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SAFEGROUNDS

The UK regulatory framework for contaminated land on nuclear-licensed sites and defence sites

Information paper for the SAFEGROUNDS Learning Network

Version 5 (August 2007)

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sharing knowledge ■ building best practice



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The UK regulatory framework for contaminated land on nuclear-licensed sites and defence sites

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CIRIA

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Foreword

This is the fifth version of a paper that was originally produced for the SAFEGROUNDS Project Steering Group. It is mainly intended to be a factual summary of the key features of the UK regulatory framework for the management of contaminated land on nuclear-licensed sites and defence sites. The regulatory regimes included are those for radioactive contamination, non-radioactive contamination and mixed contamination on such sites, and on other sites where it is known or suspected that radioactive contamination may be present. The paper incorporates information from the regulatory bodies for England, Scotland, Wales and Northern Ireland, from central government departments and from the devolved administrations but it is in no way a formal statement of their positions.

This version of the paper reflects developments over the period from September 2005 to August 2007. The main text deals primarily with the regulatory framework in England. Differences in Scotland, Wales and Northern Ireland are signposted in the main text and summarised in an appendix. There is a parallel paper for CIRIA's SD:SPUR Learning Network that contains information about the regulatory framework for the management of radioactive and non-radioactive wastes produced during the remediation of contaminated land (see <www.sdspur.com>).

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List of acronyms and abbreviations

Acronym	Meaning
ALARA	as low as reasonably achievable
ALARP	as low as reasonably practicable
BPEO	best practicable environmental option
BPM	best practicable means
Bq	becquerel (unit of radioactivity), also kBq (kilobecquerel, a thousand becquerels), MBq (megabecquerel, a million becquerels), Bq/g (becquerels per gram), Bq/ml (becquerels per millilitre)
BSS Directive	European Directive on basic safety standards for protection against exposure to ionising radiation
CDM	Construction (Design and Management) Regulations
CIRIA	Construction Industry Research and Information Association
COSHH	Control of Substances Hazardous to Health Regulations
DCLG	Department of Communities and Local Government
DE	Defence Estates
Defra	Department for Environment, Food and Rural Affairs
DETR	Department of Environment, Transport and the Regions (a predecessor of Defra)
DoE	Department of Environment (a predecessor of Defra)
DoE(NI)	Department of Environment for Northern Ireland
DNSR	Defence Nuclear Safety Regulator
EA	Environment Agency
EHS(NI)	Environment and Heritage Service (Northern Ireland)
EIA	environmental impact assessment
EIADR	Nuclear Reactors (Environmental Impact Assessments for Decommissioning) Regulations
EO	Exemption Order (made under the Radioactive Substances Act)
EPA90	Environmental Protection Act 1990
HPA	Health Protection Agency
HSE	Health and Safety Executive
HSE(NI)	Health and Safety Executive (Northern Ireland)
HSC	Health and Safety Commission
HSWA74	Health and Safety at Work etc Act 1974
IRR99	Ionising Radiations Regulations 1999
LA	local authority

LLW	low level (radioactive) waste
LLWR	UK Low Level Waste Repository (near Drigg in Cumbria)
MHSW	Management of Health and Safety at Work Regulations
MoD	Ministry of Defence
mSv	millisievert (unit of radiation dose, one thousandth of a Sievert (Sv))
NDA	Nuclear Decommissioning Authority
NIA65	Nuclear Installations Act 1965
NISR03	Nuclear Industries Security Regulations 2003
NRPB	National Radiological Protection Board (now the Radiation Protection Division of the Health Protection Agency)
OCNS	Office of Civil Nuclear Security
ODPM	Office of the Deputy Prime Minister (responsibilities relevant to this paper are now with DCLG)
PAN 33	Planning Advice Note 33, for Scotland, see (Scottish Executive, 2000)
PAN 51	Planning Advice Note 33, for Scotland see (Scottish Executive, 2006)
Part 2A	Part 2A of the Environmental Protection Act 1990 (inserted by the Environment Act 1995)
PPC	pollution prevention and control (regime, regulations, permits)
PPS 23	Planning Policy Statement 23, for England, see (ODPM, 2004)
PSRE EO	Phosphatic Substances, Rare Earths etc Exemption Order
RSA93	Radioactive Substances Act 1993
SAPs	safety assessment principles (for nuclear facilities)
Schedule 1	Schedule 1 of the Radioactive Substances Act 1993
SD:SPUR	site decommissioning: sustainable practices in the use of resources
SEA	strategic environmental assessment
SEPA	Scottish Environment Protection Agency
SI	Statutory Instrument
SoLA EO	Substances of Low Activity Exemption Order
SR	Statutory Rule (in Northern Ireland)
SSI	Scottish Statutory Instrument
VLLW	very low level (radioactive) waste
WAG	Welsh Assembly Government
WLGA	Welsh Local Government Association

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1

Key features of the regulatory framework

1.1

Sites included

Throughout this paper the term “nuclear-licensed site” is used to mean (see the Nuclear Installations Act 1965, as amended):

- any site in respect of which or part of which a nuclear site licence is for the time being in force
- any site in respect of which, after revocation or surrender of a nuclear site licence, the period of responsibility of the licensee has not come to an end.

All the nuclear power station sites are nuclear-licensed sites, as are the sites where nuclear fuel is manufactured, the site where spent fuel is reprocessed (Sellafield), the UKAEA sites where R&D was or is carried out, and the low level radioactive waste repository (LLWR) near Drigg. Sites where nuclear weapons are made and sites where nuclear-powered submarines are maintained are also nuclear-licensed sites; these sites are owned by the Ministry of Defence (MoD) but operated by contractors. Other nuclear-licensed sites include radioisotope production facilities and research reactors. All the major civil nuclear-licensed sites that are being wholly or partly decommissioned are owned by the Nuclear Decommissioning Authority (NDA) and operated by “site licence companies”, under contract to the NDA.

The term “defence site” is used to mean any site that is owned by MoD that is not a nuclear-licensed site and on which it is known or suspected that radioactive contamination is present on, in or under the land. Most defence sites are ones where the main operation involving radioactive materials was the maintenance of radium luminised instruments, and where this ceased many years ago. MoD is in the process of remediating many of these sites with a view to their sale or re-use for another purpose. A small number of defence sites are ones where nuclear operations (particularly the storage of nuclear weapons) are, and will continue to be, carried out. These defence nuclear sites are not subject to the civilian control regime imposed by the Nuclear Installations Act but it is MoD policy that, where practicable, equivalent standards of control should be applied.

For completeness, mention is also made of other sites where radioactive contamination may be present. These include industrial sites and sites formerly owned by MoD. All sites are subject to the Health and Safety at Work etc Act and regulations made under it (in particular, in the present context, the Ionising Radiations Regulations 1999).

1.2

Summaries of regulatory regimes

Table 1 shows the UK regulatory regimes for radioactively and non-radioactively contaminated land and Table 2 shows the principal regulators. Tables 3–5 summarise the key features of the current regulatory regimes for:

- radioactively contaminated land on nuclear-licensed sites (Table 3)

- chemically (ie non-radioactively) contaminated land, and land with mixed contamination (ie radioactive and non-radioactive), on nuclear-licensed sites (Table 4)
- all contaminated land on defence sites and other sites (Table 5).

The main legislation is listed in Table 6. A key to the acronyms used in the tables and the text of the paper is given in Table 7. Chapters 2 and 3 identify the major differences between the regimes for radioactive and non-radioactive contamination that appear at the beginning of Tables 3–5. These concern definitions of “contaminated land” (see Chapter 2) and their implications for the management, and in particular the remediation, of that land (see Chapter 3). Chapters 2 and 3 deal primarily with the regulatory regimes in England. Differences in Scotland, Wales and Northern Ireland are summarised in Appendix A, and mentioned in the main text.

2

Definitions of contaminated land

In UK law there is no single definition of “contaminated land” that applies to both radioactive and chemical (non-radioactive) contamination or to all types of site. The definitions for non-radioactive contamination are somewhat more straightforward so these are dealt with first, in Section 2.1 below. The definitions for radioactively contaminated land are discussed in Section 2.2.

2.1

Definitions for non-radioactively contaminated land

There are two main components of the environmental regulatory framework that are relevant for definitions for non-radioactively contaminated land. These are:

- the Part 2A regime, which applies to land in its current use (including any use for which planning permission has been granted), and which is designed to deal with the legacy of contaminated land that is posing the greatest risks to people, human activities and the environment
- the planning regime, which applies to land proposed for development.

The Part 2A regime, which applies in England, Scotland and Wales, has a statutory definition of “contaminated land” (see Section 2.1.1), as does the corresponding legislation in Northern Ireland (see Appendix A). English guidance under the planning regime uses the wider term “land affected by contamination” (see Section 2.1.2). Scottish planning guidance also has a definition that is broader than that in Part 2A (see Appendix A).

2.1.1

Part 2A definition of “contaminated land”

Part 2A of the Environmental Protection Act 1990 (inserted by Section 57 of the Environment Act 1995) defines “contaminated land” as any land that appears to the local authority “to be in such a condition, by reason of substances in, on or under the land, that significant harm is being caused or there is a significant possibility of such harm being caused” or “pollution of controlled waters is being, or is likely to be caused”. In this definition “harm” means harm to the health of human beings and various other living organisms, or other interference with the ecological systems of which they form a part, and, in the case of humans, includes harm to property. Regulations (see Table 6) and Statutory Guidance set out what harm is to be regarded as “significant”, what is meant by “significant possibility” and how to determine whether pollution of controlled waters¹ is being or is likely to be caused (Defra, 2006).

This definition of “contaminated land” is based on the principles of risk assessment and the application of the definition has two steps. The first is to find out whether a “contaminant”, a “pathway” and a “receptor” all exist for one or more of the substances on the land. The second is to determine whether these “pollutant linkages” are leading or are likely to lead to significant harm or pollution of controlled waters. Unless there is one or more “significant pollution linkage” for the land it cannot be deemed to be contaminated land under Part 2A, whatever the levels of contamination present.

¹ For England and Wales, “controlled waters” are as defined in Part II of the Water Resources Act 1991; they include groundwaters. In Scotland the sections of Part 2A that deal with pollution of controlled waters have been changed to bring them into line with recent Scottish legislation (see Appendix A). There are likely to be corresponding changes in England and Wales in due course. Legislation in Northern Ireland uses different terminology (see Appendix A).

If land on nuclear-licensed sites or defence sites is contaminated land they are to be dealt with as “special sites” under the Part 2A regime, which means, in essence, that they are regulated by the relevant environment agency (see below). If the land on a nuclear-licensed site or defence site is not contaminated land (as defined above) then the site will not be a “special site” under Part 2A. Other sites on which there is land that is deemed to be contaminated land and that are not “special sites” are regulated by local authorities, with advice from the environment agencies where necessary.

Local authorities are responsible for identifying land in their areas which meets the Part 2A definition of contaminated land. In doing so, they will seek information from the relevant environment agency and advice in respect of pollution of controlled waters. In cases where a local authority believes that land, if found to be contaminated land, would subsequently be a “special site”, it will normally ask the environment agency to carry out a site inspection prior to determination. However, the responsibility for the formal determination of land as contaminated land remains with the local authority in all cases. Once land has been determined to be contaminated land, and where the environment agency and local authority agree (or in case of dispute the relevant Minister decides) that the land is also a “special site”, the environment agency will take over regulatory responsibilities from the local authority to ensure that appropriate remediation is carried out.

2.1.2 Planning regime definition of “land affected by contamination”

In late 2004 the Office of the Deputy Prime Minister (ODPM) issued Planning Policy Statement 23 (PPS 23), which, in Annex 2, provides guidance to English planning authorities on development on contaminated land (ODPM, 2004). The PPS 23 guidance uses the term “land affected by contamination”, which it states is intended to cover “all cases where the actual or suspected presence of substances in, on or under the land may cause risks to people, human activities or the environment, regardless of whether the land meets the statutory definition in Part 2A”.

This wide term “land affected by contamination” reflects the context of planning control. The aim of the guidance is to ensure that all situations in which there are, or could in future be, unacceptable risks from land contamination are addressed in the planning process and that developments are carried out in such a way as to remove these unacceptable risks (see also Section 3.1.2). The PPS 23 guidance covers radioactive contamination as well as non-radioactive contamination (see also Section 2.2.6) and applies to both natural and artificial contamination (ODPM, 2004).

The PPS 23 guidance is for all sites in England that come within the planning regime. Nuclear-licensed sites are included after they have been delicensed and when a development is proposed that requires planning permission. Defence sites for which a change of use is proposed are included if that change requires planning permission. Planning guidance for Scotland is given in PAN 33 and is discussed in Appendix A (Scottish Executive, 2000). There is also guidance for developers in Wales (WAG, 2006).

2.2 Definitions for radioactively contaminated land

Six definitions for radioactively contaminated land are used in connection with the regulatory framework. These are:

- 1 A general definition of “radioactively contaminated land” that is largely consistent with the Radioactive Substances Act 1993.

- 2 The definition of “radioactively contaminated land” in the Health and Safety Executive’s (HSE’s) safety assessment principles for nuclear facilities.
- 3 The definition of “radioactive contaminated land” in the Part 2A regime for England and Wales.
- 4 The definition of “radioactive contaminated land” in the Part 2A regime for Scotland.
- 5 The Environment Agency definition of “land contaminated with radioactivity”.
- 6 A definition relevant to the planning regime guidance on development on “land affected by contamination”.

These definitions are discussed in turn below.

2.2.1

General definition of “radioactively contaminated land”

This definition is that land is radioactively contaminated if activity levels are above the ubiquitous natural and artificial background that is typical of the area in which the land is located. The ubiquitous artificial background is taken to include radioactivity from atmospheric testing of nuclear weapons in the 1950s and 1960s, fallout from the Chernobyl accident, and radioactivity resulting from effluent discharges from distant nuclear facilities. The definition is, in most respects, consistent with the regulatory regime for the control of radioactive substances and radioactive wastes of the Radioactive Substances Act 1993. Under this Act a substance is radioactive if:

- a It contains activities per unit mass (expressed in Becquerels per gram (Bq/g)) of the naturally-occurring radioelements uranium, thorium, radium, protactinium, polonium, lead and actinium that are above the levels given in Schedule 1 of the Act.
- b It contains any substances that are not naturally occurring and the radioactivity of which is wholly or partially due to nuclear fission or to bombardment by neutrons or ionising radiations, but excluding radioactivity that is a consequence of past disposals of radioactive waste that at the time were authorised under the Act.

Item (a) of this definition of a radioactive substance is not applicable when defining radioactively contaminated land. This is because Schedule 1 levels were derived several decades ago in the context of the management of radioactive wastes. Subsequent reviews of the appropriateness of these levels have also focused on this context and it could be that, in some circumstances, land contamination at or below the Schedule 1 levels would lead to risks that could be considered unacceptable. Item (b) is applicable except that radioactive contamination that is a consequence of past disposals of radioactive waste from the site in question, or nearby sites, is usually viewed in the same way as any other contamination.

With this general definition the determination of whether land is radioactively contaminated relies only on measurement. Unlike the Part 2A definition for non-radioactive contamination (see Section 2.1.1), and the Part 2A definitions for radioactive contamination (see Section 2.2.3 and 2.2.4), there is no identification of pollutant linkages or risk assessment involved. When this definition is used it is implicitly assumed that if radioactivity levels are above background in, on or under the land then there may be risks to people or the environment. It follows that assessment is needed to find out whether action is required to reduce or remove these risks. In some cases the assessment need only be very simple, for example if there are no receptors or no pathways to people.

In the past it has been argued that the Substances of Low Activity Exemption Order (the SoLA EO) made under the Radioactive Substances Act is relevant to the definition of radioactively contaminated land. The SoLA EO states that solid materials and wastes that contain artificial radionuclides at levels less than 0.4 Bq/g, in substantially insoluble form, need not be dealt with as radioactive substances or radioactive wastes under the Radioactive Substances Act regime. This argument is no longer considered valid, for the same reason as given above for the Schedule 1 levels. The situation now is that the 0.4 Bq/g level in the SoLA EO is not used in defining whether land is radioactively contaminated on nuclear-licensed sites, defence sites, or any other types of sites.

2.2.2

HSE definition of “radioactively contaminated land” for nuclear-licensed sites

The 2006 HSE safety assessment principles (SAPs) for nuclear facilities contain principles for dealing with radioactively contaminated land on nuclear-licensed sites (HSE, 2006). They define “radioactively contaminated land” as “land containing radioactive contamination that would preclude HSE giving notice in writing that in its opinion there ceases/has ceased to be any danger from ionising radiations on the site, or part of the site”. The criterion for delicensing is that the risk of death to an individual should not be more than one in a million per year (see Section 3.2.2). So, in effect, the SAPs definition is that land is radioactively contaminated if the risk it would present to any individual in any future use is greater than one in a million per year.

2.2.3

Part 2A definition of “radioactive contaminated land”, England and Wales

During 2006 the Part 2A regimes in England and Wales were extended to include radioactive contaminated land (Defra, 2006; WAG, 2006). A corresponding extension is being made in Scotland in 2007 (see Section 2.2.4 and Appendix A). New regulations for radioactive contaminated land were introduced in Northern Ireland in 2006 that serve the same purpose as the Part 2A extensions (see Appendix A).

Like the remainder of the Part 2A regime (see Section 2.1), the extension is designed to deal with contaminated land that is at present posing the greatest risks. It applies to land in its current use, including any new use for which planning permission has already been granted and any foreseeable change of use for which planning permission would not be required. As well as dealing with the legacy of radioactively contaminated land, the extension also covers land that becomes contaminated as a result of a future, non-nuclear, radiological emergency. The new Part 2A regulations do not apply to nuclear-licensed sites, or to land contaminated as a result of accidents at nuclear-licensed sites or at nuclear sites in other countries. Further regulations are expected to be made for such sites in due course (see Section 4.1).

In the extension to Part 2A for England and Wales, “radioactive contaminated land” is defined as any land that appears to the local authority to be “in such a condition, by reason of substances in, on or under the land that harm is being caused or there is a significant possibility of harm being caused”. In this definition, “harm” refers only to the potential effects of long-lasting radiation exposure on the health of humans. Land is defined as “radioactive contaminated land” under Part 2A if the individual effective dose from lasting exposure is equal to or greater than 3 mSv per year (and/or the dose to the skin is equal to or greater than 50 mSv per year, and/or the dose to the lens of the eye is equal to or greater than 15 mSv per year) (Defra, 2006). The individuals to be considered in determining whether the land is contaminated are those currently present and those who might be present if the land is used for other purposes that are

consistent with existing planning permission. Individuals who are not likely to be present can be disregarded. The Statutory Guidance also indicates what is to be considered as “a significant possibility of harm being caused” (Defra, 2006). The approach in the extension is based on the principles of risk assessment and is consistent with the use of “significant pollutant linkages” in the remainder of the Part 2A regime (see Section 2.1.1).

Land that is “radioactive contaminated land” under the extension to Part 2A is to be dealt with as a “special site”. In England and Wales, local authorities are responsible for identifying radioactively contaminated land that meets the statutory definition. In doing so they only need to inspect sites that they have “reasonable grounds” for believing are radioactively contaminated. Local authorities are expected to seek advice from the Environment Agency in identifying sites and to ask the Environment Agency to inspect each site before determining formally that it is “radioactive contaminated land” and hence a “special site”. As in the remainder of the Part 2A regime (see Section 2.1.1), the Environment Agency takes over the regulation of sites after local authorities have determined that they are “radioactive contaminated land” and hence “special sites” (Defra, 2006; WAG, 2006).

2.2.4

Part 2A definition of “radioactive contaminated land”, Scotland

The regulations that extend the Part 2A regime in Scotland to radioactive contaminated land came into force at the end of October 2007 (see Appendix A). They define “radioactive contaminated land” in the same way as “contaminated land” is defined in the Scottish Part 2A regulations for non-radioactively contaminated land, but with a different definition of “harm”.

The Scottish Part 2A definition of “radioactive contaminated land” is “any land that appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

- significant harm is being caused or there is a significant possibility of such harm being caused
- significant pollution of the water environment is being caused or there is a significant possibility of such pollution being caused”.

In this definition “harm” means “lasting exposure to any person resulting from the after-effects of a radiological emergency, past practice or past work activity”. There is also a separate definition of “harm” in relation to the water environment (ie surface water, groundwater and wetlands) and this includes harm to living organisms other than humans (see Appendix A). There will be new statutory guidance for the 2007 regulations and this will provide further details of the definitions (see Section 4.2).

2.2.5

Environment Agency definition of “land contaminated with radioactivity”

The Environment Agency website (www.environment-agency.gov.uk/subjects/landquality) contains guidance for land with radioactive contamination, to accompany the extended Part 2A regime. The guidance gives the Part 2A definition of “radioactive contaminated land” for England and Wales (see Section 2.2.3) and introduces the term “land contaminated with radioactivity”. This is defined as “land into or onto which radioactive substances have been introduced as a consequence of man’s activities”, where “radioactive substances” are “radioactive materials” and “radioactive wastes” as defined in the Radioactive Substances Act 1993.

This definition of “land contaminated with radioactivity” is similar to the general definition of “radioactively contaminated land” given in Section 2.2.1. The major difference is that the Environment Agency definition contains no caveats about the interpretation of the Radioactive Substances Act in the context of radioactively contaminated land.

2.2.6

Definition of “land affected by radioactive contamination” for the planning regime

PPS 23 does not contain an explicit definition of “land affected by radioactive contamination”. From the discussion above, it appears that a suitable definition of “land affected by radioactive contamination” could be one that is very similar to the general definition of radioactively contaminated land given in Section 2.2.1. This is because the definition in Section 2.2.1 would meet the objective of the PPS 23 guidance of ensuring that all land that has potentially unacceptable risks from radioactive contamination is addressed in the planning process. Such a definition would also have the advantage of being largely consistent with the Radioactive Substances Act regime.

As noted in Section 2.1.2, the PPS 23 guidance is for all sites in England that come within the planning regime. Nuclear-licensed sites are included after they have been delicensed and when a development is proposed that requires planning permission. Defence sites for which a change of use is proposed are included if that change requires planning permission.

3

Management of contaminated land

3.1

Management of non-radioactively contaminated land

3.1.1

Management under the Part 2A regime

By definition, land that is “contaminated land” in the Part 2A sense is causing or is likely to cause significant harm or pollution of controlled waters and therefore some kind of action is required. In general this action will take the form of “remediation”, which is defined in Part 2A as:

- “the doing of anything for the purpose of assessing the condition of –
 - the contaminated land in question
 - any controlled waters affected by that land
 - any land adjoining or adjacent to that land
- the doing of any works, the carrying out of any operations or the taking of any steps in relation to such land or waters for the purpose of –
 - preventing or minimising, or remedying or mitigating the effects of, any significant harm, or any pollution of controlled waters, by reason of which the contaminated land is such land
 - restoring the land or waters to their former state
- the making of subsequent inspections from time to time for the purpose of keeping under review the condition of the land or waters.”

The Statutory Guidance for Part 2A describes the aim of remediation for an area of contaminated land as the “standard of remediation” (Defra, 2006, WAG, 2006). The standard of remediation should be established for each significant pollutant linkage. The minimum aim in each case should be to ensure that the land in its current use (including any future use for which planning permission exists) is no longer “contaminated land”, and that the effects of any significant harm or pollution are remedied. Under Part 2A, the enforcing authority (ie the local authority or, on “special sites”, the relevant environment agency) has a clear role in establishing and implementing the standard of remediation under a variety of situations. In particular:

- under voluntary remediation, the enforcing authority reviews the proposed works to ensure that they will meet the required standard of remediation and then reviews the implementation of the works to ensure that they continue to do so
- under a remediation notice, the enforcing authority is responsible for identifying the standard of remediation to be achieved by the actions specified within the notice. The authority will then review the implementation of the works to ensure that they continue to meet the required standard.

The enforcing authority is required to take into account the best practicable technique for remediation and in all cases the remediation selected must be reasonable. If remediation actions are not reasonable then they cannot be considered to be the best practicable techniques for the relevant significant pollution linkages (Defra, 2006, WAG, 2006).

The Part 2A regime is designed to encourage voluntary remediation. It is recognised that this will often be funded by redevelopment and that in such cases it is for the planning system to ensure that the contaminated land is investigated appropriately and that remediation is carried out. It is the responsibility of the developer to carry out the remediation and, in most cases, remediation requirements will be enforced through planning conditions and building control, rather than through remediation notices.

There will be sites that are not proposed for development where contamination is present but that are not “contaminated land” as defined in the Part 2A regime (for example, because there is no significant pollutant linkage). The options for such sites are to do nothing, or to implement any remedial measures that the site owner feels to be desirable or that are needed for reasons not connected with Part 2A (for example, to comply with the Environment Agency’s requirements specified under the Anti-Pollution Works Notice Regulations 1999). At nuclear-licensed sites remediation of non-radioactively contaminated land may be necessary in order to comply with site licence conditions related to general safety, or because of the potential for contamination to affect nuclear safety.

3.1.2

Management under the planning regime

PPS 23 states that, in all cases where it is known or suspected that contamination is present, or when the proposed use of the land would be particularly vulnerable (eg housing, schools, hospitals, children’s play areas), the local authority should, as a minimum, require the applicant for planning permission to submit a report of a desk study and site reconnaissance (walk-over). In some cases these will be sufficient to show either that there is no contamination present or to develop a conceptual model, carry out a risk assessment and appraise remediation options. If contamination is present, it is more likely that the desk study and site reconnaissance will be used to provide input to the design of further site investigations and more detailed risk assessments. PPS 23 states that local planning authorities should take a balanced approach when specifying the investigations and assessments that the applicant is required to carry out, so that the effort and costs for the applicant are commensurate with the potential risks of the contaminated land to people and the environment (ODPM, 2004).

In deciding on planning applications for land affected by contamination the local authority needs to be satisfied that the proposed development does not create, or allow the continuation of, unacceptable risks, either from the land in question or from adjoining land. All existing significant pollution linkages should be broken and no new ones created. Part 2A principles apply when assessing and acting on risks (see Section 3.1.1) but the planning regime is broader because it is concerned with both existing and new risks and with a wider range of receptors (eg general fauna and flora, landscape, amenity and heritage are included). The local authority has to be satisfied that the proposed development will protect all receptors relevant to a site to appropriate standards and that, as a minimum, the land in its new use will not be “contaminated land” under Part 2A.

The local authority also has to consider the potential impact of remediation activities and be satisfied that the development can be carried out without unacceptable risks to workers, neighbours or other off-site receptors. PPS 23 states that a balance should be struck between the overall social and economic benefits of the development, including the remediation proposals, and the temporary impacts of remediation activities. It also recommends that applicants carefully consider waste management implications when deciding on the best approach to remediation (ODPM, 2004). The local planning authority can attach conditions to planning permissions to ensure that proposed developments meet their requirements.

The management of contaminated land in Scotland under the planning regime is outlined in PAN 33 (Scottish Executive, 2000). The terms used are somewhat different to those in PPS 23 but the overall intentions are similar (see Appendix A).

3.2

Management of radioactively contaminated land

3.2.1

Radioactively contaminated land on nuclear-licensed sites – general

The most recent HSE guidance to its inspectors on the management of radioactively contaminated land is given in its revised safety assessment principles for nuclear facilities (SAPs) (HSE, 2006). Some of the previous guidance is also still relevant (HSE, 2001). The SAPs contain eight principles for the control and remediation of radioactively contaminated land. These principles are about (HSE, 2006):

- 1 Preparation of a strategy for managing radioactively contaminated land up to the time of any delicensing (see Section 3.2.2).
- 2 Detecting radioactively contaminated land on or adjacent to nuclear-licensed sites.
- 3 When radioactively contaminated land is discovered, identifying and controlling the source of contamination.
- 4 Characterisation of the contaminated areas.
- 5 Monitoring and surveillance.
- 6 Preparing and implementing plans for the control and remediation of all radioactively contaminated areas.
- 7 Record-keeping.
- 8 Remediating radioactively contaminated land before any new facilities are constructed on it.

“Remediation” is defined in the SAPs as “any measure that may be carried out to reduce the radiation exposure from existing contamination of land areas through action applied to the contamination itself (the source) or to the exposure pathways to humans”.

It is for licensees to identify and evaluate the possible management options for radioactively contaminated land when developing their strategies and plans. HSE enforcement powers in this area derive from the conditions attached to nuclear site licences, particularly the conditions that require adequate arrangements for storage of nuclear matter, including radioactive material and radioactive waste (condition 4), adequate records of amounts and locations (conditions 6 and 25), safety cases (conditions 14 and 23), wastes to be minimised (condition 32) and wastes to be contained (condition 34). The environment agencies have powers relating to unauthorised discharge of radioactive materials into the environment and, in principle, these could be used in the event of, for example, movement of radioactive contamination into off-site groundwater. In practice, under arrangements between HSE and the environment agencies, HSE aim to ensure that remediation is undertaken before such events occur.

HSE require licensees to prepare safety cases for radioactively contaminated land that are compatible with their land management strategies, and to review any existing safety cases that might be affected by the presence of newly-discovered radioactively contaminated land. The detail in safety cases should reflect the extent and nature of the contamination, the harm it could cause, and how much it is spreading or could spread. HSE provide guidance on the information to be included in safety cases (HSE, 2006).

3.2.2

Radioactively contaminated land on nuclear-licensed sites – delicensing

Under the Nuclear Installations Act 1965 (as amended), in order to delicense part or all of a nuclear site HSE must be satisfied that there is “no danger” from ionising radiations from anything on, in or under the land that is to be delicensed. In 2005, after a public consultation, HSE issued its policy statement on the criterion for delicensing (HSE, 2005). The criterion for what HSE will regard as constituting “no danger” is “a demonstration that any residual radioactivity, above background radioactivity, which remains on the site, which may or may not have arisen from licensable activities, will lead to a risk of death to an individual using the site for any reasonably foreseeable purpose of no greater than one in a million per year”. The statement notes that the overarching requirements of the Health and Safety at Work etc Act to reduce risks to “as low as reasonably practicable” (ALARP) apply but, if risks are below 10^{-6} , HSE will only expect licensees to show that there are no other, inexpensive clean-up activities that could be carried out.

When determining the extent of remediation required in order to make land delicensable, it is necessary to take into account radioactive contamination in surface water, groundwater and any structures that are to remain in place, as well as the contamination in soils and rocks. The range of exposure pathways considered must be wide enough to encompass all the uses to which the land might be put in future, not only the next proposed use. Remediation techniques that rely on blocking or removing one exposure pathway will rarely be appropriate when land is to be delicensed.

There is no requirement for licensees to remediate all the radioactively contaminated land on their sites to the extent necessary for delicensing, ie so that the land is no longer “radioactively contaminated land” in the SAPs sense. Any land that remains radioactively contaminated must be managed appropriately and in particular be subject to monitoring and surveillance.

3.2.3

Radioactively contaminated land on defence sites

On defence nuclear sites the situation is similar to that on nuclear-licensed sites except that nuclear safety is regulated by MoD’s Defence Nuclear Safety Regulator (DNSR), and HSE regulation is via the Health and Safety at Work etc Act and the Ionising Radiations Regulations. MoD were involved in preparing the new HSE SAPs and the DNSR intends to adopt them for its own assessments.

Non-nuclear defence sites that are to remain in MoD ownership and in their current use are subject to the Part 2A regime (see Section 3.2.4) if levels of radioactive contamination on them are sufficiently high for the land to be “radioactive contaminated land” in the Part 2A sense (see Sections 2.2.3 and 2.2.4). Defence sites that are scheduled for a change of ownership and/or use come under the planning regime if the proposed development of the site requires planning permission (see Section 3.2.5).

For all defence sites that are to be transferred to civilian ownership and/or use a primary consideration is that the requirements of the Radioactive Substances Act are met. The Act does not control radioactively contaminated land directly; it controls the management of radioactive wastes. As soon as any work is carried out on such land, whether site investigation or remediation, the potential to generate radioactive wastes exists and, unless the site has Crown immunity, the Act applies (EA, 2006).

3.2.4

Management of radioactive contaminated land under the extension to the Part 2A regime

The management approach for “radioactive contaminated land” (see Section 2.2.3) in the extension to the Part 2A regime is designed to implement the requirements of the European Basic Safety Standards Directive for “intervention” to protect people against lasting exposure to radiation (the BSS Directive) (Council of the European Communities, 1996). In essence these requirements are that “intervention” to reduce radiation exposure should only be undertaken if it will do more good than harm (“justification”), and that it should always be undertaken in such a way as to maximise the net benefit of intervening (“optimisation”) (Defra, 2006; WAG, 2006).

The Statutory Guidance on Part 2A contains information on identifying the types of “intervention” that would be “justified” and choosing those that would be “optimised” (Defra, 2006; WAG, 2006). It suggests that the enforcing authority (ie the Environment Agency, because sites with “radioactive contaminated land” are “special sites”) may find it useful to use quantitative decision-aiding methods, such as multi-attribute analysis, and to consult relevant stakeholder groups when assessing what is “justified” and “optimised”. The guidance makes it clear that social, as well as financial, costs of remediation should be considered in decision-making and indicates what those social costs could be (Defra, 2006; WAG, 2006). The Environment Agency website contains a series of briefing notes about the Agency’s roles under the Part 2A regime and for other “land contaminated with radioactivity” (EA, 2006).

3.2.5

Management of radioactively contaminated land under the planning regime

Under the planning regime, the management of radioactively contaminated land is the responsibility of the developer, who has to meet any conditions set in the planning permission granted by the local authority. The environment agencies regulate the management of any radioactive wastes produced and advise local authorities and developers on radioactive waste management matters (EA, 2002 and 2006).

Local authorities and developers are expected to take account of the views of the Health Protection Agency (HPA), which has advised that (NRPB, 1998):

- no remediation will usually be required if land in its new use would lead to individual risks below 10^{-6} per year
- remediation is likely to be required if individual risks are above 10^{-5} per year.

When risks are between these two levels, and in complex situations, an evaluation and comparison of land management options should be carried out to assist decisions on whether and what type of remediation should take place. At sites where an environmental impact assessment (EIA) or strategic environmental assessment (SEA) is needed for a proposed development, the evaluation and comparison of options for the radioactively contaminated land will be part of that assessment.

3.3

Land contaminated by nuclear activities

The Energy Act 2004 contains arrangements that could be used to clean up any sites in the UK that are “contaminated as a result of nuclear activities” but that are outside nuclear-licensed sites and (non-licensed) defence nuclear sites. Under the Act, such “contaminated sites” can be “designated” by the Secretary of State for Trade and Industry, acting with Scottish Ministers for sites in Scotland, to be the responsibility of

the NDA. It would then be for the NDA to arrange for remediation of the sites, in accordance with its duties under the Energy Act, and in compliance with other relevant legislation. These arrangements cover radioactive and non-radioactive contamination arising from incidents and from routine operations.

3.4

Providing information to the public

The full provisions of the Freedom of Information Act 2000 came into force at the beginning of 2005, as did the Environmental Information Regulations 2004 made under this Act, and the corresponding Act and regulations in Scotland. The regulations are relevant to contaminated land in that they require “public authorities” to disseminate progressively to the public “environmental information” that they hold and to make such information available to the public on request.

“Public authorities” include all government departments and agencies (most notably, in the context of this paper, MoD, HSE, the Environment Agency, SEPA and the NDA). “Environmental information” includes any information (written, visual, aural, electronic) on the state of land and soil, with respect to factors that include radioactivity and other releases to the environment, and information about the state of human health and safety. It also includes information about policies and plans for protecting the environment and human health, reports on the implementation of environmental legislation and cost benefit and other economic analyses, and assumptions used in protecting the environment and human health.

There are some grounds on which a “public authority” can refuse to disclose information (eg because disclosure would have an adverse effect on public safety or national security or protection of the environment, or would infringe commercial confidentiality where this is protected by law). Although these exceptions will apply in some situations, the general effect of the freedom of information regime is expected to be to bring more information on contaminated land on nuclear-licensed sites and defence sites into the public domain. Under the Part 2A regime for non-radioactively contaminated land, and the extensions to radioactively contaminated land, information about sites that have been assessed to be “contaminated” has to be placed on a public register. For “special sites” this is done at the time that they are so designated but for other sites it is done after they have been remediated.

3.5

Preventing new contamination of land

The potential for land on nuclear-licensed sites and defence sites to become contaminated is controlled through various pieces of legislation. For radioactive contamination the most important regimes are those of the Nuclear Installations Act 1965 and the Radioactive Substances Act 1993, which apply throughout the UK. For non-radioactive contamination the relevant legislation includes Parts I and II of the Environmental Protection Act 1990, the Pollution Prevention and Control Act 1999, the Pollution Prevention and Control Regulations 2000, and the corresponding legislation in Scotland, Wales and Northern Ireland. The Ministry of Defence has immunity from some of this legislation but operates its own controls to achieve the same standards, consulting regulators as appropriate.

3.6

Security at nuclear-licensed sites

The main pieces of legislation that are relevant to security on civil nuclear sites are the Nuclear Industries Security Regulations 2003 (NISR03) and the 2006 regulations that

amend these, and the Terrorism Act 2006 (see Table 6). The regulator is the Office for Civil Nuclear Security (OCNS), which is a division of HSE's Nuclear Directorate. The regulations require nuclear premises (as defined in NISR03) to have security plans that are approved by OCNS. Information about the current status of plans and security is given in the OCNS annual reports (OCNS, 2007).

The security plans for nuclear premises must contain standards, procedures and arrangements to ensure the security of "nuclear material" (as defined in the Anti-Terrorism, Crime and Security Act 2001 and NISR03), other nuclear and radioactive material, equipment, software and "sensitive nuclear information" (as defined in the 2001 Act). They must describe the arrangements for receipt and despatch of nuclear material, for policing and guarding nuclear premises and for approving people who work in such premises. There must also be arrangements for dealing with events such as unauthorised access, malicious damage, and theft or attempted theft of nuclear or radioactive material or sensitive information. The security plans and arrangements should include radioactively contaminated land and wastes produced during its remediation.

4 Possible future developments

This section of the paper indicates the changes to the regulatory framework that are likely to happen over the next year or so.

4.1 Further regulations for radioactively contaminated land on nuclear-licensed sites

The original government intention was that the extension of the Part 2A regime to radioactively contaminated land would include nuclear-licensed sites and land contaminated by accidents at nuclear sites. Although there are existing powers (in the Nuclear Installations Act 1965 and the Energy Act 2004) that enable such land to be managed appropriately, it was felt that explicit regulations were necessary to meet the requirements of the BSS Directive. It was found to be difficult to make such regulations within the Part 2A regime because its provisions for assigning financial liabilities differ from those in the Nuclear Installations Act 1965 (which implement international conventions). It is anticipated that Defra will introduce new regulations to meet the BSS Directive obligations. These regulations will be for the UK as a whole and will cover nuclear-licensed sites in the UK, land contaminated by accidents at such sites, and land contaminated by accidents at nuclear sites in other countries.

4.2 Statutory guidance for Part 2A regime for radioactive contaminated land in Scotland

The Scottish Executive is to issue new statutory guidance for the Part 2A regime in Scotland for “radioactive contaminated land”. This will contain guidance on what is to be regarded as “significant harm”, a “significant possibility of significant harm”, “significant pollution of the water environment” and a “significant possibility of significant pollution of the water environment” for radioactive contamination (see Section 2.2.4). There will also be guidance on “justification” and “optimisation” of “interventions” to remediate “radioactive contaminated land” (see Section 3.2.4). The statutory guidance will be for SEPA, which has the responsibility for identifying and designating “radioactive contaminated land” in Scotland and for regulating its remediation (see Appendix A).

References

Council of the European Communities (1996)
Council Directive 96/29 Euratom laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation
OJ No. L159, 29.6.96, p1. Available from <ec.europa.eu>

Defra (2006)
Environmental Protection Act 1990: Part 2A Contaminated Land. Statutory Guidance
Defra Circular 01/2006, Defra. Available from <www.defra.gov.uk>

DoE(NI) (2006)
Contaminated land, implementation of part III of the Waste and Contaminated Land (Northern Ireland) Order 1997

A consultation paper on proposals for Contaminated Land Regulations (Northern Ireland) 2006 and statutory guidance. Available from <www.doeni.gov.uk>

Environment Agency (2006)

Briefing Notes on:

- 1 *Potential sources of radioactive contamination*
- 2 *Overview of land contaminated with radioactive substances*
- 3 *Developing land contaminated with radioactivity*
- 4 *Contaminated land regime (Part 2A) and radioactivity*
- 5 *Land contaminated with radioactivity on nuclear licensed sites*
- 6 *Land contaminated with radioactivity and the Radioactive Substances Act 1993*
- 7 *Voluntary remediation of land contaminated with radioactivity*
- 8 *Land contaminated with radioactivity and the principles of radiation protection.*

Environment Agency. Available from <www.environment-agency.gov.uk>

Environment Agency (2005)

Radioactive Substances Regulation Environmental Principles (Interim). A framework for technical decisions and technical guidance on radioactive substances regulation

Version 1, Environment Agency. Available from <publications.environment-agency.gov.uk>

Environment Agency (2002)

Guidance on the characterisation and remediation of radioactively contaminated land

Environment Agency. Available from <www.safegrounds.com/other_guidance.htm>

HSE (2006)

Safety assessment principles for nuclear facilities, 2006 Edition

HSE Books, Sudbury, UK. Available from <www.hse.gov.uk>

HSE (2005)

HSE Criterion for delicensing nuclear sites. Policy statement

HSE Books, Sudbury, UK. Available from <www.hse.gov.uk>

HSE (2001)

Guidance for inspectors on the management of radioactive materials and radioactive waste on nuclear licensed sites

HSE Books, Sudbury, UK. Available from <www.hse.gov.uk>

NRPB (1998)

Radiological protection objectives for land contaminated with radionuclides

Doc. NRPB Volume 9 No.2, 1-12. Available from <www.hpa.gov.uk>

OCNS (2006)

The state of security in the civil nuclear industry and the effectiveness of security regulation, April 2006 to March 2007

A report to the Minister of State for Energy by the Director of Civil Nuclear Security.

Available from <www.hse.gov.uk/nuclear/ocns>

ODPM (2004)

Planning Policy Statement 23: *Planning and pollution control, Annex 2: development on land affected by contamination*

Available on the DCLG website <www.communities.gov.uk>

Scottish Executive (2006a)

Environmental Protection Act 1990: Part IIA Contaminated land. Statutory guidance: Edition 2.

Paper SE/2006/44. Available from <www.scotland.gov.uk>

Scottish Executive (2006b)

Planning, environmental protection and regulation

Planning Advice Note 51 (revised 2006), Scottish Executive Development Department.

Available from <www.scotland.gov.uk>

Scottish Executive (2000)

Development of contaminated land

Planning Advice Note 33, Scottish Executive Development Department. Available from

<www.scotland.gov.uk>

Welsh Assembly Government (2006)

Part 2A Statutory Guidance on Contaminated Land 2006

Available from <www.wales.gov.uk>

Welsh Local Government Association, Welsh Assembly Government and Environment Agency (2006)

Land contamination: A guide for developers

Available from <www.environment-agency.gov.uk>

Note

Websites that are useful for details of the UK regulatory framework for contaminated land are as follows:

www.defra.gov.uk

www.doeni.gov.uk

www.ehsni.gov.uk

www.environment-agency.gov.uk

www.hse.gov.uk

www.hseni.gov.uk

www.opsi.gov.uk

www.netregs.gov.uk

www.new.wales.gov.uk

www.sepa.org.uk

www.scotland.gov.uk

www.wales.gov.uk

Table 1 *Regulatory regimes*

Type of site	Radioactive contamination	Non-radioactive contamination	Mixed contamination
1 Nuclear-licensed sites			
1.1 Operational sites	NIA, (RSA)	Part 2A	NIA, (RSA), Part 2A
1.2 Sites to be delicensed	NIA, (RSA), (Planning regime)	Part 2A, (Planning regime)	NIA, (RSA), Part 2A , (Planning regime)
2 MoD sites (non-licensed)			
2.1 Nuclear sites	MoD	Part 2A	MoD, Part 2A
2.2 Non-nuclear sites, no change of land use proposed	Part 2A, (MoD)	Part 2A	Part 2A, (MoD)
2.3 Non-nuclear sites, change of land use proposed	Planning regime, (RSA)	Planning regime	Planning regime, (RSA)
3 Other sites			
3.1 No change of land use proposed	Part 2A, (RSA)	Part 2A	Part 2A, (RSA)
3.2 Change of land use proposed	Planning regime, (RSA)	Planning regime	Planning regime, (RSA)

Key

NIA Nuclear Installations Act 1965 (as amended)

RSA Radioactive Substances Act 1993 (as amended)

Part 2A Part 2A of the Environmental Protection Act 1990 (and associated Regulations and Statutory Guidance)

Planning regime See PPS 23 for England, PAN 33 for Scotland, WLGA *et al* guidance for Wales

Regimes in parenthesis are relevant but subsidiary.

Table 2 *Principal regulators*

	Radioactive contamination	Non-radioactive contamination	Mixed contamination
Nuclear-licensed sites	HSE	Environment Agency, SEPA	HSE, Environment Agency, SEPA
Defence sites (non-licensed)	MoD, HSE, Environment Agency, SEPA, EHS(NI)	Environment Agency, SEPA, EHS(NI)	MoD, HSE, Environment Agency, SEPA, EHS(NI)
Other sites	Environment Agency, SEPA, EHS(NI), local authorities	Local authorities (environment agencies on "special sites")	Environment Agency, SEPA, EHS(NI), local authorities

Key

HSE Health and Safety Executive (in Great Britain, Northern Ireland has its own agency, the Health and Safety Executive for Northern Ireland (HSE(NI)))

SEPA Scottish Environment Protection Agency

MoD Ministry of Defence

EHS(NI) Environment and Heritage Service (Northern Ireland)

Note

There are no nuclear-licensed sites in Northern Ireland

Table 3

Summary of current regulatory framework for radioactively contaminated land on nuclear-licensed sites

Regulator	Key features of regulatory framework (principal legislation) [references to regulatory or other guidance]
HSE	<ul style="list-style-type: none"> ● strategy required for management of radioactively contaminated land, to be developed by comparing management options on a range of factors (NIA65) [HSE, 2006] ● to be integrated with waste management and decommissioning strategies (NIA65) [HSE, 2006] ● definition of “radioactively contaminated land” linked to delicensing [HSE, 2006] ● all site licence conditions apply but conditions 4, 14, 23, 25, 32, 34 are particularly important (NIA65) ● sources of contamination to be controlled [HSE, 2006] ● contaminated areas to be characterised, controlled and remediated [HSE, 2006] ● environmental impact assessments required for reactor decommissioning (EIADR99) ● standards and procedures for worker safety same as for other operations on nuclear-licensed sites (IRR99) ● delicensing requires demonstration of “no danger” (NIA65) [HSE, 2005] ● remediate to appropriate standards before constructing new facilities [HSE, 2006] ● see HSE [2006] and HSE [2001] for further details.
Environment Agency, SEPA	<ul style="list-style-type: none"> ● authorisations for disposals of radioactive wastes (authorisations generally include conditions) (RSA93) [EA, 2005] ● movement of contamination off-site is an unauthorised discharge, remediation of off-site contamination may be required (RSA93) ● need to compare remediation strategies, for BPEO, ALARA (RSA93) [EA, 2002 and 2005] ● availability of methods for disposal of remediation wastes depends on EOs (under review) and new LLW and VLLW arrangements (RSA93) [<www.sdspur.com>] ● planning guidance relevant after land is delicensed, if it is to be redeveloped, see PPS 23 for England, PAN 33 for Scotland [ODPM, 2004; Scottish Executive, 2000].

Notes

See Tables 6 and 7 for list of legislation and key to acronyms.

There are no nuclear-licensed sites in Northern Ireland.

Table 4 *Summary of regulatory framework for non-radioactive and mixed contamination on nuclear-licensed sites*

Regulator	Key features of regulatory framework (principal legislation) [references to regulatory and other guidance]
Non-radioactive contamination	
Environment Agency, SEPA	<ul style="list-style-type: none"> ● nuclear-licensed sites that have “contaminated land” are “special sites” under Part 2A regime (Part 2A of EPA90, inserted by Section 57 of Environment Act 95) ● definition of “contaminated land” depends on presence of a “significant pollution linkage” (has to be shown that “significant harm” or water pollution is happening or likely to happen) (Part 2A) [Defra, 2006; Scottish Executive 2006a; WAG, 2006] ● all “contaminated land” must be remediated if it is reasonable to do so [Defra, 2006; Scottish Executive 2006; WAG, 2006] ● voluntary remediation is encouraged ● environment agencies agree remedial measures and issue remediation notices if necessary (Part 2A) ● “appropriate persons” bear remediation costs (typically licensee or site owner if not licensee) (Part 2A) ● planning guidance relevant after land is delicensed if it is to be redeveloped, see PPS 23 for England, PAN 33 for Scotland [ODPM, 2004; Scottish Executive, 2000] ● non-radioactive waste regime for management of remediation wastes [www.sdspur.com].
HSE	<ul style="list-style-type: none"> ● general rules for occupational health and safety apply (HSA74 and regulations (MHSW, CDM, COSHH)) ● potential effects of non-radioactive contaminants on nuclear safety must be considered (NIA65).
Mixed radioactive and non-radioactive contamination	
HSE and environment agencies	<ul style="list-style-type: none"> ● joint responsibilities, HSE and the relevant environment agency decide how to fulfil them ● regimes for radioactively contaminated land and non-radioactively contaminated land apply (NIA65, RSA93, Part 2A for non-radioactive contamination) ● disposal options for remediation wastes may be very limited (RSA93, Landfill Regulations, Hazardous Waste Regulations) ● planning guidance relevant after land is delicensed if it is to be redeveloped, see PPS 23 for England, PAN 33 for Scotland [ODPM, 2004; Scottish Executive, 2000].

Notes

See Tables 6 and 7 for list of legislation and key to acronyms.

There are no nuclear-licensed sites in Northern Ireland.

Table 5 *Summary of regulatory framework for defence and other sites*

Regulator	Key features of regulatory framework (principal legislation) [references to regulatory and other guidance]
Defence sites (other than nuclear-licensed sites)	
<i>Radioactive contamination</i>	
MoD, HSE, environment agencies	<ul style="list-style-type: none"> ● NIA65 does not apply but IRR99 do apply ● operational defence sites have Crown immunity from RSA93 ● standards of control at defence nuclear sites similar to those at nuclear-licensed sites, under arrangements between MoD, HSE and environment agencies ● Environment Agency guidance is relevant in England and Wales [EA, 2006] ● extension to Part 2A for “radioactive contaminated land” (see “other sites”) applies where no change of land use is planned [Defra, 2006; WAG, 2006] ● planning guidance will apply if site is to be redeveloped (see “other sites”) ● RSA93 applies at defence sites being transferred to civilian ownership/use [EA, 2005].
Non-radioactive contamination	
Environment agencies	<ul style="list-style-type: none"> ● defence sites that have “contaminated land” are “special sites” under Part 2A regime (Part 2A of EPA90) ● definition of “contaminated land” depends on presence of a “significant pollution linkage” (has to be shown that “significant harm” or water pollution is happening or likely to happen) (Part 2A) [Defra, 2006; Scottish Executive 2006a; WAG, 2006] ● all “contaminated land” must be remediated if it is reasonable to do so [Defra, 2006; Scottish Executive 2006; WAG, 2006] ● voluntary remediation is encouraged ● environment agencies agree remedial measures and issue remediation notices if necessary (Part 2A) ● “appropriate persons” bear remediation costs (usually MoD) (Part 2A) ● planning guidance will apply if site is to be redeveloped (see “other sites”) ● non-radioactive waste regime for management of remediation wastes [www.sdspur.com].
HSE	<ul style="list-style-type: none"> ● concerned primarily with occupational health and safety (HSWA74 and regulations (MHSW, CDM, COSHH)).
Mixed radioactive and non-radioactive contamination	
MoD, HSE and environment agencies	<ul style="list-style-type: none"> ● regimes for defence sites with radioactive and non-radioactive contamination all apply (see above).
Other sites (not nuclear-licensed sites or defence sites)	
<i>Radioactive contamination</i>	
Environment agencies	<ul style="list-style-type: none"> ● Part 2A for “radioactive contaminated land” applies to land in current use, sites with “radioactive contaminated land” are “special sites”, regulated by environment agencies (Part 2A) [Defra, 2006; WAG, 2006] ● planning guidance for local authorities applies where a change of land use is proposed and where remediation can be carried out as part of redevelopment, see PPS 23 for England, PAN 33 for Scotland [ODPM, 2004; Scottish Executive, 2000] ● in England and Wales local authorities identify sites where there is “radioactive contaminated land” and designate as “special sites”; SEPA and EHS(NI) identify and designate in Scotland and Northern Ireland ● EA guidance on radioactively contaminated land applies in England and Wales [EA, 2006] ● RSA93 applies to management of radioactive wastes from remediation [EA, 2005].
HSE	<ul style="list-style-type: none"> ● concerned with occupational health and safety, accident risks to the public (HSWA74, IRR99).

Table 5 *Summary of regulatory framework for defence and other sites (contd)*

Regulator	Key features of regulatory framework (principal legislation) [references to regulatory and other guidance]
Non-radioactive contamination	
Local authorities (or environment agency if special site)	<ul style="list-style-type: none"> ● Part 2A regime for “contaminated land” applies to sites in their current use [Defra, 2006; Scottish Executive 2006a; WAG, 2006] ● planning guidance applies if site is to be redeveloped, see PPS 23 for England, PAN 33 for Scotland [ODPM, 2004; Scottish Executive, 2000] ● non-radioactive waste regime for management of remediation wastes [<www.sdspur.com>].
HSE	<ul style="list-style-type: none"> ● concerned with occupational health and safety, accident risks to the public (HSWA74 and regulations (MHSW, CDM, COSHH)).
Mixed radioactive and non-radioactive contamination	
Environment agencies and local authorities	<ul style="list-style-type: none"> ● sites where no change of land use is planned covered by extension to Part 2A for “radioactive contaminated land” (see above) and are “special sites”, regulated by the relevant environment agency (Part 2A) ● sites to be redeveloped are covered by planning guidance, see PPS 23 for England PAN 33 for Scotland [ODPM, 2004; Scottish Executive, 2000] ● disposal options for remediation wastes may be very limited (RSA93, Landfill Regulations, Hazardous Waste Regulations).

Note

See Tables 6 and 7 for list of legislation and key to acronyms.

Table 6 *List of legislation*

1	Legislation on contaminated land
1.1	<p>Primary legislation directly relevant to contaminated land</p> <p>Environment Act 1995</p> <p>Environmental Protection Act 1990</p> <p>Nuclear Installations Act 1965 (as amended) (and conditions attached to nuclear site licences)</p>
1.2	<p>Contaminated land regulations for England</p> <p>Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 (SI 1379)</p> <p>Contaminated Land (England) Regulations 2006 (SI 1380)</p> <p>Clean Neighbourhoods and Environment Act 2005 (Commencement No2) (England) Order 2006 (SI 1361)</p> <p>Environmental Protection Act 1990 (Isles of Scilly) Order 2006 (SI 1381)</p> <p>Radioactive Contaminated Land (Enabling Powers) (England) Regulations 2005 (SI 3467)</p>
1.3	<p>Contaminated land regulations for Scotland</p> <p>Contaminated Land (Scotland) Regulations 2000 (SSI 178)</p> <p>Contaminated Land (Scotland) Regulations 2005 (SSI 658)</p> <p>Radioactive Contaminated Land (Scotland) Regulations 2007 (SSI 179)</p>
1.4	<p>Contaminated land regulations for Wales</p> <p>Radioactive Contaminated Land (Modification of Enactments) (Wales) Regulations 2006 (SI 2988 (W277))</p> <p>Contaminated Land (Wales) Regulations 2006 (SI 2989 (W.278))</p>
1.5	<p>Contaminated land regulations for Northern Ireland</p> <p>Radioactive Contaminated Land Regulations (Northern Ireland) 2006 (SR 345)</p> <p>Waste and Contaminated Land (Northern Ireland) Order 1997 (SI 2778 (NI 19))</p>
2	Legislation on radioactive waste management
2.1	<p>UK legislation on radioactive waste management</p> <p>Radioactive Substances Act 1993 (as amended)</p> <p>Radioactive Substances (Phosphatic Substances, Rare Earths etc) Exemption Order 1962 (SI 2648)*</p> <p>Radioactive Substances (Substances of Low Activity) Exemption Order 1986 (SI 1002)*</p> <p>Nuclear Installations Act 1965 (as amended) (and conditions attached to nuclear site licences)</p> <p>*All the Exemption Orders under RSA93 are currently under review.</p>
2.2	<p>Radioactive waste management legislation for England and Wales</p> <p>Radioactive Substances (Basic Safety Standards) (England and Wales) Direction 2000</p>
2.3	<p>Radioactive waste management legislation for Scotland</p> <p>Radioactive Substances (Basic Safety Standards) (Scotland) Direction 2000</p>
3	Legislation on management of non-radioactive wastes
3.1	<p>Waste management legislation for the UK or Great Britain</p> <p>Control of Pollution Act 1974</p> <p>Control of Pollution (Amendment) Act 1989</p> <p>Environmental Protection Act 1990</p> <p>Pollution Prevention and Control Act 1999</p> <p>Controlled Waste Regulations 1992 (SI 588)</p> <p>Controlled Waste (Amendment) Regulations 1993 (SI 566)</p> <p>Environmental Protection (Duty of Care) Regulations 1991 (SI 2839)</p> <p>Waste Management Licensing Regulations 1994 (SI 1056)</p> <p>Waste Management Licensing (Amendment) Regulations 1995 (SI 288)</p>

Table 6 *List of legislation (contd)*

3.2	Waste management legislation for England and Wales
	Clean Neighbourhoods and Environment Act 2005
	Hazardous Waste (England and Wales) Regulations 2005 (SI 894)
	Landfill (England and Wales) Regulations 2002 (SI 1559)
	Landfill (England and Wales) (Amendment) Regulations 2004 (SI 1375)
	Landfill (England and Wales) (Amendment) Regulations 2005 (SI 1640)
	Pollution Prevention and Control (England and Wales) Regulations 2000 (SI 1973) (as amended) ²
	Waste Management Licensing (England and Wales) (Amendment and Related Provisions) (No.3) Regulations 2005 (SI 1728)
	Waste Management (England and Wales) Regulations 2006 (SI 937)
3.3	Waste management legislation for England
	Environmental Protection (Duty of Care) (England) (Amendment) Regulations 2003 (SI 63)
	List of Wastes (England) Regulations 2005 (SI 895)
	List of Wastes (England) (Amendment) Regulations 2005 (SI 1673)
3.4	Waste management legislation for Scotland
	Environmental Protection (Duty of Care) (Scotland) (Amendment) Regulations 2003 (SSI 533)
	Landfill (Scotland) Regulations 2003 (SSI 235)
	Landfill (Scotland) (Amendment) Regulations 2003 (SSI 343)
	Pollution Prevention and Control (Scotland) Regulations 2000 (SSI 323)
	Special Waste Regulations 1996 (SI 972)
	Special Waste (Amendment) Regulations 1996 (SI 2019)
	Special Waste (Amendment) Regulations 1997 (SI 251)
	Special Waste (Scotland) Regulations 1997 (SI 257)
	Special Waste Amendment (Scotland) Regulations 2004 (SSI 112)
	Waste Management Licensing Amendment (Scotland) Regulations 2003 (SSI 171)
	Waste Management Licensing Amendment (Scotland) Regulations 2004 (SSI 275)
	Waste Management Licensing Amendment (Scotland) Regulations 2006 (SSI 541)
3.5	Waste management legislation for Wales
	Environmental Protection (Duty of Care) (Wales) (Amendment) Regulations 2003 (SI 1720)
	Hazardous Waste (Wales) Regulations 2005 (SI 1806)
	List of Wastes (Wales) Regulations 2005 (SI 1820)
	Waste Management Licensing (Amendment) (Wales) Regulations 2002 (SI 1087)
	Waste Management Licensing (Amendment) (Wales) Regulations 2003 (SI 780)
	Waste Management Licensing (Amendment) (Wales) Regulations 2004 (SI 70)
3.6	Waste management legislation for Northern Ireland
	Pollution Control and Local Government (NI) Order 1978 (SI 1049 (NI 19), including amendments up to 2004)
	Waste and Contaminated Land (Northern Ireland) Order 1997 (SI 2778 (NI 19), including amendments up to 2004)
	Controlled Waste Regulations (NI) 2002 (SR 248)
	Controlled Waste (Amendment) Regulations (NI) 2003 (SR 404)
	Controlled Waste (Duty of Care) Regulations (NI) 2002 (SR 271)
	Controlled Waste (Duty of Care) (Amendment) Regulations (NI) 2004 (SR 277)
	Hazardous Waste Regulations (Northern Ireland) 2005 (SR 300)
	Hazardous Waste (Amendment) Regulations (Northern Ireland) 2005 (SR 461)
	Landfill Regulations (Northern Ireland) 2003 (SR 496)
	Landfill (Amendment) Regulations (Northern Ireland) 2004 (SR 297)

² An unofficial copy of the PPC Regulations 2000 that includes all amendments up to 11 July 2006 is available on the Defra website.

Table 6 *List of legislation (contd)*

	<p>List of Wastes Regulations (Northern Ireland) 2005 (SR 301)</p> <p>List of Wastes (Amendment) Regulations (Northern Ireland) 2005 (SR 462)</p> <p>Pollution Prevention and Control Regulations (Northern Ireland) 2003 (SR 46)</p> <p>Waste Management Licensing Regulations (Northern Ireland) 2003 (SR 493)</p> <p>Waste Management Regulations (Northern Ireland) 2006 (SR 280)</p>
4	Health and Safety legislation
4.1	<p>Health and safety legislation for Great Britain</p> <p>Health and Safety at Work etc Act 1974</p> <p>Construction (Design and Management) Regulations 2007 (SI 320)</p> <p>Control of Substances Hazardous to Health Regulations 2002 (SI 2677)</p> <p>Control of Substances Hazardous to Health (Amendment) Regulations 2003 (SI 978)</p> <p>Control of Substances Hazardous to Health (Amendment) Regulations 2004 (SI 3386)</p> <p>Ionising Radiations Regulations 1999 (SI 3232)</p> <p>Management of Health and Safety at Work Regulations 1999 (SI 3242)</p>
4.2	<p>Health and safety legislation for Northern Ireland</p> <p>Health and Safety at Work (Northern Ireland) Order 1978 (SI 1039 (NI 9))</p> <p>Health and Safety at Work (Amendment) (Northern Ireland) Order 1998 (SI 2795 (NI 18))</p> <p>Control of Substances Hazardous to Health Regulations (Northern Ireland) 2003 (SR 34)</p> <p>Control of Substances Hazardous to Health (Amendment) Regulations (Northern Ireland) 2003 (SR 288)</p> <p>Control of Substances Hazardous to Health (Amendment) Regulations (Northern Ireland) 2005 (SR 165)</p> <p>Construction (Health, Safety and Welfare) Regulations (Northern Ireland) 1996 (SR 510)</p> <p>Construction (Design and Management) Regulations (Northern Ireland) 1995 (SR 209)</p> <p>Construction (Design and Management) (Amendment) Regulations (Northern Ireland) 2001 (SR 142)</p> <p>Ionising Radiations Regulations (Northern Ireland) 2000 (SR 375)</p> <p>Management of Health and Safety at Work Regulations (Northern Ireland) 2000 (SR 388)</p> <p>Management of Health and Safety at Work (Amendment) Regulations (Northern Ireland) 2006 (SR 255)</p>
5	Planning and environmental assessment legislation
5.1	<p>Planning legislation for England and Wales</p> <p>Town and Country Planning Act 1990</p> <p>Planning and Compulsory Purchase Act 2004</p> <p>Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (SI 293)</p> <p>Town and Country Planning (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2000 (SI 2867)</p>
5.2	<p>SEA legislation for England</p> <p>Environmental Assessment of Plans and Programmes Regulations 2004 (SI 1633)</p>
5.3	<p>EIA and SEA legislation for Scotland</p> <p>Environmental Assessment (Scotland) Act 2005</p> <p>Environmental Impact Assessment (Scotland) Regulations 1999 (SSI 1)</p> <p>Environmental Impact Assessment (Scotland) Amendment Regulations 2002 (SSI 324)</p>
5.4	<p>SEA legislation for Wales</p> <p>Environmental Assessment of Programmes and Plans (Wales) Regulations 2004 (Welsh SI 1656 (W170))</p>
5.5	<p>SEA legislation for Northern Ireland</p> <p>Environmental Assessment of Programmes and Plans Regulations (Northern Ireland) 2004 (SR 280)</p>

Table 6 *List of legislation (contd)*

5.6	EIA for nuclear decommissioning
	Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (SI 2892)
	Nuclear Reactors (Environmental Impact Assessment for Decommissioning) (Amendment) Regulations 2006 (SI 657)
6 Legislation on water resources	
	Water Resources Act 1991
	Water Act 2004 (for England and Wales)
	Water Environment and Water Services (Scotland) Act 2003
	Water Environment (Controlled Activities) (Scotland) Regulations 2005 (SSI 348)
	Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2003 (SR 544)
7 Legislation on transport of radioactive materials and dangerous goods	
	Radioactive Material (Road Transport) (Definition of Radioactive Material) Order 2002 (SI 1092)
	Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2007 (SI 1573)
	Radioactive Substances (Carriage by Road) Regulations (Northern Ireland) 1983 (SR 344)
	Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (Northern Ireland) 2006 (SR 173)
	Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (Amendment) Regulations (Northern Ireland) 2006 (SR 525).
8 Other legislation	
	Anti-Terrorism, Crime and Security Act 2001
	Energy Act 2004
	Environment Act 1995 (for England, Wales and Scotland)
	Environmental Information Regulations 2004 (SI 3391)
	Environmental Information (Scotland) Regulations 2004 (SSI 520)
	Freedom of Information Act 2000
	Freedom of Information (Scotland) Act 2002
	Nuclear Industries Security Regulations 2003 (SI 403)
	Nuclear Industries Security (Amendment) Regulations 2006 (SI 2815)
	Terrorism Act 2006

Note

All legislation is available on the Office of Public Sector Information (OPSI) website <www.opsi.gov.uk>. Environmental legislation is available on the NetRegs website <www.netregs.gov.uk>.

Appendix A Differences in Scotland, Wales and Northern Ireland

This appendix briefly outlines the ways in which the regulatory frameworks for contaminated land in Scotland, Wales and Northern Ireland differ from that in England. Reference should be made to the legislation and associated guidance for further details.

A1

Scotland

A1.1

Legislation

Health and safety at work and nuclear safety are not devolved matters in Scotland so all the primary and secondary legislation on these topics mentioned in this paper and listed in Table 6 applies in Scotland. Environmental matters are devolved but most of the primary legislation (Acts) on environmental topics listed in Table 6 apply in Scotland. In particular, the Environmental Protection Act 1990, the Environment Act 1995 and the Radioactive Substances Act 1993 all apply in Scotland. There are a number of pieces of secondary legislation (regulations) that are specific to Scotland (see Table 6). Those that relate directly to contaminated land are the Contaminated Land (Scotland) Regulations 2000, the Contaminated Land (Scotland) Regulations 2005 and the Radioactive Contaminated Land (Scotland) Regulations 2007.

A1.2

Non-radioactively contaminated land in Scotland

Until 2006 the Part 2A regime for non-radioactively contaminated land in Scotland operated in essentially the same way as the corresponding regime in England (see Sections 2.1.1 and 3.1.1 of the main text). The 2006 regulations changed the sections of the Part 2A regime that deal with pollution of water. These changes were necessary to make Part 2A in Scotland more consistent with the Water Environment and Water Services (Scotland) Act 2003 and to prevent disproportionate regulation of trivial amounts of water pollution caused by contaminated land. The main changes were to replace “controlled waters” by the “water environment”, as defined in the Water Environment and Water Services (Scotland) Act 2003, and to amend the part of the definition of contaminated land that deals with water pollution so that it refers to “significant pollution” of the water environment and a “significant possibility” of such pollution being caused. Revised statutory guidance was issued to accompany the 2006 regulations (Scottish Executive, 2006a). This includes guidance to local authorities on determining what is significant pollution of the water environment and what constitutes a significant possibility of pollution.³ SEPA’s role in Part 2A is outlined in the Scottish Executive’s Planning Advice Note 51 (Scottish Executive, 2006b).

The planning regime in Scotland is outlined in the Scottish Executive’s Planning Advice Note 33 (PAN 33) (Scottish Executive, 2000). PAN 33 defines contaminated sites, for planning purposes, as “any site where the presence or suspected presence of contaminants is an obstacle to development, regardless as to whether development is proposed”. It recommends a “suitable for use” approach to dealing with the legacy of such contaminated sites (Scottish Executive, 2000). This approach is also included in the Part 2A statutory guidance (Scottish Executive, 2006a). It has three elements:

- 1 Ensuring that land is suitable for its current use.
- 2 Ensuring that land is made suitable for any new use, as planning permission is given for that new use.

3 Defra intends to consider similar changes to Part 2A in England, including significance tests for radioactive and non-radioactive pollution of water caused by contaminated land. The Water Act 2004 includes a provision to amend the section of the Part 2A definition that deals with pollution of controlled waters, but this provision is not yet in force.

- 3 Limiting requirements for remediation to work necessary to prevent unacceptable risks to human health or the environment in relation to the current use or future use of the land for which planning permission is being sought.

The approach involves site specific risk assessments, which are carried out by developers in all cases where initial site investigations (walkovers, desk studies or other investigations) indicate that significant levels of contaminants are or may be present. It is then for the developer to propose a restoration scheme that will ensure that all human and other receptors are protected adequately in the proposed use of the site. PAN 33 provides “model planning conditions” that local authorities can attach to planning permissions to ensure that appropriate restoration schemes are formulated and carried out.

A1.3

Radioactively contaminated land in Scotland

With the introduction of the Radioactive Contaminated Land (Scotland) Regulations 2007, the regulatory regimes for radioactively contaminated land in Scotland, other than on nuclear-licensed sites, are those under Part 2A, planning legislation and the Radioactive Substances Act 1993 (see Table 1 and Sections 2.2 and 3.2 of the main text). The regulators for these regimes are SEPA and the local authorities. The Nuclear Installations Act 1965 applies in Scotland and is the main regime for radioactively contaminated land on nuclear-licensed sites; the regulator is HSE. MoD regulates nuclear safety on the (non-licensed) nuclear defence sites that it operates (see Table 2).

The Scottish Part 2A regime for “radioactive contaminated land” is similar in many respects to the English one. The three major differences are:

- 1 The use of “significant harm” in defining “radioactive contaminated land” (see Section 2.2.4 of the main text).
- 2 The inclusion of water as a receptor and of “significant pollution of the water environment” as part of the definition of “radioactive contaminated land” (see Section 2.2.4 of the main text).
- 4 Local authorities have no responsibilities for identifying, inspecting or designating “radioactive contaminated land”.

The use of “significant harm”, rather than “harm”, is not expected to lead to any practical differences between the Scottish Part 2A regime and the regimes in the rest of the UK. It is anticipated that the statutory guidance that the Scottish Executive will issue to accompany the 2007 regulations (see Section 4.2 of the main text) will use the same dose criteria to define “significant harm” as the English and Welsh Part 2A regimes use for “harm” (see Section 2.2.3 of the main text), and as the corresponding regime in Northern Ireland uses for “lasting exposure” (see Section A3 below).

The Scottish extension to the Part 2A regime for radioactive contaminated land has the same approach to radioactive pollution of water as to non-radioactive pollution (see Section A1.2). This differs from the Part 2A extensions in England and Wales, in which water is only considered as a pathway that could lead to human exposure to radiation, not as a receptor in its own right. In Scottish legislation the “water environment” means all surface water, groundwater and wetlands. Under the Radioactive Contaminated Land (Scotland) Regulations 2007 “pollution” in relation to it means “the direct or indirect introduction, as a result of human activity, of substances into the water environment, or any part of it, that may give rise to any harm”. The regulations state that “harm” means (see the Water Environment and Water Services (Scotland) Act 2003):

- “(a) harm to the health of human beings or other living organisms
- (b) harm to the quality of the water environment, including:
 - (i) harm to the quality of the water environment taken as a whole
 - (ii) other impairment of, or interference with, the quality of aquatic ecosystems or terrestrial ecosystems directly dependent on aquatic ecosystems
- (c) offence to the senses of human beings
- (d) damage to property, or
- (e) impairment of, or interference with, amenities or other legitimate uses of the water environment”.

The statutory guidance for the 2007 regulations will define what is meant by “significant pollution” in the case of radioactivity. If it follows the approach used for non-radioactive contaminated land, the guidance will refer to international standards for water quality (Scottish Executive, 2006a).

In Scotland SEPA has the responsibility for identifying, inspecting and determining whether land is “radioactive contaminated land” and for designating it to be a “special site”, as well as for regulating its remediation. This is in contrast to England and Wales where identification, inspection and determination are carried out by local authorities, and the Environment Agency regulates remediation.

Management of radioactively contaminated land under the planning regime in Scotland is carried out in a similar way to England (see Section 3.2.5 of the main text). SEPA regulates the management of radioactive wastes from land investigation and remediation. Local authorities and developers are expected to take into account the criteria recommended by the HPA when deciding whether remediation of radioactively contaminated land is necessary and what form it should take (NRPB, 1998). The Energy Act 2004 provisions on land contaminated by nuclear activities apply in Scotland (see Section 3.3), as do the nuclear site security regulations (see Section 3.6).

Wales

Health and safety at work and nuclear safety are not devolved matters in Wales. Environmental matters are devolved but the Welsh Assembly can only make secondary legislation. All the primary legislation mentioned in this paper and listed in Table 6 applies in Wales, as does all the secondary legislation on health and safety at work and nuclear safety.

Much of the secondary legislation on environmental matters is common to England and Wales but there are some regulations that are specific to Wales (see Table 6). Two of the Welsh regulations are those that replace the original Part 2A regime with one that includes radioactive contaminated land. These are the Radioactive Contaminated Land (Modification of Enactments) (Wales) Regulations 2006 and the Contaminated Land (Wales) Regulations 2006. The Welsh Assembly Government issued new statutory guidance to accompany these regulations (WAG, 2006).

The main regulatory regimes for radioactively contaminated land in Wales are the same as those in England. These are the regime under the Nuclear Installations Act 1965, for nuclear-licensed sites, and those under Part 2A, planning legislation and the Radioactive Substances Act 1993, for other sites (see Table 1 and Sections 2.2 and 3.2 of the main text). The regulators for these regimes are HSE, the Environment Agency and the local authorities. MoD has regulatory responsibilities on the nuclear defence sites that it operates (see Table 2).

The Part 2A regime for non-radioactively contaminated land in Wales operates in essentially the same way as the corresponding regime in England (see Sections 2.1.1 and 3.1.1 of the main text). The Welsh Assembly Government's statutory guidance for this regime is similar to that issued by Defra for England (WAG, 2006, Defra, 2006). The Welsh Local Government Association, with the Welsh Assembly Government and the Environment Agency, has published guidance to developers on dealing with contaminated land under the planning regime (WLGA *et al*, 2006).

Northern Ireland

In Northern Ireland nuclear safety is not devolved but health and safety at work and environmental matters are. The parts of NIA65 that apply are those about the effects in Northern Ireland of accidents at nuclear-licensed sites elsewhere in the UK and accidents at nuclear sites in other countries.

The principal pieces of Northern Ireland health and safety legislation that are relevant to this paper are the Health and Safety at Work (Northern Ireland) Order 1978 and the regulations made under it, particularly the Ionising Radiations Regulations (Northern Ireland) 2000 (see Table 6). The regulator for these is the Health and Safety Executive for Northern Ireland (HSE(NI)).

The main environmental legislation for contaminated land is in the Waste and Contaminated Land (Northern Ireland) Order 1997, for non-radioactive contaminated land, and the Radioactive Contaminated Land Regulations (Northern Ireland) 2006 (see Table 6). The Radioactive Substances Act 1993 applies in Northern Ireland, as it does in the rest of the UK. The regulator for all environmental legislation is the Environment and Heritage Service for Northern Ireland (EHS(NI)), which is part of the Department of the Environment for Northern Ireland (DoE(NI)).

Part III of the Waste and Contaminated Land (Northern Ireland) Order 1997 makes provision for introducing a regulatory regime for non-radioactively contaminated land that would correspond to Part 2A of the Environmental Protection Act 1990 (which does not apply to Northern Ireland). Part III defines “contaminated land” as any land that appears to a district council “to be in such a condition, by reason of substances in, on or under the land, that significant harm is being caused or there is a significant possibility of harm being caused” or “pollution of waterways or underground strata is being or is likely to be caused”. It contains provisions for designation of land to be a “special site”, in which case it would be regulated by EHS(NI) rather than by the relevant district council.

To bring Part III of the Order into force there would have to be a Commencement Order, and regulations and statutory guidance that were specific to Northern Ireland. In 2006 DoE(NI) carried out a public consultation on proposed regulations and statutory guidance (DoE(NI), 2006). Comments on the proposals are currently being considered. A Commencement Order, regulations and statutory guidance will be issued when resources to do this have been secured. The planning regime for non-radioactively contaminated land in Northern Ireland contains a “suitable for use approach” that has features similar to those of the planning regime in Scotland (see Section A1).

The Radioactive Contaminated Land Regulations 2006 require EHS(NI) to investigate land if it has “reasonable grounds” to believe that the land is causing “lasting exposure” to ionising radiation. “Lasting exposure” is defined in the regulations to mean an effective dose to an individual person of 3 mSv per year or more from a past practice, past works or a radiological emergency (and/or a dose to the lens of the eye of 15 mSv per year or more, and/or a dose to the skin of 50 mSv per year or more).

If “lasting exposure” is occurring EHS(NI) must require the responsible person to demarcate the land, monitor it, regulate access to it and carry out any appropriate intervention. Intervention must be justified and optimised, as in the Part 2A regulations for Great Britain (see Section 3.2.4 of the main text). EHS(NI) have powers to issue an “intervention notice” if this is necessary to ensure that action is taken. The regulations exclude land contaminated by accidents at nuclear-licensed sites in Great Britain or nuclear sites in other countries. Radioactively contaminated land that is not causing “lasting exposure” is managed under the planning regime and the Radioactive Substances Act 1993.