REPPIR

Radiation Emergency Preparedness and Public Information Regulations

What you should do if there is a radiation emergency at the AWE Aldermaston or Burghfield sites

AWE

West Berkshire COUNCIL

Important Radiation Emergency Safety Advice.

Please read this booklet carefully and keep it in a safe place.

The detachable back page is a summary of what you need to do in a radiation emergency. Tear it off and keep it on your fridge or notice board for reference.

- Why do I need this booklet?
- What could happen at AWE?
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- What about food and drink?
- Radioactivity and Radiation
- Detailed Emergency Planning Zone (DEPZ) maps
- Outline Planning Zone (OPZ) maps
- Who has produced this information?
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- Summary of sheltering actions (tear off sheet)

www.westberks.gov.uk/awe

Why do I need this booklet?

You have received this booklet because your home or business is in or near the Detailed Emergency Planning Zone (DEPZ) around the Atomic Weapons Establishment (AWE) sites at Aldermaston or Burghfield and therefore you need to know what do to in the unlikely event that there is a radiation emergency on either of these sites. To check where your property is within the DEPZ you can check on line at www.westberks.gov.uk/awe and check the post codes applicable which are on this booklets back page.

The AWE sites are responsible for safely maintaining the UK's nuclear deterrent on behalf of the Ministry of Defence. They also provide expertise in national nuclear security matters to UK Government agencies and departments.

This booklet is important to read because both of the AWE sites have radioactive materials on them so they can fulfil their mission. However, if something went wrong this could result in radioactive material contaminating areas outside these sites.

You therefore need to know what to do immediately should a radiation emergency happen.

What could happen at AWE?

Both the Aldermaston and Burghfield sites are large industrial complexes. In addition to standard industrial materials, high explosives and radioactive substances are also used under carefully controlled conditions.

There is no risk of a Chernobyl or Fukushima nuclear reactor type incident, since there are no reactors on either site. However, should a significant accident result in an uncontrolled fire or explosion in a building where radioactive materials are being handled, there is a remote possibility that it could lead to the

release of radioactive particles into the environment. If such an event were to take place, a radiation emergency would be declared.

In the very unlikely event of this happening, people in the area around the affected AWE site could be exposed to radioactive particles which have been blown downwind in a 'plume'. The exact direction and extent of any plume will depend on the weather conditions at the time. This means that the amount of ionising radiation someone may be exposed to after an accident will vary considerably depending on how much is released, whether they are downwind of the affected location and whether the wind is strong enough to carry radioactive particles to their location.

For emergency planning purposes, assumptions are made regarding wind strength but, in the very unlikely event of a real incident, experts would use sophisticated computer modelling to track and forecast the plume's direction of travel and volume, as well as the extent and direction of any radioactive particles, to ensure an accurate forecast.

What emergency plans are in place?

The Radiation Emergency Preparedness and Public Information Regulations 2019 (known as REPPIR) require AWE to have a plan in place to respond to any radiation emergency on the site. This 'on-site' emergency plan must link in with an 'off-site' emergency plan coordinated by West Berkshire Council in accordance with REPPIR.

As a result AWE, the emergency services, the Councils and a large number of other agencies work together in developing and reviewing the AWE Off-Site Emergency Plan, followed by training and testing of the plan in a coordinated way.

The focus of this planning is in relation to the Detailed Emergency Planning Zone (DEPZ) areas around each site, which are determined by West Berkshire Council.

In addition, the AWE Off-Site Emergency Plan includes an area known as the Outline Planning Zone (OPZ), which is an extended area beyond the DEPZ where additional actions may need to be considered. The OPZ's for each site are shown in the map pages of this booklet.

How will I know if there is a radiation emergency?

Every household and business in the area will automatically receive a pre-recorded telephone message (landline only) from the AWE Alerting System. Local radio and TV stations will broadcast messages. Alongside this emergency service responders will use news websites and social media to issue advice to the public. Please follow the advice IMMEDIATELY.

Local radio and TV stations to tune	
Heart Berkshire	97.0 and 102.9 MHz FM
BBC Radio Berkshire	95.4 and 104.1 MHz FM
The Breeze (Basingstoke and North Hampshire)	107.6 MHz FM
The Breeze (Newbury)	105.6 and 107.4 MHz FM
BBC Radio Solent (Hampshire)	96.1 and 103.8 MHz FM
The Breeze (Reading)	107 MHz FM
BBC South	
ITV Meridian	

What is the advice and why should I follow it?

Go indoors immediately and stay there. Contamination levels are likely to be higher outside buildings than inside. Staying inside is the most important advice because the fabric of the building will provide a layer of protection against any ionising radiation and will reduce exposure to any radioactive particles. If you are not at home, go into the nearest permanent building.

As a precautionary measure, the advice of sheltering may be sent to the entire DEPZ in the initial response stages of a radiation emergency. Extensive monitoring will then be used to confirm where sheltering needs to remain for longer and to identify those areas where it is no longer required.

Keep your pets inside if they were not outside at the time of the emergency; those that have been outside could be kept in a separate room or building.

Close all windows and doors to stop radioactive particles from entering buildings.

Turn off boilers and air conditioning units and put out fires or woodburners. Fans, heating systems, boilers, gas fires and air conditioning all draw in air from outside so these should be shut down to minimise radioactive particles entering buildings.

Listen to local TV and radio for instructions and updates. During a radiation emergency, advice will be broadcast regularly. This will include updates about the care of children at school, food and water supplies and care of farm animals and pets.

Do not make phone calls by landline or mobile. This is important because the phone system could be overloaded, preventing the emergency services and other responders from receiving or making calls, or from contacting you.

Stay where you are. You will be safer to stay where you are rather than travelling around outside, vehicles provide less protection against ionising radiation than houses and other solid buildings. If you try and leave the area, roads could quickly become gridlocked and prevent access for the emergency services. You could also end up in an area with more radioactive contamination unknowingly or by accident. It is very unlikely that an evacuation would be necessary but if that does happen, details of what to do will be given on local radio, TV and social media.

Make sure everyone in your home or business understands what to do in the event of a radiation emergency.

What if I am advised to evacuate?

You should not evacuate unless you are told to do so. Normally the safest place for you is in a building – which may be for a number of days depending on the situation. However if you need to be evacuated urgently from the area, you will be told how this will be done and what you need to do by the emergency responders.

What if my children are at school during a radiation emergency?

Children at school will be kept inside to protect them from radioactive particles. Windows and doors will be closed, and air conditioning and heating systems shut down. They will be looked after by the staff.

You should not risk exposing yourself or your children to higher levels of radiation by going to collect them. Instead listen to local radio and TV or await messages from the schools directly to find out the arrangements for collecting children from their schools.

What happens at hospitals, care homes or other places that provide care for vulnerable people?

All establishments with vulnerable people are identified in the off-site emergency plan and have been provided with actions they should do.

These actions include having:

- a process to alert all staff and occupants to take cover and go inside a permanent building
- key-holder details
- relevant medical, drug and dietary requirements and supplies
- arrangements for contacting next of kin
- arrangements in place to look after people who are sheltering for up to 48 hours

No one should go to the sites to try to pick up or visit relatives, they will be looked after safely where they are. Any support they need will be provided through the emergency responders.

What about my business?

All businesses should have a robust emergency plan and business continuity plans in place. Specific actions for businesses will vary depending the type of business, the number of staff and customers on site etc. Critical to any plan is to ensure anyone working or visiting your business takes shelter in a suitable building immediately when notified of a radiation emergency and that systems are in place to look after everyone.

What about farms and other places where animals are kept?

Farmers and animal business owners should not go outside to tend to animals. Instead they should await further advice via local media, animal health officers or other emergency responders. The Department of Environment, Food and Rural Affairs (DEFRA) will also support farmers and livestock owners about what to do with their animals, feed and milk products.

No outside crops such as vegetables or fruit should be offered for consumption or for sale until such time as approved by the Food Standards Agency.

What about food and drink?

Covered food and drink (e.g. fridge, freezer, larder, in containers) will be unaffected. Water supplies are also unlikely to be affected. Outside crops such as vegetables and fruit, may be contaminated, and therefore should not be eaten.

If you are breast-feeding you should switch to using breast milk substitutes as soon as possible, as any radioactive material which you ingest or inhale could be passed to your infant on through your milk. However, if you don't have access to formula, do not stop feeding your baby, as this will be far more harmful to them. Your immediate priority should be to go inside and remain indoors until instructed otherwise.

Background Information - The Science Bit!

Radioactivity and Ionising Radiation

Atoms make up everything around us. Most atoms are stable and remain the same for ever, but some atoms (both naturally occurring and man-made) are 'unstable' and will change over time. Radioactivity is the term used to describe the action of unstable atoms changing into other atoms and emitting ionising radiation as they do so.

Ionising radiation is a specific type of radiation that is capable of disrupting stable atoms causing them to become charged. This can cause chemical changes in living matter which could harm people's health. There are other types of radiation, such as microwaves and visible light that do not harm people in this way.

We're exposed to ionising radiation all the time, mostly from natural sources. It's all around us – in the landscape, building materials, in water, in our food and it is bombarding the earth from space and is commonly referred to as 'background radiation'. Our bodies also contain naturally occurring radioactivity. Radiation can also be extremely useful, for example, medical X-rays for diagnosis, enabling smoke alarms to work and for sterilising frozen foods and medical products.

How can you be exposed to ionising radiation?

Radioactive materials and electrical radiation generators (such as X-ray machines) all emit ionising radiations. If you're close to these sources, the ionising radiation can be absorbed by your body, potentially causing chemical changes. However, you do not become radioactive and the hazard is removed once you move away from the source. You can think of ionising radiation as you would think of heat from a fire, when close to the fire it feels hot and you could potentially get burnt if you absorbed too much heat, but when you move away, the heating sensation disappears.

Radioactive material can sometimes be in a form which can be easily spread around, such as a very fine powder (potentially too fine to be visible), a liquid or gas. If this radioactive material gets onto skin or clothing, or inside the body via inhalation, ingestion or open wounds, you would be described as being contaminated. This means that you continue to be exposed to the ionising radiation no matter how far away you move from the original source as part of the source is travelling with you. Once inside the body, it can remain there for a very long period; this is called an 'internal exposure'.

Hazards from an AWE radiation emergency:

In the unlikely event of a radiation emergency, you could be exposed to radiation hazards by:

- Inhaling radioactive particles in the air
- Eating food or drinking liquids that have been contaminated with radioactive particles
- Spending time in locations where significant amounts of radioactive particles have been deposited on the ground or on other surfaces
- Not washing skin or changing clothes on which radioactive particles have been deposited.

Three main radiation types

There are different types of ionising radiation; their different properties will influence how you can be exposed to the radiation as described above. The three main types are summarised below:

Type	Symbol	Description
Alpha	α	Alpha radiation is not very penetrative and cannot penetrate the outer layer of the human skin or a sheet of paper. However, it is harmful if it is emitted inside the body (internal exposure)
Beta	β	More penetrative than Alpha radiation, but can be stopped with a thin sheet of metal or a pane of glass. Can be harmful if emitted inside the body or within a short distance (1-3m) outside of the body.
Gamma	γ	Gamma radiation is very penetrative (like X-rays), easily passes through the human body and will travel hundreds of metres in air. It requires very dense materials like lead and concrete to stop it. It is most harmful when standing near a source (external exposure) and can be reduced by creating distance from the source.

How could radiation affect your body?

If radiation is absorbed by your body, either from an external (source outside the body) or internal exposure, it can cause changes to tissues in the body at molecular level, affecting your DNA, which is the blueprint for your cells, growth and development. These changes may lead to negative health effects such as cancer, which may not appear for many years after the exposure, but this is very rare. The more you are exposed to radiation, the greater the chance of experiencing some form of health effect as a result – but the risk remains small.

Individuals exposed to very high doses of radiation may receive burns to the skin, damage to the gastrointestinal, cardiovascular or nervous systems. Exceedingly high doses can cause death. However, the levels of radiation required to create these effects are much higher than a member of the public could conceivably receive even during a radiation emergency.

Radiation measurement - quantities and units

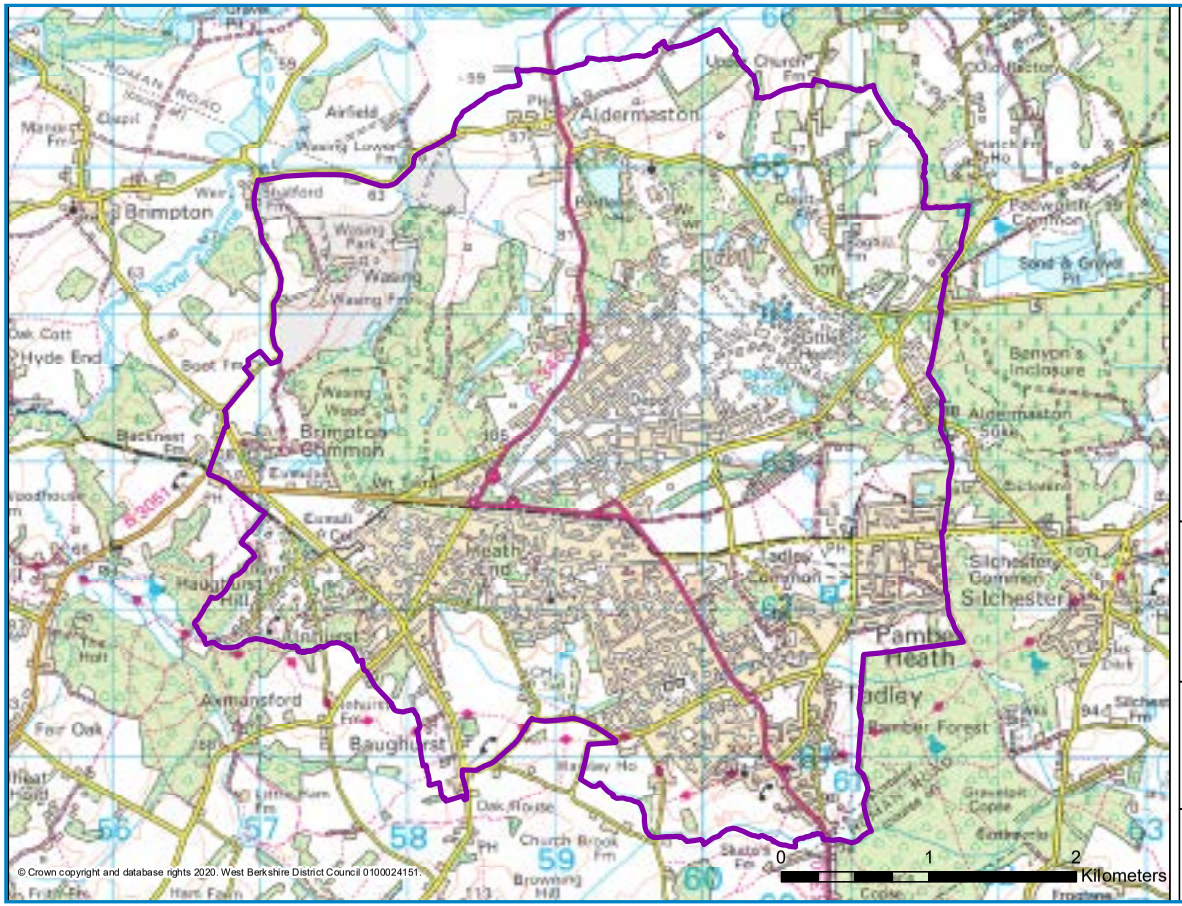
- The long-term effect of ionising radiation on the body is measured in sieverts.
- The sievert (Sv) is the unit of radiation dose.
- The sievert is a large quantity, so the term millisievert or microsievert is often used.
- One millisievert (1mSv) = 1/1000 Sv
- One microsievert (1μSv) = 1/1,000,000 Sv

By following the guidance in this booklet, you can prevent or minimise your exposure to the hazards from a radiation emergency.

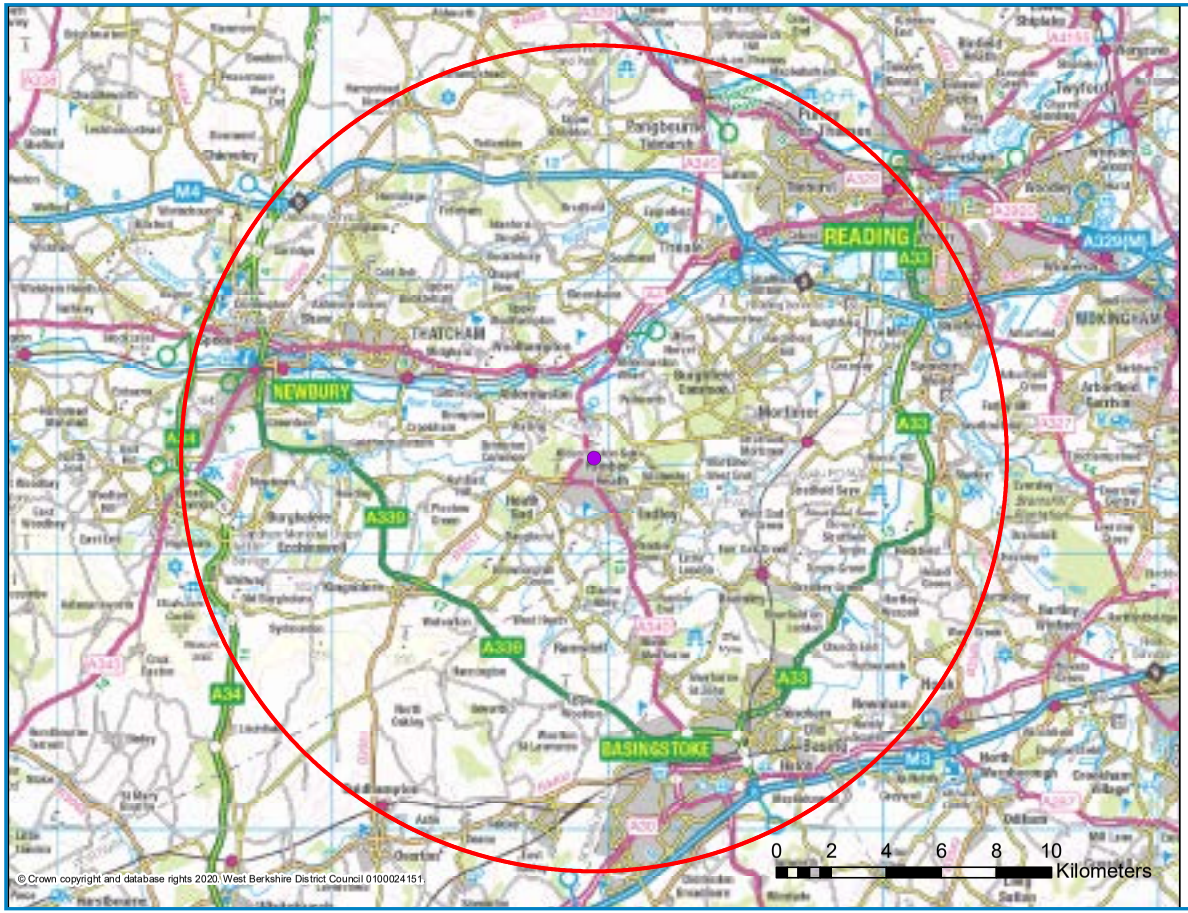
mSv	Example
0.001	Dose from eating ten bananas (from the naturally occurring radioactive content)
0.01	Average annual dose from a flight from the UK to Spain
0.02	Single chest X-ray
0.4	Average annual dose in the UK from all medical radiation
1	Average annual dose in the UK from naturally occurring radon in homes
2	Average total annual dose in the UK from natural radiation sources
8	Average annual dose from all sources of radiation in Cornwall
20	Annual legal worker dose limit
500	Threshold for nausea and reduction in white blood cells

By following the guidance in this leaflet, you can prevent or minimise your exposure to the hazards from a radiation emergency.

Aldermaston Detailed Emergency Planning Zone Map



Outline Planning Zone Map for AWE Aldermaston 15km



Legend

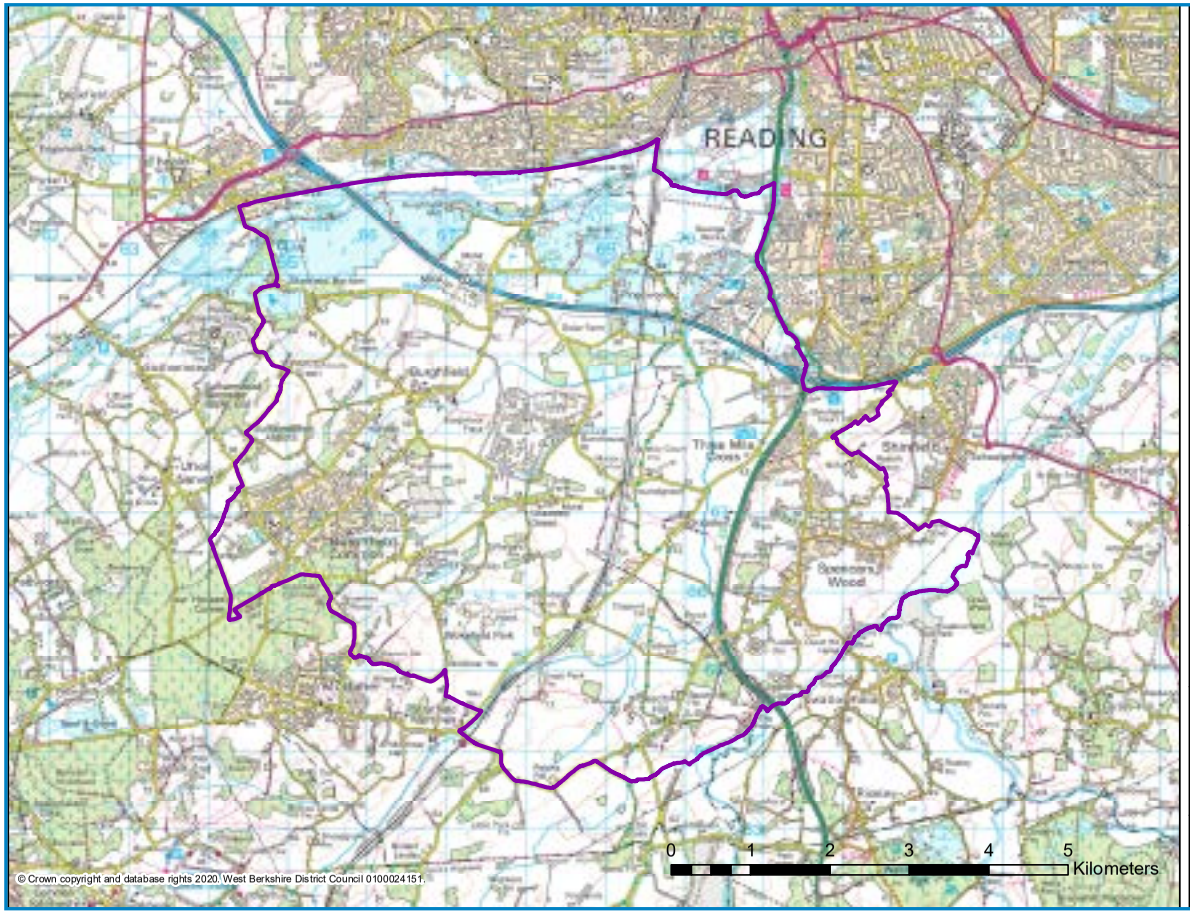
Site Centre

OPZ

23/04/2020

1:173000

AWE Burghfield DEPZ



Legend

DEPZ

23/04/2020

1:60000

Outline Planning Zone Map for AWE Burghfield 12km

Legend

Site Centre

OPZ

23/04/2020

1:140000

What to do in the unlikely event of a radiation emergency at an AWE site

IF you get a call or find out that there is a radiation emergency about AWE then follow the steps below:

 Go in	Go indoors and follow the advice below
 Stay in	Close and stay away from all windows and doors. Damp down or put out fires and turn off any fans that could draw in air from outside
 Tune in	Tune in to local radio and TV. Advice and updates will also be given on news websites and social media.
 Don't use your phone	Don't use your landline or mobile unless there is a separate emergency. This could overload the system and should be left clear for the emergency services.
 Don't leave the area	Don't leave the area unless told to do so by the emergency services. You will be much safer indoors.

TEAR THIS PAGE OFF AND KEEP IT ON YOUR FRIDGE, OR NOTICE BOARD

REPPIR

Radiation Emergency Preparedness and Public Information Regulations

This information has been prepared by West Berkshire Council and AWE. It is valid from its period of issue May 2020 for a maximum of 3 years until May 2023. It will be subject to review and revision following any of the criteria outlined in Regulation 21(6) of REPPIR 19.

This booklet is being distributed to all residents and businesses in the following postcode areas: RG2 0, RG2 6, RG2 9, RG7 1, RG7 2, RG7 3, RG7 4, RG7 8, RG26 3, RG26 4, RG26 5, RG30 3, RG31 7. This is because the DEPZs enter these post codes either partly or fully.

This information is also presented in the off-site emergency plan which can be found at www.westberks.gov.uk/awe
Further information can be found at www.awe.co.uk

More information about the Basic Concepts of Radiation can be found online at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/467205/Basic_concepts_of_radiation_October_2015.pdf

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We are committed to being accessible to everyone. If you require this document in an alternative format or translation, please call Emergency Planning on Telephone 01635 503581.

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