent state would be able to import SDP ILW. There has been no work undertaken by us to understand the cost implications of this assumption. It is noted that Dounreay is a significant distance from either of the two identified dismantling sites for SDP. Rail travel would almost certainly have to be used for transport.

SLC	NDA SITE	Does the site meet the SDP ILW Functional Specification requirements?	Are there any current NDA consultations ongoing concerning the site?		When is the site due to enter quiescence?		Are there any effects on NDA's Land and Property Management Strategy?	Is there any effect on the co-generation sites?	Additional Comments
			ILW storage consolidation	FED Dissolution	Date	Comment			
LLWR	LLWR	Meets all aspects of the SDP ILW functional specification.	N/A	N/A	N/A	None	Would not be consistent with current permitted land use. The land associated with LLWR is a valuable strategic asset for the NDA. It is not considered suitable to use this for the storage of SDP ILW.	N/A	
RSRL	Harwell	Meets all aspects of the SDP ILW functional specification.	N/A	N/A	2027	Site due to enter quiescence after any potential store would be fully commissioned.	Siting of a store for SDP ILW on Harwell site is inconsistent with the next planned use. The land at this site is not owned by the NDA but leased. It is seen as valuable and actively sort for uses outside of the nuclear industry such as light industry and housing. When Harwell enters interim end state the only task left will be emptying storage of the waste. No further decommissioning is required e.g. reactor buildings.	N/A	An assumption was made at the beginning of the process that a site in a quiescent state would be able to import SDP ILW. There has been no work undertaken by us to understand the cost implications of this assumption.
	Winfrith	The site does not meet the SDP ILW functional specification as it enters end state before durnig the storage period	N/A	N/A	2021	The current baseline puts the Winfrith site into an end state by 2021 with none of the required infrastructure in place to support SDP storage operations.	Would not be consistent with the agreed end use of public access health-land which the current site restoration programme will deliver by 2021	N/A	

Annex 7: Habitats Regulations Assessment

SUBMARINE DISMANTLING PROJECT

Draft
Habitats Regulations Assessment for Interim Intermediate Level Waste Storage Site Selection

Issue 1.0 – August 2014

MINISTRY OF DEFENCE

Defence Infrastructure Organisation

Document Information

Project Name:	**Submarine Dismantling Project**	
Document Title:	**Main Gate Approval - Habitats Regulations Assessment**	
Issue Status:	Issue 0_2 (Draft)	**Deliverable Reference:**
Produced By:	DIO ODC IPS Conservation	**Level of Control:**

Document Authorisation

Owner:	[redacted]	**Peer Reviewer**	
Author:	[redacted]	**Committee Endorsement:**	
Editorial Checker:	[redacted]	**Technical Checker:**	
Document Approver:	[redacted]	**Approver's Signature:**	[redacted]
Document Authoriser:		**Authoriser's Signature:**	

Document Revisions

Version No.	Details	Date
0.1	Initial draft	17 July 2014
0.2	Revised Draft	23 July 2014
1.0	Final Draft HRA for Release with SEA Consultation	25 July 2014
1.1	Revised Draft	
2.0	Final HRA for Main Gain Business Case Decision	

Conditions of Use

MOD Form 2223 (Revised)

Habitats Regulations Assessment (HRA)[1]

Consideration of Plan/ Project (PP) Judgement of Likely Significant Effect (JLSE) and/ or Appropriate Assessment (AA)

This Decision Form should be completed in conjunction with guidance provided in Section 5 of the Sustainability and Environmental Appraisal Tools (SEAT) Handbook for the MOD Estate, and the DIO Practitioner Guidance – Designated Sites. For an explanation of the terms used see the Practitioner Guidance. Copies of all completed Habitats Regulations Assessment forms should be submitted to:

Post: [redacted]

Email: [redacted]

Plan/Project: MOD Submarine Dismantling Project (SDP) Interim Intermediate Level Waste (ILW) Storage.

Name of Natura 2000 and Ramsar site(s):

The following Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites have been identified as being within 20 km of the SDP candidate interim ILW storage sites or otherwise potentially affected by the SDP

AWE Burghfield	Thames Basin Heaths SPA
	Kennet & Lambourn Floodplain SAC
	Hartslock Wood SAC
	River Lambourn SAC
AWE Aldermaston	Thames Basin Heaths SPA
	Kennet & Lambourn Floodplain SAC
	Hartslock Wood SAC
	River Lambourn SAC
	Kennet Valley Alderwoods SAC
Capenhurst Nuclear Services	Dee Estuary SAC
	Dee Estuary Ramsar
	Dee Estuary SPA
	Mersey Estuary SPA
	Mersey Estuary Ramsar
	Midland Meres & Mosses - Phase 1 Ramsar
	Midland Meres & Mosses Phase 2 Ramsar
	West Midlands Mosses SAC

1 The 'Habitats Regulations' differ between UK nations: England and Wales - The Conservation of Habitats and Species Regulations 2010 SI 2010/490; Scotland - The Conservation (Nature Habitats, etc.) Regulations 1995 (as amended in Scotland); Northern Ireland - The Conservation (Nature Habitats, etc.), Regulations (Northern Ireland) 1995 SI 95/380

	Oak Mere SAC
Sellafield	Lake District High Fells SAC
	River Ehen SAC
	North Pennine Dales Meadows SAC
	Drigg Coast SAC
	Wast Water SAC
Chapelcross	Upper Solway Flats & Marshes SPA
	South Solway Mosses SAC
	Upper Solway Flats & Marshes Ramsar

Other Competent Authority Consents, Permissions and Authorisations:

The Habitats Regulations (Reg. 65 in England and Wales; Reg 52 in Scotland & NI) state that a competent authority is not required to assess the implications of a plan or project, which would be more appropriately assessed by another competent authority. Where more than one competent authority is involved there should be agreement as to which will act as the lead competent authority. This form should only be used if MOD is agreed as the lead competent authority and regard must be given to the views of the other competent authorities involved.

The Submarine Dismantling Project (SDP) is a national programme which consists of seven broad stages of work, some of which involve (or will involve in the future) a number of site options across the UK. The MOD will take decisions on preferred options and for each stage, and for the overall the SDP, and as such is the only Competent Authority for this 'Plan-level' HRA.

A wide range of other Public Bodies have been consulted through the SDP Strategic Environmental Assessment 2011 (SEA)[2] and the SDP Interim Intermediate Level Waste Storage Site Selection Strategic Environmental Assessment Environmental Report, to which this HRA is annexed.

Irrespective of the final site chosen as the preferred location for the proposed interim ILW store, project-level EIA will be required as the proposed interim ILW store is 'Schedule 1 Development' and an Environmental Statement must be prepared to accompany the planning application. The project-level EIA will reconsider whether there could be any likely significant effects on the environment as a result of the project and provide a description of measures envisaged to prevent, reduce and where possible offset any such significant adverse effects including those, if identified at that time, on any SPA/SAC/Ramsar Sites.

Are there any other designated sites which may be affected by this PP, or are there any other relevant nature conservation issues?

This is not required as part of the Habitats Regulations Assessment process, but identification of any other biodiversity conservation issues supports MOD's statutory biodiversity obligations.

The SDP Interim Intermediate Level Waste Storage Site Selection Strategic Environmental Assessment Environmental Report identifies other designated sites and relevant nature conservation issues which may be affected by this Plan. These issues are not considered further in this HRA.

2 Strategic Environmental Assessment for the MOD Submarine Dismantling Project. Available from www.mod.uk/submarinedismantling

Introduction

Summary of the requirement for HRA and the purpose of this report.

1.1 This HRA has been prepared by Defence Infrastructure Organisation (DIO), on behalf of the Ministry of Defence in respect of Defence Equipment and Support Submarine Dismantling Project, Interim Intermediate Level Waste (ILW) Storage Site Selection in accordance with the EC Habitats Directive (92/43/EEC) and transposing Regulations. The Habitats Regulations (Reg. 61 in England and Wales; Reg 48 in Scotland & NI) require that a Competent Authority carries out an Appropriate Assessment (AA) before deciding to undertake, or give any consent, permission or other authorisation for a plan or project which is likely to have a significant effect on a European site.

1.2 This Plan-Level HRA uses the MOD's standard HRA Form, which was primarily developed for Project-Level HRAs. The MOD HRA process and template are set out in the MOD Sustainability and Environmental Appraisal Tools (SEAT) Handbook. The Form format, text and annexed tables have been adapted to follow guidance[3] and examples of Plan-Level HRAs for National Policy Statements and Regional Spatial Strategies[4].

1.3 The overall process of assessing a plan or project under the Habitats Regulations is generally referred to as HRA. The stages to be followed under the HRA process are set out in Box 1 and Figure 1 overleaf. In brief, this report covers:

- Stage 0: Screening of the SDP Interim Intermediate Level Waste Storage Site Selection against the requirement for HRA.

- Stage 1: 'Judgement of Likely Significant Effects' (JLSE), identifying aspects of the SDP Interim Intermediate Level Waste Storage Site Selection that may result in impacts on Natura 2000 and Ramsar Sites; identifying sites that could be affected; and for those European sites that may be affected, to assess whether there are any possible significant effects (alone or in combination with other projects)

1.4 This HRA has been undertaken at a strategic 'plan or programme' level. HRA at this level necessarily requires a broader approach than a project-level assessment. In particular, it is acknowledged in EC and UK guidance that at this level there are usually limitations and uncertainties in predicting the effects, and hence how such effects can be avoided or mitigated. A precautionary approach is required to ensure that assessment is not deferred or delegated to the project level and possible adverse effects are not overlooked within the plan level assessment, but also a proportionate approach is required *"that recognises the more general nature of plans, and does not unnecessarily or unreasonably prevent or impede the adoption of plans. If the implications of uncertainty are taken to an extreme, it would be impossible for many plans ever to meet such an extreme*"."[5]

[3] Assessing Development Plans in Terms of the Need for Appropriate Assessment, Scottish Executive, May 2006; Planning for the Protection of European Sites: Appropriate assessment, DCLG August 2006; Appropriate Assessment of Plans, Scott Wilson, Levett-Therivel Sustainability Consultants, Treweek Environmental Consultants and Land Use Consultants, September 2006

[4] e.g. National Flood and Coastal Erosion Risk Management Strategy HRA 2011, Wastewater NPS HRA 2011, Appropriate Assessment of the Draft South East Plan Implementation Plan, 2006; Appropriate Assessment of the Draft South East Plan, 2006; Habitats Regulations Assessment of the Draft Regional Spatial Strategy for the South West, 2007; Habitats Regulations Assessment of the North West Regional Spatial Strategy, 2008

[5] HABITATS REGULATIONS APPRAISAL OF PLANS: GUIDANCE FOR PLAN-MAKING BODIES IN SCOTLAND VERSION 2.0 AUGUST 2012 http://www.snh.gov.uk/docs/B1116296.pdf

1.5 The HRA has been undertaken alongside Strategic Environment Assessment (SEA) of the SDP Interim Intermediate Level Waste Storage Site Selection. The SEA (Reference A) aims to identify, describe and evaluate any likely significant environmental effects of implementing the SDP Interim Intermediate Level Waste Store on any of the five candidate sites, with a view to promoting sustainable development. It has been undertaken in accordance with the SEA Regulations[6], and as such it appraised the effects of implementing the SDP on, amongst other things, biodiversity. As data and information are common to the SEA and HRA processes, the detailed analysis is presented in the SEA and summarised in this HRA. This MOD HRA Form is not intended to be a standalone document and must be read alongside the SEA.

References:

A. Defence Equipment and Support Submarine Dismantling Project – Interim Intermediate Level Waste Storage Site Selection: Strategic Environmental Assessment Environmental Report.

B. MOD SDP Main Gate Business Case 1 – Submarine Dismantling Project Demonstration Phase, November 2012 [RESTRICTED-COMMERCIAL]

C. Defence Equipment and Support Submarine Dismantling Project – Strategic Environmental Assessment, October 2011. Available at www.mod.uk/submarinedismantling

D. MOD SDP HRA, March 2011. Available at www.mod.uk/submarinedismantling

E. Defence Equipment and Support Submarine Dismantling Project – Strategic Environmental Assessment Post-Adoption Report March 2013 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/229357/20130315-SDP_SEA_PAR_V1_0_updated-U.pdf

F. Submarine Dismantling Project Environmental Statement January 2014 http://www.hse.gov.uk/consult/condocs/rosyth-royal-dockyard/documentation.htm

G. Defence Equipment and Support Submarine Dismantling Project - Intermediate-Level Waste Storage Site Selection: Strategic Environmental Assessment Scoping Report February 2014https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/279002/20140204-SDP_SEA_Scoping_Rpt_REDACTED_FINAL-clean-U.pdf

Annexes:

A1 Map of SPAs, SACs & Ramsar Sites within 20 km or otherwise potentially affected by potential SDP interim ILW storage at AWE Burghfield
A2 Map of SPAs, SACs & Ramsar Sites near within 20 km or otherwise potentially affected by potential SDP interim ILW storage at AWE Aldermaston
A3 Map of SPAs, SACs & Ramsar Sites within 20 km or otherwise potentially affected by potential SDP interim ILW storage at Capenhurst
A4 Map of SPAs, SACs & Ramsar Sites within 20 km or otherwise potentially affected by potential SDP interim ILW storage at Sellafield
A5 Map of SPAs, SACs & Ramsar Sites within 20 km or otherwise potentially affected by potential SDP interim ILW storage at Chapelcross

[6] The Environmental Assessment of Plans and Programmes Regulations 2004 (SI No. 1633).

Box 1: Summary of the Stages of HRA

Stage 0 Screening - Is the proposal a 'plan' or 'project' requiring assessment under the Habitats regulations

Stage 1 Judgement of Likely Significant Effects– for plans that are not directly connected with or necessary for site management, this involves identifying the likely effects of the plan or project upon European Sites, either alone or in-combination with other projects or plans, and assessing whether these effects are likely to be significant. If significant adverse effects cannot be excluded on the basis of objective evidence (reflecting the Waddenzee judgement it is necessary to undertake an Appropriate Assessment of the implications for the European Sites in view of the sites' conservation objectives.

Stage 2 Appropriate Assessment – where significant adverse effects cannot be ruled out, this stage assesses the effects of the plan or project on the integrity of the relevant European Sites, either alone or in-combination with other projects or plans, with respect to the sites' structure and function, and its conservation objectives. Where there are adverse effects, it also includes an assessment of the potential mitigation for those effects. Following the Appropriate Assessment, permission can only be granted (without proceeding to Stage 3 below) if it is certain that there will be no adverse effect on the integrity of European Sites, i.e. no reasonable scientific doubt remains (again reflecting the Waddenzee judgement).

Stage 3 Assessment of Alternatives – if the Appropriate Assessment cannot conclude that there will be no adverse effect on the integrity of European Sites, and this effect cannot be removed by conditions or other restrictions, there is a requirement to examine any alternatives to the plan (or part of the plan) or project (including sites or different approaches) with a view to determining whether there are any feasible alternatives that will have no adverse effect or a lesser adverse effect on the integrity of European Sites. If feasible alternatives exist, they should be subject to assessment under Stage 1 or 2 above, as appropriate, and if these have no (or a lesser effect) on European Sites then the plan or project as proposed cannot go ahead.

Stage 4. Assessment where no Feasible Alternatives exist – if there are no feasible alternative solutions that would have no (or a lesser effect) on European Sites then the plan or project can only proceed if there are imperative reasons of overriding public interest (IROPI). If this is the case, it will be necessary to implement measures to compensate for remaining adverse impacts, so as to ensure the overall coherence of the Natura 2000 network.

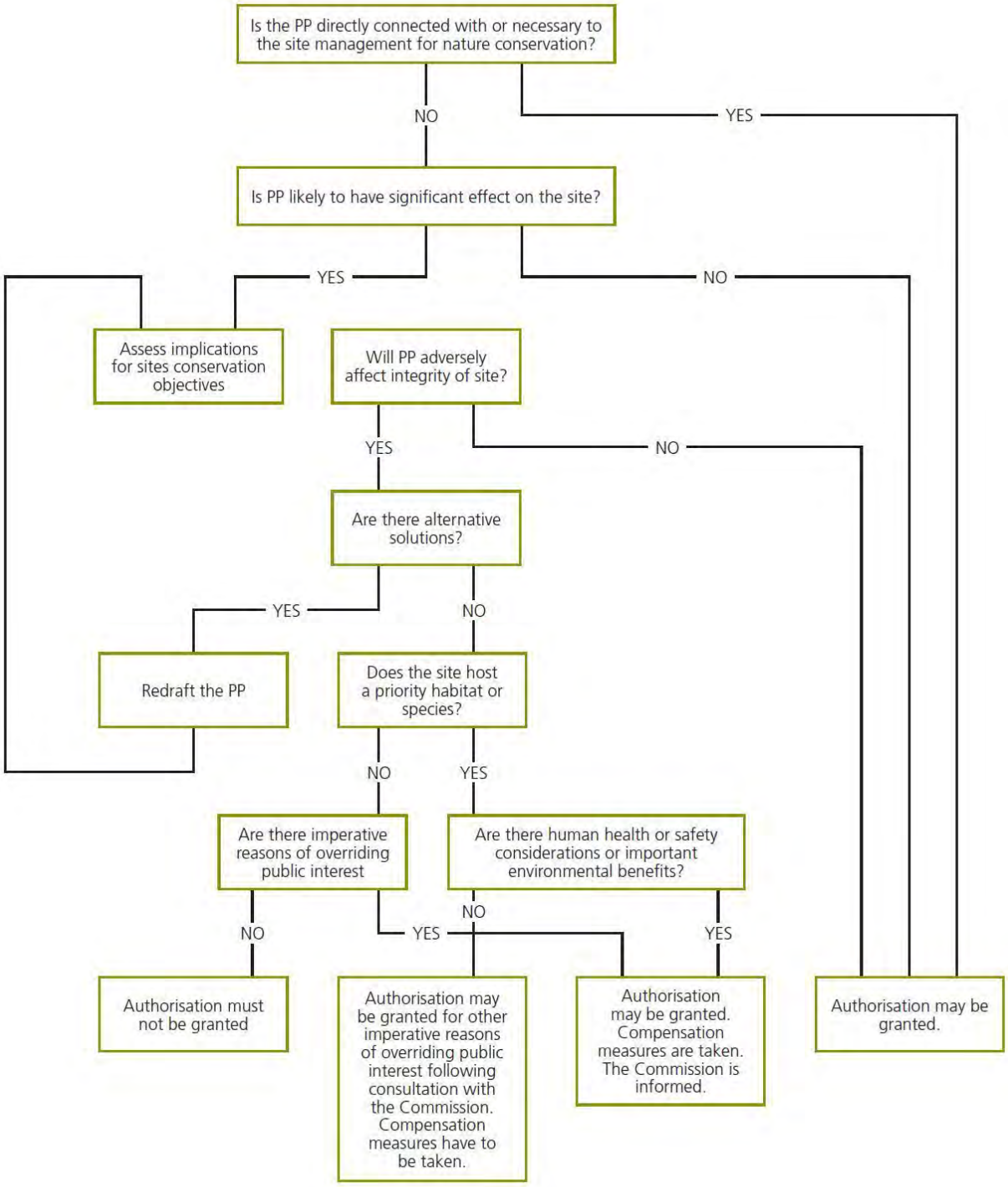


Figure 1 provides a graphical representation of the key stages in the HRA process.

Summary of the Project
Full details of the plan/project should be referenced or Annexed. This section provides summary details.

2. What are the Plan/ Project proposals?

2.1 The overall aim of the SDP is to define, develop, procure and implement a timely solution for the dismantling and disposal of the UK's redundant, defueled nuclear powered submarines. The project (which was set up in 2000 as Project ISOLUS) will provide an alternative to the continued afloat storage of the defueled submarines, which will include the interim storage of Intermediate Level Waste (ILW) and the eventual disposal of ILW to the proposed UK Geological Disposal Facility (GDF).

2.2 The scope of the SDP, which extends over a several decades, encompasses the following:

- provision of facilities and expertise to dismantle 27 Royal Navy nuclear submarines once defueled, re-using and recycling as much non-radiological material as possible;
- provision of interim, land-based storage for the resulting ILW until at least 2040, pending the availability of the proposed GDF; and
- the eventual decommissioning of the dismantling and storage facilities used in this process.

2.3 The seven key stages of the overall SDP are summarised in **Box 2 (overleaf)**. The Interim ILW Storage Site Selection SEA (Reference A) and this HRA consider stages II, V, VI, VII.

2.4 Following approval of the project's first Main Gate Business Case (MGBC1), (Reference B, and accompanying SEA and HRA at References C and D) the MOD announced in March 2013 that the RPVs will be removed from the submarines and stored intact. All radioactive materials will be removed from the submarines in situ, at Rosyth (where seven boats are stored) and at Devonport (where 11 boats are stored and where the remaining nine boats, which are still in service, will be stored once they have left service). The first submarine will be dismantled at Rosyth as a demonstration of the radioactive waste removal process. The completion of this demonstration, however, is subject to a storage solution being agreed for the RPVs and any necessary planning approvals obtained.

2.5 In the first instance, the low-level waste (LLW) will be removed from the submarines and sent for disposal at existing licensed facilities such as the UK LLW repository (LLWR). Once the necessary approvals and permits have been received for the construction of the interim intermediate-level radioactive waste (ILW) storage facility, the RPVs will be removed intact so that they can be sent there for storage until the UK's planned Geological Disposal Facility (GDF) is developed. The original intent had been to propose a specific interim ILW storage site in the MGBC1 submission. However, it was decided not to compare specific storage sites at that stage because of the different contexts and developing strategies affecting different types of site.

2.6 Now that MGBC1 decisions have been taken, a further stage of analysis and public consultation is necessary to determine the specific interim ILW storage site. Stakeholders recommended that the SDP's analysis must consider all potential storage sites, including NDA sites, on a 'level playing field'. The SDP received legal advice that this would also be the most

robust approach in demonstrating a rational and transparent site selection process, and so the project's Screening and Option Assessment processes have been designed on that basis.

2.7 Following assessment against multiple criteria the MOD produced in 2014 a provisional short list of 5 candidate sites suitable for SDP interim ILW storage. These are AWE Burghfield, AWE Aldermaston, Capenhurst Nuclear Services, Sellafield and Chapelcross.

Box 2 Key Stages, Activities and Options of the SDP

(elements addressed in this HRA are underlined)

At this stage, the SDP is a national programme consisting of a number of broadly sequential stages, which may, however, overlap or coincide:

Stage I: Design and develop the initial submarine dismantling facilities - This involves providing the means (essentially the facilities, processes and personnel) to safely dock the defuelled submarines and remove the radioactive materials.

Stage II: Design and develop the interim ILW storage facilities - This involves providing the means (facilities, processes and personnel) to safely store the arising ILW, until such time as the proposed GDF becomes available to the SDP.

Stage III: Dock submarines and remove the radioactive material- This involves docking the defuelled submarines into the dismantling facility before removing and processing the radioactive material, in accordance with industry good practice.

Stage IV: Dismantle the residual submarine hulls and process wastes- This involves recovering re-useable components and then taking the rest of each submarine apart in accordance with appropriate industry good practice, producing recyclable and non-recyclable waste streams. To make the best use of existing skills and to maximise value for money, the residual submarine hulls would be transported to an established commercial ship recycling facility in the UK, since (unlike the radioactive materials) these sections do not need to be processed at a Nuclear Licensed or Authorised site. Low Level Waste would be taken away to a Licensed disposal facility, and very Low Level Waste would, once cleared, be handled in conventional waste streams.

Stage V: Transport Reactor Compartment (RC) / Reactor Pressure Vessel (RPV) / Packaged Waste (PW) to interim storage- This involves transporting the ILW from the dismantling facility/ies to interim storage. The types of transport used to move the ILW will depend upon the size of the packages, the location(s) of the dismantling and storage facilities and the availability of suitable transport infrastructure.

Stage VI: Size reduce the RC / RPV (if required); transfer PW to the proposed GDF- If the RPV is cut apart ('size reduced') to packaged waste at Stage III, this stage will solely involve transporting the containers to the proposed GDF. If, however, initial dismantling at Stage III involves separation of the RC or removal of the RPV, this Stage will see these components being size reduced to Packaged Waste before being transported to the proposed GDF.

Stage VII: Decommission the SDP facilities- This involves safely decommissioning the dismantling and interim storage facilities, and returning them to a condition that is consistent with any proposed future use. It is assumed that this would be back to their original condition.

HRA Stage 0: Consideration of Plans and Projects under the Habitats Regulations

The European Court of Justice has widely interpreted what is meant in the Directive by a 'plan or project'. EC guidance[7] notes that: "…the Directive does not circumscribe the scope of either 'plan' or 'project' by reference to particular categories of either. Instead, the key limiting factor is whether or not they are likely to have a significant effect on a site". However this guidance also states that "a distinction needs to be made with 'plans' which are in the nature of policy statements i.e. policy documents which show the general political will or intention of the ministry or lower authority."

Plans or parts of plans which are merely general policy statements, or which only show the general political will or intention of a public body, will not be likely to have a significant effect on a European site.

However, it is a case-by-case decision as to whether a plan should be subject to appraisal, a critical test being whether it, or any part of it, would be likely to have a significant effect on a European site. A plan-making body should seek legal advice if in doubt.[8]

3. Is the SDP a Plan or Project?

3.1 This is a record of the consideration undertaken by Defence Infrastructure Organisation, on behalf of the Ministry of Defence, to determine whether the above proposal is a 'plan or project' in terms of the EC Habitats Directive (92/43/EEC) and transposing regulations, and to determine whether the PP is directly connected with or necessary to the [conservation] management of the site.

3.2 All of the relevant government departments and regulatory bodies for England, Scotland and Wales have been consulted on the requirement for SEA and HRA. The conclusions of this consideration are in accordance with their advice and recommendations.

a) Is the proposal a 'plan or project' in terms of the EC Habitats Directive (92/43/EEC) and transposing regulations? **YES**

b) Is the PP directly connected with or necessary to the [conservation] management of the site concerned? **NO**

[7] EC, 2000, Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC April 2000, section 4.3 http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf

[8] Habitats Regulations Appraisal of Plans Guidance for Plan-Making Bodies in Scotland Version 2.0 August 2012 http://www.snh.gov.uk/docs/B1116296.pdf

HRA Stage 1: Judgement of Likely Significant Effects (JLSE)

This section should consider the implications of the Plan or Project on the conservation objectives of the sites concerned. It should outline any avoidance or mitigation measures that have already been integrated into the P/P, and any remaining residual effects, both alone and in combination with any other relevant plans and projects that are likely to have residual effects on the site. The technical consideration may be presented in an accompanying report or Environmental Statement, but should be summarised in Annexed Tables. The technical consideration should refer to favourable condition tables for each feature, and for European Marine sites to relevant "Regulation 33 advice". Impacts may include for example, physical habitat loss, physical habitat damage, non-toxic contamination, toxic contamination, noise disturbance, visual disturbance (not exhaustive)

4. What International Designations may be affected by this Plan or Project?

4.1 The following SPAs, SACs and Ramsar Sites are within 20km[9] or otherwise potentially affected by the SDP:

AWE Burghfield	Thames Basin Heaths SPA	~8km
	Kennet & Lambourn Floodplain SAC	~16km
	Hartslock Wood SAC	~13km
	River Lambourn SAC	~17km
AWE Aldermaston	River Lambourn SAC	~8km
	Hartslock Wood SAC	~13km
	Thames Basin Heaths SPA	~14km
	Kennet Valley Alderwoods SAC	~16km
	Kennet & Lambourn Floodplain SAC	>20km
Capenhurst Nuclear Services	Mersey Estuary SPA	~7km
	Mersey Estuary Ramsar	~7km
	Dee Estuary SAC	~8km
	Dee Estuary Ramsar	~8km
	Dee Estuary SPA	~8km
	River Dee and Bala Lake SAC	~8km
	Midland Meres & Mosses Phase 1 Ramsar	~15km
	Midland Meres & Mosses Phase 2 Ramsar	~15km
	West Midlands Mosses SAC	>20km
	Oak Mere SAC	>20km
Sellafield	Drigg Coast SAC	~5km
	Lake District High Fells SAC	~11km
	River Ehen SAC	~11km
	Wast Water SAC	~12km
	North Pennine Dales Meadows SAC	~17km
Chapelcross	Upper Solway Flats & Marshes SPA	~5km
	South Solway Mosses SAC	~5km
	Upper Solway Flats & Marshes Ramsar	~5km

[9] This 20km study area was recommended in previous rounds of consultation with Statutory Bodies and Other Government Departments

5. What are the qualifying interest features of the SPA/SAC/Ramsar Sites and their associated conservation objectives?

5.1 The lists of qualifying interest features of each site are available on the Joint Nature Conservation Committee web site http://jncc.defra.gov.uk/

What are the possible impacts of the Plan/Project?

5.2 The interim ILW storage SEA is based on he following assumptions about Implementing ILW Storage (taken from Reference A):

SDP Stage / Activity	Elements of Each Activity Which Could have an Environmental Impact
Stage II: Design and develop the interim ILW storage facilities	Store design: • Building currently estimated to be approximately 20 m tall • Building footprint will be approximately 2,100 m^2 with a 50% contingency which if required would increase the footprint by 1050m^2 to 3150m^2 [10] • Adjacent 11 kV electricity sub-station may be required subject to power requirements and existing site infrastructure availability and capacity • 100-year design life of the interim ILW storage facility, with allowance for periodic intervention and upkeep (e.g. replacement of cladding) • Construction of the facility would take in the region of one year Typical construction activities associated with a large industrial-type storage building. These may include: • Heavy machinery and plant (e.g. bulldozers, dumper trucks, cranes), small-scale on-site power generation and powered equipment / tools • Temporary accommodation during construction • Arrival and presence of construction site staff (assumed to be fewer than 100 full-time equivalent staff) • Deliveries of construction materials • Site / vegetation clearance and exposure of bare earth, plus excavation • Materials storage mounds and fenced-off areas • Erection of the interim storage facility • Transport for removal of construction wastes
Stage V: Transport Reactor Pressure Vessel (RPV) / to interim storage Stage VI: Transfer RPV to the proposed GDF	• Transport of an RPV package weighing up to 135 tonnes by a specialised road vehicle *[NB if at a later date the SDP proposes transport by sea, further assessment may be required]* • It is envisaged there would be one delivery per year on average but with a maximum of three deliveries in any one year • No road closures are anticipated on strategic highway network. However there may be some restrictions on local roads close to site • Transport will be managed to minimise effects on the environment. Nuclear and security aspects of RPV transport will be subject to strict regulation *[NB this stage of the overall SDP potentially includes size reduction of the*

[10] This is the maximum size envisaged, assuming that a new store is required (rather than extension of an existing, shared store), and that the detailed size can only be ascertained by the site licensed contractor during detailed design. The figures presented represent current 'best estimate' sizes.

SDP Stage / Activity	Elements of Each Activity Which Could have an Environmental Impact
	RPV before storage in the GDF. Options for this element of the programme have not been yet been developed or assessed]
Stage V: ILW Storage Facility Operation	• RPV transport (see above) and placement of shielded containers using lifting machines or overhead crane • Limited operational staff (employment generation at the site would be minimal – fewer than 10 full-time equivalent jobs per year) • Commuting of limited operational staff – potential use / reallocation of existing site staff • Small numbers of HGVs delivering materials or for site waste collection • Building maintenance, assuming a 100-year design life, noting that the majority of operational period will be passive storage (closed and locked facility) • Connection into existing site drainage if required. With exception of electricity, minimal services required. Requirements for water, drainage, telecommunications, etc. would be to service basic welfare facilities • RPVs stored in shielded containers; store itself unshielded. • Potential for occasional maintenance of the RPV transport containers involving them being moved within the facility • It is highly unlikely that degradation of the waste package will be required before the end of interim storage. It is assumed that the container will not be suitable for onward transport and repackaging will be required at the end of interim storage. The discarded packaging would not be radioactive. . • The 50% footprint contingency footprint (mentioned above) will add the capacity to repackage RPVs if required • Use of mobile lifting plant such as a straddle carrier to move RPVs within the store • Loading of the repackaged RPVs onto road vehicles for transport to the size reduction facility or GDF (near end of operation) • Under normal operation there would be no discharges to air, water or soil from the ILW interim storage facility and therefore there would be no requirement to vary existing site permits / authorisations
Stage VII: Decommissioning (assuming facility will be removed)	• Disconnecting existing services (e.g. electricity, drainage and water supply) • Set up demolition site compounds / areas • Transport (arrival / departure) of demolition equipment, e.g. dumper trucks and hydraulic excavators • Commuting site staff • Removal of superstructure and substructure • Reinstatement of footprint area for subsequent use • Collection and removal of demolition waste for disposal or recycling • Identification of an appropriate after use for the site

5.3 The Maps at Annexes A-1 to A-5 show that none of the candidate storage sites are located significantly closer than 5km from a SPA / SAC / Ramsar site.

5.4 No impact pathways to SPA/SAC/Ramsar Sites are anticipated during design, construction and decommissioning of the ILW store. These activities will be subject, as a prerequisite for them commencing, to regulatory oversight, nuclear safety cases and construction best practice (e.g. construction environmental management plans, construction transport planning etc). Land quality assessments and land characterisation studies will be required and appropriate management and remedial measures will limit or prevent mobilisation of

contaminants. Under legislation, risks must be managed to As Low As Reasonably Practicable (ALARP)/ As Low As Reasonably Achievable (ALARA).

5.5 No pathways to SPA/SAC/Ramsar sites are anticipated during operation of the storage facility. The store will be largely passive. It is not anticipated to produce any radioactive emissions or discharges to the environment and risks will be managed to ALARP/ALARA. Throughout the lifetime of the store it will be subject to regulation through nuclear licensing, periodic safety case reviews and monitoring to confirm no significant environmental effects.

5.6 No pathways to SPA/SAC/Ramsar sites are anticipated during transport of the ILW. Transport is assumed to be by road and to be infrequent (circa 1 to 3 movements per year over a period of several decades). The ILW transport containers will be shielded, transport will be subject to regulatory oversight, nuclear safety case and transport risks and emissions will be managed to ALARP/ALARA. NB If at a later date the SDP proposes transport by sea, further assessment may be required.

6. What avoidance and mitigation factors or measures have been identified to avoid any likely significant effects of the P/P on the SPA/SAC/Ramsar Sites?

6.1 Nuclear regulation requires management to ALARP/ALARA thereby obviating likely significant effects from activities involving radioactive material. This is achieved through nuclear licensing and safety cases which will be prerequisites for all activity associated with the ILW interim store. Transport will be managed to ALARP/ALARA through regulation by MOD and external regulators thereby obviating likely significant effects from transport of radioactive material.

6.2 Irrespective of the final site chosen as the preferred location for the proposed interim ILW store, project-level EIA will be required as the proposed interim ILW store is 'Schedule 1 Development' and an Environmental Statement must be prepared to accompany the planning application. The project-level EIA will reconsider whether there could be any likely significant effects on the environment as a result of the project and provide a description of measures envisaged to prevent, reduce and where possible offset any such significant adverse effects including those, if identified at that time, on any SPA/SAC/Ramsar Sites.

7. After mitigation, what are the likely residual effects of the proposal on the international nature conservation interests for which the site(s) is designated?

7.1 In the very unlikely event of any accidental release of radioactive material, the distance between potential source and receptor sites, and quantities and natures of materials involved, means that impacts on SPAs, SACs and Ramsar sites would be at most negligible in comparison to background variation. No residual effects on SPAs, SACs or Ramsar Sites are anticipated.

8. Is further Appropriate Assessment Required?

8.1 The MOD's judgement is that Appropriate Assessment **is not required** for this Plan.

JLSE Conclusion & MOD Decision

If the judgement is that the effects will not be significant or that the Plan or Project (P/P) has integrated sufficient measures to effectively avoid significant residual effects, the formal record of decision should be completed and signed off by the Authorising Officer.

If additional information is required to make a fuller assessment to enable the competent authority to decide whether the proposed P/P would adversely affect the integrity of the site, Appropriate Assessment (AA) will need to be completed

HRA Stage 2: Appropriate Assessment

This section may be used to record detailed assessments into whether significant effects identified in Stage A will have an adverse impact on the integrity of the site, and/or may consider whether any further avoidance or mitigation measures could be implemented beyond those already integrated into the plan or project proposal, and assess whether there are any remaining residual adverse impacts on the integrity of the site.

Recent EC Caseslaw[11] has clarified that adverse effects on the integrity of a site are those that would have a permanent or long lasting affect on the site's conservation objectives.

9. Can further avoidance or mitigation factors or measures be implemented?

9.1 Not applicable

10. Can the MOD be certain that there will not be an adverse impact on the integrity of the site, ie could residual effects be permanent and long-lasting?

10.1 Not applicable.

MOD Decision

The Formal Record of HRA Decision should be completed and signed off by the Authorising Officer.

If the there are remaining residual adverse impacts on the integrity of the site that cannot be avoided or mitigated, the plan or project sponsor will need to consider alternatives. If there are no alternatives the MOD will need to consider if the plan or project must proceed for imperative reasons of overriding public interest, and if so will need to liaise with Defra or devolved administrations to identify whether sufficient compensation can be secured to enable the project to proceed. Stage C will need to be completed.

[11] Advocate General's Opinion - 22 November 2012; Sweetman and Others, Case C-258/11
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:62011CC0258:EN:HTML

MOD Formal Record of HRA Decision

Consultation: Have Relevant Statutory Bodies (NE, CCW, SNH, NIEA), and any other bodies, been consulted? Briefly explain why and describe any comments received, etc.

A wide range of Statutory Bodies and Government Departments have been consulted throughout the development of the SDP.SEA Scoping for SDP interim ILW storage took place in early 2014. Details of responses including from statutory consultees can be found within this SEA Environmental Report (Reference A) to which this draft HRA is annexed and feedback from wider consultation activities is on the SDP website (www.mod.uk/submarinedismantling).

Natural England were consultees to the SEA Scoping for SDP interim ILW storage but made no response. SNH in their response to the SEA Scoping for SDP interim ILW storage stated: "We note that you have concluded that a Plan level HRA is not required. However, we would suggest that the alternative candidate sites to the plan are also screened as part of an updated HRA. If there is no connectivity or pathway between a proposal and a Natura site such proposals could be screened out as having no likely significant effect and the reason for this set out in the HRA record."

Any further comments from Statutory Bodies arising from the SEA consultation will be fully taken into account when finalising this HRA for the Main Gate Business Case decision brief.

MOD Decision

There are **no likely significant effects** of the SDP ILW Storage Site Selection on any SPA, SACC or Ramsar Sites.

MOD Environmental Adviser Authorisation

This HRA Decision Form may be prepared by estates or environmental advisers or consultants, but must be authorised by an MOD competent individual (refer to List of Competent Individuals in the SEAT Handbook for details of those authorised to approve JLSE and AA).

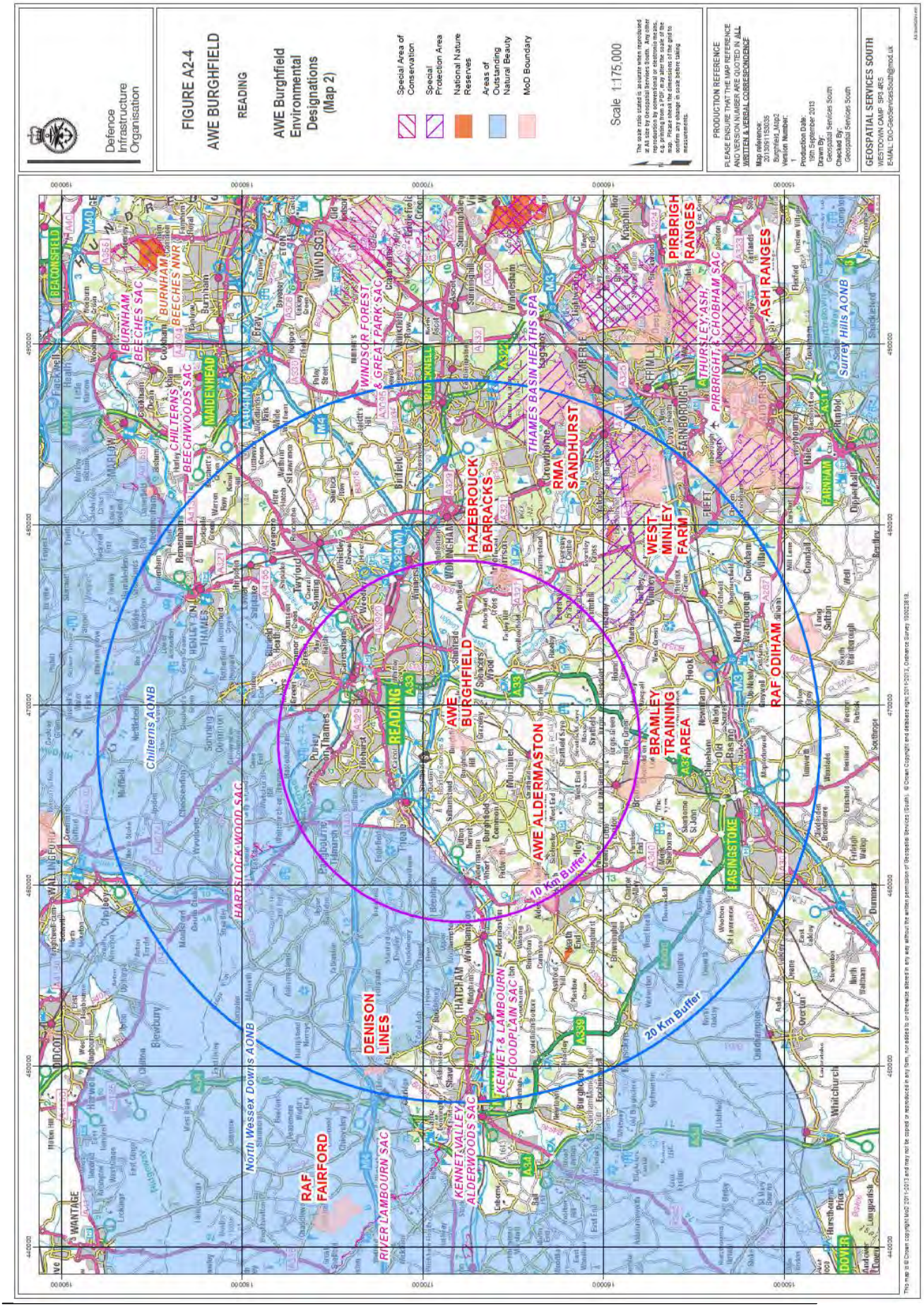
Prepared & Authorised by:

[redacted]

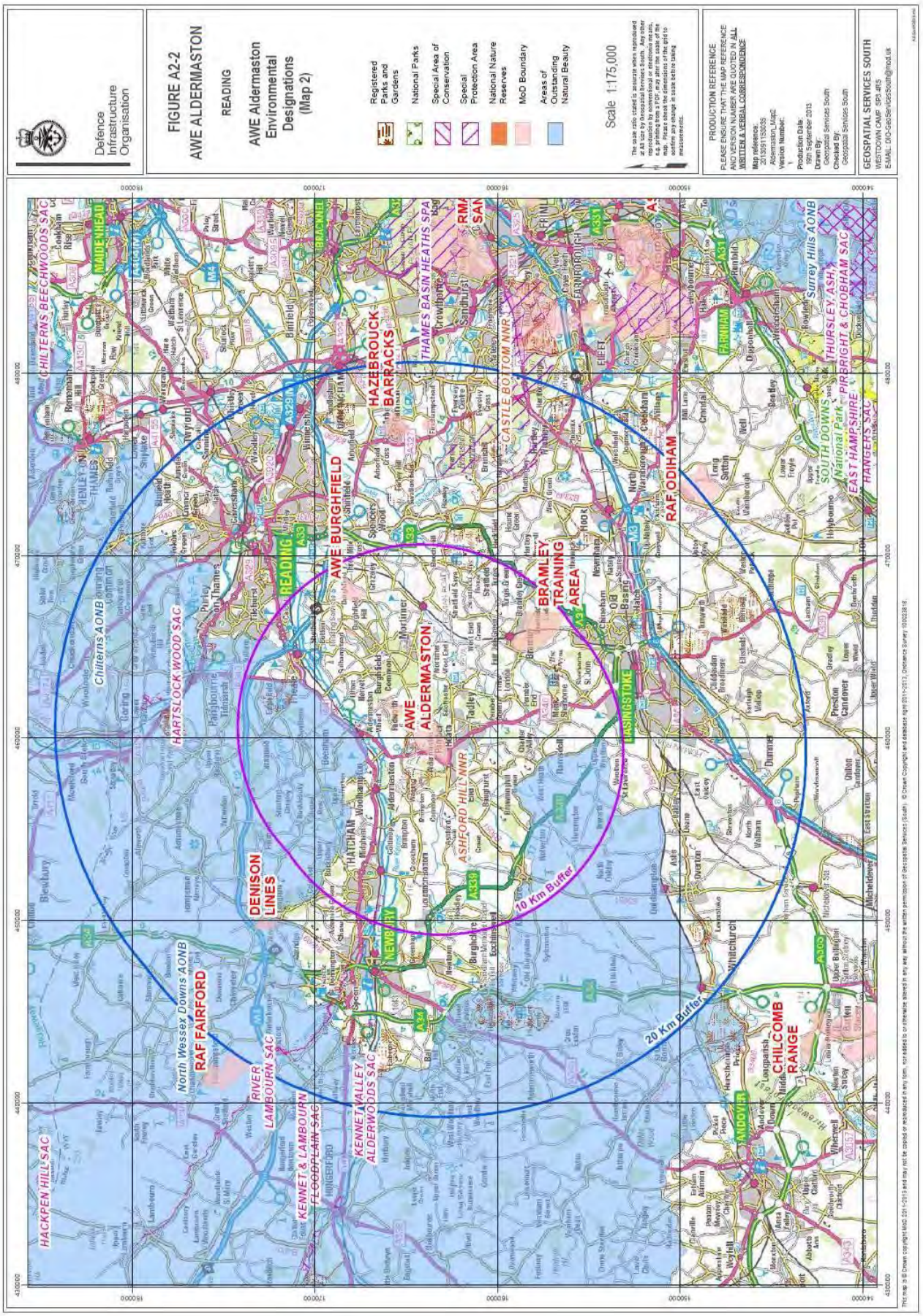
Email: [redacted]

Signature: [redacted]	**Date:** [redacted]

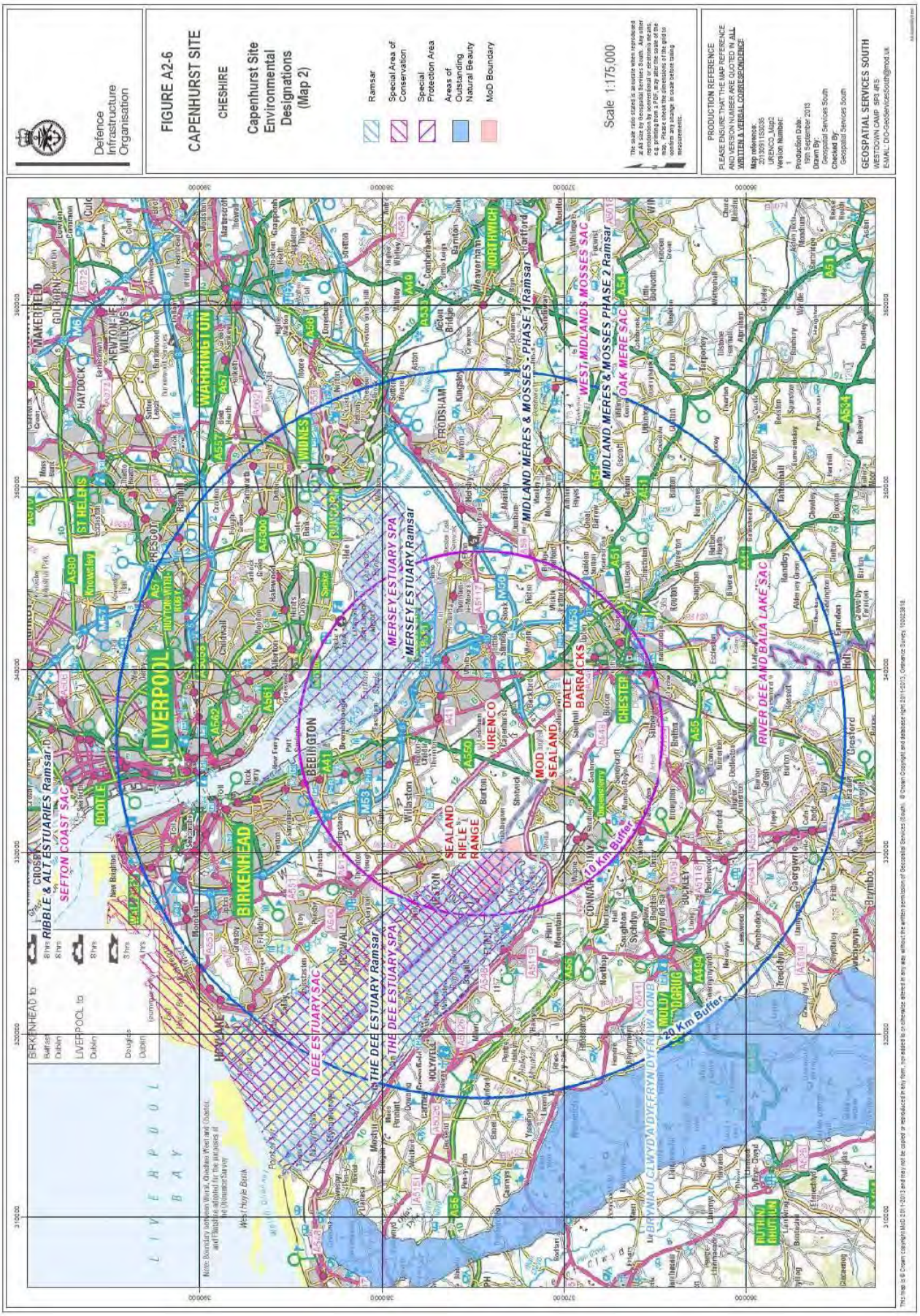
A1 Map of SPAs, SACs & Ramsar Sites within 20 km or otherwise potentially affected by potential SDP interim ILW storage at AWE Burghfield



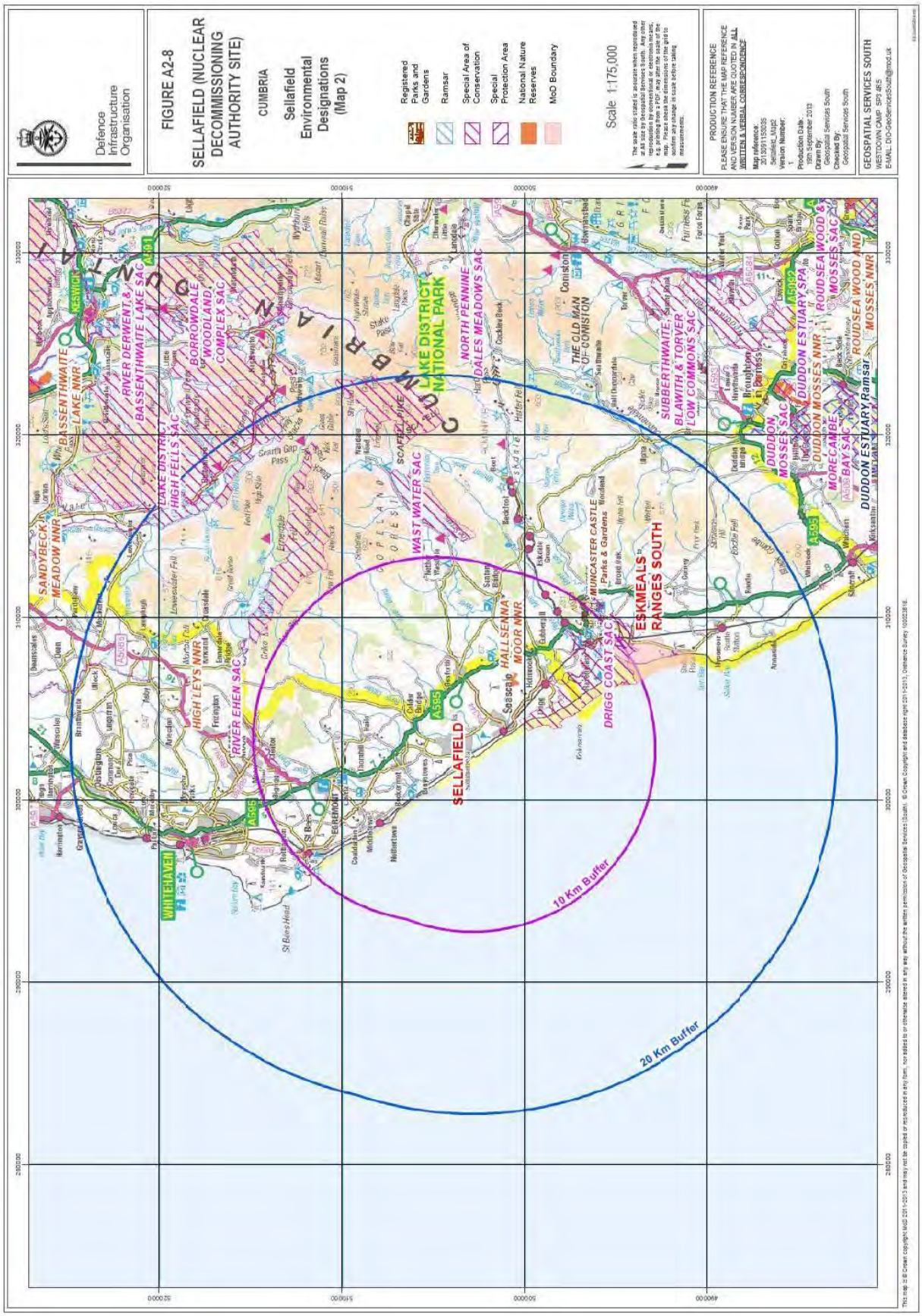
A2 Map of SPAs, SACs & Ramsar Sites near within 20 km or otherwise potentially affected by potential SDP interim ILW storage at AWE Aldermaston



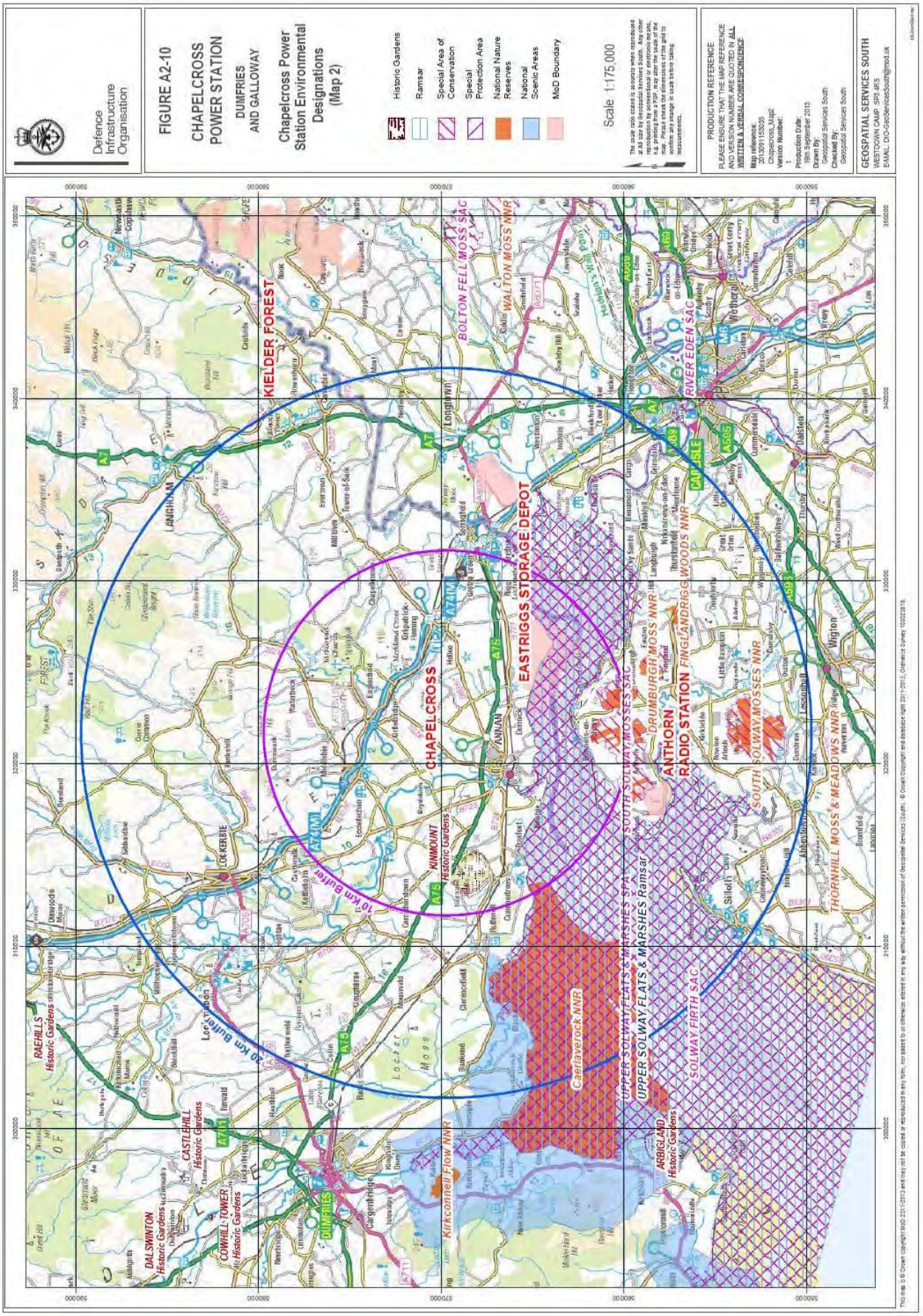
A3 Map of SPAs, SACs & Ramsar Sites within 20 km or otherwise potentially affected by potential SDP interim ILW storage at Capenhurst



A4 Map of SPAs, SACs & Ramsar Sites within 20 km or otherwise potentially affected by potential SDP interim ILW storage at Sellafield



A5 Map of SPAs, SACs & Ramsar Sites within 20 km or otherwise potentially affected by potential SDP interim ILW storage at Chapelcross



Annex 8: Planning and Consents Requirements for ILW Storage

Definitions of Radioactive Waste

The Nuclear Decommissioning Authority provide the following definitions of radioactive waste:

- *'High Level Waste (HLW) – waste that is sufficiently radioactive for its decay heat to significantly increase its temperature and the temperature of its surroundings, such that heat generation has to be taken into account in the design of storage and disposal facilities.*

- *Intermediate Level Waste (ILW) – waste whose radioactivity exceeds the limits for Low Level Waste (see below), but whose decay heat is insufficient for heat removal to be a factor in the design of storage or disposal facilities.*

- *Low Level Waste (LLW) – waste whose radioactive content does not exceed 4GBq/Tonne of α or 12 GBq/Tonne of β-γ activity.*

- *Very Low Level Waste (VLLW) – waste whose radioactive content does not exceed 4MBq/Tonne, the activity limit for tritium being 10 times higher.*

HAW is defined as: High Level Waste (HLW), Intermediate Level Waste (ILW); and; Low Level Waste (LLW) that has no available disposal route at present (a situation that can occur if some feature of the LLW concerned is incompatible with the Conditions for Acceptance at the Low Level Waste Repository, such as chemical composition).'

Taking account of these definitions, the ILW arising from SDP is a form of HLW. For simplicities sake the term ILW has been used within this Chapter where appropriate.

'Disposal' and 'Interim' Storage' of ILW.

The term 'disposal' of radioactive substances occurs when packages of radioactive waste are deposited in a disposal facility ('final storage') with no intention of retrieval.

The term 'interim storage' of ILW is defined by the Nuclear Decommissioning Authority as *'storage of (ILW) waste packages within a facility which aims to maximise the lifetime of the waste packages and where there is the planned intention for a final management step, specifically the transfer of the packages to a licensed Geological Disposal Facility (GDF) when it becomes available'.*

Accordingly the proposed SDP ILW interim storage facility does not represent disposal of the ILW, as there is a planned intention for the final management step, specifically the transfer of the packages to a GDF when it becomes available, currently anticipated to be not earlier than 2040.

Scottish Government Policy which applies to ILW in Scotland takes a different approach. Scotland's Higher Activity Radioactive Waste Policy 2011 states that Scottish Government policy *'is that the long-term management of higher activity radioactive waste, as defined in Section 2, should be in near-surface facilities. Facilities should be located as near to the site where the waste is produced as possible.'*

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

Despite a possible level of uncertainty being introduced to interpretation of the above wording as initial dismantling of submarines is proposed by SDP at Rosyth, which is subject to regulation under RSA93, for the purposes of this SEA it is assumed that the above Scottish Government Policy does not apply to the ILW arising from SDP. This assumption is re-inforced by SEPA in their

response to the ILW Store SEA scoping report which confirmed '*that submarine ILW is not included in the scope of the Scottish Government Higher Activity Waste policy; this point should be made clear in the [SDP ILW store] SEA Environmental Report.'*

It should be noted that the term 'disposal' also applies to discharging radioactive liquid, gaseous and solid effluents into the environment. These discharges are subject to 'permissioning' (in England) or 'authorising' (in Scotland) and strictly monitored to ensure that these discharges are controlled and minimised.

In England disposal by discharging liquid, gaseous and solid wastes from nuclear licensed sites into the environment is regulated by the Environment Agency (EA) under the Environmental Permitting Regulations 2010 (EPR10), and in Scotland by the Scottish Environment Protection Agency (SEPA) under the Radioactive Substances Act 1993 (RSA93).

Accordingly if there could be any variation to existing permitted or authorised limits for site discharges of liquid radioactive effluents or discharges to air and land as a result of the interim storage facility, consideration would be necessary as to whether permission would be needed from EA if the site chosen is in England or authorisation from SEPA if the site chosen is in Scotland.

Need for Planning Permission

The Town and Country Planning Acts determine the need for and scope of planning approvals required for "developments". Planning permission is required for any development which comprises: any engineering operation above, on and below ground, any material change of use of land and/or buildings, any material change in appearance of an existing building and/or structure.

Therefore, irrespective of the choice of site, the interim storage facility will need Planning Permission under the Town and Country Planning Acts.

Planning Policy

The basic structure of the planning systems in Scotland and England are similar being "plan-led" which means that decisions are made in line with formal development plans, which set out national and local planning policy, unless there are 'material considerations' that justify going against the plan. However there are differences in the detail and in how each system works.

Scottish Planning Policy (SPP) was published on June 23, 2014. It sets out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land. The SPP promotes consistency in the application of policy across Scotland whilst allowing sufficient flexibility to reflect local circumstances. It directly relates to; the preparation of development plans, the design of development, from initial concept through to delivery, and the determination of planning applications and appeals.

In Scotland, the National Planning Framework sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole. It sets out the Scottish Government's development priorities over the next 20-30 years and identifies national developments which support the development strategy.

In England, the National Planning Policy Framework (NPPF) sets out the Government's planning policies and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

Details of the local planning context is given in the 'Assessment Results' Chapters for each of the candidate sites in this Report.

The planning systems in both Scotland and England continue to evolve with frequent review and reforms.

Planning Application Process

Following a decision by MOD on the chosen site, a planning application and supporting information will be prepared for the proposed interim storage facility by the operator of the site and submitted to the relevant local planning authority. The relevant authorities for each of the sites currently under consideration are listed below:

- AWE Aldermaston; West Berkshire Council (unitary authority),
- AWE Burghfield; West Berkshire Council (unitary authority),
- Capenhurst; Cheshire West and Chester Council (unitary authority),
- ChapelCross; Dumfries and Galloway Council (Council)
- Sellafield; Cumbria County Council (County Council but see below)

If Sellafield is the chosen site, Cumbria County Council will be the determining authority for a planning application for a proposed interim ILW storage facility on the site, which is within Copeland Borough Council. Copeland Borough Council will be involved in the planning process under existing arrangements.

Environmental Impact Assessment

Irrespective of the choice of site for the proposed interim storage facility, the planning application will be required to be accompanied by an Environmental Statement under the Environmental Impact Assessment (EIA) Regulations as it is 'Schedule 1' development under (2) (e) '*being solely for the storage (planned for more than ten years) of …radioactive waste in a different site than the production site.'*

The Town and Country Planning (Environmental Impact Assessment) Regulations) 2011 applies in England and the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 apply in Scotland.

The aim of EIA, in this context for Town and Country Planning, is to protect the environment by ensuring that a planning authority when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects and takes this into account in the decision making process.

EIA also ensures that the public are given early and effective opportunities to participate in the decision making procedures

The Environmental Statement to accompany a planning application for the proposed interim storage facility will provide;

Part1

1. Description of the development, including in particular—

(a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;

(b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used;

(c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc) resulting from the operation of the proposed development.

2. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effects.

3. A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.

4. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from—

(a) the existence of the development;

(b) the use of natural resources;

(c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant or appellant of the forecasting methods used to assess the effects on the environment.

5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.

6. A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.

7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant or appellant in compiling the required information.

PART 2

1. A description of the development comprising information on the site, design and size of the development.

2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.

3. The data required to identify and assess the main effects which the development is likely to have on the environment.

4. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effects.

5. A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.

Consultation on the Planning Application

The local planning authority will have an obligation to circulate the planning application to a wide range of consultees including statutory consultees. These consultation bodies will be dependent on the location of the chosen site and determined by specific legislative and policy requirements and guidance which applies in Scotland and England.

Scotland:
Under Planning Circular 3 2011, which applies to Scotland, the statutory and non-statutory consultation bodies are likely to include:

- Any adjoining planning authority, where the development is likely to affect land in their area,

- Scottish Natural Heritage,
- Scottish Water,
- The Scottish Environment Protection Agency,
- The Scottish Ministers,
- Health and Safety Executive,
- The Office for Nuclear Regulation,
- Transport Scotland,
- Other bodies designated by statutory provision as having specific environmental responsibilities and which the planning authority or Scottish Ministers, as the case may be, considers are likely to have an interest in the application.

England:
As identified in national planning policy or guidance, in England the statutory and non statutory consultation bodies are likely to include:

- Any adjoining planning authority, where the development is likely to affect land in their area,
- The Environment Agency,
- Health and Safety Executive,
- The Office for Nuclear Regulation,
- Natural England,
- English Heritage,
- Highways Agency.

Additionally the local planning authorities in Scotland and England will also notify requisite local bodies such as Community Councils or Parish Councils and raise general public awareness through measures such as advertisements, notices and web based information.

Timescale for Determination

Once a planning application has been validated, the local planning authority is required to make a decision on the proposal within statutory time limits unless a longer period is agreed in writing with the applicant. The statutory time limit for determination of a planning application for the proposed interim storage facility is 16 weeks as it will be subject to statutory Environmental Impact Assessment.

Determination

Following the consultation period the Planning Officer will take due consideration of all the responses to consultation, the information in the Environmental Statement, adequacy of the information provided and any other relevant information and will prepare a report with a recommendation to the relevant Planning Committee.

The Planning Committee comprising of elected members of the relevant Council will take into account the Planning Officer's report and will make the final decision to approve or refuse the application and set any planning conditions.

The Local Planning Authority is obliged to inform the public of the Planning Committee's decision and the main reasons for that decision.

If the application is approved then the interim storage facility can be constructed.

Appeal and call-in

If the application is refused an applicant has the right if they so wish to appeal against the decision.

Scotland:
In Scotland planning appeals can be decided by Scottish Government reporters, although the Scottish Government can 'recall' an appeal for determination.

England:
A similar process applies in England where the majority of planning appeals are decided by an Inspector from the Planning Inspectorate but with the power for the Secretary of State to 'recover' an appeal for determination

Both Scottish Ministers and the Secretary of State have a general power to 'call-in' planning applications for their own determination. 'Calling in' can be done at any time during the planning application process, up to the point at which the local planning authority actually makes the decision. Scottish Ministers and the Secretary of State have the authority to consider a called in application through a public inquiry, informal hearing or through written submissions.

Other Relevant Regulatory Regimes

As well as securing planning permission, the proposed interim storage facility will have to pass a number of other regulatory 'hold points'.

Nuclear Site Safety

The main legislation governing the safety of nuclear sites in the UK, (including the candidate sites) is the Health and Safety at Work etc Act 1974 (HSWA74) and the associated relevant statutory provisions of the Nuclear Installations Act 1965 (as amended) (NIA65). Under the NIA65, no site may be used for the purpose of installing or operating a nuclear installation unless a nuclear site licence has been granted by the Office for Nuclear Regulation (ONR)

The Office for Nuclear Regulation (ONR) is the safety regulator for the civil nuclear industry in the United Kingdom. It is an independent statutory corporation whose costs are met by charging fees to the nuclear industry. The ONR reports to the Department for Work and Pensions, although it also works closely with the Department of Energy and Climate Change.

It was initially created on 1 April 2011 as a non-statutory agency of the Health and Safety Executive (HSE), with the Government intending to put the ONR on a statutory basis at a later date.

ONR was duly established as a statutory Public Corporation on 1 April 2014 under Part 3 of the Energy Act 2013. The Energy Act 2013 provides the framework of responsibilities and the powers of the ONR. Under Part 3, Chapter 3, paragraph 78 (1) and (2) defines the principle function of ONR as:-

'(1) The ONR must do whatever it considers appropriate for the ONR's purposes.

(2) That includes, so far as it considers appropriate, assisting and encouraging others to further those purposes.'

ONR confirms that its duty is to ensure that the nuclear industry controls its hazards effectively including by assessing safety cases and inspecting sites for licensing compliance. It sets national regulatory standards and helps to develop international nuclear safety standards.

Other legislation that underpins the legal framework for the nuclear industry includes:

- Ionising Radiations Regulations 1999 . These regulations provide for protection of workers in all industries from ionising radiations and by the general health and safety regulation which ONR also enforces at nuclear sites, and

- Nuclear Industries Security Regulations 2003. ONR Civil Nuclear Security (CNS) conducts its regulatory activities, approving security arrangements within the industry and enforcing compliance under the authority of these regulations.

Nuclear Site Licensing

To indicate the scope of Nuclear site licensing conditions (LCs), they cover

1. Interpretation
2. Marking of the site boundary
3. Restriction on dealing with the site
4. Restrictions on nuclear matter on the site
5. Consignment of nuclear matter
6. Documents, records, authorities and certificates
7. Incidents on the site
8. Warning notices
9. Instructions to persons on the site
10. Training
11. Emergency arrangements
12. Duly authorised and other suitably qualified and experienced persons
13. Nuclear safety committee
14. Safety documentation
15. Periodic review
16. Site plans, designs and specifications
17. Management systems
18. Radiological protection
19. Construction or installation of new plant
20. Modification to design of plant under construction
21. Commissioning
22. Modification or experiment on existing plant
23. Operating rules
24. Operating instructions
25. Operational records
26. Control and supervision of operations
27. Safety mechanisms, devices and circuits
28. Examination, inspection, maintenance and testing
29. Duty to carry out tests, inspections and examinations
30. Periodic shutdown
31. Shutdown of specified operations
32. Accumulation of radioactive waste
33. Disposal of radioactive waste
34. Leakage and escape of radioactive material and radioactive waste
35. Decommissioning
36. Organisational capability

The majority of the LCs will be pertinent to the proposed interim store, inter alia, the licensee will be required to:

LC4 - ensure that no nuclear matter is stored on the site except in accordance with adequate arrangements made by the licensee for this purpose,

LC32 - make and implement adequate arrangements for minimising so far as is reasonably practicable the rate of production and total quantity of radioactive waste accumulated on the site at any time and for recording the waste so accumulated

LC35 - make adequate arrangements for the production and implementation of decommissioning programmes for the proposed interim storage facility. ONR has interpreted “decommissioning” as being “the set of actions taken at the end of a nuclear facility’s operational life to take it permanently out of service with adequate regard for the health and safety of workers and the public and the protection of the environment. The ultimate aim of decommissioning is to make the site available for other purposes”.

All the candidate sites, apart from AWE Burghfield, have confirmed their view that there is potentially sufficient land for siting the proposed SDP interim storage facility within existing licensed site boundaries. AWE plc have confirmed their view that there is insufficient room within the licensed site boundary at Burghfield which means that AWE plc must seek consent from ONR to vary the licenced area albeit within the existing secure boundary of the site.

Summary

In summary, irrespective of the site chosen, in addition to achieving planning permission and the outcome of any consideration of variation to existing site environmental permitting or authorisation, regulatory consent must be granted by the ONR before the proposed interim storage facility can be built, commissioned or operated.