On-site disposal of solid radioactive waste on nuclear licensed sites
Joint Regulators' Statement of Common Understanding

A Memorandum of Understanding (MoU) exists between the Office for Nuclear Regulation (ONR) and each of the environment agencies (http://www.onr.org.uk/agency-agreements-mou.htm). The MoUs provide a high level framework for co-ordination of regulatory activities in order to achieve effective and efficient regulation of the nuclear industry. The MoUs recognise that joint guidance should be prepared as necessary to manage working arrangements in key areas where there are joint regulatory activities.

The purpose of this document is to provide a statement of common understanding between the Environment Agency, the Scottish Environment Protection Agency, Natural Resources Wales and ONR ("the regulators") of the requirements applicable to the on-site disposal of solid radioactive waste on nuclear licensed sites, and the harmonised approach the regulators will take in regulating such matters.

This document does not cover disposals outside of a nuclear licensed site where the environment agencies and other regulators have different powers and arrangements, nor does it apply to the disposal of liquid or gaseous radioactive waste.

1 Definitions and Interpretation

1.1 "EPR16" means the Environmental Permitting (England and Wales) Regulations 2016, which apply in England and Wales.

1.2 "EASR18" means the Environmental Authorisations (Scotland) Regulations 2018 which apply in Scotland.

1.3 "NIA65" means the Nuclear Installations Act 1965.

1.4 "RSR" is an abbreviation of Radioactive Substances Regulation and means those parts of EPR16 and/or EASR18 that describe the environment agencies' radioactive substances regulatory regimes.

1.5 Within RSR, "radioactive waste" is as defined in EPR16, Schedule 23, Part 2, paragraph 3, and in EASR18, Schedule 8, Part 1, paragraph 5. It can include any substance or article that is waste as defined in EPR16, Sch. 23, Part 2, paragraph 3(2) / EASR18, Part 1, paragraph 2 except as specified in the exclusions and exemptions which apply. A substance or article becomes radioactive waste immediately when the RSR definitions are met; there is no discretion on behalf of permit holders or regulators as to when radioactive waste is created. This means that any article or substance, if contaminated to levels exceeding RSR thresholds, will become radioactive waste when the definition is met.

1.6 "Disposal" of radioactive waste is defined in EPR16, Schedule 23, Part 2, paragraph 1(1), and in EASR18, Schedule 8, Part 1, paragraph 4. Disposal is an activity that requires permitting and for the purpose of this statement includes emplacing radioactive waste permanently on site (e.g. into a purpose-built facility or

into an existing void) and leaving radioactive waste in situ permanently (e.g. pipework and foundations).

1.7 "Optimisation" is the principle of ensuring that all exposures to ionising radiation of any members of the public and the population as a whole are kept as low as reasonably achievable (ALARA), economic and social factors being taken into account[1].The terms "optimised" and "optimal" should be construed accordingly. Best Available Techniques (BAT in England and Wales) or Best Practicable Means (BPM in Scotland) is the means an operator uses in the operation of a facility to deliver an optimised outcome, i.e. to reduce exposures to ALARA.

1.8 "Environment agencies" means the Environment Agency (EA), the Scottish Environment Protection Agency (SEPA) and Natural Resources Wales (NRW).

1.9 "Operator" means the authorised person for the purposes of RSR and the licensee for the purposes of nuclear safety regulation.

1.10 "ALARP" means "as low as reasonably practicable". The acronym is frequently used in ONR guidance synonymously with the requirement in the Health and Safety at Work etc. Act 1974 and other legislation to reduce risks so far as is reasonably practicable (SFAIRP).

1.11 Radioactive waste may be stored before disposal. For the purposes of distinguishing[2] between storage and disposal of radioactive waste in this statement:

a) "disposal" applies where there is no apparent intention to retrieve the waste; and

b) "storage" applies where the operator has demonstrated the intention to retrieve the waste in the future and the waste is contained in the interim.

The regulators will use this distinction in agreeing on a case by case basis their view of the intent of operators' proposals and actions for their management of radioactive waste.

1.12 "Accumulation" of waste in the context of this statement includes:

a) waste held pending disposal under an EASR18 or EPR16 permit. Such waste may also be described in this statement as "waste awaiting disposal"; and

b) storage of waste as described in paragraph 1.11(b) above.

[1] This definition for Optimisation is taken from the *Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation* (GRR) published by EA, SEPA and NRW, Version 1.0, July 2018. https://www.sepa.org.uk/media/365893/2018-07-17-grr-publication-v1-0.pdf

[2] This distinction is derived from the definitions for disposal and storage of radioactive waste contained in the IAEA Safety Glossary, 2018 Revision.

2 General approach to the Regulation of Solid Radioactive Waste Disposal on Nuclear Licensed Sites

2.1 Any operator undertaking activities on a nuclear licensed site that constitute the disposal of radioactive waste as defined within RSR must comply fully with the requirements of both RSR and nuclear safety legislation, in whatever form that disposal takes place.

2.2 ONR regulates the safety of radioactive waste disposal operations on nuclear licensed sites through conditions attached to licences granted under NIA65, and through other applicable health and safety legislation. Licensees must ensure that there are adequate arrangements in accordance with the site licence conditions to ensure safety.

2.3 The environment agencies regulate radioactive waste disposal operations on nuclear licensed sites for the protection of members of the public and the environment. The EA or NRW does this through granting a permit for radioactive waste disposals on and from nuclear licensed sites in England and Wales respectively. SEPA grants permits for the management of radioactive waste, including its disposal, on nuclear licensed sites in Scotland. Operators must hold a permit that authorises disposal of radioactive waste, and carry on such disposals in accordance with the conditions of their permit.

2.4 The regulators consult each other at the earliest opportunity during the process of formal regulatory decision making on matters that may affect the other, in accordance with our bilateral MoUs. This means that our decisions take full account of each other's views.

2.5 Throughout the life of their sites, nuclear licensed site operators must demonstrate to the relevant environment agency that the disposal of radioactive waste is optimised[3] and must ensure that risks to the health and safety of employees and other persons are reduced so far as is reasonably practicable.

2.6 The environment agencies expect operators to make timely applications for the appropriate authorisation for disposal of wastes, including those arising from the eventual demolition of redundant structures.

2.7 During decommissioning in particular, waste disposal decisions are likely to be more frequent. At a strategic level the regulators have a preference for early decommissioning, including the associated decision-making about radioactive waste disposals. If an operator seeks to defer decommissioning of a redundant structure it should demonstrate that deferral is optimal and that the structure will be adequately maintained in accordance with relevant legislative and regulatory requirements; the operator's approach must be coordinated and consistent for both safety and environmental protection purposes.

2.8 Redundant structures, such as buildings, vaults and ponds comprise a mixture of materials and wastes which may include both non-radioactive and radioactive waste, for example:

[3] As required under EPR16 & EASR18

- redundant ducts, drains, sumps, or pipes (whether at, above or below ground level);
- rubble or scrap resulting from the dismantling or demolition of such structures; and,
- waste resulting from clean-up of ground or groundwater contaminated by radioactivity from redundant structures.

2.9 Any waste arising from the demolition or decontamination of such structures must be managed according to the applicable legislation i.e. RSR or the relevant waste legislation in England, Wales or Scotland.

2.10 The Annex to this statement provides further information on the practical application of this statement and provides illustrative examples.

3 Authorisation of Solid Radioactive Waste Disposals on a Nuclear Licensed Site by the Environment Agencies

3.1 A detailed explanation of how the environment agencies will permit the disposal of solid radioactive waste on a nuclear licensed site is provided in the document entitled *Management of radioactive waste from decommissioning of nuclear sites: **G**uidance on **R**equirements for **R**elease from Radioactive Substances Regulation* ("the GRR") (see footnote 1).

3.2 In applying the GRR the following points are especially relevant to achieving a harmonised approach:

a) Authorisation is required, in the form of an RSR permit, prior to any specific act of disposal of radioactive waste, which includes the permanent emplacement of radioactive waste into a void or onto land.

b) For waste in situ, where there may be no readily identifiable physical act of emplacement, authorisation by the relevant environment agency, in the form of an RSR permit, will be required before operators can leave the waste in situ permanently. Waste in situ prior to disposal is regulated by the ONR and considered by the environment agencies to be waste awaiting disposal[4]. In Scotland SEPA also has regulatory duties for radioactive waste on nuclear sites prior to disposal with respect to protection of the environment and public.

c) The operator must demonstrate to the relevant environment agency that its management of radioactive waste represents the optimised management option for that waste. The optimisation process should give due consideration to safety matters and is likely to also be of interest to ONR. The operator must also demonstrate that any disposal, in combination with all other past and prospective disposals and contamination remaining on site, satisfies the relevant requirements in the GRR.

d) The ONR and the relevant environment agency will work to prevent sham storage, in which an operator claims that certain radioactive waste is in storage,

[4] Where building structures remain intact and are maintained the environment agencies will not require an application to dispose of contaminated footings until such time as the building is demolished.

pending a decision to treat or to retrieve it, or to dispose of it elsewhere, when in fact there is no feasible intent to take any further action in relation to the waste. The environment agencies deem that the lack of such feasible intent may constitute disposal, as defined in RSR. The environment agencies will therefore scrutinise such claims and may take appropriate enforcement action if it is determined that operators have made unauthorised disposals.

3.3 The environment agencies require operators under their permits to:

a) develop and maintain a waste management plan (WMP) for the site identifying how radioactive wastes will be and have been managed in an optimised way, including prospective disposals on and from the site (including transfer) over the remaining lifetime of the site; and,

b) develop and maintain a site wide environmental safety case (SWESC) that demonstrates consistency with the environment agencies' standards both before and after the site is released from RSR, taking account of all past and prospective disposals of radioactive waste and other potential sources or features that could impact on people and the environment, such as radioactive contamination of land or groundwater.[5]

3.4 The environment agencies encourage nuclear licensed site operators to apply for variations to their RSR permits as soon as reasonably practicable, taking account of the timings set out in their WMPs.

3.5 Early application for on-site disposal may confer many benefits but does not constrain the operator's eventual decision should circumstances change. This is because the RSR permit effectively only enables the activity rather than 'requiring' the activity. Early application can:

- provide regulatory certainty for an operator;
- help avoid sub-optimal solutions;
- make best use of the existing knowledge of the site and its environs;
- enable constructive discussions with other stakeholders such as planning authorities;
- provide a clear and definite disposal route for the waste;
- help local communities understand how matters will be resolved.

3.6 Radioactive waste in storage on nuclear licensed sites is regulated by ONR (noting that in Scotland SEPA also has regulatory duties for the storage of radioactive waste with respect to the protection of the environment and public). Such waste should be managed under appropriate safety and environmental cases, and be accounted for under Licence Condition 25. Any storage (whether of waste or material) must be satisfactorily contained to prevent the loss of radioactivity or other contaminants into

[5] The WMP and SWESC are living products and will evolve with time; they will be important inputs to any application for the variation of a permit for on-site disposal of radioactive waste and will need to be sufficiently detailed to support such an application. While we refer to radioactive waste here we encourage operators to integrate their waste management. For details see the environment agencies' guidance *Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation* (GRR) (see footnote 1).

the environment. A failure to prevent such a loss may be deemed a breach of the RSR permit and/or a breach of Licence Condition 34 (Leakage and escape of radioactive material and radioactive waste), for which the regulators may take appropriate enforcement action.

3.7 The regulators may take enforcement action for an unauthorised disposal where for example:

a) the operator states an intent to retrieve waste in the future but the regulators are not satisfied that this intent is feasible or practicable;

b) the operator declines to state their intent and the environment agencies consider that the waste has been disposed of as a result of the operator's actions (or inaction) in relation to that waste; or

c) the operator has breached applicable legislation or site licence or permit conditions.

4 Regulation of Safety of Disposal Activities by ONR

4.1 The safety of disposal activities on nuclear licensed sites is regulated by ONR through conditions attached to licences granted under NIA65, and through other applicable health and safety legislation, that include but are not limited to requirements to:

- make and implement adequate arrangements for the production and assessment of safety cases to demonstrate the safety of operations affecting safety (Licence Conditions 14 & 23);

- make and implement adequate arrangements for minimising the accumulation of radioactive waste (Licence Condition 32) and ensure adequate control or containment of radioactive material and radioactive waste so that it cannot leak or otherwise escape (Licence Condition 34);

- make and implement adequate arrangements for training those on site who have a responsibility for any operations which may affect safety (Licence Condition 10) and to ensure that only suitably qualified and experienced persons perform duties affecting safety of operations (Licence Condition 12), and that no operations that may affect safety are carried out except under the control and supervision of suitably qualified and experienced persons appointed for that purpose (Licence Condition 26);

- provide adequate instructions as regards risks and hazards, precautions to be observed and action to be taken in the event of an accident or emergency (Licence Condition 9) and make and implement adequate arrangements for dealing with any accident or emergency (Licence Condition 11);

- make and implement adequate arrangements for the notification, recording, investigation and reporting of incidents (Licence Condition 7);

- require suitable and sufficient safety mechanisms, devices and circuits (Licence Condition 27) and adequate arrangements for examination, inspection, maintenance and testing of plant affecting safety (Licence Condition 28);

- ensure, so far as is reasonably practicable, the health, safety and welfare at work of employees, and ensure that other persons are not exposed to risks to their health or safety (Health and Safety at Work etc. Act 1974 and its relevant statutory provisions); and

- ensure compliance with other applicable health and safety legislation such as the specific requirements in the Ionising Radiations Regulations 2017 to restrict exposure and limit dose, and in the Radiation (Emergency Preparedness and Public Information) Regulations 2019 for preparing emergency plans against radiation emergencies.

4.2 ONR does not require separate documentation where the WMP and SWESC satisfy all of the relevant licence conditions and statutory provisions. Operators may structure their documentation in other ways, and make use of other sources of information provided that it is sufficient and adequate to demonstrate compliance.

4.3 ONR may decide to permission the licensee's activities associated with disposal to ensure control of safety is maintained through implementation of regulatory hold points.

5 Harmonised Regulation

5.1 The regulators consider that the WMP and SWESC, as described in the GRR, provide the basis for a harmonised ONR/environment agencies approach to regulation of radioactive waste management and land quality management (LQM) over the lifetime of the site. Their use should ensure that sites are brought to a condition that demonstrably complies with the environment agencies' requirements both before and after the site is released from RSR, and with relevant ONR nuclear safety requirements for the duration of the nuclear site licence.

5.2 The environment agencies and ONR will work jointly to consider the adequacy of the WMP and SWESC in meeting their respective relevant regulatory requirements. This work will be in accordance with memoranda of understanding (MoU) between the ONR and each of the environment agencies. These provide mechanisms for co-ordinated regulatory advice and action.

6 Other approvals

6.1 The regulators note that, in addition to the need for authorisation under RSR and safety legislation, operators may need other forms of approval before they can undertake the disposal of radioactive waste or indeed approval for the wider activity giving rise to the generation and disposal of radioactive waste (e.g. the demolition and decommissioning of nuclear facilities). Such requirements may include the need to consider other environmental regulations, transboundary implications, planning permission under the relevant planning legislation or other authorisations issued by relevant authorities.

6.2 In addition to this, operators may need to consider the requirements of the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR), where the disposal of radioactive waste is undertaken as part of the

decommissioning project. Further guidance on EIADR is available from the ONR website at http://www.onr.org.uk/eiadr.htm

6.3 The regulators encourage operators to consider and seek confirmation of these and any other such approvals at the earliest possible opportunity.

7 Further Information

7.1 Queries regarding the content of this statement and its site-specific application should be directed to the environment agencies and ONR. The regulators will aim to co-ordinate their responses via their Joint Working Group on Land Quality Management (JWGLQM).

Annex: Practical application of this Statement

A1) Further information on the practical application of this statement is provided below, including some illustrative examples in Table 1.

A2) Figure 1 Part a) shows the timeline of a facility undergoing decommissioning, with part of an underground structure being left in situ. If part of the structure will remain in situ, and it is contaminated, either wholly or in part, above RSR out of scope values, then it becomes radioactive waste for the purposes of RSR, and an operator requires a permit variation before it can be left in situ permanently. The environment agencies encourage operators to apply at the earliest practicable opportunity for an RSR permit variation authorising disposal for the reasons set out in paragraph 3.5 above.

A3) Figure 1 Part b) shows that an RSR permit variation must be in place prior to the emplacement of radioactive waste into an existing structural void. If a structural void is used in this way, and is itself contaminated with radioactivity above RSR out of scope values, then one permit variation can cover both the in situ disposal of the structure and the disposal of waste in the structure. The application for any such RSR permit variation must therefore include radioactivity associated with the structure itself, as well as that of the waste being emplaced. Operators must obtain an RSR permit variation before commencing disposal of waste in the structure.

A4) The operator should set out its proposals for any disposal as early as possible in their WMP and SWESC. This will allow the relevant environment agency to consider both the optimisation arguments for any disposals as well as the likely suitability of any on-site disposals in the context of the site as a whole. This in turn allows the regulator to advise the operator (without prejudice) whether it is likely to permit such prospective disposals should the operator decide to apply.

A5) An operator may apply for a variation to its RSR permit authorising disposal at any time during the authorisation window (see Figure 1). As already noted, the environment agencies encourage operators to apply at the earliest practicable opportunity. This will normally be when the operator has completed the assessments in its WMP and SWESC, plus any nuclear safety requirements, and has decided whether it intends to dispose of any radioactive waste on site. In this way, operators may gain greater regulatory certainty about their ability to make on-site disposals of radioactive waste (subject to compliance with permit conditions at the time of disposal).

A6) At a site where the lifetime plan calls for a quiescent period it may be preferable to make applications to vary the RSR permit on several occasions depending on the overall programme of work. Figure 2 illustrates this with a simple schematic of a site with plans for a long quiescent period prior to the site being put into its final configuration. Where a structure is already in its disposal configuration before entry into the quiescent period, authorisation for that disposal should be sought by the operator without delay. Where the final configuration of disposal structures will only be achieved following further work after a long quiescent period, then those structures can be subject to later applications for variation. However, such variations must be in place prior to any emplacement of radioactive waste into any disposal structure, as described in A3 above.

A7) The regulators recognise that circumstances on nuclear licensed sites undertaking decommissioning may be much more complex than the scenarios described above. Therefore, it may not always be straightforward to identify those activities that

represent the disposal of radioactive waste and to determine when disposal occurs. For these reasons operators are encouraged to enter into early and regular discussions with the regulators to help understand what may be the appropriate timing for an application to vary the RSR permit. Operators will also need to consider the need for other permissions e.g. planning permission and plan for relevant applications accordingly.

A8) The following paragraphs illustrate the sort of considerations that may be relevant in discussions with the regulators about the practical application of this statement. Further details of these scenarios are provided in Table 1.

a) Where works are required to enhance safety and/or to improve levels of environmental protection prior to any final decision on disposal (eg. scenario 1 in Table 1), the operator should present the justification for early implementation clearly demonstrating that the work has been optimised and ensures that risks to the health and safety of employees and other persons are reduced so far as is reasonably practicable. Where such works subsequently form part of a proposal for an in situ disposal then they will need separate evaluation by the environment agencies as part of the determination of a permit variation for that disposal. Operators should consider the engineering standards that may be required to support any possible future disposal application.

b) Decommissioning of large complex sub-surface structures (eg. scenario 2 in Table 1) may create some radioactive wastes such as demolition rubble or large blocks of concrete that the operator wishes to leave close to the location where the decommissioning activity took place while a decision regarding disposal of the whole structure is considered. While the operator determines the optimal disposal option for the whole sub-surface structure the radioactive waste created by the decommissioning activities must be managed at all times, and ONR will regulate its safety under relevant licence conditions. The operator also needs to demonstrate to ONR and the relevant environment agency that the waste management adequately protects land and groundwater quality. If the optimal disposal option for the whole sub-surface structure is to leave it in situ any rubble or concrete blocks lying in the structure will need to be included in an application to the relevant environment agency to authorise its disposal when placed in its final disposal configuration.

c) Phased decommissioning of large structures (eg. scenario 4 in Table 1) may mean that some parts of a structure are effectively placed in their disposal configuration before other parts, but the structure as a whole is not yet in its final configuration and a disposal requiring a permit variation has not yet occurred. Where the early works are undertaken for safety and/or environmental protection reasons they should be justified to the regulators on that basis.

A9) Notwithstanding these practical considerations and the regulators' enabling approach, operators should always bear in mind the following principles:

- Early determinations of the optimum waste management option for radioactive wastes and prompt applications for RSR permit variations for any proposed on-site disposals are preferred and will help to provide regulatory certainty for the operator. Prior to entry into a long quiescent period (a decade or more), operators must identify in situ structures for which no further act of disposal is foreseen and obtain an RSR permit variation authorising these disposals.

- Activities that achieve demonstrable safety and/or environmental benefits can be undertaken by the operator during the period prior to authorisation of any on-site disposal of waste in order to fulfil existing regulatory obligations. However, where possible it is preferable to have the disposal permit prior to such work being undertaken.
- Claims from an operator that an activity does not represent a disposal of radioactive waste because the situation could be changed at any time are not sufficient grounds for delaying the application for a suitable RSR permit variation. For example, shallow features, such as drains, left in situ with no credible intent to retrieve represent disposals even though they are readily accessible with standard excavation equipment.
- The operator must have control over its full inventory of radioactive waste throughout the period of regulation and must be able to demonstrate satisfactory nuclear and environmental safety of any stored waste and waste awaiting disposal. This is particularly important during a quiescent period. ONR has regulatory responsibility for the safety of radioactive waste accumulation, storage and disposal activities, and for regulating the safety of the site for workers and members of the public while the nuclear site licence remains in place. In Scotland SEPA also has regulatory duties on nuclear licensed sites for protection of the environment and public from radioactive waste activities prior to disposal.
- All disposals of radioactive waste must be appropriately authorised. The environment agencies will not accept lifetime plans, business plans or commercial drivers as sufficient reasons for undertaking activities comprising the disposal of radioactive waste in advance of obtaining authorisation through the RSR permit. The operator's proposals must be consistent with their WMP and SWESC and be demonstrably optimal and ALARP.

(a) **Figure 1** Timing for the authorisation of radioactive waste disposals

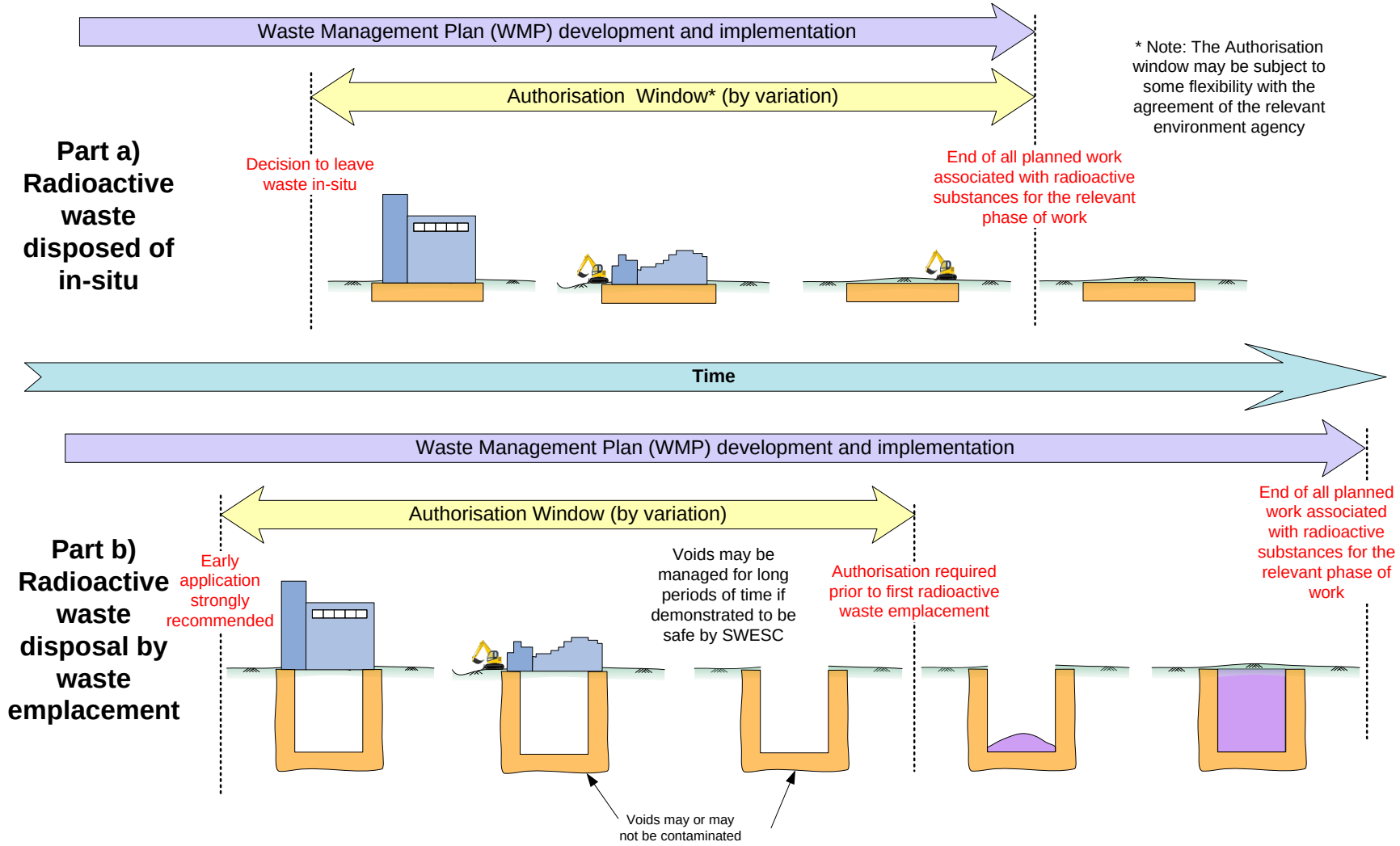

Figure 2 Phasing of applications for authorisation of radioactive waste disposals

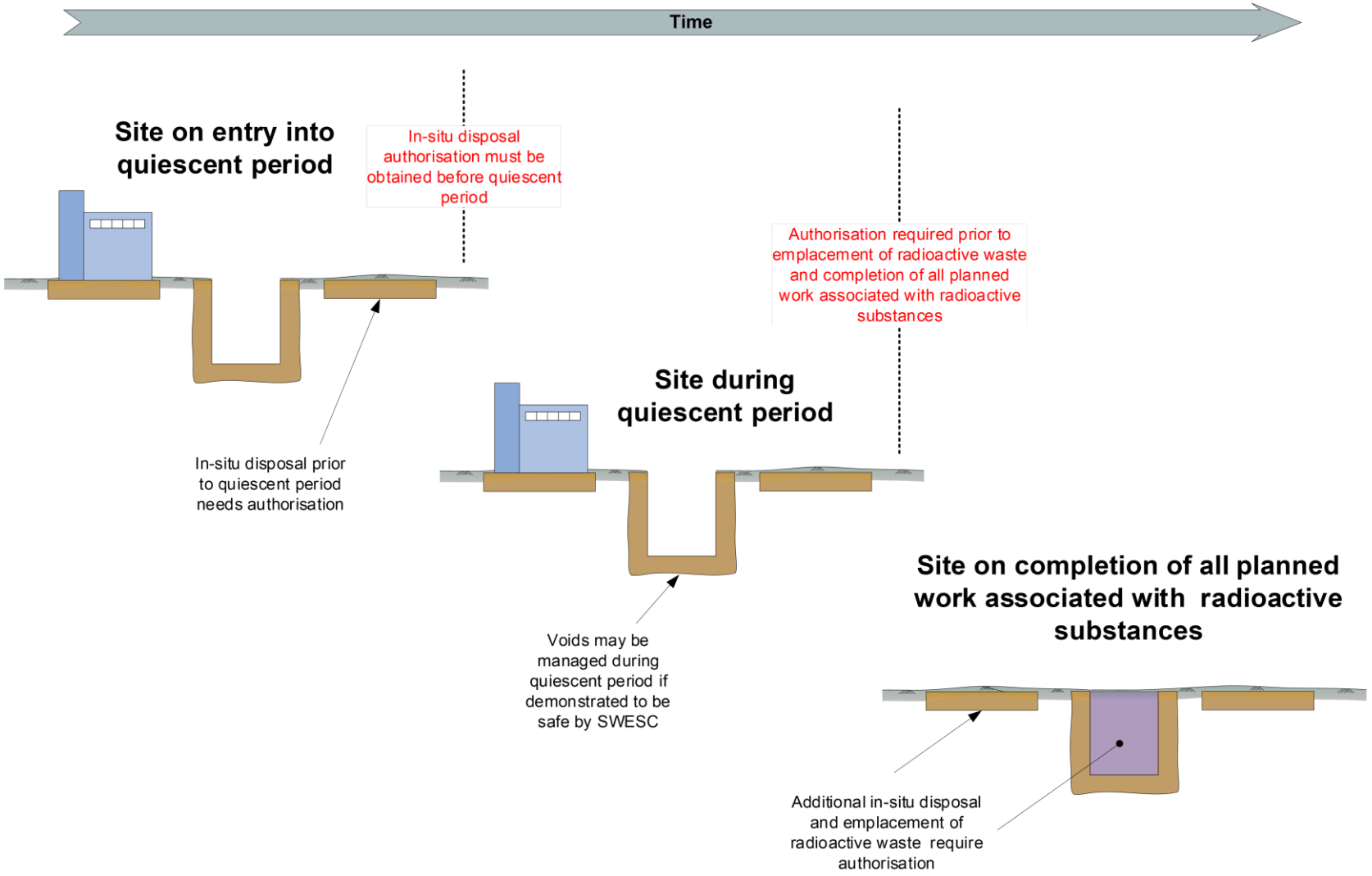

Table 1: Example scenarios[1] examining the timing of applications for RSR permit variations for solid radioactive waste disposals on nuclear licensed sites		
Ref	Summary of scenario	Considerations for determining a regulatory approach with the operator
1	<u>Grouting of radioactive drain networks ["active drains"]</u> The operator wishes to grout up the drains and claims that this will have the following benefits, for example: • Grouting of the active drains would reduce the volume of aqueous radioactive waste arisings because drains currently suffer from ingress of surface water or groundwater; • Grouting would also reduce the risk of the active drains acting as a preferential flow pathway for the migration of contaminated water including shallow groundwater; • Grouting would provide physical reinforcement of degraded drain-legs that extend beneath important site infrastructure such as roadways, and would facilitate the use of large plant to decommission adjacent large structures.	Where works are required to enhance safety and/or to improve levels of environmental protection, the operator should present the justification for early implementation clearly demonstrating that the proposals are optimised and ensure that risks to the health and safety of employees and other persons are reduced so far as is reasonably practicable. Such arguments should be fully developed and should evaluate alternative options to achieve the desired improvement in safety and environmental protection, for example: pulling out the primary pipework, while only the secondary active pipework is grouted in-situ. Good characterisation of the drain network and surrounding land and groundwater conditions will be necessary to support the demonstration of optimisation and ALARP. The proposed works to enhance safety and/or to improve levels of environmental protection should not foreclose realistic alternative management options that might be considered as part of the site-wide optimisation of radioactive waste disposal required by the WMP and SWESC. Alternative options could include the excavation of grouted pipework in the future. The grouting of below-ground active drains may ultimately form part of a proposal for an in-situ disposal, and will need to be separately evaluated by the environment agencies as part of the determination of a permit variation for that disposal. Consequently, operators should consider the engineering standards that may be required to support the disposal application when determining the nature of the short term enhancement works. If the grouting in-situ of active drains has been undertaken prior to a decision being made on the intended future disposal option, the environment agencies will expect the operator to confirm their intentions as soon as practicable. Once it is decided that they are to be disposed of in situ, the operator must seek an RSR permit variation from the relevant environment agency authorising the disposal. If the operator demonstrates its intent to retrieve the drains at some future point it should demonstrate that this is optimal and that the structure will be adequately maintained in accordance with relevant legislative and regulatory requirements for safety and environmental protection purposes.
2	<u>Decommissioning of component parts of a larger sub-surface structure</u>	Component features of a larger structure may undergo decommissioning and clean-up much earlier than the structure as a whole. The regulators would expect the operator to set out an optimised case for all the component features and to look ahead and identify realistic options

	Decommissioning of a large, complex sub-surface structure is expected to involve many interim works, for example: • the in-situ grouting of construction-joint drains situated below former spent fuel ponds. Below pond drains are degraded and acting as a preferential flow-pathway for contaminated water and increasing the volume of aqueous radioactive waste arisings; • the in-situ grouting of "vault" features situated within reactor basements; and, • the demolition of larger component features such as walls to facilitate physical access for other decommissioning activities, with the removed wall laid down in-situ. At the time of such interim works, the operator has not yet determined the optimum disposal configuration and the engineering details to enable an application for disposal of the structure as a whole to be made.	for the larger structure as a whole. An optimal approach will need to be demonstrated in the WMP and SWESC. Where works are required to enhance safety and/or to improve levels of environmental protection, the operator should present the justification for early implementation clearly demonstrating that the proposals are optimised and ensure that risks to the health and safety of employees and other persons are reduced so far as is reasonably practicable. On the basis that satisfactory assessments can be presented justifying the interim activities, a permit application for disposal of the radioactive waste would not be required until the final configuration for the whole structure or building is known. The operator may propose a delay to the larger structure entering this final configuration until after a quiescent period. If this arises, the operator will need to demonstrate environmental and nuclear safety during any quiescent period. The environment agencies expect an operator to evaluate the known and potential inventory of radioactive waste remaining on-site as part of their WMP (including from buildings and structures). Reasonably practicable efforts should be undertaken to characterise and confirm the expected inventory of wastes in advance of any interim works that may make parts of the building or site inaccessible. Where it is desirable in the interests of nuclear safety for ONR to control and have oversight of some of the licensee's decommissioning arrangements and operations or proposed operations, ONR may consider whether to impose appropriate regulatory holdpoints for the permissioning of activities. This may include the licensee implementing a particular proposal, undertaking an activity, or progressing from one stage of a project to the next. Although decommissioning may not pose an immediate nuclear safety hazard, ONR may choose to permission activities to ensure the licensee has reduced risks so far as is reasonably practicable at the point the hazard could be realised.
3	<u>In-situ grouting or in-filling of below ground voids or tanks which are not components of a larger structure</u> A nuclear licensed site has a below-ground tank that is contaminated with radioactivity. The operator expects that in-situ disposal of the tank will be the optimal waste management option. The operator wishes to avoid conventional safety risks associated with such structures being left open and accessible and therefore a potential hazard to people following their post operational clean out (POCO). The operator also wishes to prevent the ingress	The operator should undertake characterisation of the below-ground void or tank, and any other investigation/assessment activities necessary to support the case for in-situ disposal of the structure. In advance of any infilling activity taking place, the environment agencies will expect the operator to obtain a variation to their RSR permit authorising in-situ disposal of the structure, and the fill where appropriate. Any applicable safety related requirements would also need to be met.

	of water which could lead to the secondary generation of radioactive waste requiring treatment or disposal. The operator therefore proposes to fill the void with a suitable material and place it in its final disposal configuration.	
4	<u>Demolishing only selected parts of a larger structure to ground level and temporarily covering the contaminated foundations in situ, in advance of the whole structure being demolished and entering its "final configuration" as an in-situ disposal</u> A nuclear licensed site has large complexes of interconnected buildings (e.g. former fuel pond complexes) and demolition of parts of this footprint, with other parts remaining intact, is planned to occur over a prolonged period. The intact parts of the remaining complex may be overclad (weather-protected) to form "safestores" for the duration of a quiescent phase. This example scenario is prompted by lifetime or business plan considerations, and by drivers to undertake decommissioning of only part of a complex in order to facilitate access for plant to enable decommissioning of adjacent areas.	The regulators consider there are benefits for all parties in making applications for authorisation of disposal as soon as practicable. However, in this scenario, if the operator is not in a position to make such an application for disposal of the whole structure, and providing the operator can demonstrate that its proposals are optimal and ALARP, then a permit application for disposal of radioactive waste would not be required until the final configuration for the complex of buildings is known. In the interim, the still-standing parts of a partly demolished structure will be considered to be waste awaiting disposal. In this scenario, involving interim covering of contaminated building footings, an environment and nuclear safety justification would have to be made by the operator to the relevant regulators to demonstrate that any interim protection measures proposed are both optimal and ALARP. Should the operator not yet be in a position to fully define the "final configuration" for a complex, the environment agencies would expect the operator to declare in its WMP a programme of work for determining this, covering the whole complex in question. This programme of work should identify the optimum approach to the decommissioning of the entire complex and the intended timing of applications for variation of the RSR permit. This programme of work should be submitted no later than entry into a quiescent phase, such as care and maintenance, and should be fully discussed with the regulators during its development.
Note[1]: The scenario descriptions and the considerations for determining the regulatory approach are for illustrative purposes only. The regulators' decisions in any individual case will be subject to the specific circumstances and facts of that case, and may therefore differ from the approach outlined in this statement.		