Statement on behalf of the Claimant
Witness: Mrs C Richardson
1st Statement
Dated: 17th December 2025
Exhibits:

IN THE HIGH COURT OF JUSTICE
IN THE MATTER OF PROSPECTIVE PROCEEDINGS

Claim No.

BETWEEN:-

WEST BERKSHIRE COUNCIL

Claimant

-and-

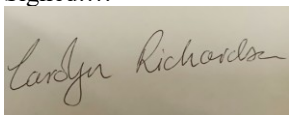
(1) UK LAND HOLDINGS 1 LTD
(2) CAROLINE BERRY
(3) NORA CONNORS
(4) PATRICK FAGAN CONNORS
(5) JIMMY O'CONNORS
(6) JOHNNY WALL
(7) PATRICK JAMES CONNORS
(8) JOHN JUDE O'BRIEN
(9) MICHAEL WALL
(10) JERRY GROGAN
(11) RICHARD O'BRIEN
(12) JOSEPH DOYLE
(13) NOREEN FLYN
(14) C RYAN
(15) C STOKES
(16) PATRICK STOKES
(17) BERNARD STOKES
(18) TOMMY STOKES
(19) VINCENT CRUMLISH
(20) HUGHIE STOKES
(21) DHESI
(22) THOMAS FLYNN
(23) MARTIN STOKES
(24) FLYNN
(25) PERSONS UNKNOWN (THOSE WITH AN INTEREST IN OR INTENDING TO UNDERTAKE WORKS OR INTENDING TO OCCUPY THE LAND KNOWN AS "LAND SOUTH OF READING ROAD")

Defendants

WITNESS STATEMENT OF MRS C RICHARDSON, BSc (Hons)

I certify this is the exhibit marked CR1 referred to in the Witness Statement of **Carolyn Richardson.**

Signed:…



Carolyn Richardson

Dated: 17th December 2025

A. Exhibits

1.	Exhibit CR1 to the First Witness Statement of Carolyn Richardson	A 1
2.	Appendix 1 AWE Off-Site Emergency Planning Supporting Information	A 2 - A 51
3.	Annex 1 to Appendix 1 REPPIR_A-Site_ConsequencesReport 2019	A 52 - A 61
4.	Annex 2 to Appendix 1 REPPIR_B-Site_ConsequencesReport_2019	A 62 - A 69
5.	Annex 3 to Appendix 1 REPPIR_A-Site_Declaration 2022	A 70 - A 71
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Appendix 1 AWE Off-Site Emergency Plan Supporting Information

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1. Legislation & Risk

1.1 The Atomic Weapons Establishments (AWE) at Aldermaston and Burghfield within the geographic area of West Berkshire Council are both nuclear licenced sites. Both sites are operated by AWE plc for the Ministry of Defence in order to support the UK defence and security work, in particular the nuclear warhead activities. Both sites were previously used in World War II and have been involved in the current work since the 1950s.

1.2 The legislative basis relating to protecting the public and the environment from radiation emergencies is to be found in the Radiation (Emergency Preparedness and Public Information) Regulations 2019[1] (REPPIR 19), which replaced the previous legislation known as REPPIR 01.

1.3 REPPIR 19 came into effect in May 2020.

1.4 The Health and Safety Executive guidance on REPPIR 19 explains the main changes as follows:

The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR 19) implement in Great Britain the articles on emergency preparedness and response in the Basic Safety Standards Directive 2013/59/Euratom (BSSD 2013)… (*available in additional proof documents*),

REPPIR 2019 are concerned with preparedness for radiation emergencies. The Regulations establish a framework of preparedness measures to ensure that arrangements are in place to effectively respond to that emergency, both on the site of the emergency situation and off-site where members of the public might be affected. The Regulations ensure that members of the public are provided with information, both before and during an emergency, so that they are properly informed and prepared, in advance, about what they need to do in the unlikely event of a radiation emergency occurring…

1.5 There were a number of changes in the new Regulations, with the main changes being:

a. *A change to the definition of a radiation emergency. A radiation emergency is no longer defined in relation to an emergency scenario have the potential for a specific dose to a member of the public;*
b. *The introduction of Outline Planning, with associated Outline Planning Zones. These planning zones are in addition to Detailed Emergency Planning Zones; and*

c. *The Local Authority now determines the Detailed Emergency Planning Zones. Previously, this was done by the Regulator.*

1.6 The changes in the new regulations came about following the lessons from the radiation emergency in Japan when an earthquake and subsequent Tsunami caused the Fukushima Daiichi Nuclear Power Plant disaster (2011) and changes made to the Basic Safety Standards Directive 2013/59/Euratom (BSSD 2013) which the UK was required to transpose into legislation in order to protect the public in the context of a reduced appetite to the risks associated with nuclear licensed sites.

1.7 Therefore, the new Regulations require two zones, DEPZ and OPZ, to be the focus in relation to emergency planning. The DEPZ is designated under Regulation 8, and the OPZ under Regulation 9. The requirement for an adequate off-site emergency plan is set out in Regulation 11.

1.8 DEPZs are about **capabilities** and consider sheltering, evacuation/displacement, and how to put these into effect. These capabilities should be pre-planned and can be put into effect quickly once an emergency has been declared and are set out in the Off-Site Emergency Plan (OSEP).

1.9 The DEPZ is a defined zone where it is proportionate to predefine protective actions which would be implemented without delay to mitigate the most likely consequence of a radiation emergency. This protective action should provide prompt protection to those who may be affected, maximising effectiveness which would be reduced if time was taken to consider and implement the action. (REPPIR Guidance 8(1) 233). This is particularly relevant to the AWE sites as a result of the very short time to alert those in the affected area to take the immediate protective action of shelter. The details relating to the timings required for protective actions to be in place are set out in Section 2, to this document.

1.10 The REPPIR 19 legislation has several requirements for local authorities which have nuclear licenced sites located within their areas. In this Appeal, AWE Burghfield is one such site. The requirements include:

a. Requirement to determine a geographical area known as the “Detailed Emergency Planning Zone” (DEPZ) (Reg. 8) on the basis of the operator’s “Consequence Report” under Regulation 7 and paragraph 2 of Schedule 4,
b. Prepare an Off-Site Emergency Plan (Reg. 11),
c. Review and test of emergency plans (Reg. 12),

d. Provision of information to the community within the DEPZ. These off-site arrangements link with the requirements on the site operators On-site emergency arrangements. (Reg. 21).

1.11 Regulation 8(1) DEPZ relates to land in this way:

(1) The local authority must determine the detailed emergency planning zone on the basis of the operator's recommendation made under paragraph 2 of Schedule 4 and may extend that area in consideration of—

(a) local geographic, demographic and practical implementation issues;

(b) the need to avoid, where practicable, the bisection of local communities; and

(c) the inclusion of vulnerable groups immediately adjacent to the area proposed by the operator.

1.12 Regulation 11 requires the local authority to prepare an Off-Site Emergency Plan (OSEP) in line with Schedules 6 and 7.

1.13 Within REPPIR 19, the Approved Code of Practice (ACOP) (*available in additional proof documents*), and associated guidance documents the processes to be undertaken to achieve compliance which are clearly set out, and to which the Emergency Planning Service has adhered.

1.14 Significantly the REPPIR 19 Regulations ***'aim to establish a framework for the protection of members of the public and workers from and in the event of radiation emergencies that originate from premises.'*** *(*Page 1, para 1 of the ACOP). This is the golden thread throughout from determining the Detailed Emergency Planning Zone (DEPZ), developing the Off-Site Emergency Plan (OSEP) and ensuring the OSEP remains 'adequate' as required by Regulation 11. More information relating to this is set out throughout this document.

1.15 This document evidences the complexity of a radiation emergency, and more 'normal' emergencies, in order to help a decision-maker understand the challenges likely to be experienced both during the initial emergency response, but also, significantly, in the recovery phase in relation to protecting public safety, health and wellbeing.

1.16 In addition to the REPPIR 19 legislation and guidance, there is also the National Nuclear Emergency Planning and Response Guidance which, although published in 2015, and therefore prior to REPPIR 19, is still largely relevant.

1.17 REPPIR 19 is not the only legislation relevant to emergency response and recovery in relation to any emergency including a radiation emergency. Other legislation which also applies includes the Civil Contingencies Act 2004 (CCA) and associated guidance.

1.18 The CCA legislation places duties on a wide range of agencies including local authorities. These duties include: to assess risk; put in place emergency plans and business continuity plans; have in place and maintain arrangements to make information available to warn and inform the public; to share information and cooperate with other responders; and provide business continuity advice to businesses and volunteer organisations.

1.19 Having regard to the requirement of the CCA to assess risk, there is a link to the National Risk Register (NRR) 2023 edition which is a public document and found in additional proof documents. The NRR covers a broad area of risks to the UK such as flooding, cyber, animal diseases, major fires, malicious attacks. The NRR takes into account and captures the impact of emergencies into 7 areas as set out below:

a. The *impact on human welfare*, including fatalities directly attributable to the incident, casualties resulting from the incident (including illness, injury and mental health impacts), and evacuation and shelter requirements.
b. Behavioural impacts, including changes in individuals' behaviour or levels of public outrage.
c. The impact on essential services, including disruption to transport, healthcare, education, financial services, food, water, energy, emergency services, telecommunications and government services.
d. Economic damage, including numbers of working hours lost.
e. Environmental impact, including damage to the environment.
f. The impact on security, including on law enforcement agencies, armed forces, border security, and the criminal justice system.
g. International impacts, including damage to the UK's international relations and ability to project soft power, disruption to international development, violation of international law and norms, and international displacement and migration.

1.20 The impact from a radiation emergency at a nuclear facility such as AWE Aldermaston or Burghfield would include all the above impacts with a significant impact on human welfare and the environment, in the short and long term, and have a financial cost by way of billions of pounds. Therefore, the national risk register has assessed that a civil nuclear accident, although unlikely, would have a **catastrophic impact–** the highest impact category This is also shown on the Figure 1 below with the civil nuclear accident likelihood and impact shown as serial 28.

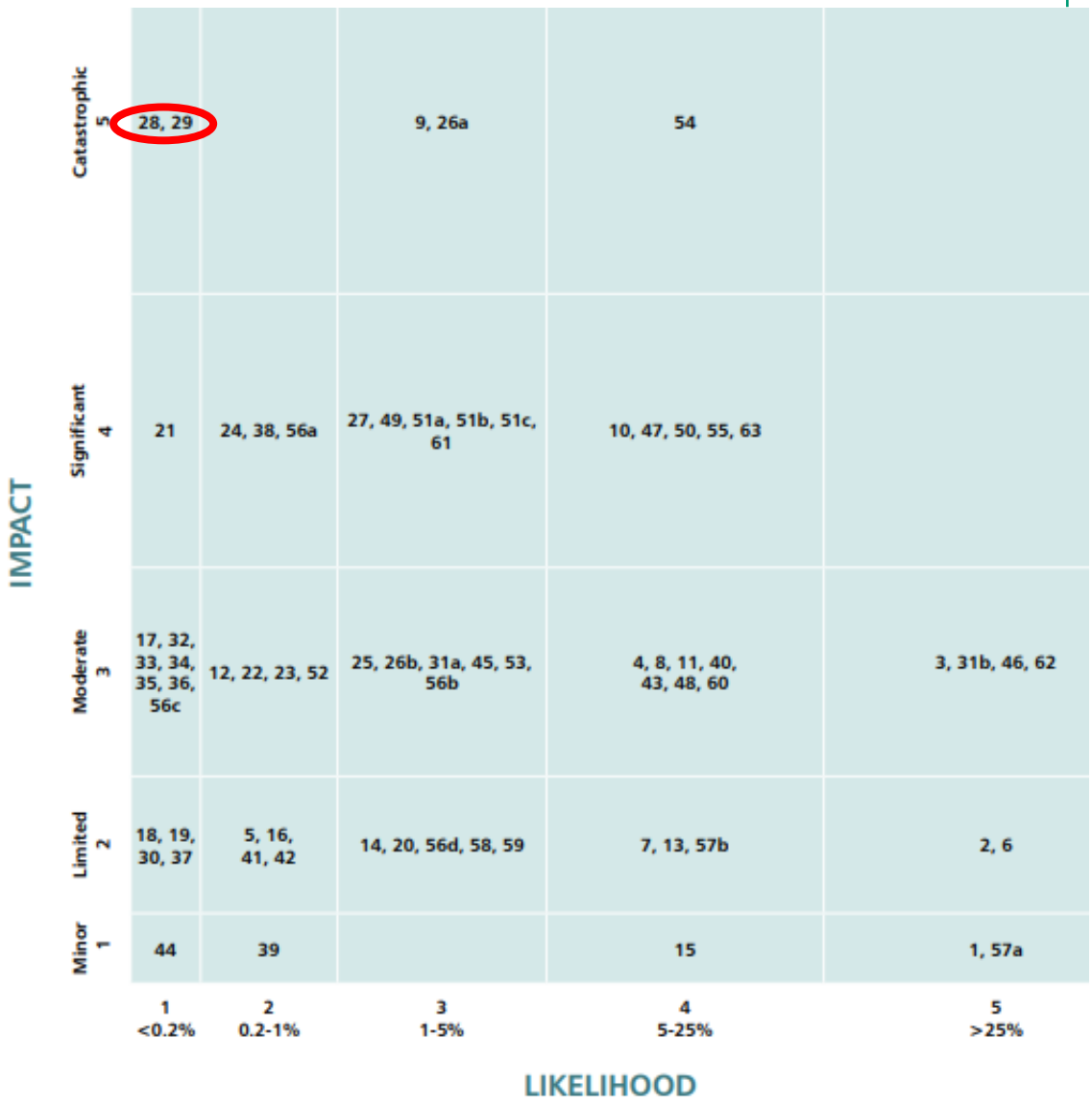


Figure 1: National Risk Assessment Matrix

1.21 In addition to the National Risk Register and within the Approved Code of Practice (ACOP) for REPPIR 19 is a Risk Framework which, as stated in the ACOP, is based upon the National Risk Assessment. As with any risk framework it is based upon the impact and likelihood. The details including the descriptors are set out below in Tables 1 & 2.

Impact	Descriptors					
		1	2	3	4	5
	Impact descriptor and effective dose	Human life (Acute exposure/ Deterministic Effects)	Health & Safety (Cancer induction)	Quality of life	Property	Environment
A	Catastrophic (>1 Sv)	Death and life changing consequences severe deterministic effects possible.	Possibility of life changing consequences because of significant (> 5%) increased risk of cancer induction.	Complete reconstruction of life activities.	Asset value completely lost.	Exclusion zones increase and heavy restrictions extended to further distance.
B	Significant (100-1000 mSv)	Possibility of moderate deterministic effects.	Possibility of life changing consequences because of very small (0.5%) increased risk of cancer induction.	Initial reconstruction and continued interruption of normal life activities.	Major asset value depreciation.	Exclusion zones of environmental areas and heavy restrictions.
C	Moderate (10-100 mSv)	No potential for deterministic effects, below threshold dose.	Possibility of life changing consequences because of very small (0.5%) increased risk of cancer induction.	Enforced prevention or interruption of normal life activities.	Potential or real asset value depreciation.	Restricted or temporary loss of environmental growth or produce.
D	Minor (1-10 mSv)	No potential for deterministic effects, below threshold dose.	Minimal impacts and unlikely to have life changing consequences.	Potential self-imposed restrictive changes in normal life activities.	Assumed asset value depreciation.	Reluctance to use environmental areas and produce.
E	Limited (less than 1 mSv)	No potential for deterministic effects, below threshold dose.	Normal background	Sustained normal life activities.	Asset value sustainable or dominated by market forces.	Sustained environmental conditions.

Table 1: REPPIR 19 Risk Framework P 180 (ACOP Appendix 2, Table 1 Impact Table)

Likelihood descriptor	Relative likelihood of occurring in the next 5 years
Events not considered in the design	Less than 1 in 20,000
Very low	1 in 20,000 – 1 in 2,000
Low	1 in 2,000 – 1 in 200
Medium	1 in 200 – 1 in 20
High	1 in 20 – 1 in 2
Very high	Greater than 1 in 2

Table 2: REPPIR 19 Risk Framework P181, (ACOP Appendix 2, Table 2 Likelihood table)

1.22 Also within Appendix 2 of the ACOP is the risk framework output which sets out where no emergency planning is required (which is not the case for AWE) but also where outline and detailed emergency planning is required which does apply to AWE as highlighted below.

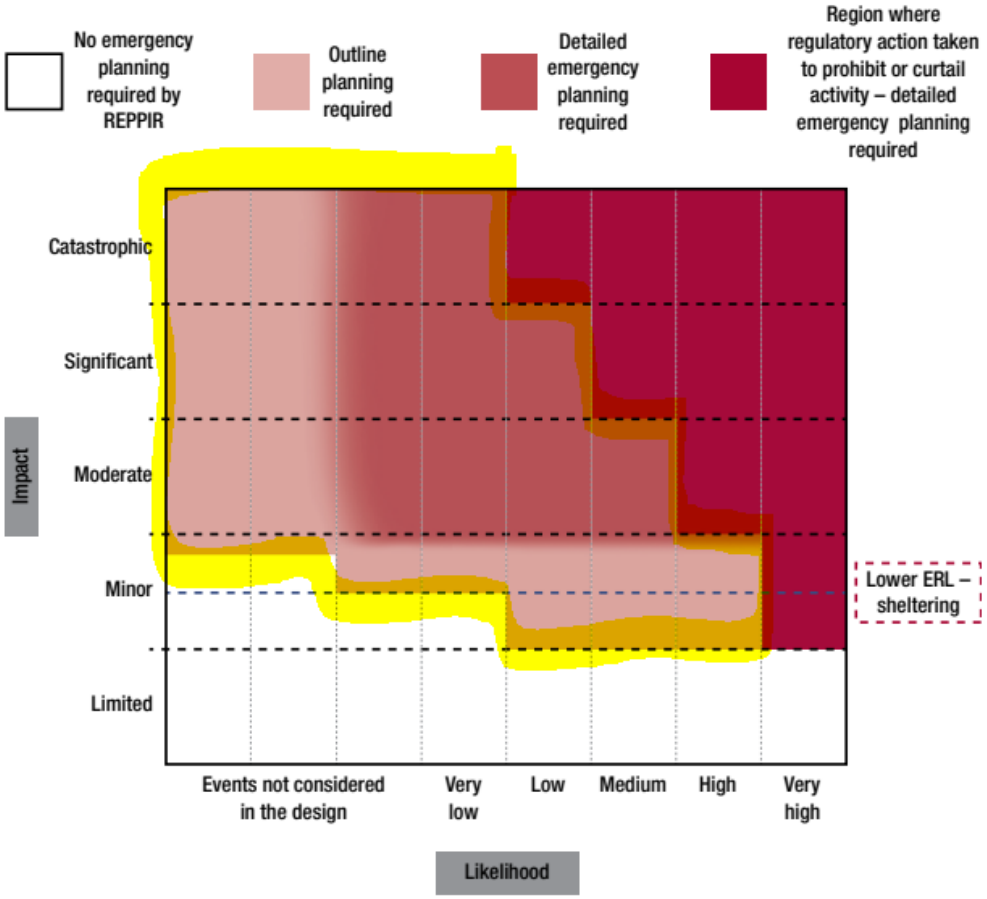


Figure 2: REPPIR 19 Risk Framework P181, (ACOP Appendix 2, Figure 3, Risk Framework)

1.23 The above figure clearly demonstrates, in the area outlined in yellow, that under REPPIR 19 there is a likelihood and an impact hence the need for Outline Emergency Planning and

Detailed Emergency Planning requirements with the impact ranging from minor to catastrophic.

The areas highlighted in 'orange' in tables 1 and 2 show the likelihood and impact of AWE radiation emergencies.

1.24 The actual impact, it is recognised, will be variable as a result of the scenario at the time including the weather conditions, time of day, what events are going on in the area and the cause of the radiation emergency. However, whilst the scale of the impact may reduce, there will be an impact and significantly it should be noted that it is not just in the immediacy of the radiation emergency that there will be an impact but in the recovery. This may be prolonged and include long-term health, environmental and economic impacts requiring sustained recovery.

1.25 The likelihood of a radiation emergency arising at an AWE site remains very low, due to the layers of safety put in place and the oversight of the Nuclear Regulators. Nevertheless, the purpose of REPPIR 19 is to address the impact of emergencies which may not be likely to occur but would have a catastrophic impact if they did occur.

1.24 The recently issued National Risk Register (NRR) 2023 (available in supporting documents) refers to only a small number of accidents occurring in the UK since 1956. However, the scenarios they have built their assessment on are '*those far beyond a reasonable worst-case. The scenario used for this assessment is therefore extremely unlikely. It is based on an accident occurring at a UK civil nuclear site that results in a release of radiological material that extends beyond the boundary of the site.*

Onsite casualties could require decontamination, monitoring and treatment. No immediate fatal health effects would be anticipated offsite but there could be offsite casualties suffering from the effects of radiation.

There could also be an increase in the risk of longer-term health impacts, such as cancers. The resulting contamination could affect the environment and food production, and there could be disruption to domestic and international transport. The overall impacts of a release are highly dependent on weather patterns.'

1.26 It is also recognised in the NRR about the response capabilities and recovery as set out below:

Response capability requirements

*There would be a **large-scale, multi-agency response**. A communications campaign would be needed to communicate key messages to the public. Protective actions would be*

promptly implemented to protect people's health, which based on the nature of the accident, could include sheltering, evacuation or the use of stable iodine. A ready stockpile of stable iodine tablets could be required as a medical countermeasure. Immediate capabilities could include radiation monitoring and decontamination services, alongside remediation services to restrict the spread of radioactive material. Humanitarian services would also be required to support those displaced, including but not limited to emergency shelter, food and water.

Recovery

Around affected parts of the UK, there could be significant and prolonged long-term health, environmental and economic impacts requiring sustained recovery

1.27 A number of caveats relate to the above detail in the NRR in that it relates to Civil Nuclear accidents and therefore does not directly relate to the AWE nuclear sites. That said, the AWE sites are unique and complex and the impact relating to a radiation emergency arising from these sites would also be unique and complex. In particular this relates to the time required to warn and inform the public to take shelter to afford the best protection for the public and noting that the use of stable iodine tablets does not apply to the AWE sites due to the nature of the radioactive material involved.

1.28 Therefore, regrettably and notwithstanding safeguards which continue to improve being applied no doubt diligently by all concerned, radiation emergencies can and do happen and for the AWE sites they will be more complex than other nuclear sites.

1.29 It is significant that a 'radiation emergency' is defined in REPPIR 19 and the ACOP to include both actual hazards and ***perceived risks***:

'a non-routine situation or event arising from work with ionising radiation that necessitates prompt action to mitigate the ***serious consequences****—*

(a) of a ***hazard resulting from that situation or event****;*

(b) of a ***perceived risk*** *arising from such a hazard; or*

(c) to any one or more of—

(i) ***human life;***

(ii) health and safety;

(iii) quality of life;

(iv) property;

(v) the environment;

1.30 Significantly the **perceived risk** as described in the ACOP at paragraphs 75-77 is broad and includes situations where an explosion is heard at a distance from a known nuclear facility but in reality, no release or exposure to radiation has in fact occurred.

1.31 The Council's Off-Site Emergency Plan (OSEP) therefore must be designed to mitigate, so far as is reasonably practical, the consequences of a radiation emergency (Regulation 11(1)) as defined in Regulation (2)(1), which includes actual hazards as well as perceived risks.

1.32 Regulation 11(1) requires that the OSEP is "adequate". That is informed by Schedule 7 ("Principles and purposes of emergency plans)". Part 1 of Schedule 7 sets out the principles that any person with responsibility for preparing an emergency plan must consider. Part 2 of Schedule 7 states (emphasis added):

"2. Any person with responsibility for preparing an emergency plan under these Regulations ***must ensure that the plan, if implemented, would fulfil the following purposes****—*

(a) to reduce or stop the effects of the radiation emergency;

(b) to reduce the exposure to individuals and to the environment resulting from the release of ionising radiation;

(c) if necessary, to ensure that provision is made for the medical treatment of those affected by the radiation emergency; and

(d) to prioritise the implementation of the plan in relation to any person exposed to a dose in excess of the reference levels set out in regulation 20".

2. Detailed Emergency Planning Zone (DEPZ)

Legislation

2.1 Regulation 8 of REPPIR 19 requires the local authority to determine a Detailed Emergency Planning Zone (DEPZ) on the basis of the operator's recommendation. The operator is the Atomic Weapons Establishment (AWE). This was a new obligation on the relevant local authority brought in under REPPIR 19, with the zoning previously undertaken by the Regulators.

2.2 Prior to determining the DEPZ, information is provided by the operator of the nuclear site in the form of a "Consequences Report" (Annex 1). AWE provide two reports, one for each nuclear site, both of which are publicly available on the West Berkshire Council website . The relevance of the contents of the Consequences Report relating to any nuclear licenced site is that it forms the basis under REPPIR 19 for determining the *minimum size* of the DEPZ and therefore the main area of interest for the AWE Off-Site Emergency Plan (OSEP) to cover.

2.3 The Consequence Report not only provides the information in relation to the minimum geographical distances for setting the DEPZ, but also provides the justification behind operator's the recommendation, including response times to put in place urgent protective actions.

Background to the DEPZ

2.4 AWE nuclear sites in West Berkshire are very different to the majority of the other nuclear licenced sites around the UK. Many of these other sites are very remote locations, often on the coast and far from communities as shown in the ONR sites and facilities map. (Available in supporting documents). They are often on a coastal area and many of them have nuclear reactors which are very different to the processes undertaken at the AWE sites. Therefore, the area for urgent protective action, the DEPZ and the response times for these other sites are different to those around AWE. Significantly, the urgent protective action response time may be hours, and not minutes as is the case for the AWE sites.

2.5 An example of such a difference is Hunterston B Power Station which states in its Consequence Report that sheltering out to ~2km from the site is recommended, that stable iodine can be administered up to *5-8 hours* following exposure for averting iodine inhalation dose, advise should be issued within 24hr regarding consumption of leafy green

vegetables, milk etc downwind of the site along with a 'conservative time factor for implementing the protective measure of 2 hours'. These measures are significantly different to the AWE sites where the time to put measures in place from start of incident is *13 minutes* for AWE Aldermaston and *25 minutes for AWE Burghfield*. Stable iodine tablet distribution is not applicable for AWE sites due to the different materials used, in addition countermeasures such as, *not* eating vegetables and milk, will be put in place almost *immediately*.

2.6 The procedures undertaken by West Berkshire Council to determine the DEPZ in March 2020 were upheld in January 2021 following a Judicial Review which was unsuccessfully challenged the process undertaken by the Council. (Crest Nicholson Operations Limited, Hallam Land Management Limited, Wilson Enterprises Limited and West Berkshire District Council and AWE Plc, Secretary of State for Defence, Public Health England (now UK Health Security Agency) and Office for Nuclear Regulation EWHC **[2021] EWHC 289 (Admin)**. The Hon. Mrs Justice Thornton DBE 12 February 2021 rejected the claim on all grounds. Whilst the focus for at challenge was about AWE Burghfield the processes challenged were also utilised for the AWE Aldermaston site.

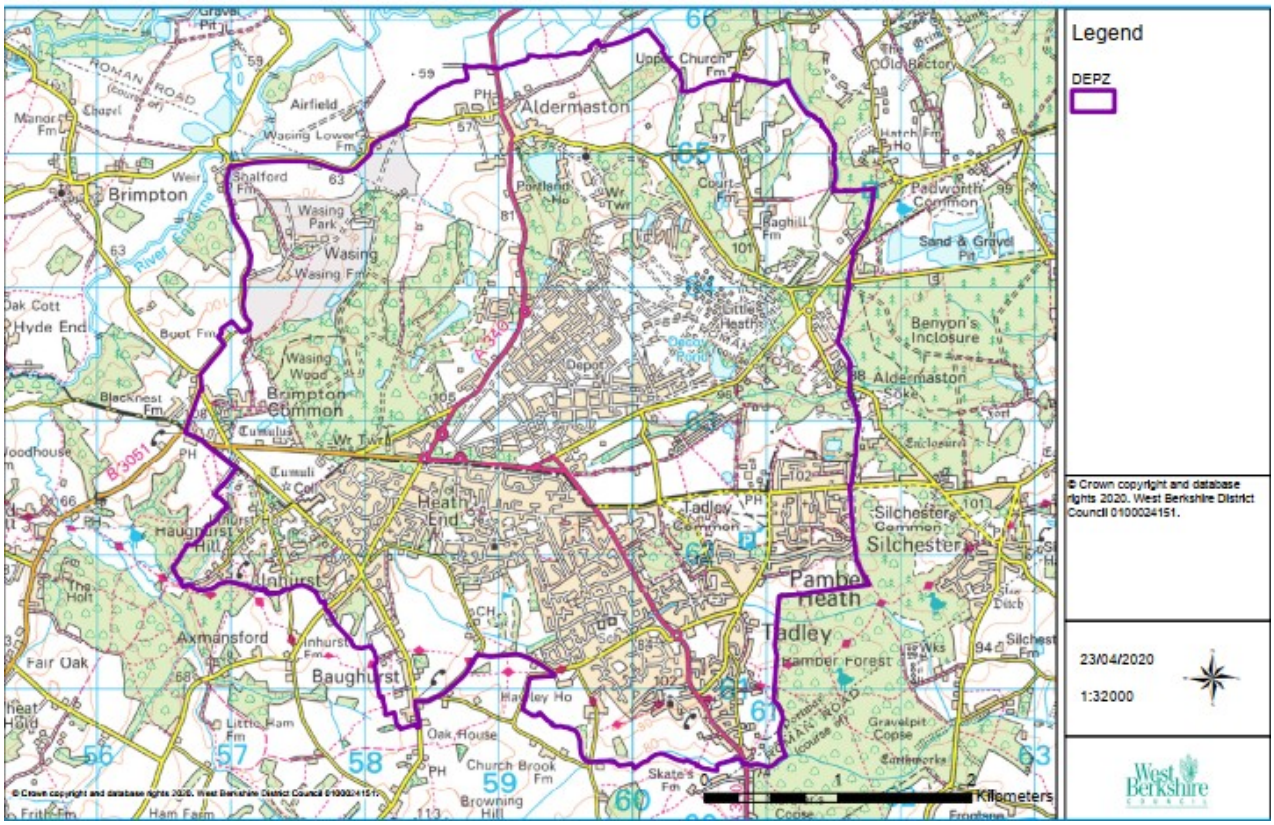
2.7 Since the initial determination in March 2020 the DEPZs for both AWE nuclear sites have been reviewed and re-determined in January 2023.

2.8 No changes were made to the AWE Aldermaston site however there were two minor changes made to the AWE Burghfield DEPZ with the addition of two small areas to include properties within communities which had previously been excluded.

Extent of AWE Aldermaston DEPZ

2.9 The DEPZ for AWE Aldermaston did not change in 2020 as a result of the REPPIR 19 legislative changes.

2.10 The map below sets out the scale of the DEPZ for AWE Aldermaston:



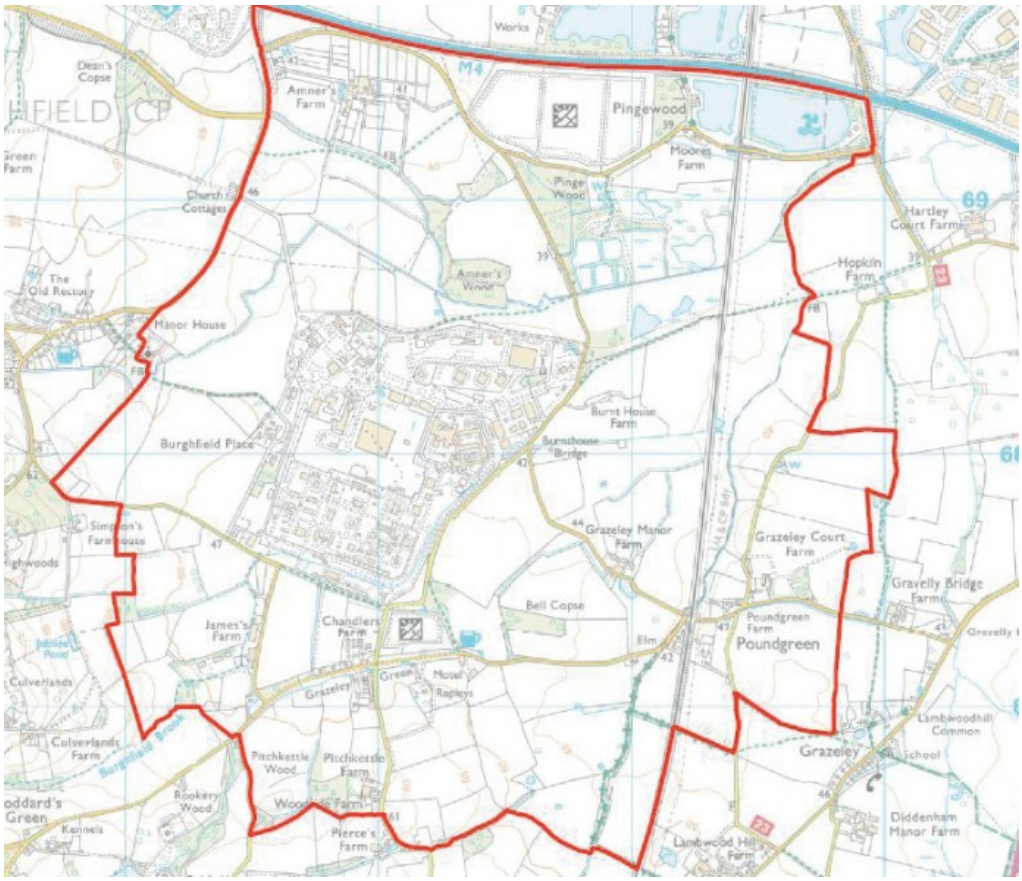
Map 1 – DEPZ for AWE Aldermaston 2018 and 2024 (pre and post REPPIR 19)

2.11 The DEPZ for AWE Aldermaston includes the geographic areas of West Berkshire Council, Basingstoke and Deane Borough Council and Hampshire County Council.

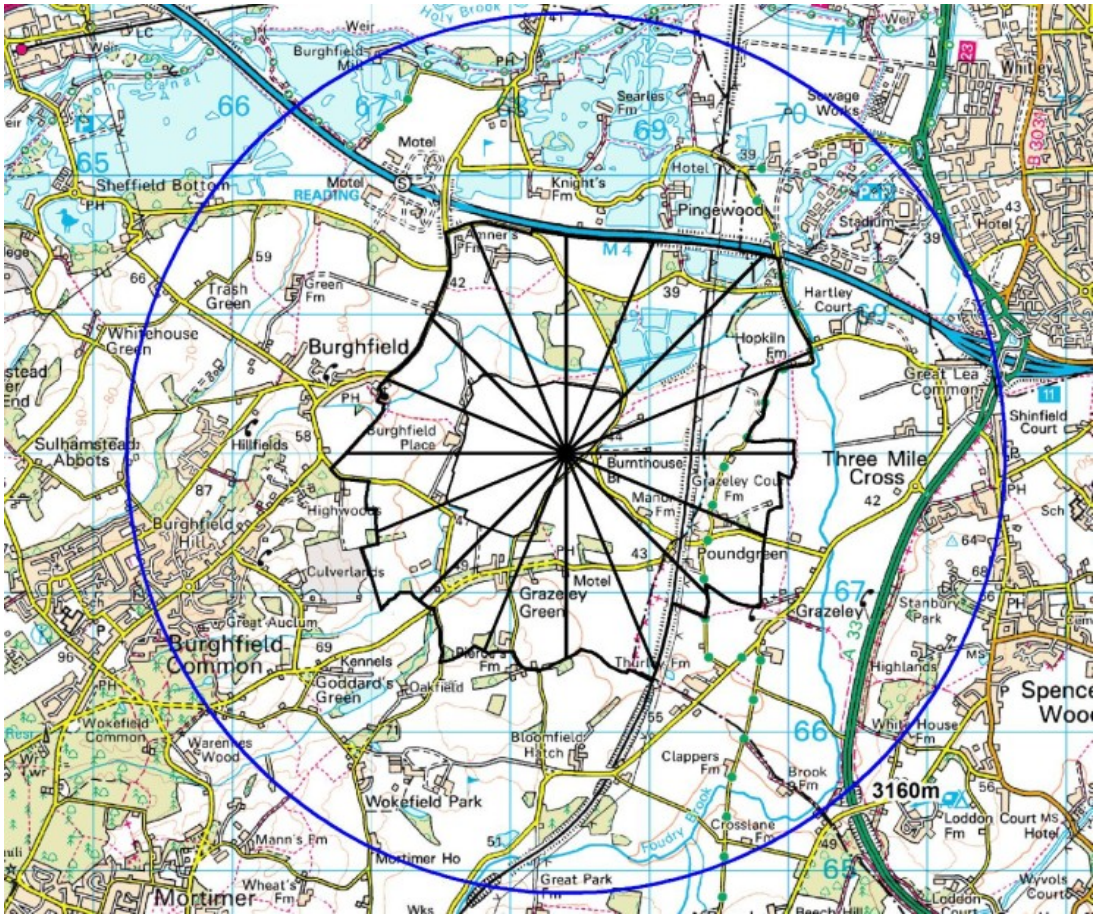
Extent of AWE Burghfield DEPZ

2.12 The DEPZ for AWE Burghfield significantly changed by way of size and population density (residential and commercial) as a result of the changes in REPPIR 19.

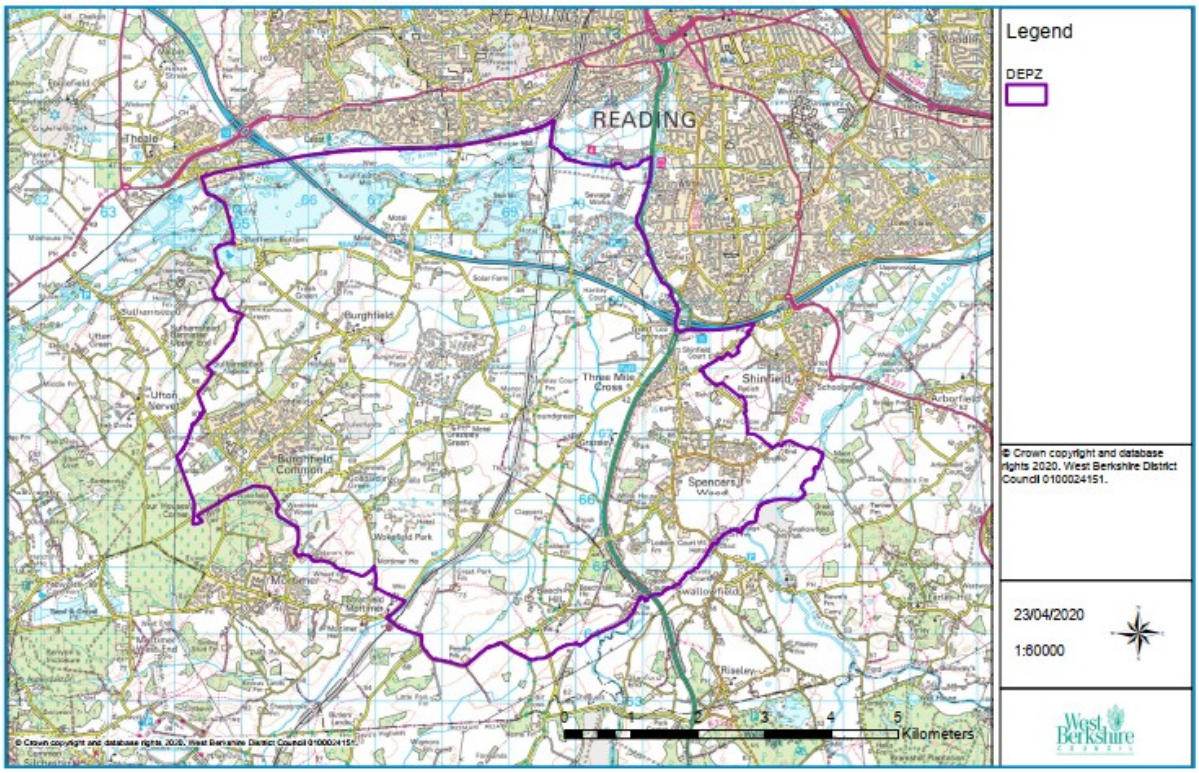
2.13 The maps below sets out the DEPZ prior and post REPPIR 19 changes including the area of Urgent Protective Action to give some context to the changes. Significantly it can be seen the DEPZ prior to 2019 was Southwest of the M4 motorway and did not impact on many of the conurbations including Burghfield Common, Three Mile Cross, Spencers Wood and communities in Reading area.



Map 2 DEPZ for AWE Burghfield Pre REPPIR 2019



Map 3 – DEPZ for AWE Burghfield pre REPPIR 19 within the UPA post REPPIR 19



Map 4 DEPZ for AWE Burghfield post REPPIR 19 and redetermination 2023

2.14 The maps above clearly show the scale of the increase in the size of the DEPZ for AWE Burghfield and the significant increase in the communities within the DEPZ.

2.15 The DEPZ for AWE Burghfield includes the geographic areas of West Berkshire Council, Reading and Wokingham Borough Councils.

2.16 Further information in relation to the Consequence reports and determination reports are detailed in **Annexes 1, 2, 3, 4, & 5** to this document.

2.17 The DEPZ is reviewed and re-determined every 3 years, unless there is a change in operations on the AWE sites and /or the local authority considers there is a change in the local area which necessitates a re-determination.

2.18 Therefore, any new improved facilities and/or closure of old facilities in the AWE sites may reduce the size of the DEPZ. The area may also be extended in consideration of the factors listed in Regulation 8(1).

2.19 Equally, the *methodology* for calculation of the DEPZ may change based on new evidence - which may mean it increases in size. In addition, over time different *parts* of the AWE site

may be used for new nuclear facilities, subject to the normal planning and various consenting processes but that may result in changes in the risk profile and therefore changes in the DEPZ.

2.20 The DEPZ and the process of determination is undertaken carefully and reservedly by West Berkshire Council, not only for the impact on the community, but also in relation to ensuring compliance with REPPIR 19. This includes the provision of public information and the development and implementation of the AWE OSEP in accordance with Regulation 11 and Schedules 6 and 7 of REPPIR 19.

2.21 The Consequence Reports for both AWE sites and the associated decision reports from March 2020 when the DEPZs were originally determined and subsequently in January 2023, are at **Annexes 1, 2, 3, 4, & 5** to this document.

2.22 Within these reports it information relating to the urgent protective actions (UPA) the materials involved and the risk pathways, the minimum distances, why they are required and how quickly they ought to be put in place. The information relating to each AWE site is set out below

AWE Aldermaston Summary – Risk materials, Risk pathways, Urgent Protective Actions

2.22 The AWE's evaluation of the *minimum* geographical extent of the DEPZ for AWE Aldermaston is 1540m (Annex 1 – Site Consequences Report) Part 2 2.(a)). This is also known as the "Urgent Protection Actions" (UPA) area. The "urgent protective action" recommended is sheltering. A further "Outline Planning Zone" (OPZ) of 15km is also recommended. The OPZ is set by the Ministry of Defence.

Part 2, 2. (a) states that 1540m (the DEPZ) is *"the largest distance determined by detailed consequence assessment of a range of source terms and includes consideration of a range of weather conditions and vulnerable grounds within the population".*

2.23 AWE recommends '*that people are instructed, as soon as is practical, to immediately take-cover in a* ***suitable building*** *and to stay inside with the windows and doors all properly shut*.' (this is the "sheltering" and it is required to be immediate).

'*this 'sheltering' action may be necessary for a period of up to two days, or at least until the initial contaminated plume has passed and monitoring of the ground contamination has*

been undertaken to determine the level of groundshine; and subsequent potential for further dose uptake, (e.g. from contaminated locally produced foodstuffs).'

Thus, the period of time for sheltering may be extended, or it is more likely that due to the reduced benefit of sheltering in place then 'subsequent' evacuation/displacement of people may be necessary to protect public health.

2.24 Part 2, 2.f. of the Consequences Report advises that *assuming no early warning of the onset of any incident starting, and that the Site response Group could take up to an estimated 15 minutes to set up and formally notify the local authority,* ***there could be no time available to inform the public****, and for the public to find suitable shelter to obtain any dose saving.*

2.25 Therefore, anyone in the area at the time of an incident will immediately be at risk and adding more into the area places more people at risk. The above is based on a no notice accident which is the most likely type of event for either AWE site.

2.26 Part 2, 3 of the Consequences Report for AWE Aldermaston also sets out the *details of the environmental pathways at risk in order to support the determination of food and water restrictions in the event of a radiation emergency* as:

a. The release of radioactivity from the Aldermaston Site as a result of a fault condition has the potential to result in doses to the public through a range of exposure pathways, including:

i. First-pass inhalation of air in the plume of contamination;
ii. Short term external irradiation during passage of the plume – Cloudshine
iii. Long-term inhalation after resuspension, from ground contaminated by the initial plume;
iv. Long-term external irradiation from ground contamination by the initial plume – Groundshine;
v. Ingestion of food crops contaminated by the initial plume
vi. Ingestion of breast milk that has been contaminated by the mother's intake of a particular radioactive material;
vii. Irradiation as a result of a criticality

b. The relative importance of the different exposure pathways is ***dependent on the type of accident and the potential radioactive isotopes which may be released.***

2.27 The Consequence report goes on to explain what the impacts of these are and what would be necessary by way of mitigation including the need or not for local food and water restrictions; what the dominant materials will be i.e. the alpha emitter plutonium or the beta emitter tritium which have different impacts on the community such as fine particulates

which may be inhaled and may be found in the food chain and may be resuspended resulting in longer term impacts or in the case of tritium which may be inhaled, via food especially leafy vegetables however a significant point is the intake of tritium by mothers which may result in direct inhalation doses for those infants. As a result, sheltering, immediate restrictions on all locally produced food and finding uncontaminated milk substitutes for infants is a recommended priority until such time as the extent of contamination is fully investigated, examined and understood.

AWE Burghfield Summary – Risk materials, Risk pathways, Urgent Protective Actions

2.28 The AWE's evaluation of the *minimum* geographical extent of the DEPZ for AWE Burghfield is 3160m (Annexe 1 – Site Consequences Report) Part 2 2.(a)). This is also known as the "Urgent Protection Actions" (UPA) area. The "urgent protective action" recommended is sheltering. A further "Outline Planning Zone" (OPZ) of 12km is also recommended. The OPZ is set by the Ministry of Defence.

Part 2 2.(a) states that 3160m (the DEPZ) is *"the largest distance determined by detailed consequence assessment of a range of source terms and includes consideration of a range of weather conditions and vulnerable grounds within the population".*

2.29 AWE recommends '*that people are instructed, as soon as is practical, to immediately take-cover in a suitable building and to stay inside with the windows and doors all properly shut*.' (this is the "sheltering" and it is required to be immediate).

'*this 'sheltering' action may be necessary for a period of up to two days, or at least until the initial contaminated plume has passed and monitoring of the ground contamination has been undertaken to determine the level of groundshine; and subsequent potential for further dose uptake, (e.g. from contaminated locally produced foodstuffs).*'

Thus, the period of time for sheltering may be extended, or it is more likely that due to the reduced benefit of sheltering in place then 'subsequent' evacuation/displacement of people may be necessary to protect public health.

2.30 Part 2) 2.e. of the Consequences Report advises that assuming no early warning of the onset of any incident, then there will be an average of approximately **25 minutes** from the start of the event until the leading edge of any radiation plume travels to the minimum distance recommended for urgent action. However, it should be noted that the Site Response Group could take up to an estimated 15 minutes to set-up and formally notify the

Local Authority, and **there remains approximately 10 minutes to inform the public, and for the public to find suitable shelter, <u>in order to realise any substantive benefit</u>** from the sheltering action.

2.31 Therefore, anyone in the area at the time of an incident will immediately be at risk and adding more into the area places more people at risk. The above is based on a no notice accident which is the most likely type of event for either AWE site.

2.32 Part 2, 3 of the Consequences Report for AWE Burghfield sets out the details of the environmental pathways at risk in order to support the determination of food and water restrictions in the event of a radiation emergency.

a. The release of radioactivity from the Burghfield Site as a result of a fault condition has the potential to result in doses to the public through a range of exposure pathways, including:

i. First-pass inhalation of air in the plume of contamination;
ii. Short term external irradiation during passage of the plume – Cloudshine
iii. Long-term inhalation after resuspension, from ground contaminated by the initial plume;
iv. Long-term external irradiation from ground contamination by the initial plume – Groundshine;
v. Ingestion of food crops contaminated by the initial plume

*b. The relative importance of the different exposure pathways is **dependent on the type of accident and the potential radioactive isotopes which may be released**.*

2.33 In effect this section of the Consequences Report advises that radioactive material can be resuspended by the action of the weather, or by farming practices, or any other disturbance processes, resulting in the potential for radiation exposure beyond the immediate aftermath of an incident.

<u>Demographics within DEPZs</u>

2.34 Any radiation emergency response will be impacted not on the geographic size of the DEPZs but also the demographics within the DEPZs with high numbers of people within the DEPZ making the capabilities available to responders more challenging and therefore the plan more likely to be inadequate.

2.35 Set out below is the data relating to the two AWE sites as at December 2024:

Sites	**AWE Aldermaston**		**AWE Burghfield**	
	No of sites	Nos of people when known	No of sites	Nos of people when known
Care Homes	9		5	
Early Years settings	6		6	
Other educational Establishments	2	~2000 children	2	~ 3500 children
Primary Schools	2		6	
Secondary Schools	1		2	
Special Needs	3		1	
Places of Worship	9		8	
Hotels & B&Bs	3		9	
Residential	7409	~17782	8317	~19961
Caravans/Mobile homes	231	~554	245	~ 598
Commercial Units	470		460	
Event & Leisure sites	1	~10000	1	~24,000 capacity

2.36 The above clearly shows significant numbers of sites where people are living, working, attending schools, and being attracted into the area due to commercial businesses and events located within both DEPZs for each AWE site.

2.37 The data has been pulled from the Councils GIS database which is based on current gazetteer information. It does not include empty buildings but only those occupied, it also does not included developments which have been approved but not built. It also focuses on the areas with greatest impact on the AWE OSEP by way of vulnerabilities etc.

2.38 The relevance of the DEPZ and the demographics within the DEPZ are important since West Berkshire Council, as the duty holder, is required to make an **adequate** AWE OSEP in accordance with Regulation 11(1). As a result, any increase in population within the DEPZ places the adequacy of the AWE OSEP at risk. More information relating to this is set out in Section 3 to this document.

3. AWE Off-Site Emergency Plan (AWE OSEP)

3.1 As required under REPPIR 19 legislation, the operator is required to have an adequate on-site emergency plan (Reg.10) and the local authority must make an adequate off-site emergency plan covering the DEPZ and OPZ. (Reg. 11).

3.2 The legislation further requires that the plan contains the information as set out in Chapter 1 of part 2 of Schedule 6, Chapter 2 of part 2 of Schedule 6, Chapter 3 of part 2 of Schedule 6 and the principles and purposes of Schedule 7. The information required within the OSEP includes the following, noting it is not a comprehensive list but a summary:

a. Provide a framework for the management, coordination and control of the off-site response
b. Plan can be implemented at speed including notifying the public, and maintaining the communications to the public including a return to normality process
c. Detailed planning to implement urgent protective actions within hours (albeit this would be too late for AWE sites)
d. Provision of welfare for the local population (e.g. the provision of food and shelter)
e. Possible reductions in staffing levels or closure of facilities during weekends, public holidays etc
f. Have the ability to be a sustained response
g. Have arrangements in place for:
    i. sheltering members of the public
    ii. evacuating members of the public
    iii. preventing people entering the affected area
    iv. controlling traffic
    v. food, feed and water restrictions
    vi. protecting property
    vii. any other actions concerning the protection of members of the public e.g. restrictions on outdoor activities
    viii. determining the nature and impact of the radiological hazard to inform decisions
    ix. recovery processes

3.3 In addition, under Schedule 7 it states that there is a ‘necessity to optimise protection strategies to ensure the proposed response, as a whole, is predicted to do more to mitigate

the radiation emergency and facilitate the transition from that emergency than to increase its duration or consequences, taking into account:

a. The health risks arising from exposure to ionising radiation as a result of the radiation emergency, in both the long and the short term,
b. The economic consequences of the radiation emergency
c. The effects of the disruption, both on the premises and in the area immediately surrounding it, and on the public perception of the effects of the radiation emergency'

3.4 This is in addition to 'avoiding, as far as possible, the occurrence of serious physical injury to person or persons' and 'ensuring than an appropriate balance is struck between the expected harms and benefits of any particular protective action so as to maximise the benefit of the action'.

3.5 Therefore, there are a wide range of requirements to be put in place in the AWE OSEP to comply with REPPIR 19.

3.6 It is also recognised that the '*adequacy of the plan is an ongoing process involving review, revision and testing'*. (ACOP Para 341). However, there is also no requirement to provide 'headroom' for more and more people in the DEPZ.

3.7 Whilst the two nuclear sites of AWE Aldermaston and Burghfield are within the geographic area of West Berkshire Council (WBDC), the development of the AWE OSEP requires coordination of a wide range of stakeholders who would be involved in a response relating to a radiation emergency at either site. The list of organisations and agencies which the local authority must consult is in Regulation 11(5).

3.8 The development of the most recent plan involved over 31 agencies ranging from the emergency services in the Thames Valley and Hampshire; several government departments and agencies including the Environment Agency, UK Health Security Agency and Food Standards Agency; four local authorities due to the cross-border nature of the DEPZs and OPZs, health services including Integrated Care Boards and hospitals, utility companies and transport companies (Rail and Road). Therefore, the role of this local authority in developing the AWE OSEP is coordination and ensuring compliance with REPPIR 19 as the local authority responsible under Regulation 11(1).

3.9 The agencies involved in developing, training and testing on the AWE OSEP are set out below, along with the various groups relating to AWE to ensure compliance:

Group/ Meetings	Membership	Aim	Meeting Frequency
AWE Off-Site Planning Group (AWE OSPG) (31 agencies)	Animal & Plant Health Agency AWE - Defence Fire & Rescue Service - Emergency Planning - Communications Basingstoke & Deane Borough Council Berkshire Healthcare NHS FT Environment Agency Food Standards Agency Hampshire Constabulary Hampshire County Council Hampshire Hospitals NHS Foundation Trust Hampshire & Isle of Wight Integrated Care Board Hampshire Fire & Rescue Service Met Office Department of Levelling Up Housing and Communities Resilience and Emergencies Directorate Ministry of Defence (MOD) • HQ SE JRLO • MOD Police National Highways Network Rail Berkshire (west), Oxfordshire and Buckinghamshire Integrated Care Board NHS England Office for Nuclear Regulation UK Health Security Agency South East UKHSA Radiation Chemical and Environmental Hazards Directorate Royal Berkshire Fire & Rescue Service Royal Berkshire Hospital Reading Borough Council Southern Gas Network South Central Ambulance Service Thames Valley Police (TVP) Thames Water West Berkshire Council • Emergency Planning • Director Public Health • Communications Wokingham Borough Council Others as necessary	To ensure the legislation relating to the nuclear licensed sites of Atomic Weapon Establishment (AWE) Aldermaston and AWE Burghfield are complied with in a multi-agency environment.	At least quarterly

Group/ Meetings	Membership	Aim	Meeting Frequency
AWE OSPG Subgroups • Comms/W&I • Recovery • Evacuation and Shelter • Education • Early Scientific Advice	Varies depending on groups	Varies for subgroup but with the overarching aim to review the AWE OSEP and put in place details into the AWE OSEP. Noting some of these have changed and will change over time depending on the work required at the time	Varies according to work of the groups but in outline the frequencies are: • Bi-monthly • 6 monthly • Quarterly • Bi-monthly • Bi- monthly
Local Authority Nuclear Working Group (LANWG)	National Group: All Councils across the UK with nuclear licenced sites, the regulators – ONR and other government departments representatives including DEFRA (EA & FSA), DoH (UKHSA), MHCLG, and DES&NZ	To provide local authorities with a national forum to share information and develop better practice for nuclear off-site emergency plans, off-site exercises, and the provision of public information in the event of an emergency to promote adequate off-site emergency arrangements and support to on-site arrangements. Providing a forum to identify and resolve local authority issues or escalate to the National Nuclear Resilience Committee (NRCC) for resolution.	6 monthly
AWE & WBDC Engagement meeting	AWE & West Berkshire Council	To ensure the operator and the local authority co-operate in respect of their duties in legislation relating to the AWE Aldermaston and AWE Burghfield	Monthly
Regulatory Intervention meeting	ONR and West Berkshire Council	To review West Berkshire Councils compliance with the legislation	Monthly

3.10 West Berkshire Council is the duty holder and is required by REPPIR 19 to have an 'adequate Off-site emergency plan covering that zone or zones' (the zones being the DEPZ and Outline Planning Zone (OPZ)) (Reg. 11). The Council should also 'have the capability available to ensure this happens without unnecessary delay' (Para 238 of ACOP). As set out in the ACOP, Para 338 the process for making an adequate plan involves:

a. writing the plan, including the minimum content required by Schedule 6 and meeting the principles and purposes in Schedule 7;
b. ***implementing the necessary requirements (or seeking confirmation of this) to ensure the plan is capable of being put into effect without delay when required***; and
c. testing the plan to demonstrate its adequacy and making any necessary improvements to the plan as identified by the test.

3.11 The focus of the AWE OSEP is in relation to responder's actions and not that of the publics recommended actions which is covered in a public information booklet.

3.12 The first revision of the AWE OSEP post REPPIR 19 was developed by May 2020 following the changes to the DEPZ around AWE Burghfield. Since that date there have been a further 5 updates to the OSEP as a result of agency updates, changes in procedures, lessons identified following 6 focused exercises on 5 themes undertaken over 2021/2022, and more detailed reviews of specific actions in the AWE OSEP which had changed due to REPPIR 19.

3.13 The last 'live' approved version of the plan issued in March 2023 is currently [November 2024] being extensively reviewed and revised. This review process can take some time depending on the updates to be put in place. The AWE OSEP is therefore a living document being amended as necessary with regular training and exercising undertaken with the other responders in order to test the adequacy of the AWE OSEP, or elements of it. This is recognised in the ACOP as normal practice.

3.14 It should however be noted that there has been an AWE OSEP in place for many years from the 2001 Regulations that involved the term DEPZ and at that time an area known as the 'area of extendibility'.

3.15 The AWE OSEP is a detailed document for all responding agencies to use in a coordinated way and in order to facilitate the protection of the public and/or environment following an

emergency involving an on-site release of radiation which is having an effect outside the AWE Aldermaston or Burghfield site boundaries i.e. a radiation emergency as defined in Regulation 2(1).

3.16 The AWE OSEP has a protective marking of Official Sensitive because of the content within it therefore it is not a public document. In addition, the management of old versions of the AWE OSEP is important because if the wrong actions are taken by the community affected based on out-of-date information when changes occur, the OSEP risks increasing the risk of harm to the community.

3.17 The **aim** of the AWE OSEP (2023 version) is to enable an effective response to a radiation emergency at either of the AWE sites which has or could have an impact on the community surrounding the sites.

3.18 The **objectives** of the Plan are to provide:

a. Information about the sites and their hazards
b. The roles and responsibilities of each responding agency
c. The activation, command & control and coordination procedures
d. Protective actions to implement.
e. Warning and Informing, including communication procedures
f. Information about recovery
g. Where to find more information.

3.19 Note the AWE OSEP aims to support responders to act effectively and promptly in order to protect the public.

3.20 The AWE OSEP in place is detailed but it does not cover all possible eventualities and does not provide all the answers in one document. Instead, each agencies' own emergency response and recovery plans and expertise are essential along with other supporting plans and frameworks, as stated in previously. The AWE OSEP does give the overall response framework and some specific information in relation to the site, countermeasures and mitigation options in order to support responders in the response.

Development control

3.21 The key point in relation to increases in population within the DEPZ is that if the AWE OSEP is not "adequate" then not only is public safety compromised contrary to the purpose of REPPIR 19, but the site's capability to continue work with ionising radiation is also

compromised which has serious implications for national security. The Council will also be in breach of Regulation 11(1).

3.22 Whilst the requirement is to revise and maintain the adequacy of the AWE OSEP and associated plans, it is not infinitely scalable. Its continued adequacy is dependent not only on funding but on the availability of personnel with relevant experience, and also resources such as transport for evacuations, and places to shelter.

3.23 The reality of managing an off-site radiation emergency is inherently extremely challenging due to the nature of the emergency, the existing population density within the DEPZ, the resource intensity of the response, the longevity of the response and thereafter the recovery phase. This is emphasised in **Section 4** in relation to the issues responding to 'normal' emergencies. It is also reflected in the multiple agencies involved in preparing and maintaining the OSEP.

3.24 The AWE OSEP is based on the data at the time of writing. The data being the number of **existing and occupied** residential, commercial and other communities (schools, care homes, caravan sites etc) at that time and not those which have not been built.

3.25 The AWE OSEP cannot simply be amended to accommodate every new development. There is not an infinite number of reception centres, rest centres, radiation monitoring units to accommodate and process the number of people in the DEPZ in the immediate and short-term recovery timeframe nor in the long term.

3.26 Even if there were sufficient physical sites the staffing of all these locations would be a significant issue, taking into account the shrinking size of responding agencies. In addition, whilst support may be provided by the voluntary sector this too cannot be guaranteed since they are volunteers. In addition, noting also that some of these assets are national capabilities and not just local capabilities, again they too have limitations.

3.27 Therefore, any additional residential or commercial properties regardless of scale could have an adverse effect on the effectiveness of the AWE Off-Site Emergency Plan. Whether or not the OSEP can safely accommodate a given development is matter of emergency planning expertise.

Adequacy of the AWE OSEP – existing concerns

3.28 Short of an actual radiation emergency the best way to test the adequacy of the AWE OSEP is to undertake exercises.

3.29 The last full test of the AWE OSEP was in April 2023 with the focus on the AWE Burghfield site. It was the first opportunity to do so since the changes in the DEPZ. Prior to 2023 modular tests were undertaken in 2021/2022 as a result of the COVID19 pandemic preventing a full test to be undertaken as planned in 2019/2020.

3.30 Whilst the focus of the exercise in April 2023 was focused on AWE Burghfield since in principle the sites are very similar the agencies, the response actions and challenges are also very similar.

3.31 Whilst the AWE Off-Site Planning Group (AWE OSPG) have a good understanding of the AWE OSEP and its adequacy the authoritative body in relation to the adequacy of the AWE OSEP is the Office for Nuclear Regulation (ONR).

3.32 Following the exercise and the comprehensive debrief process the regulators, the Office for Nuclear Regulation (ONR), provided their findings which raised some significant concerns.

3.33 The letter received from ONR confirms that the Council had complied with the REPPIR 19 (Reg 12) by testing the OSEP and undertaking a debrief to identify lessons. However, it goes on to state:

'The significant expansion of the Burghfield detailed emergency planning zone in 2019 (to accommodate changes introduced in REPPIR'19), together with proposals for development of land surrounding the AWE sites, has substantially increased the number of people requiring protection in the event of a radiation emergency. This is resulting in pressures that impact on the practical implementation of the OSEP. ***ONR is concerned that apparent issues with the delivery of the plan will be exacerbated by further increases in population and improvements are required to address these****.*

In ONR's opinion, the ALDEX have highlighted that key areas for improvement relate to the management of people displaced by the response to the radiation emergency, either by urgent evacuation or subsequent relocation after the period of sheltering (the protective action during the early phase of an emergency). This relates to the movement of people

and the provision of monitoring and personal decontamination, in addition to welfare support.

Noting the pressures indicated, I request that the Council provides a formal response to this letter setting out the proposed actions that it will undertake to implement improvements to the OSEP to address any capacity or capability-related concerns. ***It should clearly identify any improvements needed for the current level of population and also identify those improvements that may be needed for any future population increases that are already committed.*** *I would ask that a response is provided by 31st January 2024.*

To provide the relevant level of regulatory oversight moving forward, ***we intend to carry out a series of targeted formal regulatory interventions involving the Joint Emergency Planning Unit. The purpose of these will be to gain confidence that the necessary OSEP improvements have been correctly identified and scoped, are being managed and progressed, and that these will deliver the reasonably practicable improvements to the OSEP required to satisfactorily address and mitigate current concerns.****'*

3.34 The full letter from ONR is at **Appendix 2** along with the Councils response at **Appendix 3**.

3.35 As detailed in the letter from West Berkshire Council, the AWE OSEP is being reviewed, however the timescale for completion has been extended because of some elements of the OSEP which require more attention. In particular the concerns in relation to resources: whether there are sufficient buildings to operate from, staffing and/or equipment to implement the OSEP quickly and effectively are being reviewed in more detail.

3.36 Despite the best efforts of all the agencies involved in the AWE OSPG who develop the plan together, there is a real risk that some of the issues **cannot** be overcome and the plan may be deemed to be inadequate.

3.37 Sections 4 and 5 below provide more explanation in relation to the challenges, complexities and impacts for communities and responders in relation to the initial response, subsequent actions and recovery to a Radiation Emergency. Section 6 to this Appendix provides examples of 'ordinary' emergencies to illustrate the complexities.

4. Specific Response to an AWE Radiation Emergency

4.1 The Consequence Reports **(Annex 1 & 2)** states:

i. at 2f for AWE Aldermaston that *'Assuming no early warning of the incident starting, and that the Site Response Group could take up to an estimated 15 minutes to set up and formally notify the Local Authority,* ***there could be no time available to inform the public****, and for the public to find suitable shelter to obtain any dose saving'.*

ii. at 2e for AWE Burghfield that '*assuming no early warning of the onset of any incident, and that the Site Response Group could take up to an estimated 15 minutes to set-up and formally notify the Local Authority, there remains approximately* ***10 minutes*** *to inform the public, and for the public to find suitable shelter, in order to realise any substantive benefit from the sheltering action*'.

4.2 As a result, anyone outside will be at risk immediately following a radiation emergency.

4.3 The response to an AWE radiation emergency at either site is therefore required to be *fast* to afford the best protection to the community

Warning and Informing

4.4 The public will be alerted using an alerting system in place which AWE can activate and automatically goes to all landlines.

4.5 Responders do recognise that fewer people have landlines than when the system was originally set up, therefore in addition to the landline alerts notifications will be made to the media and through social media channels. Therefore, the multiple communication routes will be used to alert as many people as possible as quickly as possible.

4.6 The notifications for a radiation emergency will be for the whole area of the DEPZ initially, since the exact area affected will not be known in sufficient detail until monitoring and analysis has been undertaken which will take time to do, particularly due to the nature of the contaminant.

4.7 The use of the new government Emergency Alert system, which uses text alerting across the UK or more bespoke area, is currently not available for use to alert people in relation to an

AWE radiation emergency. This may change in the future which may negate the need for the alert via landlines.

Responders Activation

4.8 In addition to alerting the public the emergency responders are also activated through an automated system activated by AWE.

Initial Response Actions & Considerations

4.9 Following the activation of the responders the following actions are put in place, note it is not an exhaustive list and they are not instant measures:

#	Actions	Points to note
a	Agencies put in place their own plans.	
b	Each agency will stand up their own Emergency Operation Centres.	For each agency this could be in the order of 10- 15 people on 24/7 shifts
c	The full multi-agency coordination structures will be put in place, which will include national response due to the nature of the emergency.	To appreciate the scale of such an emergency the Strategic Coordinating Centre & Tactical Coordinating Centre for the last exercise had over 150 participants from 27 agencies over an 8-hour period. This would be replicated 24/7.
d	Continual communication messages to the public with accurate information.	The expected demand for information from those affected, the wider UK and internationally cannot be underestimated. There is a comms plan with key messages however they will need to be reviewed and new messages promoted to support those affected
e	Alerting all vulnerable sites such as schools, care homes, mobile home sites directly to ensure they are enacting any plans they have in place and identifying any issues they may have;	Within the AWE B area there are 3 primary schools, 2 secondary schools, 2 other education establishments resulting in a significant number of children (over 1500) excluding the early years settings of which there are 6. It should also be noted that based on feedback from schools the most likely action to support the schools is to remove the children, based on scientific advice at the time, with all the PPE, driver safety, coach safety systems all being put into place. Also significantly this would be based on ~ 40-45 children in any one coach along with staff and moving them to a safe place. There are also 6 care homes in the DEPZ for AWE B which range from 6 to 58 residents with complex needs. The largest is The Hollies Care Home which is directly adjacent to this appeal site.
f	Establishing the individual	Noting a workshop undertaken as part of the AWE

#	Actions	Points to note
	vulnerable people database for the area at that time and what the support may be required for them (using information sharing protocols);	OSEP review resulted in data being provided by Social Care services indicating that on that day there were over 1200 adults and children who were deemed as vulnerable and likely to require support.
g	Putting in place road closures to limit access into the area and then putting in diversions to keep people away	Noting the closure of the M4 which can be quick to do but places a risk that more traffic will try to move onto the side roads, potentially moving towards the hazard before other road closures can be fully in place;
h	Managing any impact on the rail network, including stations in the DEPZ;	Noting main Reading to Basingstoke train line operates trains at 20minute intervals, including stopping at Reading Green Park which is in the DEPZ) with knock on effects at Reading and Basingstoke stations and local responders as a result
i	Assessing the requirements for urgent evacuation;	This will be based on the early monitoring undertaken by AWE. If it is necessary, then due to the situation it will involve specialist emergency services officers and will have a number of urgent actions to undertake when they are out of the DEPZ. The numbers are likely be very low, but it will depend on the cause and impact on the local area and therefore the health, safety and welfare of those people.
j	Assessing and planning for subsequent relocation	Taking into account that after 48hrs it is very likely that sheltering in place will not be suitable since it will not afford the same protection. As a result, planning needs to start early so as to establish the resources required and communicated to the community affected. This could be a few or a significant number of properties within the DEPZ area depending on the monitoring results. Anyone displaced at this stage will initially be placed into reception centres or rest centres. Normally we would encourage people to go to friends and families and this is likely to be the case BUT they may need to be monitored first and depending on how they were moved out of the affected area they may have no transport. Both issues would need to be resolved.
k	Putting in place locations (reception and rest centres) for those who cannot go home to be supported.	It is recognised that if people are displaced than they need to go somewhere. As above in relation to reception and rest centres.
l	Putting in place locations (Assistance Centres (information locations)) for worried friends and families for those within the affected area to	These are places for people worried about relatives to come to in order to get information and be supported.

#	Actions	Points to note
	be supported	
m	Confirming the environmental & people monitoring strategies and thereafter implementing the monitoring in order to confirming the area(s) likely to be affected.	The DEPZ is split into sectors for planning and response purposes should be there be a directional plume. Importantly however for the AWE Burghfield site due to the weather conditions that may be experienced there may not be a directional plume but instead a more widespread area of contamination around the whole site therefore increasing the impact. Note the number of samples to be taken to assess the impact needs to be sufficient to provide the data to be assured of the situation. Also, the monitoring of the main source radiation (alpha particles) is not a simple process. There also will be no monitoring undertaken until the release on site is under control. Therefore, it cannot be underestimated how long this process may take.
n	Putting in radiation monitoring of all those within the affected area,	People radiation monitoring units need to be set up, which can take at least 6-12 hours post confirming the need. There are also many limiting factors relating to RMUs by way of locations, specialists to undertake the work, waste management, decontamination processes, and significantly the time it takes to undertake the monitoring which will be in the order of 20mins per person. Priority would be given to those most likely to be affected but assurance monitoring will also be necessary for many more.
o	Monitoring the weather forecast and considering the implications.	Any changes in weather when the release is on going or which is likely to cause resuspension will have an impact on monitoring strategies and the response
p	Alerting the UK NHS systems	Many people will be worried across the UK, based on previous nuclear accidents elsewhere and especially if they have travelled through the area or are in the surrounding areas such as Reading, Newbury, Aldermaston etc etc
q	Limiting the use of food related matters such as crops, fruit, vegetables and livestock in the affected area;	The Food Standards Agency will put in a 30km precautionary ban on the use of crops, fruit, vegetables and livestock including milk etc around the site. Thereafter they will be undertaking monitoring to assess the impact and the recovery where there is contamination. Noting that a 30km ban will cover an area from the AWE site roughly to Alton to the south, Maidenhead to the east and Newbury to the west so a significant area. All of which will need to be managed.
r	Considering the recovery	The recovery stage is likely to be a lot longer than the

#	Actions	Points to note
	process in readiness for a smooth transition from response to recovery, noting that this may be for days, weeks, months or years depending on the level of radiation contamination.	response phase as a result of the complexities as to how clean is clean, environmental clean ups, people long term monitoring, long term housing options, mental health and wellbeing support, compensation. Noting that the issues as a result of Fukushima are still ongoing 13 years post the incident. Significant to any good recovery is a good response and as far as possible keeping the community together, and maintaining normality as much as possible – work, schooling etc. If people are placed in temporary accommodation, hotels etc this has the risk of making the situation worse if they are not in the local area which is likely to be the case.

4.10 Speed is crucial at the start to get people into suitable shelter as quickly as possible. At the start of a response consideration is given as to who may need to be relocated, along with the practicalities such as areas to be relocated, where will they go, how will the rest centres or longer term accommodated be resourced, transportation requirements, communication methods etc etc. These all take time to implement normally and is more complex when in a radiation contaminated environment.

4.11 Significantly in relation to reception/rest centres there are a number of uses for them but they can only be used for one purpose at any one time (reception, rest centre, assistance centre)). Noting there are 23 identified rest centres within the four council areas however these centres are limited in their capacities and that would be assuming they were ALL were in place and available. There is also a different in capacity as to whether people are standing or have sleeping capacity.

4.12 Current figures indicate that the best case scenario, would be 5845 people standing or 3500 if seating or resting but is reliant on all the identified sites being available and willing to support, and that they can be sufficiently staffed. This is not likely to be the case and therefore the reality is likely to be significantly less capacity. As an example of the changing environment, two of the larger sites are not available (Nov 2024) as a result of refurbishments.

4.13 In addition rest centres are only really workable for a period of 48hrs. Beyond that a more permanent, suitable solution would need to be in place.

4.14 In addition to staffing site specific locations 24/7 to expand on the resource intensity of the response for one Council only (i.e. it would be replicated for Basingstoke and Deane, Wokingham and Reading Borough and Hampshire County Councils for a radiation emergency at either AWE site the following staffing would be necessary for every 8 hours in the strategic and tactical coordination centres.

Location	No of Staff
Strategic Coordinating Centre	1 x Executive Director 1 x Emergency Planning Tactical Advisor 1 x loggist 1 x Communications officer in Media Advisory Cell 1 x Env health rep in Scientific and Technical Advisory Cell 1 x Director of Public Health in Scientific and Technical Advisory Cell 1 x Executive Director – Recovery Cell 2 x support to recovery cell
Tactical Coordinating Centre	1 x Service Director 1 x Emergency Planning Tactical Advisor 1 x loggist 1 x Highways lead– Displaced People Cell 3 x senior officers – Displaced People Cell 1 x Public Health consultant

Table 3 Council Staffing requirements at coordinating centres for 1 x 8hr period

4.15 The above clearly shows that for the multi-agency coordination centres that for every 8 hours at least 17 officers are required every 8 hours, noting these are senior officers.

4.16 In addition the services will be undertaking many of the tasks identified above, supporting the internal Emergency Operations Centre and managing the many calls from the public. Therefore the impact on just one organisation for an 8 hour period will result in business continuity plans being implemented and mutual aid arrengements.

4.17 As indicated above these figures are only for the coordination centres and do not include staff resources for assistance centres (reception, rest and assistance centres) plus radiation mornitoring units, individual staff supporting vulnerable people, and the subgroups set up under these strategic and tactical cells by way of Media Advisory Cells, Displaced People cells, Radiation Monioring Unit cells. Examples of the number of people which may be invovled in outline are set out below:

4.17 Mutual aid would be called up from other local authorities locally and across the UK from local authorities with nuclear sites. Indeed, every agency would be doing the same to bolster their resources. Some agencies, including those who have specialist roles such as monitoring will also be activating resources from overseas. However, mutual aid cannot be guaranteed and is often only for a short period.

Summary

4.18 The response to a radiation emergency is complex with many agencies involved and many considerations to take into account.

4.19 Many emergencies are complex however the added issue of radiation will undoubtably make it more challenging because of the inevitable level of public concern.

4.20 There is also not an infinite number of resources to be called upon as has been explained previously.

4.21 An increase in population within the DEPZ will only add to the complexities of the response to a radiation emergency, therefore impacting the response and the risk to their public health and well-being as well as national security.

4.22 Ultimately the ONR is responsible for determining if the local planning authority should be advised against granting permission for more development and so an increase in population within the DEPZ. The ONR's recommendation is based on the council's emergency planning consultation response, but the ONR will ensure that their response is justified.

5. Recovery

5.1 Following the immediate response to a radiation emergency as described previously there will be a recovery phase. Recovery is the process of rebuilding restoring and rehabilitating the community following an emergency. It however is not just a remedial process but broadly interlinks categories of impact, that can be summarised as aspects of well-being, that the individuals and communities needs to recover from and include:

a. Humanitarian (including Health)
b. Economic
c. Infrastructure
d. Environmental

5.2 All of the above will be relevant to recovery from a radiation emergency.

5.3 There is a Thames Valley Local Resilience Forum Recovery Plan to support the recovery process. Its focus is more on structure and guidance rather than detail since it covers a wide range of incidents to recover from. The principles within it however include coordination and setting up arrangements where specialists can focus on their area of expertise to agree the strategy and actions within the plan. There are however many documents to support the process including the Strategic National Guidance, the National Nuclear Emergency Planning and Response Guidance, Part 3 – Recovery, the UK Radiation Recovery Handbook for Radiation Incidents 2024. These are all available as supporting documents.

5.4 The recovery phase will commence when there is a formal handover from the Strategic Coordinating Group. The recovery, however, is likely to be complex, as indicated previously.

5.5 It should be set out clearly that in the case of a radiation emergency, it is very much *not* the case that those affected, those evacuated, will be able to *immediately* return to their homes (as they might do after a flood or a fire, and to begin themselves a clean-up of their homes). Instead, there will be the requirement for environmental monitoring as per the strategy, people monitoring, remediation of land and building clean up strategy, clear communications, physical clean up and the long-term health and environmental monitoring. All these processes and activities take time due to the nature of the material involved.

5.6 Regardless of the level of radiation contamination there is likely to also be a requirement of continual monitoring of the environment over a number of years. Indeed in 1958 there was an alleged crash on Greenham Common involving the US Air Force which involved a radiation source. In the late 1990s environmental monitoring was taking place in relation to this in order to establish if there were any material in the environment or in the food chain. This involved taking house dust samples, grass, fish and meat samples from the local area. Whilst no evidence was found, there was a genuine fear factor associated with the ongoing monitoring after an incident over a 40-year period. That fear factor also reduces well-being significantly.

5.7 How long 'recovery' will take cannot be specified before any emergency plan because there are so many variables to take into account which will only be known at the time of the incident. It may be hours or days but equally it may be months or years. This has been the case as set out previously in relation to radiation and other non-radiation-type emergencies.

5.8 Recovery is likely to be complex, in particular if there is remediation work to property and the land to be undertaken and an evacuation has taken place.

5.9 Throughout that period of recovery, any area contaminated with radiation may require anyone living or working there to be displaced and accommodated elsewhere or as the recovery strategy directs until it is certified that it is safe for the community to return. It should be noted that depending on the level of contamination then the residential units may be deemed unfit of human habitation under housing legislation. The consequential need for re-housing permanently in alternative accommodation also reduces well-being significantly and disrupts communities because of their fragmentation.

5.10 The recovery process including ongoing monitoring of property, the environment and people is also likely to be an ongoing process for some time.

5.11 Like the response to an emergency, the recovery from a radiation emergency will be complex and resource intensive. The time period cannot be predicted since the data at the time will direct the type of recovery and how it will be undertaken. It will also be a costly process due to the experts and specialist resources which will be required.

5.12 Regardless of how long or not the recovery process would be, there also remains the real fear and genuine concerns that properties within the DEPZ, including the proposed new

properties, would be 'blighted' by the ionising event affecting their property or being associated with their property.

5.13 The psychological wellbeing of those living and working within the DEPZ area is likely to be affected in a significant way and for a significant period, as was the case at Three Mile Island and in flooding events.

5.14 There can be support available in particular by way of the Bellwin scheme which is a Government scheme which may support local authorities as set out in S155 of the Local Government Act 1989. However, it is not a given and there are parameters including that it may only cover '*the costs of immediate actions taken in the aftermath of an emergency or disaster'* and so not extend to the potentially medium and longer term recovery from a radiation emergency at AWE Burghfield, howsoever long that aftermath may be.

5.15 In addition for the residential or commercial properties, there is no insurance in relation to radiation emergencies. As a result, there can be expected to be significant costs associated with this type of incident for the owners of these properties including any new properties proposed as in these at the Appeal site.

5.16 Finally, whilst this recovery section is perhaps the shortest in length it is very likely to actually be the longest piece of work ongoing in the community after a radiation emergency. As has been referenced previously the impact of Fukushima in 2011 is still being felt as the recovery process continues both in physical clean up recovery but significantly in the health and wellbeing of the community affected. Therefore, again the impact of a radiation emergency cannot be overstated – hence the potential for the catastrophic impact as detailed in the national risk register and the risk framework relating to REPPIR 19.

6. Emergency Response - Impacts on Responders and the Community

6.1 In order to understand more fully the impacts on responders and the community when an emergency happens, set out below are a variety of incidents, many of which I have been involved with directly and therefore have direct experience of the challenges and different levels of complexities or have been involved in the scrutiny of the debriefs and lessons identified as Chair and member of the Thames Valley Local Resilience Forum Continuous Improvement Group (previously Training, Exercising and Organisational Learning)

6.2 There has not been an off-site radiation emergency from a site in the UK since 10 October 1957 at the Windscale site, Cumbria. Therefore, there are no recent radiation emergencies in the UK to compare with directly. However, what can be drawn from it is that, in comparison to the AWE sites, the location of Windscale was quite remote from communities and the communications by way of social media etc. were very different to those now. Lessons were learnt from that incident. However, the fact there has not been a radiation emergency since 1957 in the UK does not mean it is not possible and the impact of radiation emergencies can be drawn from more recent radiation emergencies elsewhere and indeed other 'normal' emergencies. All of which demonstrate the reason why placing people in a known risk area is not appropriate.

6.3 There are examples of more recent radiation emergencies where learning can be drawn from in relation to the impact both short and long term on the community including the radiation emergencies at:

a. **Three Mile Island**, **USA** 1979 (Reactor Accident). Feedback from some of the community living near the site at the time reported they had thought it was safe to live near the site. However, when things went wrong thousands of people evacuated from the area with subsequent concerns such as whether they could have children, would any children born to them in the future be normal, what would happen to their homes and their pets. They did not know who to trust since they had been assured it was safe and it wasn't. This fear was elevated for them at the time since they recalled Hiroshima, Japan in 1945. Therefore, whilst the risk of contamination in itself was low, the fear factor – the fear of irradiation effects on people, property and food – and related mental health concerns and trust relating to the radiation emergency during the incident and following

the incident caused significant and far longer-term impacts on the community that was required to be displaced as a result of the incident.

b. **Chernobyl Nuclear Power plant, Ukraine**, 1986. The resulting steam explosion and fires were not only experienced in Ukraine where workers and those in the local community were directly affected and are still by the radiation but also across northern areas of the UK. 9800 farms across North West Scotland, Wales, Northern Ireland and Cumbria had controls placed on them by the Food Standards Agency with the final controls only being lifted as recently as 2012 in those geographic locations, no less than 26 years after the event as a result of radioactive particles in the upland peat. This meant that livestock in the area had to be tested prior to moving from the affected areas until 2021 in order to ensure that contamination levels were actually at safe levels. Whilst the AWE sites do not have reactors, they are nuclear licensed sites and the potential implications in the local areas for a long period of recovery with implications for property owns, landowners and farmers in the event of a radiation emergency is likely to be significant either in reality or due to a perceived risk with long term mitigation and monitoring required.

c. **Fukushima Daiichi Nuclear Power Plant, Japan** (2011). This radiation emergency was a result of earthquakes and subsequent Tsunami in 2011, but it is still having an effect in the Country over 13 years later. The situation in Japan was complex since there had been an earthquake followed by a Tsunami and the nuclear site was a nuclear reactor site, which AWE sites are not, the recent IAEA report 'Ten Years of Remediation Efforts in Japan', available in supporting documents, does demonstrate learning and impacts for the recovery phase of any radiation emergency. In particular the learning set out:

   i. the clear expectations of the communities being '*as low as possible'* clean ups;
   ii. the extensive and different types of remedial actions required to be put in place;
   iii. the perception in relation to health impacts, similar to those from Three Mile Island;
   iv. the waste management challenges;
   v. the specialist contractors required and
   vi. the impact on responders in addition to the community.

In addition, the IAEA reported that the other knock-on consequences of this emergency were the reduction in power after the incident and the *reduced trust in nuclear safety* which had a ripple affect across the world.

These are examples of the genuine fears and concerns that arise for people who are displaced by an radiation emergency, as well as the long period of time during which those fears and real concerns subsist.

The report also stated that '*the initial relocation of thousands of people, leads to impact of social dimensions*' with suggestions by the authors that *'management of social identity, in addition to social support is important for mitigating psychological distress after a nuclear accident, and the support for individuals should be focused on the management of both host and evacuee communities in relation areas*'.

The report provides details in relation to the public expectations in relation to remediation which included:

a. Confusion by the meaning of the Government long term remediation goal and how it would be achieved
b. Increased distrust in the government by the residents
c. Shortage of labour for the recovery activities
d. Volume of contaminated waste and its storage
e. Communications in particular the post–accident reality including the impact of perception on health. It was noted that despite the knowledge, people living in the contaminated environments will be anxious about radiation related diseases and in particular cancer, although it was noted that their public information in advance was limited.
f. Evacuation and time periods.

   The incident happened in March 2011 however the lifting of the evacuation orders in the 'difficult to return zones' may be lifted in 2023 – 12 years later. Part of the reason for this time period was the lack of maintenance of infrastructure in that time period caused by the long-term evacuation. Therefore, the area not only required decontamination but repairs to properties and infrastructure to ensure it was habitable prior to occupation. In addition, it has been highlighted in a recent IAEA report that 'many former residents of the evacuated zone in Fukushima have significant fears about moving back, even after decontamination'.
g. Environmental clean-up – including agricultural fields, forests, reservoirs, lakes and matters relating to food safety.

h. Financial and reputational damage

Whilst the report can be used to influence the AWE OSEP and implement the lessons identified there are some elements which are unlikely to be resolved including the perception on long term health impacts; the impacts of evacuation on the community affected and the responding agencies as a result and the time periods which could be involved.

As a result linking back to one of the definitions of a 'radiation emergency' (para 1.25) including a 'perceived risk' it is clear this can go for a long time after the radiation emergency has taken place.

6.4 The impacts on responders and the community can also be drawn from more conventional emergencies as set out below are examples of such incidents:

a. **Buncefield explosion and fire in 2005**, (an upper tier Control of Major Accident Hazard (COMAH) site), This incident caused a change in planning legislation as a result of the 'domino' effect with a large petrol distribution site being adjacent to other businesses and a residential area. The incident is reported to have cost in the order of £100m to local companies, with an increase in unemployment as companies relocated or folded, increased debt in the community, psychological impacts relating to the unemployment, being displaced from homes. 2000 people were evacuated in the initial response with some still not back in their homes a year later due to the damage and remained living in hotels. Reports highlight the emotional and mental health stresses of the incident along with financial concerns.(available in supporting documents) By contrast with a radiation emergency, this was an incident where you could move around relatively freely after the event of the explosion incident and where the damage to property could be seen after the initial fire was extinguished. This is not going to be the case in a radiation emergency at AWE. The very invisible nature of radioactive contamination is what makes it so genuinely fearful and so significant a cause for real concerns for a population living within a risk area.

In 2015 reporting of the 'Buncefield' fuel depot (COMAH site) explosion and as reported by the BBC relating to 10 years post the accident residents stated that 'The damage to Mr Mitchell's house took about six months to repair at a cost of about £200,000 but the psychological impact was even more significant, with his family developing post-traumatic stress disorder (PTSD).' This is relevant since they knew they lived near a fuel

depot but the long term psychological effects including flashbacks and the individual financial effect of the explosion was significant for years afterwards.

The wider implications of Buncefield were changes in development control such that there are now strict limits as to what can be build adjacent to COMAH sites in order to protect the community.

b. **Flooding in West Berkshire.** The impact of your home being at risk or actually flooded has been experienced in West Berkshire several times. There was flash flooding in 2007 when a 1:300yr event affected over 2500 properties by internal flooding. The impact on the responders was significant in that when it was raining it was not safe and /or very difficult to move around the area since vehicles were being stranded. However, the impact on the communities affected was much more with people having 1m of water coming through their home destroying everything inside, all to be seen by everyone in days to come when drives and gardens became full of the contents of these homes. This early clear up whilst significant was not the end of the recovery, instead the reality of the whole family living in a family home upstairs for several months, or people moved out until the works were completed which for many was at least 6 months to a year. School work suffered for children living in smaller areas in their homes or due to longer travel times if they had to move out; people also struggled with work again often since they had longer travel times. Many people lived in caravans on their drives over the winter period to save money or due to insurance issues. However, the additional hidden impact was the fear of it happening again with anxiety levels increasing every time there was a period of heavy rain. The impact of flooding whether you can expect it if you live next to a river or not as a result of flash flooding is generally the same. With an initial removal of the obvious damage and muck in the homes but with a very long recovery by way of drying out and repairing the physical damage but with the ongoing mental health concerns. The impact on responders is also great by way of support with the clean-up and through the health system. I have been involved with many of those affected through the Flood Forums in place in Berkshire and have seen the stress and strain on people with some breaking down into tears as a result of the pressures. Following the floods in 2013/2014 West Berkshire Council undertook a survey of those affected. During the floods approximately 181 properties were flooded internally. Of those 36 responders to the survey confirmed that they had moved *out* of their property. A significant percentage, approximately 31%, *left their homes* and had to move *outside* West Berkshire administrative area. The reason given by survey respondents was that the lack

of availability of the type of home they needed for their family in the administrative area of West Berkshire.

The table below shows where they moved to:

	Within West Berkshire	Outside West Berkshire
Lived with friends/family	68.4%	31.6%
Rented a house	61.5%	38.5%
Lived in a hotel/B&B	77.8%	22.2%

These events in West Berkshire demonstrate that *without* it being a radiation emergency the impact of flooding on the community in the short term can be, and here was, significant.

But the impact is even more so in the longer term by way of housing availability because evacuated people have to reside in dwellings *somewhere* as each day passes and, in the case of radioactive contamination, for a likely considerable long period before it is confirmed as safe to return and also a person feels sufficiently comfortable returning to a residence that has been subject to ionisation or a risk of the same.

In addition, the stresses placed on families when living away when work is being done on their homes, or their homes are being made safe for their return, or indeed the stresses related to being out of their homes and outside the area due to the shortages of temporary / rental accommodation in the area cannot be underestimated.

The above flooding evacuation related to *only* 181 households whereas within the DEPZ and the numbers of properties within it are significantly more.

c. **Grenfell Tower Fire in 2017**. The fire in the 120 flat tower block resulted in 72 lives being lost. However, it *also* resulted in longer term residential issues arising from over 200 people being made homeless and having no residence.

In 2021, over 4 years later it was reported that all but 6 households had been rehoused into permanent housing. Therefore, even with the type of more relatable emergency and tragic incident such as a fire, it can be seen for a relatively small number of people (200) it can take many years (here, 4 years) to find permanent housing for those displaced.

In the interim period the 'community' of residents were rehoused over a wide area of London and the Home Counties resulting in the 'community' and therefore local support network being split up too.

This event also demonstrates the impact of housing availability and the loss of community and related harm to well-being because of being moved or having to move away from the area which added to the physiological recovery.

d. **Salisbury nerve agent poisonings in 2018**. This incident more closely demonstrates the similarities to an AWE radiation emergency in that the nerve agent could not be seen or smelt by a person.

There are a number of points which can be drawn from this incident to demonstrate the longer term impacts on recovering from such an incident including:

i. How far the incident was spreading without it being seen. It was not just a town centre incident but the homes of both sets of victims created new incident scenes.

ii. The fear across the community was significant, particularly after the two local people were affected and one person sadly died.

iii. The impact on responders, not only as a result of the police officer who became very ill, but the hospital setting and the removal of emergency vehicles from being used again due to potential contamination.

iv. The community seeing emergency services and the military in full personal protective equipment (PPE).

v. The effect on businesses with perhaps the most recognised one being 'Zizzi' where two of the victims had been which was only able to open 8 months after the event. Critical to this was ensuring it was 'clean' to operate again was a significant recovery plan in relation to bringing people back into the city.

The scale of this incident however was relatively small in relation to the potential impact as a result of an AWE radiation emergency.

e. **COVID19 Pandemic 2020**. The start of the CV19 pandemic until when the vaccination programme was rolled out also demonstrates the fear associated with something you cannot see or smell and may cause you significant harm.

The result was general compliance with the requirements and guidance in relation to staying at home, isolating from each other and the wearing of masks. The response also however highlighted some significant challenges faced by the responders by way of overwhelming of the NHS, the significant support required for the vulnerable (either in their homes and or in care/nursing homes), the testing regime put in place and the significant support needed for businesses.

This would also be the case with an AWE radiation emergency in that there would be a risk of the NHS in the immediate aftermath being overwhelmed with 'worried well' and this could be across the UK. The support needed in order to visit vulnerable clients within the area affected could be significant not least in that the carers would need PPE or depending on the hazard may not be able to enter the area and therefore specialist responders would be involved. Testing/monitoring of people and the environment would be required which takes time to set up and there are also limited specialists to undertake this role therefore international support may be required. The support required for businesses to continue afterwards whether in the same location or elsewhere is likely to be significant financially, in addition financial support is likely to be required for any residents since most if not no insurance policies cover for radiation emergencies.

f. **Large utility outage 2022.** In Oxfordshire in 2022 there was a significant water outage involving over 35000 properties. As part of the plans the identification of vulnerable people was required in order to ensure they were being provided with bottled water directly.

Mutual aid was provided by West Berkshire Council in order to lead on the identification of vulnerable people. The process involves an agreed Thames Valley Local Resilience Forum data sharing protocol with data being shared by a number of agencies to identify all the vulnerable people in an area. This could be social care data, assisted bin collection data, supported living and priority service user data from the utility companies. The data when reviewed resulted in over 5000 records. The impact therefore on the responders on checking on all of these residents and supporting them was significant.

The same process would be applied to an AWE incident. It cannot be done in advance and held in a plan since the vulnerable databases regularly change. Any vulnerable person within the AWE area however may need to be supported before they are either evacuated or within a short period of time depending on their vulnerabilities.

The addition, in relation to the Appeal proposals, would reasonably be expected to add to the number of vulnerable people in the DEPZ area at some time in the lifetime of the properties and therefore the impact upon responders.

g. **Evacuations due to 'suspect chemicals' 2022**. In 2022 there was a security incident in Bracknell Forest Council area whereby 124 homes were evacuated.

When the police evacuated the residents, they were asked if they had anywhere else to go, including overnight, in order to assess the needs for overnight accommodation should the incident go into the evening. 25 households, over 30% had nowhere else to go.

During any emergency people are encouraged to go to friends and families where they can hopefully be more comfortable. But, for many, this is not necessarily an option as was demonstrated in the recent Bracknell incident.

Therefore, rest centres - such as leisure centres - may be utilised. However, such facilities are only meant to be for a short period of time in the order of 48-72 hours in the immediate aftermath of an incident. They are also resource intensive for the local authority but other responders too in particular health agencies will be impacted.

h. **Evacuation using Hotels as accommodation.** Other options for displaced people may involve using hotels. This is not a simple option not only in relation to availability but from experience in West Berkshire it is also resource intensive. By placing displaced people in a hotel does not negate the agencies of responsibilities with staffing required to support the occupants by ensuring, as far as possible:

    a. Suitable safeguarding is in place
    b. Children can attend school;
    c. People can get to their work
    d. Supporting with basic human needs such as clothing, toiletries and food and
    e. Supporting the health and well-being of the guests especially over prolonged periods.

Therefore, the use of hotels may be a temporary solution but not likely to be the longer-term solution.

6.5 The above nuclear and 'conventional' emergencies demonstrate the complexities of any response and the impact on those affected in the community and the responders. There is no one cap fits all situations, and this would be the same for a radiation emergency.

6.6 Significantly the amount of resources by way of rest centres, housing for those displaced, staff to support the displaced residents, specialist staff and equipment have significant limitations as to their availability and how quickly they can be delivered and for long they can be maintained. Noting that any delay will impact the response and therefore the confidence, assurances and trust the affected community will have.

6.7 It is also clear that, unlike a radiation emergency, in most of the incidents above people could move around relatively freely after the event, and where there was damage to property it could be seen. This is not going to be the case in a radiation emergency. As has also been referred to the intangible nature of radioactive contamination is what makes an incident so significant a cause for concerns for a population living within a risk area. The inclusion of "perceived risk" within the REPPIR definition of a radiation emergency reflects this reality.

ATOMIC WEAPONS ESTABLISHMENT

AWE ALDERMASTON

CONSEQUENCES REPORT

Introduction

This document is the consequences report for the Aldermaston Site, as required under Regulation 7(1) of The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR 2019).

The following information has been titled to relate specifically to the REPPIR 2019 Schedule 4 items required to be included within this report.

Part 1 – Factual Information

1. Regulation 7(3) Schedule 4, paragraph 1(a) - Name and address of the operator:

AWE plc, Aldermaston, Reading, Berkshire, RG7 4PR.

2. Regulation 7(3) Schedule 4, paragraph 1(b) - Postal address of the premises where the radioactive substance will be processed, manufactured, used or stored, or where the facilities for processing, manufacture, use of storage exist:

AWE plc, Aldermaston, Reading, Berkshire, RG7 4PR.

3. Regulation 7(3) Schedule 4, paragraph 1(c) - The date on which it is anticipated that the work with ionising radiation will commence or, if it has already commenced, a statement to that effect:

The Aldermaston Site has been occupied in support of the UK nuclear deterrent since 1950 and work with ionising radiation has been conducted on the site since that date.

Part 2 – Recommendations

1. Regulation 7(3) Schedule 4, paragraph 2(a) - The proposed minimum geographical extent from the premises to be covered by the local authority's off-site emergency plan:

a. The proposed minimum geographical extent to be covered by the Local Authorities Off-Site Emergency Plan is an area extending to a radial distance of 1540m from the Aldermaston Site centre location.
This is illustrated on Map A in Appendix A.

b. In addition to the minimum geographical extent recommended above, an Outline Planning Zone, extending to a radial distance of 15km around the Aldermaston Site centre location, has been determined by the Secretary of State for Defence, in accordance with Regulation 9(1)(c).
This is illustrated on Map B in Appendix B.

2. Regulation 7(3) Schedule 4, paragraph 2(b) – The minimum distances to which urgent protective actions may need to be taken, marking against each distance the timescale for implementation of the relevant action; and Clause 3(a) – The recommended urgent protective actions to be taken within that zone, if any, together with timescales for the implementation of those actions.

a. The following distance is recommended for the urgent protective action of sheltering. This is the largest distance determined by detailed consequence assessment of a range of source terms and include consideration of a range of weather conditions and vulnerable groups within the population.

b. The minimum distance to which urgent protective actions should be taken corresponds to an area with radial distance of 1540m.

c. It is recommended that people are instructed, as soon as is practical, to immediately take-cover in a suitable building and to stay inside with the windows and doors all properly shut. This 'sheltering' action may be necessary for a period of up to two days, or at least until the initial contaminated plume has passed and monitoring of the ground contamination has been undertaken to determine the level of groundshine; and subsequent potential for further dose uptake (e.g. from contaminated locally produced foodstuffs).

d. For exposure to tritiated water vapour, the most vulnerable humans are those dependent on their mothers for sustenance. Immediate protective sheltering action will contribute to dose savings, but further protective action may be required to prevent contamination from the mother delivering a dose to their off-spring over the next month (e.g. use of uncontaminated formula milk). These further protective actions may be required until a time when active monitoring of the environment, particularly the air (inhalation dose) and the ground (re-suspension dose), can be undertaken to declare that there is no further danger.

e. It is recommended that the declaration of a Radiation Emergency, by the operator, to the Local Authority, is the trigger for implementing the off-site emergency plan and initiating all of the above recommended urgent protective actions.

f. Category F weather conditions typically has an associated mean wind speed of $2ms^{-1}$. From the event site, there will be approximately 800 seconds (approx. 13 minutes) from the initiation of the event until the leading edge of the plume travels to the minimum distance recommended for urgent action. Assuming no early warning of the incident starting, and that the Site Response Group could take up to an estimated 15 minutes to set up and formally notify the Local Authority, there could be no time available to inform the public, and for the public to find suitable shelter to obtain any dose saving.

g. The benefit from dose saving is likely to be greater if there is any advance warning of an incident.

3. Regulation 7(3) Schedule 4, paragraph 3(b) – Details of the environmental pathways at risk in order to support the determination of food and water restrictions in the event of a radiation emergency:

a. The release of radioactivity from the Aldermaston Site as a result of a fault condition has the potential to result in doses to the public through a range of exposure pathways, including:

i. First-pass inhalation of air in the plume of contamination;
ii. Short-term external irradiation during passage of the plume – Cloudshine;
iii. Long-term inhalation after resuspension, from ground contaminated by the initial plume;

iv. Long-term external irradiation from ground contamination by the initial plume – Groundshine;
v. Ingestion of food crops contaminated by the initial plume;
vi. Ingestion of breast milk that has been contaminated by the mother's intake of a particular radioactive material;
vii. Irradiation as a result of a criticality.

b. The relative importance of the different exposure pathways is dependent on the type of accident and the potential radioactive isotopes which may be released.

c. An emergency that results only in the emanation of radiation from the site without a Schedule 1 release of radioactive material (e.g. an accidental criticality event) does not lead to the need for local food and water restrictions.

d. The accidents which have been identified as relevant to emergency planning are those which result in the spread of radioactive material by atmospheric dispersion and these can, in some instances, be driven by fire. These are non-fission incidents, where the dominant material will be plutonium (which is an Alpha emitting actinide) or tritium (a soft Beta emitter).

e. For plutonium release emergencies, the consequences arise from fine particulates of plutonium oxide and the predominant exposure pathway to individuals outside the Aldermaston Site during the passage of the contaminated plume, would be by inhalation. As the contaminated plume travels downwind, deposition mechanisms would deplete particles from the plume and leave radioactive material on the ground. Most forms of plutonium are removed from biological pathways by being fixed in the soil and only small amounts are concentrated by biological processes into the food chain, primarily through grazing animals. However, the material can be resuspended by the action of the weather, or by farming practices, or any other disturbance processes, resulting in a potential for longer term inhalation doses. Minor dose contributions to the public, resulting from this type of scenario, may include cloudshine, long-term inhalation following resuspension, and groundshine.

f. For tritium release emergencies, the tritium is conservatively assumed to be present as inhalable tritiated water vapour. The predominant exposure pathway to individuals outside the Aldermaston Site during the passage of the contaminated plume would be by inhalation. As the plume travels downwind, deposition mechanisms would deplete the plume and leave radioactive material on the ground. Tritiated water is readily taken-up into biological pathways and may be ingested. In terms of the significance of different food groups, tritium is absorbed more readily by leafy vegetables due to the large surface area of the crop and the already high internal water content. However, ingestion of contamination due to a mother's intake of tritium can be a more significant dose pathway for infants than the direct inhalation dose for those infants. Given the nature of radiation emitted from a tritium release, dose contributions are dominated by first-pass inhalation and ingestion.

g. Overall, the primary concern for early response decision-making to radiation emergencies involving possible accidents at the Aldermaston Site only merits

consideration of the first-pass inhalation dose for exposure to actinides and therefore sheltering is the recommended urgent protective action. Given the properties of tritiated water releases, sheltering and finding uncontaminated milk substitutes, for vulnerable infants are recommended as a priority.

Part 3 - Rationale

1. Regulation 7(3) Schedule 4, paragraph 4 – The rationale supporting each recommendation made:

a. The release of radioactive particles small enough to be readily transported in the open atmosphere also makes them respirable. Such particles have the potential to result in radiological doses to the public from a range of exposure routes, most notably:
- First-pass inhalation of air from the plume of contamination;
- Long-term inhalation after resuspension of ground contamination by the initial plume;
- Ingestion of food crops contaminated by the initial plume;
- Long-term external irradiation from ground contamination by the initial plume;
- Ingestion of breast milk that has been contaminated by a mother's intake of a particular radioactive material.

b. It has been assessed for the identified scenarios at the Aldermaston Site that the first-pass inhalation dose is the most significant by far, for initial emergency response purposes. This has resulted in the recommendation to shelter as the most appropriate urgent protective action. In the case of a scenario where tritiated water is released, urgent protective actions should also involve finding uncontaminated milk substitutes for vulnerable infants. This should be coupled with an immediate restriction on the consumption of all locally produced food, until the direction of the plume and the extent of the contamination has been fully investigated, examined and understood. Appropriate local instructions should then be made available to the public based on the prevailing conditions.

c. The recommendation for the minimum emergency action distance at the Aldermaston Site originates from the Consequence Assessment carried out under REPPIR 2019. The guidance set out in the Approved Code of Practice is to use the largest candidate distances recommended for the urgent protective actions identified against the lower Emergency Reference Level. This 1540m distance about the Aldermaston Site Centre location is selected as the minimum geographical extent for urgent protective actions and is consistent with the established Detailed Emergency Planning Zone (See appendix C for definition).

d. The REPPIR 2001 determination was based on a 5mSv dose contour using 55%Cat D weather conditions. Under REPPIR 2019, the minimum distance for urgent protective actions is based on a 7.5mSv dose contour. However, in accordance with the new requirements of REPPIR 2019, the 'reasonable foreseeability' argument is no longer allowed, and several different requirements have had to be taken into consideration, these being that the assessment must:

- Consider age, and other characteristics which would render specific members of the public especially vulnerable;
- Include all relevant pathways;
- Consider a representative range of source terms;
- Consider a range of weather conditions to account for consequences that are less likely, but which have greater consequences.

e. A further consideration is the geographical area around the site and the potentially significant period that these adverse weather conditions could be experienced.

f. AWE has analysed the dose from a range of weather conditions and has decided to base its proposal on a weather category that is less likely, but which could provide significantly greater doses. Consideration of less likely weather categories, which occur around 12% of the time in the local geographical area provides the 7.5mSv dose contour at 1540m around the site centre location.

2. Regulation 7(3) Schedule 4, paragraph 5(a) – The rationale for its recommendation on the minimum distances for which urgent protective action may need to be taken:

a. The minimum distances recommended are based on a full range of possible consequences from the identified radiation emergencies, evaluated in the Consequence Assessment made in accordance with Regulation 5(1) for the appropriate source terms, and is based on the requirement to identify a distance that has the potential to deliver a dose saving of 3mSv.

b. The tritium source term released by a fire will release tritium in the form of tritiated water (HTO), which is readily absorbed through the skin by humans. Intakes of airborne HTO are dominated by inhalation with a lesser contribution by direct absorption. The HTO is rapidly distributed throughout the body and typically is excreted with a biological half-life close to 10 days.

c. Sheltering from a plume of HTO will give some dose saving (40% is recommended by Public Health England (PHE) for emergency planning) to adults. This same ratio for the reduction in HTO intake will give larger dose savings for any humans dependent for sustenance on their mother. Some significant further protective action would be worthwhile in preventing tritium contamination being consumed via their mother (e.g. using uncontaminated formula milk).

d. For the postulated accident in the main Aldermaston Site tritium facility the 3 mSv dose saving from prompt sheltering for pregnant women and the unborn child are at a distance of 1.35 km. The potential 3 mSv dose saving to a vulnerable infant from an effective ban on contaminated mother's milk would extend to 2.0 km.

e. Given the relative proportions in the UK population of the two most vulnerable groups of humans (unborn child and vulnerable infant) dependent for sustenance on their mothers, it is considered proportionate to derive recommendations purely for sheltering providing immediate protection. The distance associated with the relevant vulnerable group, including the off-set from the tritium facility to the site

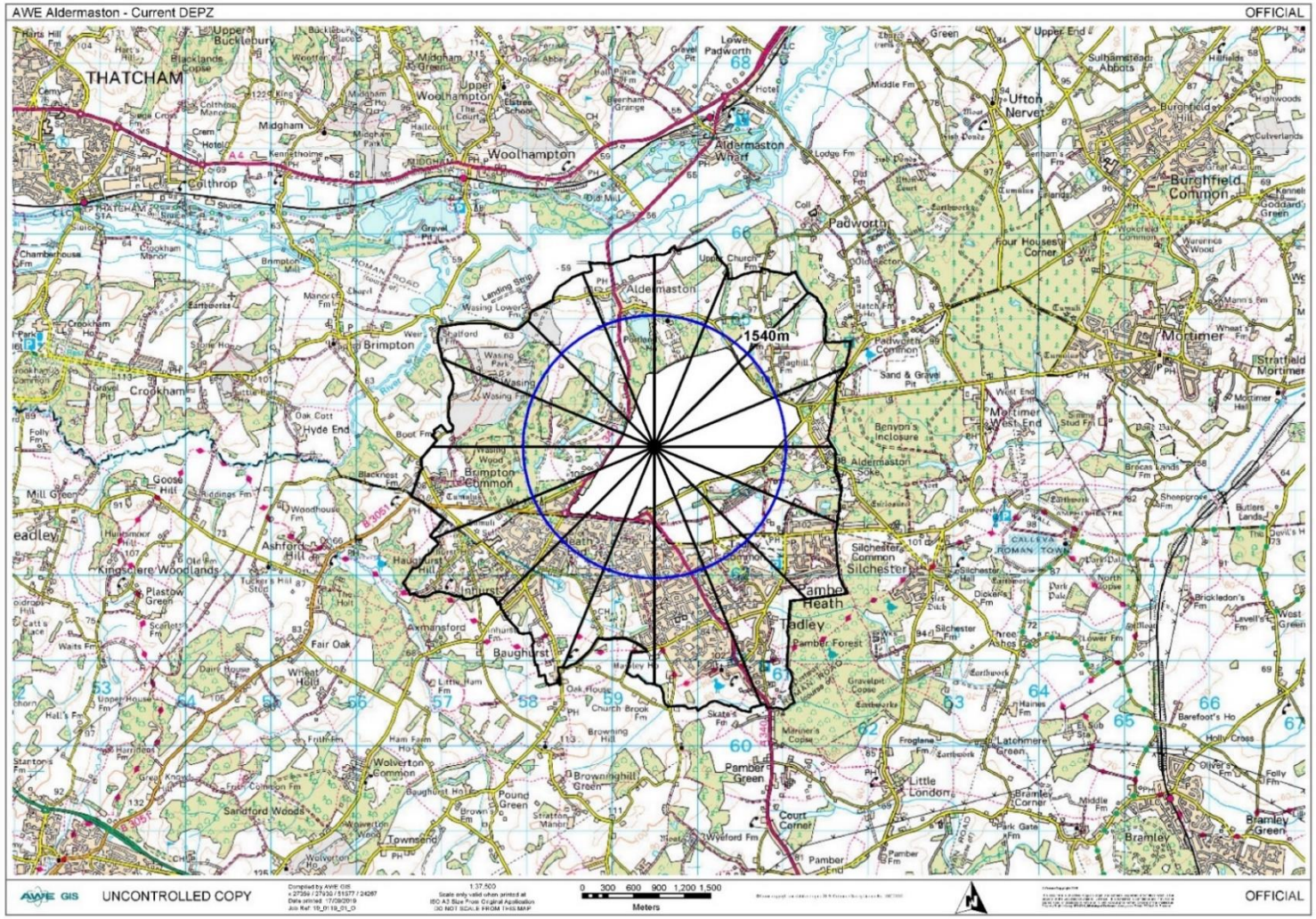
centre location, gives a nominal circle of radius 1.54 km, around the site centre location.

f. This minimum distance for urgent action at the Aldermaston Site is wholly within the existing DEPZ boundary. Under these circumstances, this submission recommends that the current DEPZ is retained for AWE(A).

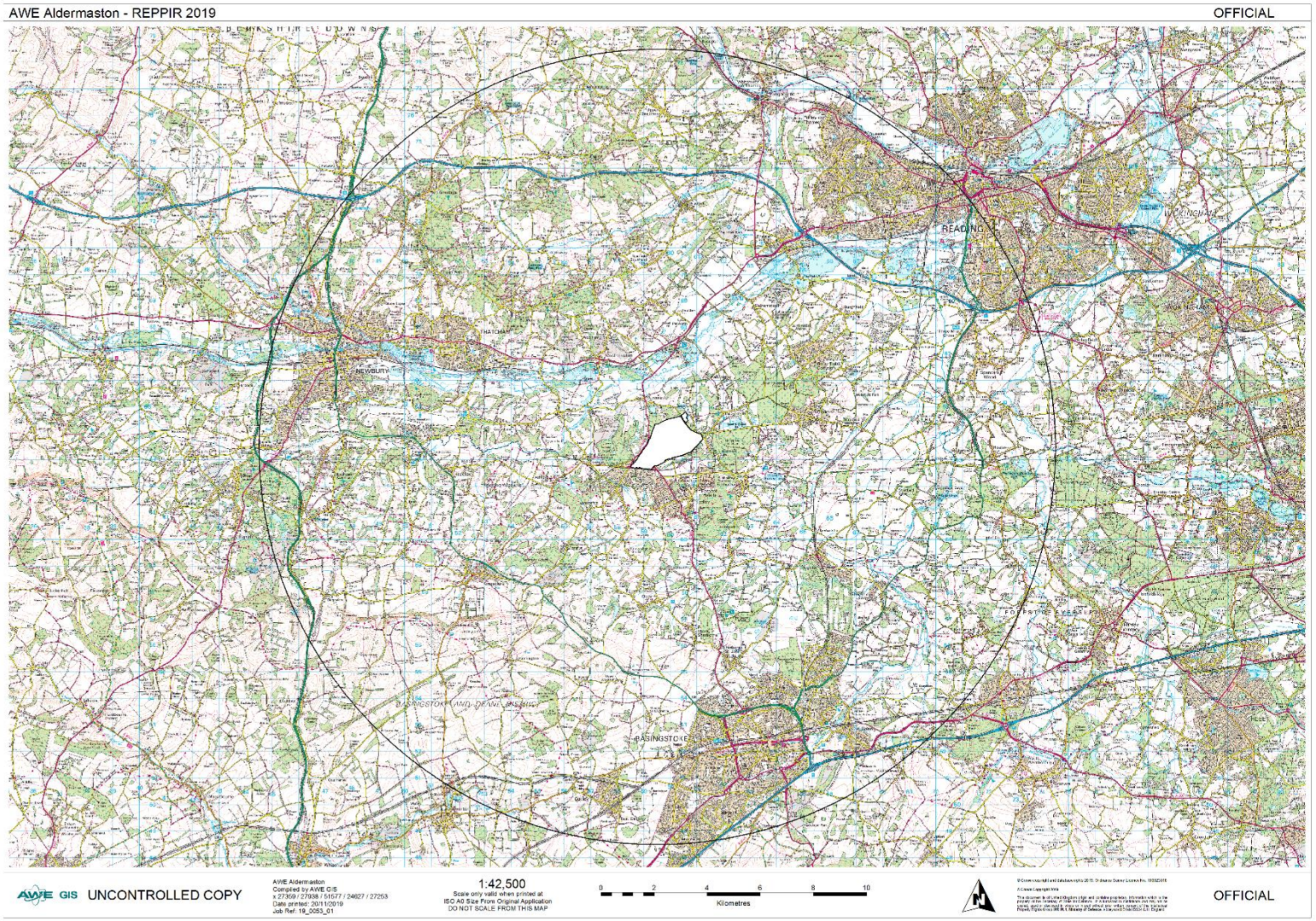
3. Regulation 7(3) Schedule 4, paragraph 5(b) – The rationale for agreement that no off-site planning is required.

a. Given the content of this Consequences Report, this requirement does not apply to the Aldermaston Site.

Appendix A: Map A – The ragged bold black sector is the current boundary of the Detailed Emergency Planning Zone. The Proposed Urgent Protective Distance (blue circle), set at 1540m for the Aldermaston Site.



Appendix B: Map B – The Outline Planning Zone Boundary, set at 15Km for the Aldermaston Site.



Appendix C: Definitions

Detailed Emergency Planning Zone (DEPZ)	A zone determined in accordance with Regulation 8 of the REPPIR 2019 Regulations. This is now covered by the Local Authority's off-site emergency plan
Outline Planning Zone (OPZ)	A zone determined in accordance with Regulation 9 of the REPPIR 2019 Regulations and covered by the Local Authority's off-site emergency plan.

ATOMIC WEAPONS ESTABLISHMENT

AWE BURGHFIELD

CONSEQUENCES REPORT

Introduction

This document is the consequences report for the Burghfield Site, as required under Regulation 7(1) of The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR 2019).

The following information has been titled to relate specifically to the REPPIR 2019 Schedule 4 items required to be included within this report.

Part 1 – Factual Information

1. Regulation 7(3) Schedule 4, paragraph 1(a) - Name and address of the operator:

AWE plc, Aldermaston, Reading, Berkshire, RG7 4PR.

2. Regulation 7(3) Schedule 4, paragraph 1(b) - Postal address of the premises where the radioactive substance will be processed, manufactured, used or stored, or where the facilities for processing, manufacture, use of storage exist:

AWE plc, Burghfield, Reading, Berkshire, RG7 2PQ.

3. Regulation 7(3) Schedule 4, paragraph 1(c) - The date on which it is anticipated that the work with ionising radiation will commence or, if it has already commenced, a statement to that effect:

The Burghfield Site has been occupied in support of the UK nuclear deterrent since 1950 and work with ionising radiation has been conducted on the site since that date.

Part 2 – Recommendations

1. Regulation 7(3) Schedule 4, paragraph 2(a) - The proposed minimum geographical extent from the premises to be covered by the local authority's off-site emergency plan:

a. The proposed minimum geographical extent to be covered by the Local Authorities Off-Site Emergency plan is an area extending to a radial distance of 3160m from the Burghfield Site centre location.
This is illustrated on Map A in Appendix A.

b. In addition to the minimum geographical extent recommended above, an Outline Planning Zone, extending to a radial distance of 12km around the Burghfield Site centre location, has been determined by the Secretary of State for Defence, in accordance with Regulation 9(1)(c).
This is illustrated on Map B in Appendix B.

2. ***Regulation 7(3) Schedule 4, p*aragraph *2(b) – The minimum distances to which urgent protective actions may need to be taken, marking against each distance the timescale for implementation of the relevant action; and paragraph 3(a) – The recommended urgent protective actions to be taken within that zone, if any, together with timescales for the implementation of those actions.***

a. The following distance is recommended for the urgent protective action of sheltering. This is the largest distance determined by detailed consequence assessment of a range of source terms and includes consideration of a range of weather conditions and vulnerable groups within the population.

b. The minimum distance to which urgent protective actions should be taken corresponds to an area with radial distance of 3160m.

c. It is recommended that people are instructed, as soon as is practical, to immediately take-cover in a suitable building and to stay inside with the windows and doors all properly shut. This 'sheltering' action may be necessary for a period of up to two days, or at least until the initial contaminated plume has passed and monitoring of the ground contamination has been undertaken to determine the level of groundshine; and subsequent potential for further dose uptake, (e.g. from contaminated locally produced foodstuffs).

d. It is recommended that the declaration of a Radiation Emergency, by the operator, to the Local Authority is the trigger for implementing the off-site emergency plan and initiating all the above recommended urgent protective actions.

e. Category F weather conditions typically has an associated mean wind speed of $2ms^{-1}$. From the event site, there will be an average of approximately 1500 seconds (25 minutes) from the initiation of the event until the leading edge of any plume travels to the minimum distance recommended for urgent action. Assuming no early warning of the onset of any incident, and that the Site Response Group could take up to an estimated 15 minutes to set-up and formally notify the Local Authority, there remains approximately 10 minutes to inform the public, and for the public to find suitable shelter, in order to realise any substantive benefit from the sheltering action.

3. Regulation 7(3) Schedule 4, paragraph 3(b) – Details of the environmental pathways at risk in order to support the determination of food and water restrictions in the event of a radiation emergency:

a. The release of radioactivity from the Burghfield Site as a result of a fault condition has the potential to result in doses to the public through a range of exposure pathways, including:

i. First-pass inhalation of air in the plume of contamination;
ii. Short-term external irradiation during passage of the plume – Cloudshine;
iii. Long-term inhalation after resuspension, from ground contaminated by the initial plume;
iv. Long-term external irradiation from ground contamination by the initial plume – Groundshine;
v. Ingestion of food crops contaminated by the initial plume.

b. The relative importance of the different exposure pathways is dependent on the type of accident and the potential radioactive isotopes which may be released.

c. The most likely predicted accidents would spread material by explosive distribution, these are non-fission incidents, where the material that would dominate in this type of release will be plutonium (which is an Alpha emitting actinide) in an inhalable particulate form.

d. For potentially more energetic events, a range of fission products would be produced meaning that both internal (inhalation) as well as external exposure (irradiation) would dominate.

e. For the majority of fault sequences, the material released would be in the form of fine particulates of plutonium oxide and the predominant exposure pathway to individuals outside the Burghfield Site during the passage of the plume would be by inhalation. As the plume travels downwind, deposition mechanisms would deplete the plume and leave radioactive material on the ground. Most forms of plutonium are removed from biological pathways by being fixed in the soil and only small amounts are concentrated by biological processes into the food chain, primarily through grazing animals. However, the material can be resuspended by the action of the weather, or by farming practices, or any other disturbance processes, resulting in a potential for longer term inhalation doses.

f. Doses to the public resulting from this consequence may include contributions from cloudshine, first-pass inhalation, long-term inhalation following resuspension, and groundshine.

g. Overall, the primary concern for early response decision-making to radiation emergencies involving possible accidents at the Burghfield Site only merits consideration of the first-pass inhalation dose and therefore sheltering is the recommended urgent protective action.

Part 3 - Rationale

1. Regulation 7(3) Schedule 4, paragraph 4 – The rationale supporting each recommendation made:

a. The release of radioactive particles small enough to be respirable have the potential to result in radiological doses to the public from a range of exposure routes, most notably:

- First-pass inhalation of air from the plume of contamination;
- Long-term inhalation after resuspension of ground contamination by the initial plume;
- Ingestion of food crops contaminated by the initial plume;
- Long-term external irradiation from ground contamination by the initial plume.

b. It has been assessed that the first-pass inhalation dose is the most significant by far, for initial emergency response purposes, which has resulted in the recommendation to shelter as the most appropriate urgent protective action. This should be coupled with a restriction on the consumption of all locally produced food, until the direction of the plume and the extent of the contamination has been

fully investigated, examined and understood. Appropriate local instructions should then be made available to the public based on the prevailing conditions.

c. The recommendation for the minimum emergency action distance at the Burghfield Site originates from the Consequence Assessment carried out under REPPIR 2019. The guidance set out in the Approved Code of Practice is to use the largest candidate distances recommended for the urgent protective actions identified against the lower Emergency Reference Level. This 3160m distance is selected as the minimum geographical extent of the Detailed Emergency Planning Zone (see appendix C for definition) about the Burghfield Site Centre Location.

d. This distance has increased from the REPPIR 2001 ONR determination. The REPPIR 2001 determination was based on a 5mSv dose contour using 55%Cat D weather conditions. Under REPPIR 2019, the minimum distance for urgent protective actions is based on a 7.5mSv dose contour. However, in accordance with the new requirements of REPPIR 2019, the 'reasonable foreseeability' argument is no longer allowed, and several different requirements have had to be taken into consideration, these being that the assessment must:
   - Consider age, and other characteristics which would render specific members of the public especially vulnerable;
   - Include all relevant pathways;
   - Consider a representative range of source terms;
   - Consider a range of weather conditions to account for consequences that are less likely, but which have greater consequences.

e. A further consideration is the geographical area around the site and the potentially significant period that these adverse weather conditions could be experienced.

f. AWE has analysed the dose from a range of weather conditions and has decided to base its proposal on a weather category that is less likely, but which could provide significantly greater doses. Consideration of less likely weather categories, which occur around 12% of the time in the local geographical area, increases the 7.5mSv dose contour to 3160m around the site centre location.

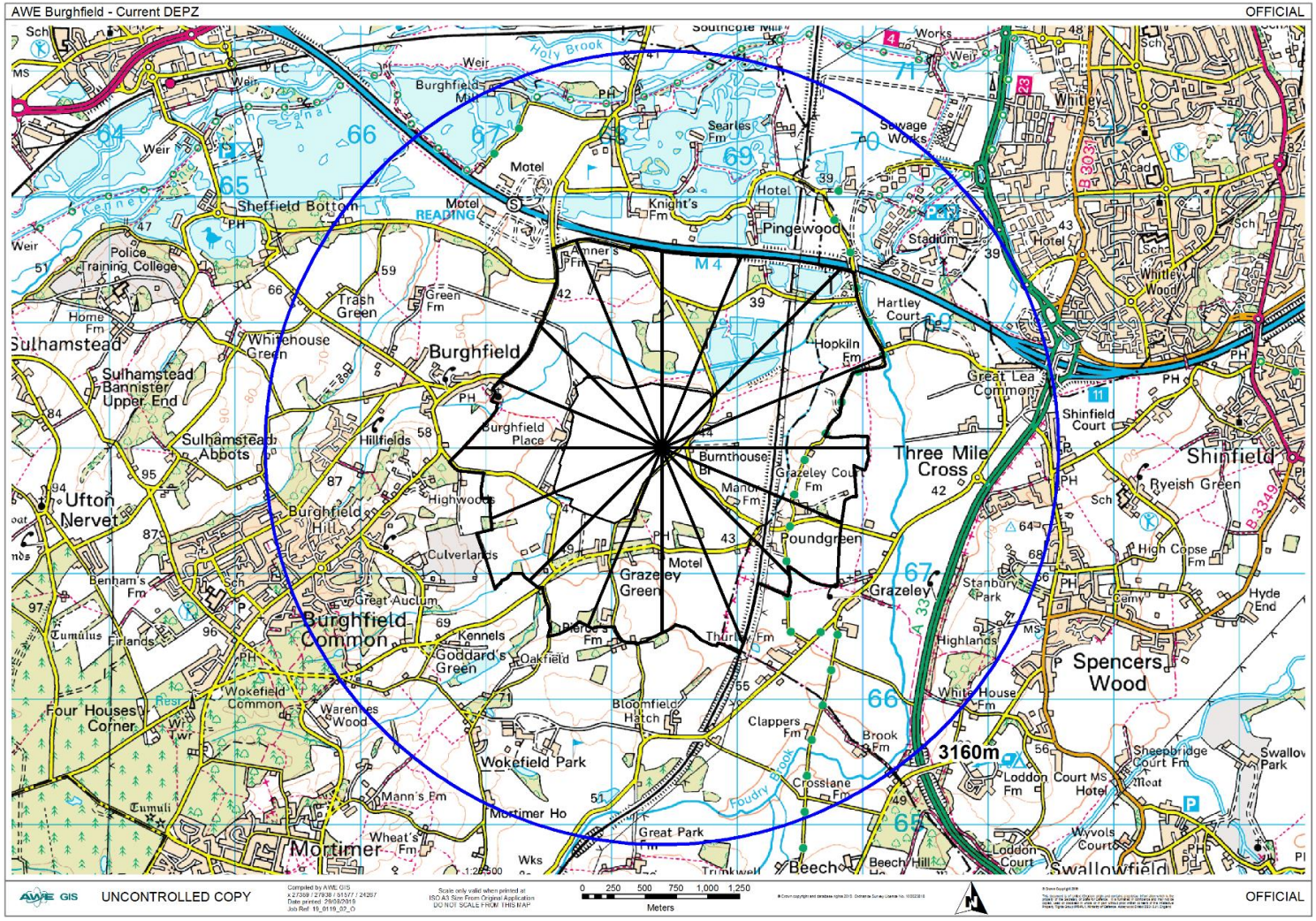
2. Regulation 7(3) Schedule 4, paragraph 5(a) – The rationale for its recommendation on the minimum distances for which urgent protective action may need to be taken:

a. The minimum distance is established from the guidance provided in support of the Regulations, for the appropriate source terms, and is based on the requirement to identify a distance that has the potential to deliver a 3mSv dose saving, when adopting the recommended urgent protective action; which in this case is sheltering.

3. Regulation 7(3) Schedule 4, paragraph 5(b) – The rationale for agreement that no off-site planning is required.

a. Given the content of this Consequences Report, this requirement does not apply to the Burghfield Site.

Appendix A: Map A – The ragged bold black sector is the current boundary of the Detailed Emergency Planning Zone.The Proposed Urgent Action Distance (blue circle) is set at 3160m for the Burghfield Site.



Appendix B: Map B – The Outline Planning Zone Boundary, set at 12Km for the Burghfield Site.

Appendix C: Definitions

Detailed Emergency Planning Zone (DEPZ)	A zone determined in accordance with Regulation 8 of the REPPIR 2019 Regulations. This is now covered by the Local Authority's off-site emergency plan
Outline Planning Zone (OPZ)	A zone determined in accordance with Regulation 9 of the REPPIR 2019 Regulations and covered by the Local Authority's off-site emergency plan.

ATOMIC WEAPONS ESTABLISHMENT

AWE ALDERMASTON

Declaration of No Change

REPPIR 2019

Introduction

This document contains a "declaration of no change" for AWE Aldermaston, in accordance with Regulation 6(2)(b) of The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR 2019).

Review of AWE Aldermaston's last hazard evaluation and consequence assessment

Regulation 6(2) of REPPIR 2019 provides that:

> *"For such time as the work with ionising radiation in respect of which an evaluation made pursuant to Regulation 4(1) continues, the operator must, within 3 years of the date of the completion of the last evaluation (whether made in accordance with Regulation 4(1) or this paragraph), or longer, if agreed by the regulator, either-*
>
> *(a) make a further evaluation; or*
> *(b) if there is no change of circumstances which would affect the last Consequences Report required by Regulation 7, make a declaration to that effect."*

A review of the last AWE Aldermaston hazard evaluation and consequence assessment carried out in 2019, as required under Regulation 6(2) of REPPIR 2019, has been completed.

This review process has been undertaken in accordance with the requirements of Regulation 6 of REPPIR 2019 and the current Approved Code of Practice and guidance (second edition 2020).

The evidence gathered by the review process has concluded there has been no change in circumstances or material change which would affect the conclusions of the previous hazard evaluation or consequence assessment required by Regulations 4(1) and 5(1).

Declaration of No Change

This document is a "declaration of no change", in accordance with Regulation 6(2)(b).

The 2022 review of the 2019 hazard evaluation and consequence assessment has concluded the Consequences Report (Issue 1) dated November 2019 continues to provide the necessary information for the local authority (in this case West Berkshire District Council) to prepare an off-site emergency plan.

ATOMIC WEAPONS ESTABLISHMENT

AWE BURGHFIELD

Declaration of No Change

REPPIR 2019

Introduction

This document contains a "declaration of no change" for AWE Burghfield, in accordance with Regulation 6(2)(b) of The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR 2019).

Review of AWE Burghfield's last hazard evaluation and consequence assessment

Regulation 6(2) of REPPIR 2019 provides that:

> *"For such time as the work with ionising radiation in respect of which an evaluation made pursuant to Regulation 4(1) continues, the operator must, within 3 years of the date of the completion of the last evaluation (whether made in accordance with Regulation 4(1) or this paragraph), or longer, if agreed by the regulator, either-*
>
> *(a) make a further evaluation; or*
> *(b) if there is no change of circumstances which would affect the last Consequences Report required by Regulation 7, make a declaration to that effect."*

A review of the last AWE Burghfield hazard evaluation and consequence assessment carried out in 2019, as required under Regulation 6(2) of REPPIR 2019, has been completed.

This review process has been undertaken in accordance with the requirements of Regulation 6 of REPPIR 2019 and the current Approved Code of Practice and guidance (second edition 2020).

The evidence gathered by the review process has concluded there has been no change in circumstances or material change which would affect the conclusions of the previous hazard evaluation or consequence assessment required by Regulations 4(1) and 5(1).

Declaration of No Change

This document is a "declaration of no change", in accordance with Regulation 6(2)(b).

The 2022 review of the 2019 hazard evaluation and consequence assessment has concluded the Consequences Report (Issue 1) dated November 2019 continues to provide the necessary information for the local authority (in this case West Berkshire District Council) to prepare an off-site emergency plan.

AWE Detailed Emergency Planning Zone

Decision Paper:	Service Director Development & Regulation
Date of Decision:	19th January 2023
Report Authors:	Jonah Maddocks & Carolyn Richardson

1 Purpose of the Report

1.1 To provide information and the decisions made in relation to the determination of the Detailed Emergency Planning Zones (DEPZ) around both Atomic Weapons Establishment (AWE) sites review process as required under Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR19).

1.2 To confirm the next steps to ensure compliance with REPPIR19.

2 Executive Summary

2.1 This report explains the need to determine the Detailed Emergency Planning Zones (DEPZ) around both Atomic Weapons Establishment (AWE) sites as required under the Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR19).

2.2 The DEPZ is the defined zone around the nuclear site where it is necessary to pre-define protective actions which would be implemented without delay to mitigate the likely consequences of a radiation emergency.

2.3 There are requirements in REPPIR19, the associated Approved Code of Practice (ACoP) and guidance detailing why, how and when to determine or review any DEPZ.

2.4 Under REPPIR19 the operator needs to undertake a review of hazard evaluation and consequence assessment within 3 years of the date of the completion of the last evaluation (or longer if agreed with the regulator or earlier should there be material changes in operations on the nuclear site).

2.5 The last determination for both AWE sites was in March 2020 with the last Consequence Report received in November 2019.

2.6 In undertaking this statutory review the Council has followed the legislation, ACOP and guidance.

2.7 The Council had two months to comply from the date of receipt of the information from AWE. This was received on the 18th November 2022 and therefore the date for completion of the process is 18 January 2023. In view of the timeframe over the festive period and the internal governance structure a request was made to the Regulators,

Office for Nuclear Regulation, with a request for an additional day to complete the determination process.

2.8 The options considered are detailed in this report.

2.9 The decision was to:

(a) Amend the DEPZ for AWE Burghfield as detailed in Appendix A.

(b) Make no changes to the DEPZ for AWE Aldermaston.

3 Supporting Information

3.1 There is a legal process in place in order to allow the DEPZ to be determined by the Council which is clearly set out in the legislation, ACoP and guidance. This is summarised in this section with respect to the process for the AWE sites.

3.2 The role of the Council is to:

(a) To determine the boundary of the Detailed Emergency Planning Zone (DEPZ) for each site, based on a minimum area identified by the operator (AWE), taking into account those matters detailed within the legislation and guidance such as local communities, geographical features, etc. As noted above, the DEPZ is the geographic area that the AWE Off-Site Emergency Plan must cover in detail and the Council, along with the other agencies involved in the AWE Off-Site Emergency Plan, must be able to support.

(b) To provide information to the public within the DEPZ areas.

(c) To review and revise the AWE Off-Site Emergency Plan in compliance with REPPIR19 (taking into account any changes in the DEPZ).

3.3 The Council was required to comply with REPPIR19 by updating the DEPZ by the 18th January 2023. Officers therefore prepared the key actions and timeline in relation to this deadline. As a result of internal governance and the festive period a request was made to ONR for an additional day to finalise the process.

3.4 The primary focus for the Council in respect of REPPIR19 is public safety. All actions should be focussed around ensuring the Council protects its residents and businesses, mitigates risk where possible and works closely with AWE and other partners to deliver, in the event of an incident, a comprehensive off-site response by virtue of a good quality Off-Site Emergency Plan.

3.5 In order to undertake the requirements there are a number of steps required of the operator in advance as set out below.

3.6 Hazard Evaluation and Consequence Assessment (HECA) (Regulations 4, 5 & 6)

3.7 The first part of the process requires AWE as the site operator to provide a Consequence Report to this Council and the Regulators. In order to do so, AWEs

technical experts undertook a Hazard Evaluation and Consequences Assessment (HECA).

3.8 AWE Aldermaston and AWE Burghfield have different inventories of radioactive and explosive materials and therefore different fault scenarios are applicable to each site under the legislation.

3.9 The process is undertaken within 3 years of the date of the completion of the last evaluation of where the operator proposes a material change, or where a material change occurs, in the work with ionising radiation to which an operator was required to make an evaluation pursuant to regulation 4(1).

3.10 Consequence Report (Regulation 7)

3.11 Based on the results of the assessment, AWE, as the operator, must propose the minimum area for any Urgent Protective Actions (UPA) required in the unlikely event of a radiation emergency with an off-site impact.

3.12 The UPA forms the basis of the information provided to the Council and the regulators, ONR, in a document called the Consequence Report (CR). These reports, one for each AWE site, set out the minimum areas to be included in the DEPZ, what the urgent protective action(s) should be and how quickly it would need to be put in place in order to protect the public.

3.13 The latest Consequence Reports for each site were received by the Council on the 18th November 2022.

3.14 There has been **no change** to the UPA areas for either AWE site under the REPPIR19 HECA. It should also be noted that for both sites there has been no change in activity or risk.

3.15 AWE Aldermaston Consequence Report Summary:

(a) Urgent Protection Actions (UPA) area for the site is a 1540m radius. However based on analysis of vulnerable groups exposure to tritium it was further recommended to extend the minimum area out to 2000m.

(b) Outline Planning Zone (OPZ) area for the site is a radius 15km.

(c) The recommended Urgent Protective Action (UPA) is shelter.

(d) Timescales for undertaking the UPA (Shelter) is as soon as possible.

3.16 AWE Burghfield Consequence Report Summary:

(a) Urgent Protective Actions (UPA) area for the site is a radius of 3160m.

(b) Outline Planning Zone (OPZ) area for the site is a radius of 12km.

(c) The recommended Urgent Protective Action (UPA) is shelter.

(d) Timescales for undertaking the UPA (Shelter) is as soon as possible and no later than 25 minutes from the start of the incident.

3.17 Developing the DEPZ (Regulation 8)

3.18 The distances identified in the Consequence Reports determine the **minimum** boundaries for the area to be included in the DEPZ and subsequent OPZ.

3.19 In addition to the minimum geographic extent, the UPA, then taking into account the details set out in the regulations, ACoP and guidance, there are additional requirements to consider when developing the DEPZ.

3.20 Reg 8 (1) requires that the local authority must determine the DEPZ on the basis of the operator's recommendation made under (paragraph 2) of Schedule 4 and may extend that area in consideration of:

(a) local geographic, demographic and practical implementation issues;

(b) the need to avoid, where practicable, the bisection of local communities; and

(c) the inclusion of vulnerable groups immediately adjacent to the area proposed by the operator.

3.21 Those properties within the DEPZ are therefore afforded a means of warning and informing process to alert them to take shelter as soon as possible and minimise the risk to their health.

3.22 The ACOP provides further details to be considered:

3.23 The DEPZ must be based on the minimum geographical extent proposed by the operator in the consequences report and should:

a. be of sufficient extent to enable an adequate response to a range of emergencies; and

b. reflect the benefits and detriments of protective action by considering an appropriate balance between;

i. dose averted; and

ii. the impact of implementing protective actions in a radiation emergency across too wide an area.

3.24 In defining the boundary of a DEPZ, geographic features should be used for ease of implementing the local authority's off-site emergency plan. Physical features such as roads, rivers, railways or footpaths should be considered as well as political or postcode boundaries, particularly where these features and concepts correspond with other local authority emergency planning arrangements.

3.25 Actions undertaken to determine the DEPZ

3.26 The process for assessing and developing the DEPZs for both sites followed the legislative requirements and included:

(a) A desk top exercise was initially undertaken to review maps and consider the options.

(b) Site visits were subsequently conducted in the areas concerned to confirm what was shown on the map was the same in reality, having regard to any new developments, changes in features etc. This was jointly undertaken, where appropriate, with the Emergency Planning Officers from Wokingham, Reading and Hampshire Councils. These were undertaken in advance of receipt of the Consequence Report (CR) due to the timings involved in the process. If the CR had been significantly different then further site visits would have been undertaken.

(c) A review of all the planning applications which have been approved but not developed which were still valid was undertaken in order to check they were not going to result in a bisection of the DEPZ should they be built in the next 3 years. At this time there are no developments with planning permission which will impact the DEPZ boundary as determined within this report.

3.27 The output of this process was a draft DEPZ with justifications as to why some suggested amendments to the DEPZ were offered, all of which were based on the legal requirements. These are shown in Appendix A.

3.28 Liaising with relevant organisations

3.29 Although no formal consultation is required under the legislation and the ACoP, the guidance suggests that the Council may liaise with other organisations to consider the draft DEPZ.

3.30 In view of the cross border implications of the revised DEPZ area, liaising with the AWE Off-Site Planning Group (OSPG) was considered the best approach, since it was already a formed group of agencies with knowledge of the AWE sites and emergency planning in detail. As a result the AWE OSPG was consulted.

3.31 On the 24th November 2022 there was a meeting of the AWE OSPG where a presentation was provided giving background information and the proposed details of the DEPZs for each site, as well as access to map with the potential changes.

3.32 At the time of the meeting there was general agreement with the proposed changes.

3.33 The AWE OSPG was given a further two weeks to consider the proposals and provide any suggested changes by 9 December 2022.

3.34 The results of the consultation with the AWE OSPG confirmed that the group agreed with the proposals for the AWE Burghfield Site DEPZ changes.

3.35 There was some feedback in relation to the AWE Aldermaston proposed changes however as noted in Appendix A the implications are more in relation to formalising a situation which already happens by way of notifications etc. and not splitting a

community. The disadvantage to this however is there are properties to the south of the potential expansion, leading to the possibility of more properties being added into the DEPZ which is some distance away from the area where Urgent Protective Actions are necessary.

3.36 Proposed options with Rational

3.37 Following the receipt of the Consequence Reports and using the legislation, ACoP and guidance in undertaking the actions detailed in 5.25 to 5.35 the proposed options are:

(a) Confirm the minor changes for AWE Aldermaston site as detailed in Appendix A to the AWE Aldermaston DEPZ.

(b) Confirm one or both changes for the AWE Burghfield site as detailed in Appendix A to the AWE Burghfield DEPZ

(c) Make no changes to one or both AWE site DEPZ.

3.38 There are no changes for the OPZs for either site.

4 Implications of Proposed DEPZs

4.1 Should options 3.37 (a) or (b) have been approved then the minor increases to both DEPZs will result in eight additional properties being included in the DEPZ. Therefore they would need to be formally written to in order to ensure they are aware of the changes regardless of the fact they have received the booklet and AWE Connect Newsletter previously.

4.2 There would also be some questions in relation to the above changes since there is no change in the UPA, no change in the risks etc. It could also be seen that it was not concluded effectively in 2020. It is however considered that that the options for changing either DEPZ is instead fine tuning the DEPZ following the first determination by this Council in 2020 which is what formal reviews should do.

4.3 There would be no changes to land use planning policies.

5 Feedback from Governance Consultation

5.1 In addition to the AWE Off-Site Planning Group the process and proposed outcomes were considered in advance of a final decision by the Councils Corporate Board, Ops Board and Opposition leaders were briefed.

6 Decision by Service Director – Development and Regulation

6.1 The Service Director- Development & Regulation reviewed the reports prepared and discussed with officers in relation to the proposals in advance of confirming the determination of the DEPZ as per his delegated authority under the Scheme of Delegation as:

(a) Amend the DEPZ for AWE Burghfield as detailed in Appendix A.

(b) Make no changes to the DEPZ for AWE Aldermaston. This decision was taken having regard to the details in Appendix A and in particular the potential further extension to the south of Baughurst as a result of more properties south of that area. Therefore the proportionate decision was to make no changes to the DEPZ for AWE Aldermaston.

7 Next Steps

7.1 As a result of the DEPZ determination the following steps will be undertaken:

(a) Revising the AWE Off-Site Emergency Plan in order to mitigate the impact for those people/properties now included in the DEPZ.

(b) Informing the new properties within the DEPZ that they are in the DEPZ and what they should do in the event of an incident at either of the sites. A multi-agency Communications Plan lead by WBDC has already been developed to contact these properties, as well as the wider communities of the changes.

(c) The DEPZ leaflet and website will also be updated and sent to all residents within the DEPZ before the 31st March 2023.

8 Conclusion

8.1 The proposed changes to the DEPZs for both AWE sites as required have received careful consideration, with due consideration to the legislation, ACOP and guidance.

9 Appendices

9.1 Appendix A – DEPZ options

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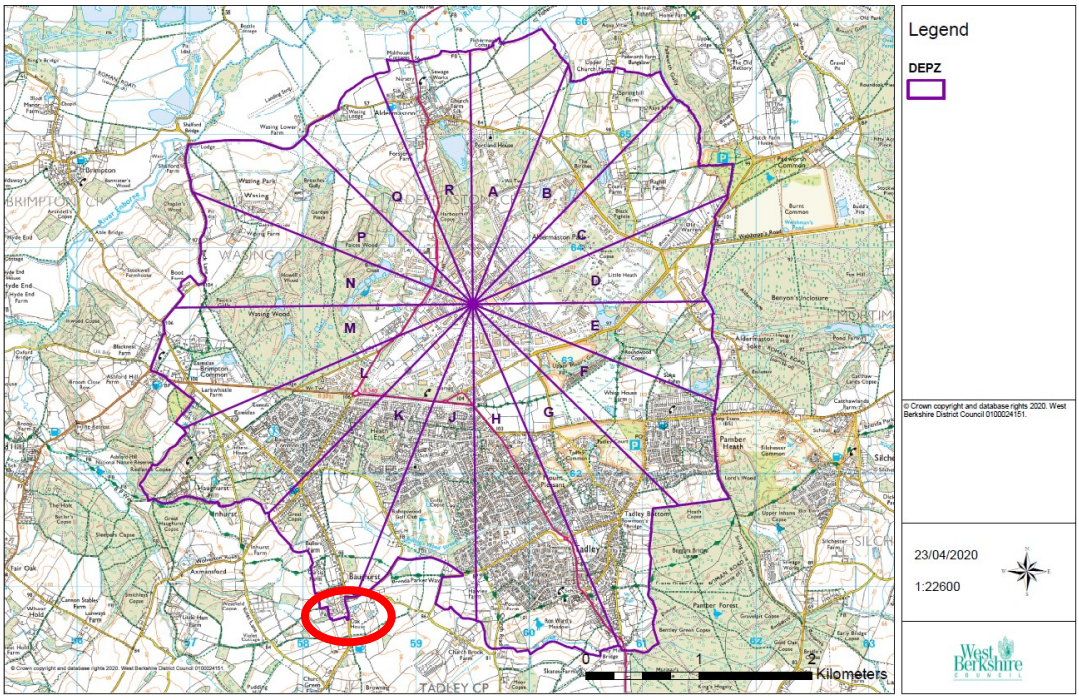
Appendix A DEPZ Amendment Options (Regulation 8 (2))

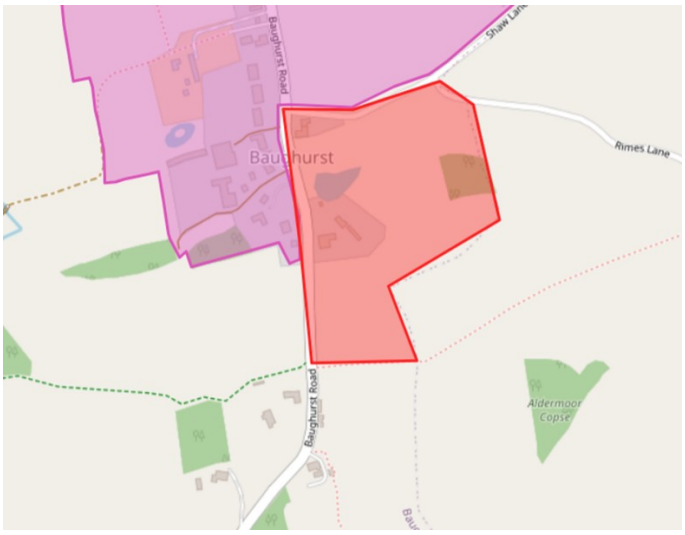
Set out in this appendix are the existing and proposed changes to the AWE Aldermaston and Burghfield DEPZs with relevant justifications. These are based on the requirements of the legislation, ACoP and guidance, site visits and consultation.

Existing AWE Aldermaston site DEPZ (Mar 2020 – Jan 2023):



Potential Changes to AWE Aldermaston site

On reviewing one area of the existing AWE Aldermaston DEPZ there was the potential for changes at the southern end as shown on the map below and as shown by the circle on the map above in the area of: Baughurst Rd, Tadley RG26 5LP



Justification Comments:

The map shows the bisection of the Baughurst community on the eastern side of the road.

The potential option is to extend the DEPZ by following a public footpath which would act as a clearly visible defining feature.

Factors to consider are that:

(a) The road, as per the DEPZ, acts as a clear boundary for the DEPZ.

(b) The number of additional properties would be five.

(c) Any additional developments proposed in the area would impact on the DEPZ for the future, should all other considerations remain the same, therefore the potential for additional significant development in the area would likely be advised against. Consideration to any such application would however be considered on a case by case basis.

(d) It does not cut off any additional access routes to surrounding areas, though it would remove an alternative route of access to the area outside the DEPZ. The road may need to have a closure on it and therefore access in and out will be limited.

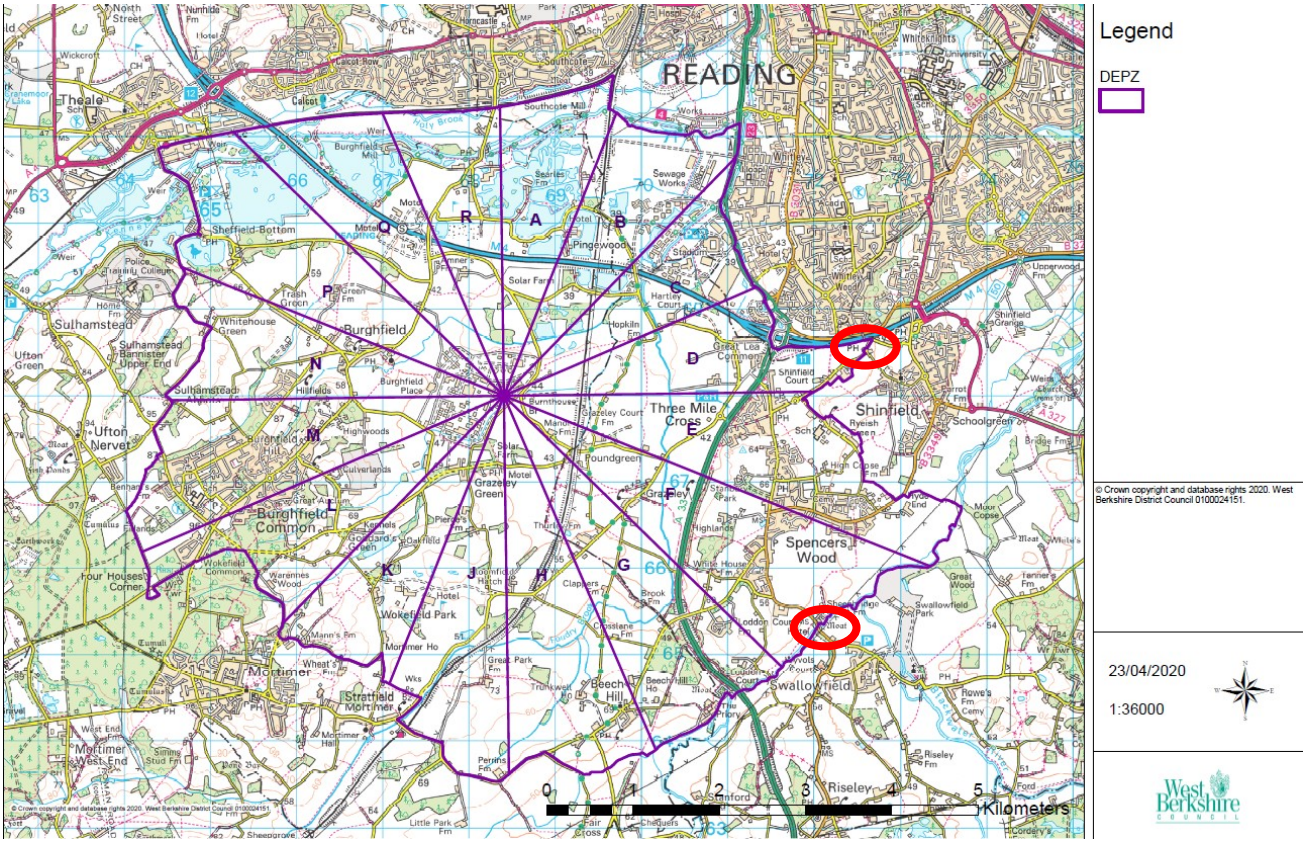
(e) The 3 yearly booklet and the quarterly AWE Connect Newsletter is already distributed to the addresses so they could currently be considered to be part of the DEPZ.

(f) The telephone alerting will also already include the properties within this area since it is based on postcodes.

(g) There are however additional properties to the south of the potential extension of the DEPZ which could result in a further expansion to include these properties. This would mean expanding the DEPZ at some distance from the Urgent Protective Action area.

Decision: On balance it was considered appropriate not to include the above option with the DEPZ for AWE Aldermaston remaining the same.

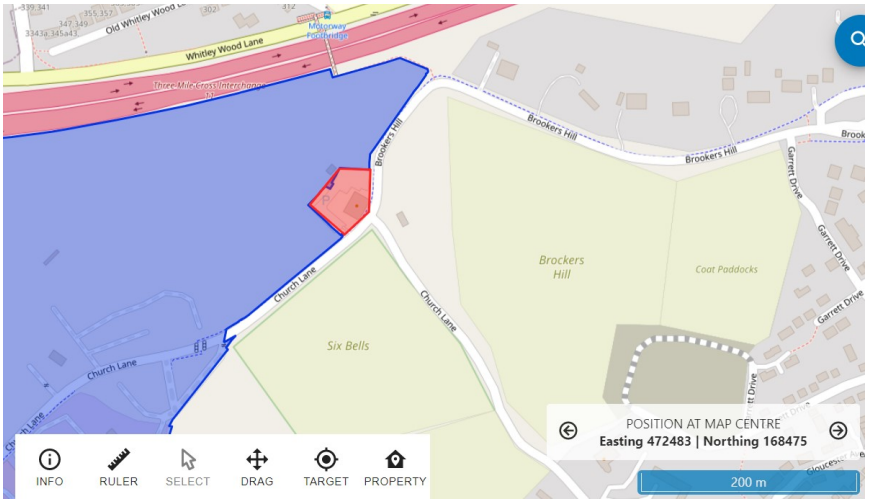
Existing DEPZ for AWE Burghfield site (Mar 2020 – Jan 2023)



Potential Changes to AWE Burghfield site

On reviewing the area around the existing AWE Burghfield DEPZ there were 2 areas which were considered to be amended to correct minor areas of ambiguity as shown in the map above and sections of the maps below

1. The Six Bells Shinfield, Church Lane, Shinfield, Reading, RG2 9DA - Easting 472593 | Northing 168524



Justification Comments

a. Previously the site had been excluded since the building identifies with the Shinefield 'Community' and not Spencers Wood which is the rest of the area included in the DEPZ.

b. This change would therefore use the full length of the road as the boundary rather than go around one property.

c. The road, as per the DEPZ, acts as a clear boundary for the DEPZ.

d. Any additional houses proposed in the area would impact on the DEPZ for the future, should all other considerations remain the same, therefore the potential for additional significant development in the area would likely be advised against. Consideration to any such application would however be considered on a case by case basis.

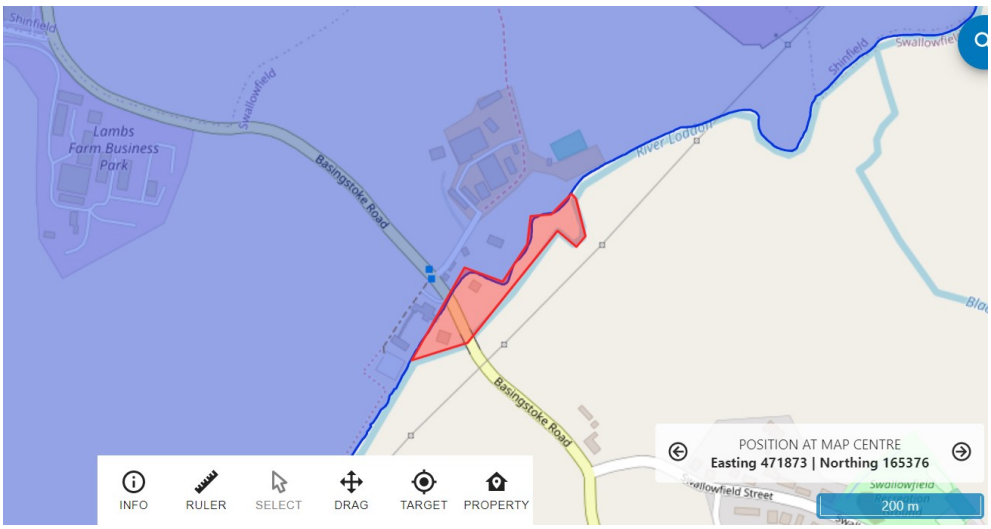
e. The road may need to have a closure on it and therefore access in and out of the property will be limited.

f. The 3 yearly booklet and the quarterly AWE Connect Newsletter is already distributed to the addresses so they could currently be considered to be part of the DEPZ.

g. The telephone alerting will also already include the properties within this area since it is based on postcodes.

Decision: On balance it was considered appropriate to include the above change to the DEPZ for AWE Burghfield.

2. Near Basingstoke Road, Swallowfield, Reading RG7 1PT - Easting 472105 | Northing 165364



Justification Comments

a. This change would redefine the DEPZ fully along the River Loddon and correct a mapping error as a result of a split in the flow of the river.

b. The river acts as a clear boundary for the DEPZ.

c. The change would result in the addition of two properties.

d. Expanding the DEPZ to bring in the 2 properties would better identify them with the properties adjacent to them in their community, and improve the warning and informing in the event of an incident at AWE.

e. Expanding the DEPZ will prevent the properties receiving different advice over sheltering in the event of an incident, which are in close proximity to each other, that differing advice could undermine their confidence and therfor safety in the warning messages.

f. The 3 yearly booklet and the quarterly AWE Connect Newsletter is already distributed to the addresses so they could currently be considered to be part of the DEPZ.

g. The telephone alerting will also already include the properties within this area since it is based on postcodes.

h. Any additional houses proposed in the area would impact on the DEPZ for the future, should all other considerations remain the same, therefore the potential for additional significant development in the area would likely be advised against. Consideration to any such application would however be considered on a case by case basis.

Decision: On balance it was considered appropriate to include the above change to the DEPZ for AWE Burghfield.