



**Defence Equipment and Support**  
**Submarine Dismantling Project**  
**Strategic Environmental Assessment (SEA)**  
**Stage 'A' Scoping Report - Update**  
**Non-Technical Summary**  
December 2010



MINISTRY OF DEFENCE



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**Report for**

In-Service Submarines  
Defence Equipment and Support  
Ministry of Defence

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# Submarine Dismantling Project

## Strategic Environmental Assessment Scoping Report: Updated Non- Technical Summary

December 2010

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## Introduction

This is the Non-Technical Summary ('NTS') of the updated Scoping Report produced as part of the Strategic Environmental Assessment (SEA) of the Submarine Dismantling Project (SDP<sup>1</sup>). The Scoping Report is the first stage of the SEA process, and sets out the way in which the Ministry of Defence (MOD) proposes to undertake the SEA assessment. Due to the complexity of the project, the MOD has undertaken this scoping stage in two phases; this stage 'A2' report takes into account the comments received during the first phase of scoping consultation.

### 1. What is Strategic Environmental Assessment?

SEA is a way by which the significant environmental effects of the SDP proposals can be identified and assessed before any major decisions are made on the outcome. This will allow potentially damaging effects to be avoided, minimised or mitigated, whilst positive ones can be enhanced.

SEA is required by legislation for certain strategic plans and programmes prepared by public bodies. The SEA Directive was implemented across Europe in 2004<sup>2</sup>; to date the Regulations have mainly been used in the development of Regional Spatial Strategies, Local Development Frameworks and other land-use plans by Local and Regional Authorities. However, SEAs for the plans and programmes of central government departments and agencies are now being published (see <http://www.direct.gov.uk/en/AdvancedSearch/Searchresults/index.htm?fullText=SEA+consultations+2010> for examples).

The purposes of SEA are:

- to identify and measure the potentially significant environmental effects of a plan or programme (in Scotland, this also includes strategies);
- to give the public the ability to see and comment upon the effects that the plan or programme may have on them and their communities, and to encourage them to comment on it, and to suggest improvements; and
- to ensure that environmental issues are properly considered throughout the planning stage, with appropriate measures being taken wherever possible to avoid, reduce or manage damaging environmental impacts and to enhance beneficial impacts.

All of the above must be completed before the plan or programme is given formal approval and planning permissions for the resulting developments are sought.

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<sup>1</sup> The SDP was previously known as the Interim Storage of Laid-Up Submarines (ISOLUS) project.

<sup>2</sup> European Union Directive 2001/42/EC (known as the SEA Directive) was transposed into UK legislation on the 20<sup>th</sup> July 2004 as Statutory Instrument No. 1633 – *The Environmental Assessment of Plans and Programmes Regulations 2004*. This applies to plans and programmes which have the potential to affect England and/or the UK as a whole. Devolved administrations have their own legislation in force.



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The main stages of the SEA process (as applied to the MOD's SDP strategy) are:

- Stage A** The scope of the SEA assessment (essentially, what issues will be covered) is proposed in a Scoping Report, and the proposed approach is then agreed with Statutory government consultees. **This Non-Technical Summary describes what is in that report in non-technical language.**
- Stage B** The likely environmental effects of the SDP's 'reasonable options' are assessed. This includes short- and long-term, direct and indirect effects, as well as cumulative effects (where multiple small effects add together to have a large combined impact) and synergistic effects (where effects add together to create an impact greater than the sum of their parts).
- Stage C** An Environmental Report is written detailing the results of the assessments, and proposing ways to improve the environmental performance of the SDP.
- Stage D** Public Consultation takes place on both the SDP proposals and its' Environmental Report, after which the responses are considered and integrated into the final decisions on how to proceed with the proposals.
- Stage E** The environmental effects of the selected options are monitored, largely through subsequent statutory assessments at project level. A post-adoption report will be published to show how MOD has taken the public's feedback into account.

Although the strict applicability of the SEA Regulations to the SDP remains unclear, the MOD is undertaking an environmental assessment on the SDP proposals incorporating the requirements of the SEA Directive, as this is considered to be good practice. Undertaking an SEA will help ensure that the potential environmental implications of the options are assessed early on, so they can help inform, shape and improve the project as it develops. The approach will follow both MOD<sup>3</sup> and wider government<sup>4</sup> guidance.

This second (or 'Stage A2') Scoping Report provides a further opportunity for the UK's Statutory Consultation Bodies (listed in **Box 1**) to comment on the scope and the level of detail which should be included in the environmental assessment. The updated Scoping Report will also be sent to relevant Government departments and agencies for comment.

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<sup>3</sup> The Environmental and Sustainability Appraisal Tool Handbook (Chapter Two: SEA) MOD, 2009.

<http://www.mod.uk/DefenceInternet/AboutDefence/CorporatePublications/DefenceEstateandEnvironmentPublications/DefenceEstates/SustainabilityAndEnvironmentalAppraisalToolHandbook.htm>

<sup>4</sup> A Practical Guide to the Strategic Environmental Assessment Directive. ODPM (now the Department for Communities and Local Government), 2006. <http://www.communities.gov.uk/publications/planningandbuilding/practicalguidesea>.



**Box 1: UK Statutory Consultation Bodies:**

- The Environment Agency (England and Wales); Scottish Environment Protection Agency (SEPA); Northern Ireland Environment Agency;
- English Heritage; Historic Scotland; Cadw (Welsh Historic Monuments);
- Natural England; Scottish Natural Heritage; Countryside Council for Wales; and
- The Scottish Government and Welsh Assembly Government.

The SEA assessment will evaluate the environmental effects of the SDP's strategic options. The main output of the SEA assessment process will be an Environmental Report, which will be issued for public consultation alongside the draft SDP proposals.

**2. What is in the Scoping Report Update?**

The Scoping Report forms the first formal stage (Stage A) of the SEA process and sets out the following information:

- an introduction to the SDP;
- the generic options for dismantling the submarines and managing the resulting waste streams until the Geological Disposal Facility (GDF) becomes available;
- a description of the current and future state of the UK environment (the 'baseline conditions'), making particular reference to any existing environmental problems that the project could impact;
- a list of relevant plans, programmes and strategies at International, National and Local Authority level, to indicate how the SDP could be affected by outside factors (such as waste or climate change strategies);
- to identify relevant plans, programmes and environmental protection objectives which will need to be taken into account in planning for dismantling;
- the proposed SEA objectives and assessment questions, by which the environmental performance of the SDP's alternative options can be assessed (these are included in this NTS);
- a top-line assessment of the potentially significant environmental effects that the SDP could have; and
- the proposed content of the Environmental Report.

The MOD will again be asking UK Statutory Consultees (listed in **Box 1**) whether they either agree with the information in the report or have anything to add.



### 3. Background to the UK's Redundant Submarines

When a nuclear-powered submarine leaves service with the Royal Navy, the nuclear fuel is removed from the reactor and sent for long-term storage at the Nuclear Decommissioning Authority (NDA) site at Sellafield, Cumbria. Serviceable equipment is then removed for re-use. Currently, Babcock International at Devonport has the only nuclear licensed site in the UK with the capability to defuel nuclear submarines. By law, this work cannot be undertaken on a non-licensed site.



Laid-up submarines at Devonport

The hull is then laid up for long-term afloat storage in Devonport. Until 2004, submarines were also defueled at Rosyth in Scotland, and seven submarines remain there in long-term afloat storage. The majority of the radioactivity remaining in the defueled submarines is contained within the Reactor Pressure Vessel (RPV), the metal container which houses the reactor. This radioactivity is mainly the result of activated steel in the RPV. The RPV is contained within the Reactor Compartment (RC) as shown in **Figure 1** below. Since it is held behind the same internal safety barriers as when the submarine was operational, it is safe to be stored afloat for a prolonged period.

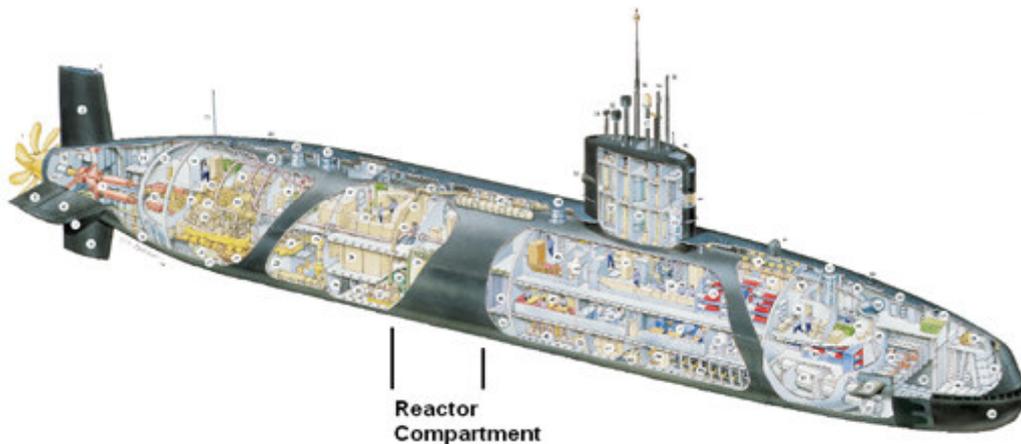


Figure 1 - Cross-Section of a Royal Navy Submarine, showing the location of the Reactor Compartment

To date, 16 nuclear-powered submarines have left naval service and are stored safely afloat. Seven are at Rosyth; the remaining nine submarines are stored at Devonport, five of which await defueling. Whilst afloat storage has proved to be a very safe arrangement for over 30 years, it does not fulfil MOD or wider Government long-term nuclear decommissioning policies, which require that nuclear decommissioning and disposal operations should be carried out *as soon as reasonably practicable*. Additionally, afloat storage capacity at Devonport is expected to run out around 2020, and the cost of maintaining the redundant submarines is increasing significantly as they age and the number of submarines in afloat storage increases. As such, the current situation is not sustainable.



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### 3. What is the Submarine Dismantling Project about?

Project ISOLUS (Interim Storage of Laid-Up Submarines) was set up in 2000 to develop and implement a safe, environmentally responsible, secure and cost-effective way of dismantling and disposing of the UK's 27 redundant and defueled nuclear submarines, of past and current classes<sup>5</sup>, as a more sustainable alternative to continued afloat storage. In 2009, the project was renamed the Submarine Dismantling Project (SDP) to better reflect the nature of its objectives.

The SDP extends over an estimated 60-year period and involves dismantling the defueled submarines, reusing or recycling as much of the resulting non-radioactive material as practicable, and storing the residual Intermediate-Level Radioactive Waste (ILW) until the proposed Geological Disposal Facility (GDF) which will eventually house the Intermediate-Level Waste from the submarines becomes available at some point beyond 2040 (see <http://www.nda.gov.uk/aboutus/geological-disposal> and <http://mrws.decc.gov.uk/> for more details on the GDF).

The Low-Level Radioactive Waste (LLW) from the Reactor Compartment has an established disposal route to the UK National LLW Repository in Cumbria, and before dismantling the nuclear fuel will already have been removed for long-term storage at Sellafield. Both dismantling and ILW storage are likely to need specialist equipment and facilities, which will eventually need to be decommissioned. At this stage, no decisions have been made about whether more than one initial dismantling site and/or one interim storage facility will be required. However, it will be possible to dismantle the non-radiological front and rear parts of the submarine at a commercial ship-breaking facility elsewhere in the UK. **Figure 2** explains the key indicative stages of the SDP (note that these stages may not occur in strict sequence, and some overlap is possible)

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<sup>5</sup> (6x 'Superb' Class; 7x 'Trafalgar' Class; 2x 'Valiant' Class; 3x 'Churchill' Class; HMS Dreadnought; 4x 'Resolution' Class; 4x 'Vanguard' Class). The scope of the SDP *does not* include disposal of ASTUTE class or successor to the Vanguard Class submarines, although facilities will retain the flexibility to accommodate future classes of submarines where possible.



**Figure 2 Key Indicative Stages and Activities of the SDP Programme**

<b>I</b>	Design and Develop the initial Submarine Dismantling Capability, and
<b>II</b>	Design and Develop the Interim ILW Storage Capability.
<b>III</b>	Dock Submarines and Process the Reactor Compartments (RCs).
<b>IV</b>	Dismantle the Front and Rear Sections of the Submarines; Process all Wastes except ILW.
<b>V</b>	Transport RC/ RPV / packaged ILW to Interim Storage
<b>VI</b>	Dismantle RC/ Reactor Pressure Vessel (RPV) (if required); transfer packaged ILW to the GDF.
<b>VII</b>	Decommission the SDP Facilities.

The key underpinning principles of the SDP are that:

- continued afloat storage is not a reasonable long term option, due to both MOD and wider Government decommissioning policies, together with storage capacity constraints and long-term cost;
- the Royal Navy's redundant submarines cannot be dismantled or disposed of abroad, for defence and security reasons;
- all submarines will already have been defueled before they undergo dismantling, so there will be neither irradiated fuel nor High Level Waste (HLW) to manage as part of the process;
- the proposed GDF is not expected to be available until at least 2040, which means that some form of interim ILW storage will be necessary;
- all dismantling activity on the Reactor Compartment must take place at a site that holds an appropriate civil Nuclear Licence and/or military Authorisation (whether this is at a new or an existing facility);
- most of the radiological work involved in dismantling (e.g. work involving radioactive materials) is already established practice in submarine refits and in civil reactor decommissioning, so there will be very few new technical procedures involved;
- the non-radiological front and rear parts of the submarine (which form the bulk of each vessel) do not have to be dismantled at a Nuclear Licensed or Authorised site, and could potentially be handled at a commercial ship breaking facility that could be selected by competition to give better value for money;
- where feasible, dismantled materials will be re-used or recycled (rather than be disposed of); and



- the principles of legal compliance, adopting industry good practice, openness and transparency will be applied to the project; further public consultation will be undertaken before any major decisions are made.

#### 4. Public Consultation on the SDP

Two public consultations on the project have been held to date (in 2002 and 2003). An independent advisory group also provides ongoing advice and guidance. See [www.submarinedismantling.co.uk](http://www.submarinedismantling.co.uk) for more information.

A key recommendation of these consultation processes was that MOD's management of its radioactive waste should fit with the recommendations made by the independent Committee on Radioactive Waste Management (CoRWM), set up by the Government in November 2003 to recommend a strategy for the long-term management of the UK's legacy higher-activity solid radioactive materials, which includes spent nuclear fuel, High-Level Waste and ILW. CoRWM recommended that a programme of robust, safe and secure interim storage of ILW would be required until the proposed GDF (and/or a near-surface Repository) is established, which fits well with the strategic aims of the SDP.

The third public consultation, of which the SEA Environmental Report will be a part, will be conducted on the proposed implementation options for the SDP.

#### 5. What Options are being considered?

The SDP is a national project which consists of seven discrete stages (**Figure 2**). Stage I (development of the initial dismantling facility/ies) involves identifying potentially suitable locations to undertake dismantling of the Reactor Compartment. Stage II (development of the interim ILW storage facilities) involves identifying the best means of storage for the ILW that arises from that initial dismantling. Stage III involves determining the best initial dismantling option (e.g. the extent to which the Reactor Compartment is taken apart 'up front'). Stages IV-VII are 'process' stages, whereby proven industry practices will be used to achieve the desired outcomes. The third public consultation will be seeking people's views on the overall proposals for all of the SDP Stages (Stages I-VII), and *specifically* on the various options for achieving Stages I-III which are outlined below:-

##### Stage I - Where should Submarine dismantling activities be undertaken?

The initial dismantling facility/ies could be developed on undeveloped, 'greenfield' land; on previously-developed 'brownfield' land (both of which would need to be Licensed for nuclear work), or on 'existing' sites which are already Licensed or Authorised. These categories have evolved from the basic distinctions of using an existing licensed/authorised nuclear site, versus developing a new site. The 'new site' category divides itself into building on land which is not built up, and building on already developed or derelict land.

Since sites on 'undeveloped' and 'previously-developed' land could potentially be anywhere in the UK, MOD proposes to include these *generic* site options in the SEA and the public consultation.



There are only a small number of 'existing' nuclear Licensed<sup>6</sup> or Authorised sites in the United Kingdom that could practically undertake initial submarine dismantling (for example, any sites must have access to the sea so inland sites would not be feasible). MOD considers it reasonable to identify those potentially suitable sites, to look at them in more detail and to assess the environmental effects of undertaking SDP activities there.

The process of identifying these potential candidate 'existing' sites has been completed on an indicative basis. The *indicative* site list for initial dismantling includes the following establishments:

- **Devonport Royal Dockyard, Plymouth;**
- **Rosyth Royal Dockyard, Fife.**

It should be noted that this implies three initial dismantling site options, involving either Devonport Royal Dockyard or Rosyth Royal Dockyard, or some combination of both sites.

An explanation of the indicative site selection process can be found in the SDP Proposed Site Criteria and Screening Paper, which has been placed on the SDP web-site at the same time as this second statutory consultation. This list is only indicative at this stage and the project intends to engage with local site stakeholders at these sites before confirming the list, at the same time as concluding Stage A of the SEA.

The non-radiological front and rear sections of the submarine (which form the bulk of each vessel) do not necessarily need to be dismantled at a Nuclear Licensed site, although all dismantling has by law to take place at a suitably-licensed ship-breaking facility. This gives the options of either undertaking all dismantling work at the initial dismantling site(s), or of sending the front and rear sections to a commercial ship-breaking facility elsewhere in the UK. This could present significant opportunities to maximise value for money without compromising safety. The submarines cannot be dismantled abroad.

## Stage II – What is the best way of managing the ILW until the GDF becomes available?

As for initial dismantling, the interim storage capability could be sited on undeveloped 'greenfield' land, previously developed 'brownfield' land, or on 'existing' Licensed or Authorised sites in the UK. These 'Existing' sites are owned by either the MOD, the Nuclear Decommissioning Authority (NDA) or by Commercial operators. The current practice in the civil nuclear sector is that ILW is stored where it is generated. There is, therefore, no established precedent for transfer of ILW between stores. The NDA have challenged this position in their latest draft Strategy<sup>7</sup> and are exploring opportunities to share current and planned storage facilities to improve value for money and reduce the environmental impact of new store build. The development of such a national waste consolidation strategy represents a significant opportunity for MOD to realise better value for money in conjunction with wider Government liabilities, but it is not sufficiently mature to support the screening of potential candidate sites.

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<sup>6</sup> See <http://www.hse.gov.uk/nuclear/licenses/pubregister.pdf> for full list

<sup>7</sup> Nuclear Decommissioning Authority, Draft Strategy Published September 2010 for Consultation



At this stage, therefore, the MOD proposes to assess the generic site options ('greenfield' sites, 'brownfield' sites and 'existing' sites), and then to assess what the environmental effects might be of developing ILW storage capability on the three different types of 'existing' site (namely those under MOD, NDA and commercial ownership).

### Stage III - How should the Reactor Compartments be dismantled?

There are three main options for handling the Reactor Compartment (the central 'slice' of the submarine), which houses the nuclear reactor that powers the vessel. These are:

- Cut out and store the entire Reactor Compartment (RC), which is the least invasive solution in the short-term, and is current practice in the USA, Russia and France.
- Partially dismantle the RC to extract the Reactor Pressure Vessel (RPV) and store it intact. The LLW would be removed, and any ILW external to the RPV would be packaged for interim storage.
- Fully dismantle the RC *in situ*, remove the LLW and package the ILW into GDF-compatible, transportable containers. This is referred to as the 'cut up' option.

In all of these options, the reactor will have to be fully dismantled and packaged as in the 'cut up' option, before the waste can be placed in the GDF. The most significant difference between these options will therefore be *when* the nuclear reactor will be dismantled and the ILW packaged for final disposal. Storing the RC or the RPV would simply mean deferring the full processing and packaging of ILW until the proposed GDF becomes available, some time after 2040.

## 6. What is the Proposed Scope of the SEA?

The MOD is proposing to do the following:

- Firstly, to assess the generic environmental impacts that could arise from each stage of the SDP (Stages I to VII in **Figure 2**). This will include assessing the environmental impacts associated with the three different initial dismantling options, and with developing dismantling and storage facilities on undeveloped land, previously-developed land and on 'existing' UK Nuclear Licensed or Authorised sites (*noting that the project will aim to use an 'Existing' site if possible*).
- Secondly, to assess what the environmental impacts might be if initial submarine dismantling takes place at the indicative 'existing' Nuclear Licensed or Authorised sites, and what the generic environmental effects of providing interim ILW storage facilities at MOD, NDA or Commercial sites could be. These are shown in **Table 1**.

Assessing individual sites will clearly contain more detail than the generic assessments, since site-specific information will be available. However, SEA is not meant to be a detailed assessment of individual options, so the findings will remain relatively high-level.

Whichever site(s) are finally chosen, further site-specific environmental assessments will be required by law before any development can take place. MOD expects that these will include (but not be limited to) Town and Country Planning Environmental Impact Assessment, Environmental Impact



Assessment for Nuclear Decommissioning and Environmental Permitting<sup>8</sup>. All of these will include further public consultation.

**Table 1 Types of Assessment Proposed for Each Stage of the SDP**

Key Stages of the Submarine Dismantling Project	Generic Assessment for the SDP's strategic options	Site-level Assessment for the SDP's strategic options
<b>Stage I:</b> Develop the initial dismantling capability	Assess each generic site category (undeveloped site, developed site or 'existing' Licensed/Authorised nuclear site).	Assess credible 'existing' Licensed/Authorised sites.
<b>Stage II:</b> Develop the interim ILW storage capability	Assess each generic site category (undeveloped site, developed site or 'existing' Licensed/Authorised nuclear site).  Consideration of different generic 'existing' site types, where relevant.	
<b>Stage III:</b> Dock submarines and process Reactor Compartments	Assess transport of submarines to dismantling facility/ies.  Assess each technical option for processing the reactor compartment.	Consideration of site-specific transport issues, where relevant.
<b>Stage IV:</b> Dismantle the fore and aft sections and process all materials (except ILW)	Generic assessment of ship-breaking, including consideration of on-site and off-site final dismantling.	
<b>Stage V:</b> Transport RC/RPV/ILW to interim storage	Generic assessment of transport options	Consider site-specific issues where relevant.
<b>Stage VI:</b> Dismantle RC/ RPV (if appropriate); transfer packaged ILW to proposed Geological Disposal Facility (ca. 2040) on	Generic assessment of the dismantling process (as per stage III) if required; generic assessment of transport options.	Consider site-specific transport issues, where relevant.
<b>Stage VII:</b> Decommission SDP	Generic assessment of the	

<sup>8</sup> The Town & Country Planning (Environmental Impact Assessment) (Amendment) (England) Regulations 2008, plus devolved equivalents; the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999; and the Environmental Permitting Regulations 2010



Key Stages of the Submarine Dismantling Project	Generic Assessment for the SDP's strategic options	Site-level Assessment for the SDP's strategic options
facilities once all submarines have been processed	decommissioning process.	

## 8. What Environmental Issues are Relevant for the SDP?

The SEA Directive requires that the existing environmental issues which are relevant to the plan or programme are identified at scoping stage. These have been identified by reviewing the plans and programmes and assessing the baseline information, and are summarised in **Table 2** below. They are not exhaustive and are not presented in any order of priority.



**Table 2 Key Environmental Issues for the SDP**

**Biodiversity and Nature Conservation:** Consideration will be given to the potential effects of the SDP proposals on the natural environment, including fisheries and areas protected for their wildlife and conservation importance.

**Population:** Consideration will be given to the potential effects of SDP proposals 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).*

**Human Health and Wellbeing:** The potential effects of SDP proposals on people's health and on health service provision will be assessed. This will include issues related to radiological work.

**Health (Noise and Vibration):** The potential noise-related impacts of the SDP options will be assessed on people and communities.

**Soil and Geology:** Consideration will be given to potential effects on soil extent, variety and quality (including contamination and on the SDP's potential to disturb historic contamination). The potential effects on protected/important geological features will also be assessed.

**Water:** Consideration will be given to potential effects on surface waters, groundwater systems and the marine environment, including the effects of Licensed and unplanned discharges to water.

**Air:** Consideration will be given to potential effects on air quality, including construction, transport and the effects of Licensed and unplanned radioactive discharges to the atmosphere.

**Climate Change and Energy Use:** Consideration will be given to the likely impacts of climate change, such as storminess, water availability and temperature. The SEA will also assess the potential effects of the SDP itself on energy use and greenhouse gas emissions.

**Coastal Change and Flood Risk:** Consideration will be given to 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 will also be assessed.

**Material Assets (Transport):** The SDP will necessarily involve dismantled components and materials being transported off-site. Consideration will be given to the potential effects of transporting oversized, hazardous and/or radioactive materials on existing transport systems and infrastructure, particularly through urban and other sensitive areas.

**Material Assets (Waste Management):** The SDP is essentially a waste management programme. Consideration will be given to potential waste volumes and the effects this may have on current waste management infrastructure and the market for recycled materials. The extent to which the SDP proposals represent good practice (e.g. reduce, re-use, recycle, dispose) will also be assessed.

**Material Assets (Materials and Land Use):** The SDP will involve the development of new or upgraded facilities. Consideration will be given to the potential effects of the SDP on land use, on the use of finite resources such as minerals, and on the quality and environmental performance of buildings and facilities.

**Cultural Heritage:** Consideration will be given to the potential effects of the SDP on the historic environment, including cultural heritage resources, historic buildings and archaeological features.

**Landscape and Townscape:** Consideration will be given to the potential effects of the SDP proposals on the quality and attractiveness of landscapes and townscapes, as well as on public access to open spaces.



## 9. What are the Proposed SEA Objectives and Guide Questions?

The review of relevant plans, programmes and environmental protection objectives, analysis of the baseline evidence and the assessment of the relevant environmental issues for the SDP (as listed above) have been used to establish a number of SEA Objectives - essentially guiding principles for sustainable development - which the project should seek to accommodate. For each objective, guideline questions will be used to assess the environmental performance of the different project options. Suggested objectives and guide questions are shown in **Table 3** below. Following the first consultation, we have amended the existing assessment categories and have included a new category on coastal change and flood risk.

**Table 3 Proposed SEA Objectives and Assessment Questions**

<b>Assessment Category and Overall Objective</b>	<b>Proposed Assessment Questions <i>Will the SDP Proposals...</i></b>
<p><b>A. Biodiversity and Nature Conservation</b> Protect and enhance habitats, species and ecosystems.</p>	<p>Affect animals or plants, including protected species? Affect designated nature conservation sites? Affect the structure and function of natural systems (ecosystems)? Affect public access to areas of wildlife interest? Have an impact on fisheries?</p>
<p><b>B. Population</b> Promote a strong, diverse and stable economy with opportunities for all; minimise disturbance to local communities and maximise positive social impacts.</p>	<p>Affect the social infrastructure and amenities available to local communities? Affect local population demographics and/ or levels of deprivation in surrounding areas? Affect opportunities for investment, education and skills development? Affect the number or types of jobs available in local economies? Affect how diverse and robust local economies are? Affect the sense of positive self-image and the attractiveness of surrounding areas as places to live, work and invest in?</p>
<p><b>C. Health and Wellbeing</b> Protect and enhance health, safety and wellbeing of workers and communities; minimise any health risks associated with processing submarines.</p>	<p>Affect the health or safety of SDP workers, or other people working at the proposed sites? Affect the health, safety and well-being of local communities? Affect local healthcare infrastructure and provision?</p>
<p><b>D. Noise and Vibration</b> Minimise disturbance and stress to people, wildlife and historic buildings caused by noise and vibration.</p>	<p>Significantly increase levels of noise and vibration? Affect the amount of noise and vibration felt by local communities?</p>



Assessment Category and Overall Objective	Proposed Assessment Questions <i>Will the SDP Proposals...</i>
<b>E. Geology and Soils</b> Minimise threats to the extent and quality of soils and geological resources.	Have an effect on soil quality, variety, extent and/or compaction levels? Have an effect on soil function and processes? Increase the risk of significant soil contamination? Have an effect on any known and existing contamination? Affect geological conservation sites and important geological features? Affect land stability?
<b>F. Water</b> Maximise water efficiency, protect and enhance water quality.	Affect demand for water resources? Affect the amount of waste water and surface runoff produced? Cause any changes in radioactive or other hazardous discharges to water? Affect the quality of groundwater, surface waters or sea water? Affect the distribution and quality of freshwater or marine sediments?
<b>G. Air</b> Minimise emissions of pollutant gases and particulates and enhance air quality	Affect air quality? Cause a change in radioactive emissions to air? Affect emissions of ozone-depleting substances? Create a nuisance for people or wildlife (for example from dust or odours)?
<b>H. Climate Change and Energy Use</b> Reduce energy consumption, minimise detrimental effects on the climate from greenhouse gases and maximise resilience to climate change.	Affect the amount of carbon dioxide and other greenhouse gases emitted? Be significantly affected by climate change (for example rising temperatures and more extreme weather events)? Affect how climate change might impact on the wider environment? Promote or impede the use of energy efficiency measures, low carbon and/or renewable energy sources? Have wider implications for combating the effects of climate change?
<b>I. Coastal Change and Flood Risk</b> Minimise the risks from coastal change and flooding to people, property and communities.	Affect existing flood risks? Be at risk of flooding from any source? Affect coastal processes and/or erosion rates? Be affected by coastal processes and/or erosion?
<b>J. Material Assets (Transport)</b> Minimise the detrimental impacts of travel and transport on communities and the environment, whilst maximising positive effects.	Affect the number and frequency of heavy, oversized, radioactive and/ or hazardous loads being transported off-site, particularly through sensitive areas (e.g. population centres, historic areas and vulnerable ecosystems)? Increase or decrease traffic congestion around SDP sites? Increase or decrease the risk of traffic accidents around SDP sites?



Assessment Category and Overall Objective	Proposed Assessment Questions <i>Will the SDP Proposals...</i>
<p><b>K. Material Assets (Waste Management)</b></p> <p>Minimise waste arisings, promote reuse, recovery and recycling and minimise the impact of wastes on the environment and communities.</p>	<p>Increase the amount of radioactive waste to be disposed of?</p> <p>Affect the amount of hazardous waste to be disposed of?</p> <p>Affect the amount of non-hazardous wastes produced?</p> <p>Affect the capacity of existing waste management systems, both nationally and locally?</p> <p>Maximise re-use and recycling of recovered components and materials?</p> <p>Help achieve government and national targets for minimising, recovering and recycling waste?</p> <p>Affect the environmental risks associated with managing radioactive and hazardous wastes?</p>
<p><b>L. Land Use and Materials</b></p> <p>Contribute to the sustainable use of land and natural and material assets.</p>	<p>Change patterns of land use on or around SDP sites?</p> <p>Affect any existing or proposed redevelopment/regeneration programmes?</p> <p>Lead to the loss of undeveloped land or green spaces?</p> <p>Increase the burden on limited natural resources such as aggregates or wood?</p> <p>Promote the use of sustainable design and construction practices and help the government achieve its targets for the quality of built environments?</p> <p>Make best use of existing infrastructure and resources?</p>
<p><b>M. Cultural Heritage</b></p> <p>Protect and where appropriate enhance the historic environment including cultural heritage resources, historic buildings and archaeological features.</p>	<p>Affect designated or locally-important archaeological features?</p> <p>Affect the fabric and setting of historic buildings, places or spaces that contribute to local distinctiveness, character and appearances?</p>
<p><b>N. Landscape and Townscape</b></p> <p>Protect and enhance landscape and townscape quality and visual amenity.</p>	<p>Have significant visual impacts (including those at night)?</p> <p>Affect protected/designated landscapes or townscapes, such as National Parks or Conservation Areas?</p> <p>Affect the intrinsic character of local landscapes or townscapes?</p> <p>Affect public access to open spaces or the countryside?</p>

## 10. How will the Assessments be undertaken?

For each of the options within the SDP (shown in **Figure 2** and **Table 1**), assessment will be undertaken using an SEA matrix which has been developed by the MOD to meet the SEA's statutory requirements. The matrix is shown in **Table 4**. This will enable both the nature and magnitude of the environmental effects to be recorded. Specific elements to be included within the assessment will include:

- The potential environmental effects of each SDP option.
- The 'mitigation' measures that could be used to reduce any potentially significant negative effects that the SDP may have, and to enhance any potentially positive effects that it may have.



- The assumptions and uncertainties that underpin the assessment.
- The additional information that would be required to address any uncertainties and to undertake more detailed site-specific assessment.
- The timescales over which the potential effects are likely to occur. For the Submarine Disposal Programme, the proposed definitions of timescale are: Short term = up to five years after each activity begins; medium term = over five years and to the end of the activity; long term = the ongoing time period after the activity has ceased.

Symbols and colour coding will also be used to indicate significant (positive or negative) impacts.

**Table 4 EXAMPLE Assessment Matrix (extract) for each SDP Option**

Assessment Category and Objective	Likely Effects (including direct, indirect, cumulative and synergistic effects, and possible mitigation measures)	Timescale		
		Short-Term	Medium-Term	Long-Term
<b>A. Biodiversity and Nature Conservation:</b> Protect and enhance habitats, species and ecosystem functionality.	A description of the biodiversity and nature conservation effects of each option will be provided here, with reasoning and justification included...	-	0	0
<b>B. Population:</b> Promote a strong, diverse and stable economy with opportunities for all, minimise disturbance to local communities and maximise positive social impacts.	A description of the population effects of each option will be provided here...	++	+	0
<b>C. Health, Safety and Wellbeing</b> Protect and enhance health, safety and wellbeing of communities and minimise potential risk associated with processing radioactive and non-radioactive materials.	A description of the health and wellbeing effects of each option will be provided here...	0	0	+
....etc				
++ Strongly positive effect	+ Positive effect	0 No significant effects	- Negative effect	-- Strongly negative effect



## 11. What are the Next Steps of the SEA Process?

This second Non-Technical Summary and the accompanying updated Scoping Report have been sent to the UK's Statutory Consultation Bodies for comment. Input has also been invited from relevant Government Departments and Agencies, and the UK's Devolved Administrations. Comments from the Scoping Consultees are being invited during the second five week consultation period, starting on the date the Scoping Report is received (the total consultation period will be seven weeks, to allow for the Christmas and New Year break). Comments and responses received during that period will be considered and used to refine the scope of the assessment. The comments received (and MOD's response to them) will be made public. The comments received from the first Statutory Consultation can be found in Annex F of the main Scoping Report.



The SEA Environmental Report will form part of the consultation material for the third national public consultation on the SDP. This 12-week public consultation will seek the views of those interested in the SDP proposals. It will be a national consultation, although specific events will take place in the areas around credible sites. The views and representations received during the public consultation will be published once the consultation has ended, with MOD's initial response to them. The MOD will study the recommendations and will use them to help inform strategic decisions on the way forward, and to optimise the environmental performance of the SDP as it moves towards the detailed planning stage.

Whilst it may not be possible for all comments and suggestions to be accepted, MOD will take all feedback fully into account before any final decisions are made, and will make those decisions and justifications public.



## Abbreviations and Glossary

Authorisation	Authorisations allow specific defence-related nuclear activity to take place at a specific site. 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.
'Brownfield,' previously-developed land	This term refers to land which is, or has, been previously been built upon or otherwise developed. Ideally, there should be sufficient existing infrastructure in place (such as a dock to accommodate the submarines), but there would be no nuclear facilities or specialist personnel available.
CoRWM	<u>Committee on Radioactive Waste Management</u> This independent committee provides scrutiny and advice to Government on the long term management of radioactive waste, including storage and disposal. See <a href="http://www.corwm.org.uk/default.aspx">http://www.corwm.org.uk/default.aspx</a>
Final Dismantling	This is the process whereby the non-radiological front and rear sections of the submarines (which form the bulk of each vessel) are dismantled. The issues associated with this are very similar to those for conventional, surface ships.
GDF	<u>Geological Disposal Facility</u> This is the government's proposed long-term, below-ground facility for disposing of the UK's Higher-Activity Nuclear Waste, which includes high-level materials such as spent nuclear fuels, and Intermediate-Level Waste. The GDF has yet to be built. See <a href="http://mrws.decc.gov.uk/en/mrws/cms/home/What_is_geolog/What_is_geolog.aspx">http://mrws.decc.gov.uk/en/mrws/cms/home/What_is_geolog/What_is_geolog.aspx</a> for more details.
'Greenfield' or 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). On such land, there would be no existing infrastructure or other resources suitable to undertake submarine dismantling or store ILW, so most or all the required infrastructure would need to be developed from scratch.
ILW	<u>Intermediate-Level Waste</u> This is radioactive waste 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 sufficient levels of heat to require it to be cooled during storage. By contrast, nuclear fuels are generally much more active, and do have to be cooled. The major components of ILW from submarines are metals and organic materials, with smaller quantities of cement, graphite and ceramics. ILW has no current final disposal route, so most is stored at or close to where it has been generated.



Initial Dismantling	This is the process whereby the Reactor Compartment, which contains the Reactor Pressure Vessel, is dismantled. This work has to take place on site with an appropriate nuclear site Licence, issued by the Nuclear Installations Inspectorate of the Health and Safety Executive. There are three technical options for initial dismantling in the SDP - namely RC cut out and storage, RPV cut out and storage, and packaged waste cut up and storage.
ISOLUS	<u>Interim Storage of Laid-Up Submarines</u>  This is the former name of the Submarine Dismantling Project. It was changed to the Submarine Dismantling Project in 2009.
Licence	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 Authorisations being granted by the Nuclear Installations Inspectorate. Nuclear power stations and other civil activities are Licensed in this way.
LLW	<u>Low-Level Waste</u>  This is defined as radioactive waste that has below 4 Gbq per tonne of alpha activity and below 12 GBq per tonne of beta-gamma activity. It covers a variety of materials which arise principally as lightly contaminated miscellaneous scrap and redundant equipment. LLW has an existing disposal route to the current UK LLW Repository in Cumbria.
MRWS	<u>Managing Radioactive Waste Safely</u>  This is the UK Government's published approach to managing the nation's radioactive wastes, irrespective of where they come from and their level of activity. The SDP will adhere to this approach. See <a href="http://mrws.decc.gov.uk/">http://mrws.decc.gov.uk/</a> for more details.
NDA	<u>Nuclear Decommissioning Authority</u>  This government agency is responsible for developing the UK's nuclear low-level waste strategy and plans, and for managing the long-term arrangements for the UK's higher-level radioactive wastes including spent nuclear fuels and ILW. The NDA manages the MOD's spent nuclear fuel on behalf of the government. See <a href="http://www.nda.gov.uk/">http://www.nda.gov.uk/</a> for more details.
Packaged Waste Storage	This term refers to fully dismantling the Reactor Compartment, so that the radioactive materials can be cut up and packaged in appropriate containers for transport, interim storage and disposal in the proposed GDF.
RC	<u>Reactor Compartment.</u>  This is the central 'slice' of the submarine which contains the nuclear reactor (housed within the Reactor Pressure Vessel) and associated pipe-work. Reactor Compartments are around 700 tonnes in weight, 10 metres in diameter and around nine metres long (depending on submarine type). The approximate location of the Reactor Compartment can be seen in Figure 1.



RC Storage	<p>This term refers cutting out the complete Reactor Compartment, separating it from the rest of the submarine. The RC is then stored intact. This is the current approach used by the USA, France and Russia. <i>This was previously referred to as the RC 'cut out' option.</i></p> <p>RCs will be far too large to fit into the proposed GDF intact. This means that each RC will eventually have to be 'cut up' to fully packaged waste before it can be disposed of.</p>
RPV	<p><u>Reactor Pressure Vessel</u></p> <p>This is a self-contained metal vessel that contains the nuclear reactor itself. Prior to defueling, the RPV contains the nuclear fuel. It is located within the wider Reactor Compartment (RC).</p>
RPV Storage	<p>This term refers to cutting out the Reactor Pressure Vessel and removing it from the submarine. The RPV is then stored intact in specialist shielded packaging and the associated pipe-work is placed into transportable containers. <i>This was previously referred to as the 'RPV cut out' option.</i></p> <p>RPVs will be too large to fit into the proposed GDF intact. This means that each RPV will eventually have to be 'cut up' to fully packaged waste before it can be disposed of.</p>
SDP	<p>Submarine Dismantling Project <a href="http://www.submarinedismantling.co.uk">www.submarinedismantling.co.uk</a></p>
SEA	<p><u>Strategic Environmental Assessment</u></p> <p>An assessment undertaken on certain public plans and programmes to ascertain the potential environmental effects that it may have, to identify ways in which damaging effects can be avoided and benefits can be enhanced. SEA also gives the public the opportunity to see what impacts a strategic plan might have on them and to shape the approach taken.</p>

