# Gladman Developments Ltd

# Basingstoke and Deane Local Plan Examination

# Issue 8 – Infrastructure

### Question 18: Nuclear Installations

**18.1 Does Policy SS7 provide sufficient guidance to accord with national planning and safety policy?**

18.1.1 Gladman submit that as currently prepared the Local Plan fails to provide a justified and sound strategy for providing development in the vicinity of the Aldermaston Atomic Weapons Establishment (AWE). We critically assert that the Council's proposals overlook the ability to provide further sustainable growth within the settlement of Tadley, and represent an unduly restrictive approach to meeting the town's development needs.

18.1.2 Tadley is one of the largest and most sustainable settlements in the Basingstoke and Deane authority area. Categorised as one of three borough Service Centres in the Council's Sustainability of Settlements Report (June 2008), the town is identified as a District Centre in the Local Plan's emerging retail hierarchy and is described as one of the most appropriate locations for development in the borough in the Council's adopted Local Plan proposals. With a population of 11,473 residents at the time of the 2011 Census, the town benefits from a good range of services and facilities, with excellent public transport links to Basingstoke and the wider surrounding area.

18.1.3 Despite Tadley's classification as one of only three higher tier settlements in the borough after Basingstoke town, the Local Plan fails to direct any housing growth or allocations to the settlement on the sole basis of its proximity to the AWE. Describing that this position has been reached in consultation with the AWE Off-Site Planning Group, the Council consider that is unable to make a robust case that development in the town would be suitable and deliverable at this time.

18.1.4 Whilst recognising that the Aldermaston AWE is an important consideration in the assessment of development proposals, Gladman assert that there is no sound basis or justification for the Council's decision to exclude Tadley from the Local Plan's spatial strategy. The AWE's

implications for further housing growth in Tadley has now been considered by both the Secretary of State and the Council's own planning committee in respect of the Boundary Hall[1] and Burnham Copse Primary School[2] proposals, where the very real but small risks to public safety were considered to be outweighed by the benefits of development. Gladman contend that the extremely remote likelihood of an accident with off-site consequences at the AWE does not support the Council's disproportionate policy approach.

18.1.5 To gain a clearer understanding of the Council's position, Gladman have commissioned consultants Mike Thorne Associates to assess the extent to which potential accidents at the AWE should be a material consideration in defining Tadley's role in the Local Plan. Provided in full as Appendix A to this statement and taking account of the regulatory framework within which developments in the vicinity of nuclear licensed sites must be considered, Mike Thorne's evidence demonstrates why the Council are advancing a strategy that is overly restrictive in response to Tadley's policy situation:

- The limited size of accidents with off-site consequences that could occur at the AWE means that effective radiation doses to residents of Tadley from a bounding reference accident would be relatively low, i.e. in the range of 2 to 17 mSv, even if they did not shelter, as they are advised to do. For worst case accidents effective doses could be a factor of two larger, but the frequency of such accidents would be about a factor of ten lower than for bounding reference accidents. These effective doses are similar in magnitude to those arising from natural background radiation or from a single CT scan. This is not to argue that they are of no importance, but they are within the range commonly experienced by members of the public in the course of their everyday life

- The frequency of accidents with off-site consequences are low - below one in ten thousand per year for bounding reference accidents and below one in one hundred thousand per year for worst case accidents. This means that the annual risk of death from accidents up to and including the bounding reference accident in size is no more than about one in ten million. For larger accidents, the risk of death is no more than one in fifty million. These risks are those that would arise in the absence of sheltering, which would substantially mitigate the risks. Even without sheltering, the risks are similar to, or less than, those of being killed by being struck by lightning and are more than a factor of ten below the boundary of the broadly acceptable risk region, as defined by the Health and Safety Executive (HSE)

[1] Appeal Ref: APP/H1705/V/10/2124548
[2] Minutes of Planning Committee held 25th February 2015

- If a bounding reference accident were to occur with the wind blowing toward Tadley and mitigation of effective doses by sheltering was not taken into account, about four deaths are projected to occur as a result of the accident. These would arise over several decades and would not be detectable against the general mortality of the population over that period. Nevertheless, this number of projected deaths emphasises why it is important to have an appropriate off-site emergency plan in place

- The AWE Off-Site Emergency Plan properly emphasises warning and informing with a view to achieving short-term sheltering. Such sheltering would very substantially reduce the effective doses incurred by individuals present downwind of the accident. Such sheltering would only be required until the atmospheric release from AWE Aldermaston had ceased. This would typically be a few hours. Provision of such advice is largely automated and does not place a heavy load on the authorities

- It is possible that if less restrictive planning requirements were imposed within the DEPZ that Tadley could increase in population relatively rapidly. Nevertheless, there is limited space for development within the current DEPZ. Together with observations of the growth in population of Wards outside the DEPZ between 2001 and 2011, it seems unlikely that the population of Tadley would grow by more than about 3,000 or 20% of the current population. In terms of sheltering, it seems likely that the new housing stock would have better control on ventilation and be more suitable for sheltering than some of the existing stock. Overall, a growth in population of up to 20% might require some detailed changes to the off-site emergency plan, but there is no reason to suppose that substantial qualitative changes would be required.

- As the off-site emergency plan has to be revised every three years, it should be straightforward to integrate updates with the implementation of proposed residential and other developments. However, it will be important to ensure that the design of these developments gives consideration to key issues in emergency planning and that access for emergency services to AWE Aldermaston is not impaired, or is enhanced

- Even if there was a significant increase in the population of Tadley, it seems clear that it would still comply with the general requirement that the general characteristics of the area around this nuclear licensed site should be preserved.

5.1.1 The Council must recognise that its strategy for Tadley will result in a number of avoidable and adverse consequences for a town that has already seen its resident population fall by 183 people between the 2001 and 2011 Census. As already acknowledged in the Council's

own Sustainability Appraisal and discussed further by consultants Rural Solutions in Appendix B to this statement, a lack of further housing development in Tadley is likely to have a number of social and economic consequences that include:

- A further exacerbation of the unhealthy population change that has taken place in the town over the past ten years, which has seen its overall population decrease by -2% compared to the average borough change of +10%, with a 19% fall in the number of residents aged 16 and under a 28% increase in the population aged 65 and over.

- A suppression of house building that is likely to create difficulties for young families and working age households looking to remain in the area, leading to a reduction in the expenditure that is available to maintain the town's status as a district retail centre and support local shops and support for key services

- A shrinking population and pool of labour to support local businesses and employers. Further housing provision within Tadley would help to provide local homes for workers at the AWE, helping to reduce unsustainable commuting patterns associated with employees travelling into the town.

18.1.6 Whilst Gladman note the provisions of Policy SS7, we submit that this policy is excessive and fails to recognise that there is capacity for a more substantial level of development within Tadley. Although the supporting text to Policy SS7 indicates that the consultation zones around the AWE and the Office for Nuclear Regulation's (ONR) advice in respect of proposals may change over time, the Council fail to describe how this may lead to a review of the Local Plan's approach. Gladman note that a recent review recommended that the Aldermaston DEPZ should be set at a revised radius of 2.125 km from the centre of the AWE site.

18.1.7 Gladman submit that the Local Plan's approach to Tadley must now be revised to make specific provision for further housing to be delivered in the town. It must now be acknowledged that there is further scope for housing development to come forward to meet Tadley's needs, without leading to an unacceptable risk to human health and affecting the AWE Off-Site Emergency Plan arrangements. Gladman reiterate that there is no reference to restricting development due to the presence of AWE installations in footnote 9 of the Framework.

**APPENDIX A**

**Evaluation of the Degree to which Potential Accidents with Off-site Radiological Consequences occurring at AWE Aldermaston are a Material Consideration in Defining the Overall Future Pattern of Development of Tadley**

**Mike Thorne Associates**

MTA/P0207/2015-2: Issue 1

# An Evaluation of the Degree to which Potential Accidents with Off-site Radiological Consequences occurring at AWE Aldermaston are a Material Consideration in Defining the Overall Future Pattern of Development of Tadley

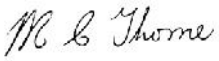
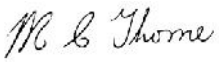
A technical note produced for: Gladman Developments Limited

M C Thorne

Mike Thorne and Associates Limited
Quarry Cottage
Ravensford Lane
Hamsterley
Bishop Auckland
County Durham
DL13 3NJ

September 2015

| | |
|---|---|
| **Title** | An Evaluation of the Degree to which Potential Accidents with Off-site Radiological Consequences occurring at AWE Aldermaston are a Material Consideration in Defining the Overall Future Pattern of Development of Tadley |
| **Customer** | Gladman Developments Limited |
| **Customer reference** | |
| **Confidentiality, copyright and reproduction** | Commercial-in-Confidence<br><br>This document has been prepared by Mike Thorne and Associates Limited in connection with a contract to supply goods and/or services and is submitted only on the basis of strict confidentiality. The contents must not be disclosed to third parties other than in accordance with the terms of the contract. |
| | |
| **File reference** | P0207 |
| **Report number** | MTA/P0207/2015-2 |
| **Report status** | Issue 1 |
| | |
| | Mike Thorne and Associates Limited<br>Quarry Cottage<br>Ravensford Lane<br>Hamsterley<br>Bishop Auckland<br>County Durham<br>DL13 3NJ<br>Telephone: 01388 488724<br>e-mail: MikeThorneLtd@aol.com |

| | **Name** | **Signature** | **Date** |
|---|---|---|---|
| | | | |
| **Authors** | M C Thorne |  | 4 September 2015 |
| | | | |
| **Approved for Submission** | M C Thorne |  | 4 September 2015 |

# Contents

# 1. Introduction

1.1 The Town of Tadley is located in Hampshire on the border with Berkshire. It lies immediately to the south of AWE Aldermaston. During the 1950s and 1960s, AWE Aldermaston became the area's largest employer and a large number of houses were built in Tadley to accommodate workers at the site. However, because Tadley is located entirely within the Detailed Emergency Planning Zone (DEPZ) for AWE Aldermaston, it is difficult to obtain planning permission for new residential developments in the town, with implications also for other non-residential, e.g. retail and amenity, developments. In this note, I argue that the individual and societal radiological risks to residents of Tadley, while real, are so small that they should not be regarded as a significant factor when considering whether residential developments should be permitted. Furthermore, I also argue that a reasonable programme of such developments, provided that it does not grossly increase the overall population of Tadley and provided that some other practical considerations (such as maintenance of ready access of the emergency services to the AWE Aldermaston site) are addressed, should not adversely affect the off-site emergency plan that has to be put in place for AWE Aldermaston. This plan has to be reviewed and updated every three years and it should be straightforward to adapt it to a structured programme of developments in Tadley, rather than regarding the current plan as a straightjacket that severely constrains the potential for giving planning permission for residential and other developments within the DEPZ.

1.2 In this Technical Note, I first describe the regulatory framework within which developments in the vicinity of nuclear licensed sites are permitted (Section 2). I then estimate individual and societal risks to residents of Tadley from the site and show them to be small (Section 3). This naturally leads on to a discussion of the off-site emergency plan and its role in mitigating these, already small, risks, as well as the extent to which that plan might be adversely affected by a less restrictive approach to the granting of planning permission for developments within the current DEPZ (Section 4). Detailed conclusions from this review, supportive of the overall views that I have expressed in this introduction, are provided in Section 5, and references cited in the review are listed in Section 6.

# 2. Regulatory Context

2.1 In broad terms, the two relevant considerations are those relating to controls on developments in the vicinity of nuclear licensed sites and those related to the development and maintenance of off-site emergency plans. Of course, these two considerations are interrelated, in that controls on development, imposed for whatever purpose, are a factor in determining the numbers and characteristics of individuals to whom the off-site emergency plan applies, while the requirements of the off-site emergency plan need to be taken into account as a material consideration when determining the acceptability of proposed developments. Nevertheless, historically these two topics have been handled somewhat differently, so it is convenient to present them separately.

## 2.1 Demographic Considerations

2.2 In the UK, controls on residential and other developments in the vicinity of nuclear installations have always been closely related to the policy position that has been adopted relating to the siting of those installations. Furthermore, the guidance on siting was largely developed in respect to nuclear power stations and has been applied by extension to control developments in the vicinity of other types of nuclear installation, such as AWE Aldermaston.

2.3 Relevant documents giving details of the development of policy on the siting of nuclear installations in the UK comprise Marley and Fry (1955), Farmer (1960), Charlesworth and Gronow (1967), Gronow (1969; 1978) and Tildsley (1985). However, the most recent government statement of that policy as it relates to developments in the vicinity of existing nuclear power stations is that given by Mr Michael Spicer, Secretary of State for Energy (Hansard, 1988) and reproduced by Highton and Senior (2008). This statement is given in full below.

2.4 'Mr Michael Spicer: ...Once a site has been accepted for a nuclear station, arrangements are made to ensure that residential and industrial developments are so controlled that the general characteristics of the site are preserved, and therefore local authorities consult the inspectorate with regard to any proposed development which might lead to an increase in population close to the site and on large developments further from the site. Limiting criteria based upon population distribution are used only for guidance and the inspectorate would not necessarily insist on rigid adherence to them. Other unquantifiable factors are also taken into account.

2.5 The limiting criteria are in the form of cumulative weighted populations out to various distances all around the site and in any 30 degree sector. To assess a site against the criteria at a certain distance, the population for a given band distance is multiplied by the appropriate weighting factor and the values up to the distance being evaluated are added together.'

2.6 It is important to note that this statement is primarily a description of the then current practice by the Nuclear Installations Inspectorate rather than a direction to the Inspectorate.

2.7 Subsequently, the quantitative approach used to assess the significance of changes in population in the vicinity of a nuclear installation has been set out in detail by Highton and Senior (2008) and Highton (2008). However, it is important to emphasise that the Office for Nuclear Regulation (ONR) no longer adopts this quantitative approach to evaluating the significance of individual developments and would not conduct a demographic analysis for individual planning cases. Instead, ONR has advised that 'After receiving a request for consultation on a planning application, where the proposed development lies within a consultation zone around a nuclear licensed site, ONR would consider the following questions: a) Does the proposed development represent an external hazard to a nuclear installation; and b) Could the proposed development be accommodated within the Local Authority off-site emergency planning arrangements.' (Randles, 2014).

2.8 If ONR had significant health and safety concerns on either count then it would advise against the development. However, if ONR was satisfied that the proposed development could be accommodated within the Local Authority off-site emergency planning arrangements and that it posed no external hazard to the installation, then ONR would have no grounds to advise against (Randles, 2014).

## 2.2 Off-site Emergency Planning

2.9 The development and implementation of an off-site emergency plan is a requirement under the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR). REPPIR requires nuclear operators and local authorities to make and implement arrangements to ensure that the members of the public are properly informed and prepared in advance about what to do in the unlikely event of a radiation emergency occurring and provided with information if an emergency actually occurs. In respect of AWE Aldermaston, West Berkshire Council has the duty under REPPIR to prepare, revise, test and implement an off-site emergency plan (the on-site plan being the responsibility of AWE Aldermaston). The off-site plan is required to bring together the emergency arrangements of all the off-site agencies with a role to play in the intervention and mitigation of an emergency occurring at AWE Aldermaston, and to prepare arrangements to supply information to members of the public in the event of a radiation emergency actually occurring.

2.10 Currently the emergency arrangements required under REPPIR are based on (a) reference accidents and (b) the principle of extendibility. The reference accident helps define a Detailed Emergency Planning Zone (DEPZ), identified by the operator within which arrangements to protect the public by introducing countermeasures are planned in detail. For practical reasons the DEPZ can extend further to avoid, for example, splitting streets in half if one part of a street is inside the DEPZ while the other part is outside. The DEPZ corresponds to a zone in which the effective dose to an individual from the reference accident could exceed 5 mSv. In the case of AWE Aldermaston, calculations show that, on this basis, the DEPZ should have a radius of about 2 km (see Section 3 for details). However, for historical reasons and for the convenience of including all of Tadley within the DEPZ, the radius of the DEPZ is cautiously set to 3 km (see further the discussion in Section 3).

2.11 The reference accident is the worst reasonably foreseeable accident with radiological consequences against which it is considered reasonable to prepare detailed emergency plans. For emergency planning purposes the reference accident assumes that, during a release, a pathway occurs that allows radioactive material to escape uncontrolled into the environment.

2.12 Extendibility means that emergency plans need to be capable of responding to accidents, which, although extremely unlikely, could have significant radiological consequences beyond the boundaries of the DEPZ. The measures that are required to extend the detailed arrangements cannot be precisely planned because the nature and potential of accidents can vary. The exact response would be based on an assessment made at the time. The response may make use of local and national plans prepared to deal with a wide range of emergencies.

2.13 The current off-site emergency plan for AWE Aldermaston is set out in West Berkshire Council (2011). This plan was applicable through to November 2014 and discussions are ongoing as to its revision (Richardson, 2015a). However, the following description and discussion is based on the 2011 version of the plan. The associated REPPIR leaflet was last printed in 2013 (West Berkshire Council and AWE, 2013) and will be updated in accord with the revised off-site emergency plan, if this proves to be necessary (Richardson, 2015b).

2.14 Although West Berkshire Council is the Local Authority (LA) with overall responsibility for the development of the off-site emergency plan, it consults with a substantial number of other bodies who would have key roles in the implementation of the plan in the event of an accident with off-site radiological consequences. In particular, the most recent plan (West Berkshire Council, 2011) was prepared by the Off Site Plan Working Group, chaired by West Berkshire Council and consisting of Emergency Planning Officers and professionals drawn from the other organisations that are also copy holders of the plan. These include Basingstoke and Deane Borough Council.

2.15 In the event of an incident at AWE Aldermaston requiring implementation of the plan, co-ordination of the response would be the responsibility of Thames Valley Police in the first instance. However, they would transfer responsibility to other organisations in the later (recovery) stages of the incident.

# 3. Potential Accidents at AWE Aldermaston with Off-site Radiological Consequences

## 3.1 Types of Potential Accidents

3.1 Potential accidents at the AWE Aldermaston site are discussed in the AWE Aldermaston Hazard Identification and Risk Evaluation (HIRE) together with the associated Report of Assessment (RoA) (AWE, 2011a; 2011b; see also AWE, 2012). In turn, these reports are reviewed by the Health & Safety Executive, Office for Nuclear Regulation (HSE, 2012). More recent data on potential accidents on the AWE Aldermaston Site are given in the REPPIR Report of Assessment for the AWE Aldermaston Site of November 2014 (AWE, 2014).

3.2 The HSE review (HSE, 2012) states that there are many facilities at the two AWE sites (Aldermaston and Burghfield) that handle a range of radioactive, explosive and chemical materials, which pose varying degrees of risk. The radioactive materials held and used at the premises include plutonium, uranium and tritium (see also AWE, 2014, Section 6 and Annex 1 of West Berkshire Council, 2011). These materials are held in sufficient quantities that the requirements of the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR) apply and make a HIRE assessment required. There are other sources of radioactivity on the site. These are substantially less significant than those present in the main materials and are used for safety checks and normal industrial purposes (e.g. sources for radiography and in level gauges). These are well controlled, pose no threat to the public, and have no potential

to give rise to a radiation emergency (AWE, 2012, paragraph 6.7 and AWE, 2014, paragraph 6.7).

3.3 It should also be noted that the off-site emergency plan (West Berkshire Council, 2011, paragraph 2.5.2) states that:

a. An explosion resulting in a nuclear yield is not possible by virtue of the safety features in the design of the weapon;
b. A reactor accident with off-site consequences is also not possible, as the site does not have an operating nuclear reactor with a significant core inventory of fission products;
c. The 'Herald' nuclear reactor at AWE Aldermaston was closed in the 1980s and its nuclear fuel removed from the site.

3.4 Operations at AWE are undertaken on a batch production basis, almost wholly during standard daytime working hours, with nuclear production materials stored securely overnight within the nuclear facilities. The AWE sites do not have a nuclear power plant (see above), nor do they hold stored nuclear fuel requiring decay heat removal. There are no bulk quantities of highly active liquors, irradiated reactor fuel or large quantities of high-level waste stored on either of the two sites (HSE, 2012). As HSE (2012) states, these considerations restrict the possibility of, and potential dose consequences arising from, a reasonably foreseeable radiation emergency at either site.

3.5 More specifically, AWE (2012, paragraphs 9.2 and 9.3 and 2014, paragraphs 9.2 and 9.3) provides a concise statement of the types of accidents that could give rise to significant off-site radiological impacts. That statement in AWE (2014) is reproduced in full below.

3.6 'The majority of identified potential faults will not result in any release of particulate radioactivity to the open environment, by virtue of the prevention, mitigation and protection provisions installed and maintained in each facility. For a significant release of radioactivity from a nuclear facility to be possible it is necessary for an initiating event to propagate and overcome all the barriers between the hazardous radioactive materials present inside the facility and the outside environment, or for these all to fail at the time of demand. These barriers have been designed to accommodate the form of the material itself, any cladding and all the containments. The physical boundary of the facility forms part of the containment system as well. Given that all of these barriers are breached, then some radioactivity could be transported out of the facility and be dispersed into the atmosphere. For many postulated accident scenarios this would be through a designed and authorised discharge point, so mitigation by appropriate filters would minimise the particulate release.

3.7 The most likely scenario in a facility which could have the potential to affect areas beyond the AWE, Aldermaston site boundary is a major fire. Such a fire might be caused by a seismic event or other significant insult to a facility or group of facilities. Only a major fire or fires (initiated as a result of a significant seismic event) engulfing a whole building or entire compartments within a building where significant quantities of radioactive material were present would have the potential to cause a radiological hazard to the public outside the site. The nature of fire accidents falls within the concept of accidents currently considered to be "reasonably foreseeable".'

3.8 Paragraph 9.4 of AWE (2014) adds that 'It is not reasonably foreseeable that the consequences of potential unauthorised behaviour of employees or the public would extend beyond the consequences of the accident scenarios assessed by AWE under regulation 4 of REPPIR.'

3.9 With respect to the pathways of significance in respect of such accidents, the HSE (2012) comments that AWE has concluded that direct inhalation of contaminants within a radiation plume is the dominant contribution. Other pathways, including ingestion and exposure by absorption through the skin, are generally considered negligible by comparison.

## 3.2 Frequencies of Potential Accidents

3.10 For its 2011 REPPIR submission, AWE Aldermaston adopted a reference accident approach to bounding the area that may be affected by a reasonably foreseeable radiation emergency. In this context, AWE adopted a definition of 'reasonably foreseeable' to include all fault sequences for which the associated dose has a return frequency of at least one in one hundred thousand per annum (HSE, 2012). AWE also examined fault sequences with a frequency of as low as one in a million per annum to establish whether there would be any stepped increases in dose consequences with the inclusion of these less frequent events. Within its HIRE, AWE also considered some even less frequent fault sequences with off-site consequences, but considered that these are not reasonably foreseeable for the purposes of detailed planning of the emergency response. However, such fault sequences are taken into account when considering the extendibility of the emergency plans.

3.11 In general, the frequency of accidents decreases as their severity increases. Therefore, the reference accident can be taken as exhibiting a frequency of around one in ten thousand per annum (the maximum return frequency for initiating seismic events, see Section 3.3) to one in one hundred thousand per annum.

## 3.3 Radiological Consequences of Potential Accidents

3.12 AWE categorises individual facilities according to the radiological hazard with which they are associated. Category 5 is defined as 'facilities or operations which are capable of yielding a significant off-site hazard at a level at which countermeasures (such as sheltering or evacuation) would be required...'. The term 'significant off-site hazard' is defined in the RoA (AWE, 2011b) as 'an off-site whole body effective dose $\geq$ 5 mSv at the nearest site boundary' (HSE, 2012).

3.13 More broadly, the Off-site Emergency Plan for AWE Aldermaston (West Berkshire Council, 2011, paragraph 2.6.4) states that accidents at the site should not exceed Level 5 on the International Nuclear Event Scale (INES) (see http://www-ns.iaea.org/tech-areas/emergency/ines.asp). Thus, it is determined that serious (Level 6) and major (Level 7) accidents (as can occur at nuclear power stations) cannot occur at AWE Aldermaston. Both the Chernobyl and Fukushima accidents have been classified as Level 7 events.

3.14 For each individual facility, the approach adopted in the HIRE is to initially assess the associated fault sequences to establish whether their off-site dose consequences are

above the 5 mSv threshold. They are then screened by frequency to establish whether the events are reasonably foreseeable (i.e. have a probability of occurrence of more than one in one hundred thousand per annum). The reference accident for each facility corresponds to the reasonably foreseeable fault sequence that leads to the largest off-site dose consequence (HSE, 2012).

3.15 Four facilities on the AWE Aldermaston site were assessed as having the potential to result in off-site doses of more than 5 mSv and a bounding 5 mSv circular dose contour, centred on the facility concerned, was established based on the reference accident for that facility. The largest such dose contour had a radius of 1,035 m and the next largest had a radius of 950 m. The 5 mSv dose contours for the other two facilities were considerably smaller (HSE, 2012).

3.16 In order to account for common cause effects from extreme external events, the HIRE also presents an analysis that combines dose estimates from individual facilities. This relates to reasonably foreseeable fault sequences initiated by a seismic event (based on a return frequency of less than one in ten thousand years), which leads to radionuclide releases from two facilities, due to the common cause. For each pair of facilities, the most adverse wind direction was assumed and the dose contour was conservatively increased to account for the distance between the facilities and the nominal centre of the site. This gave an overall bounding 5 mSv off-site circular dose contour at 2,125 m from the AWE Aldermaston centre location (HSE, 2012), i.e. substantially less than the 3 km radius of the DEPZ (note that this value for the radius has been in use for a substantial period and is not based on the reasonably foreseeable accidents currently envisaged in assessments by AWE Aldermaston and accepted as appropriate by the ONR). More recently, AWE (2014) reports that '[t]he bounding reference accident for the AWE Aldermaston Site is a seismic event leading to consequential fires causing simultaneous loss of containment in multiple facilities with an unfavourable wind direction that would cause cumulative doses from two separate facilities' (AWE, 2014, paragraph 15.2). For such an accident '[t]he maximum foreseeable radiation dose that could potentially be received by a member of the public at the site boundary has been assessed by AWE as 16.9 milliSieverts [mSv].' (AWE, 2014, paragraph 15.3). Furthermore, 'AWE's assessments have concluded that the area in which a member of the public might potentially receive a radiation dose of up to 5 milliSieverts [mSv] as a result of a reasonably foreseeable radiation emergency at AWE Aldermaston is bounded by a distance of 1.925 kilometres from the centre of the existing DEPZ for the Aldermaston Site (National Grid Reference SU 595 635). These dose assessments include contributions from plume inhalation, and the inhalation of re-suspended radioactive material over the year following the release. Contributions from irradiation from the passing plume or from deposited material have been assessed as negligible and are not included in this assessment.' (AWE, 2014, paragraph 14.2). Note that the 5 mSv dose contour has decreased slightly from 2125 m to 1925 m in the 2014 assessment and that the centre of this circular dose contour is now assigned a precise geographical location.

3.17 AWE also considered the dose consequences from a number of severe infrequent fault sequences involving extreme external events that were not considered to be reasonably foreseeable. These led to a range of 5 mSv dose contours both within and beyond the current Detailed Emergency Planning Zone (DEPZ) which is circular with a cautiously defined radius of 3 km, with its origin at the site centre. On the basis of the 2011 HIRE

(AWE, 2011a; 2011b), the HSE (2012) recommended that the ONR Emergency Arrangements Team should advise the Local Authority to adopt a circular DEPZ with a minimum radius of 2.125 km, with its origin at the site centre. However, subsequently, ONR discussed in detail with West Berkshire Council the consideration that a circular area of 2.125 km radius from the centre of the site would present a situation in which the technical basis for the DEPZ would cut through Tadley. This would present a significant issue in terms of delivery of the REPPIR emergency plan. Therefore, in terms of emergency planning and to ensure the protection of public and society in the event of radiation emergency, ONR considers it to be appropriate to set the DEPZ for AWE Aldermaston nuclear licensed site as a circular area of a distance of 3 km from the centre of the site (ONR, 2013), i.e. the value currently adopted in the off-site emergency plan (West Berkshire Council, 2011). However, the size of the DEPZ is a matter that is currently being reviewed in the context of updating the off-site emergency plan (Richardson, 2015a).

3.18 In interpreting this information relating to the 5 mSv dose contours, it is relevant to note the dose decreases according to a power law, $E = A/x^n$, where $E$ (mSv) is the effective dose, $A$ is a coefficient that depends upon the characteristics of the release, $x$ (m) is the downwind distance and n is a coefficient that typically has a value of approximately 1.5 (Highton, 2008; Highton and Senior, 2008). Thus, for example, if the 5 mSv dose contour is at 1,000 m from the source, the 2.5 mSv dose contour will be at a distance $x$ (m) given by $x = 1{,}000\times(5.0/2.5)^{1/n}$. For n = 1.5, this gives the 2.5 mSv contour at 1,590 m. More generally, the fall-off in dose with distance is as shown in Figure 3.1, normalised to 5 mSv at a distance of 1,000 m.

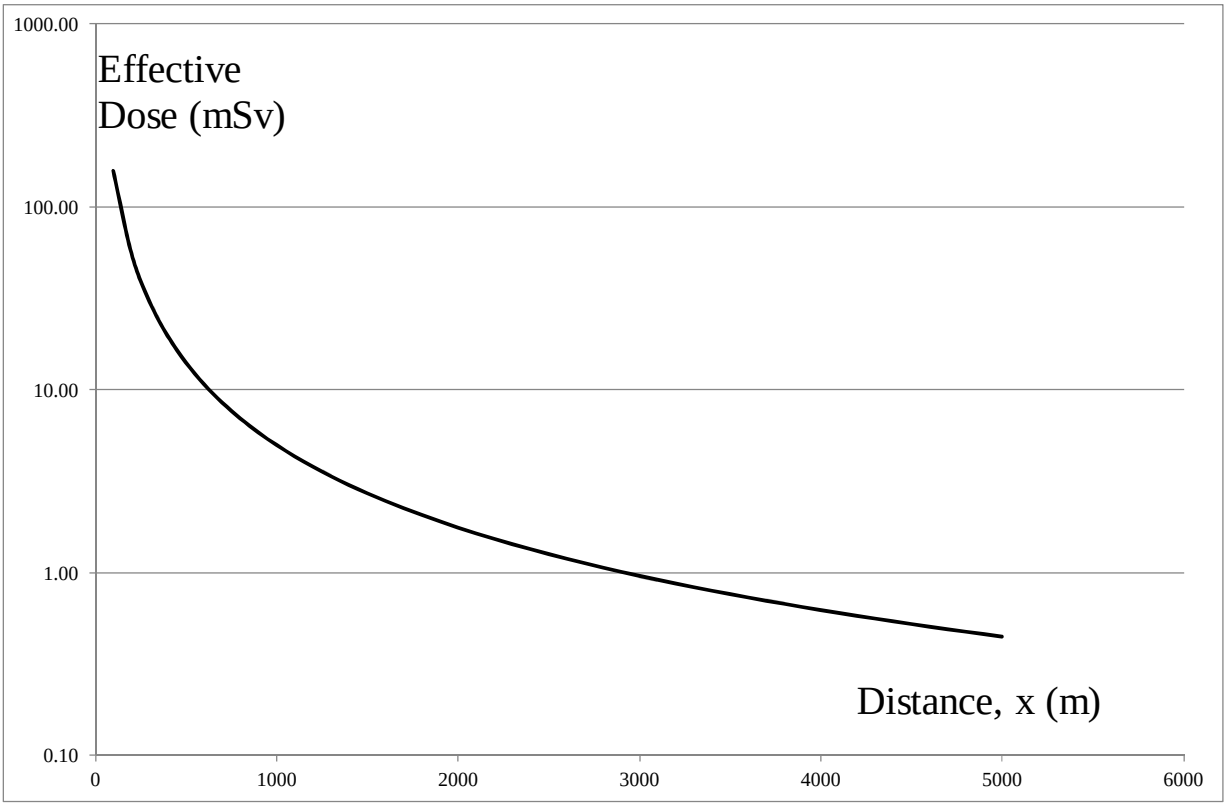



**Figure 3.1: Variation of Effective Dose with Distance Downwind**

3.19 Typically, the southern boundary of the AWE Aldermaston site, which is its distance of closest approach to Tadley is about 800 to 1,000 m from the centre of the DEPZ. Along this boundary, the effective dose from a reference accident is assessed as 16.9 mSv. The Town of Tadley lies mainly between this distance and the boundary of the DEPZ at 3,000 m from its centre. Applying the $1/x^n$ relationship described above, this results in an effective dose of about 4 to 6 mSv at 2,000 m from the centre of the DEPZ and about 2 to 3 mSv at 3,000 m. These results are in line with the recommendation described in paragraph 3.17, that the DEPZ should have a radius of 2,125 m, bearing in mind that the distance to the 5 mSv contour has recently been reduced from 2,125 m to 1,925 m (see paragraph 3.16).

3.20 For severe infrequent fault sequences (with a probability of occurrence extending to below one in one million per year), the 5 mSv dose contours were both within and beyond the current DEPZ with a radius of 3,000 m. Taking the 5 mSv contour typically to be at 3,000 m, worst case accidents, occurring with an annual probability of no more than about one tenth of that of the bounding reference accident, would typically result in a radiological impact no more than about a factor of two larger.

3.21 As the report on the Public Inquiry relating to the Boundary Hall development emphasised (Ware, 2011, paragraph 289), doses of this magnitude would only be received if the wind was blowing towards Tadley at the time of release. Furthermore, sheltering (which is the recommended emergency response, as discussed in Section 4) would substantially mitigate these doses and staying indoors, with the doors and windows closed, has been assessed to remove almost all the risk (Ware, 2011, paragraph 291). Similarly, AWE (2012, paragraph 15.5) comments that, in the event of a major release of radioactive material from the site, the dose to the public would be reduced by the imposition of appropriate countermeasures that could include the issue of instructions to the public to shelter (which reduces cloud inhalation and irradiation doses) and subsequently to evacuate (which prevents further exposure from resuspension of deposited material by moving the public from the affected area to facilitate recovery and remediation, as appropriate).

## 3.4 Comparison of Risks from Potential Accidents with those of Everyday Life

3.22 Based on the analysis presented in Section 3.3, it is determined that bounding reference accidents giving an effective dose of 2 to 17 mSv to residents of Tadley located 800 m to 3,000 m from the centre of the AWE Aldermaston site could occur with a probability ranging from one in ten thousand ($1\ 10^{-4}$) per year down to one in one hundred thousand per year ($1\ 10^{-5}$) per year. Here, the convenient notation is used that $10^n$ means $10\times10...\times10$, where n is the number of factors of ten. Similarly, $10^{-n}$ means $1/(10\times10...\times10)$.

3.23 For more extreme accidents, effective doses could range up to about a factor of two larger than for the bounding reference accident, but the likely frequency of such accidents would be no more than $1\ 10^{-5}$ per year and could be as low as $1\ 10^{-6}$ per year.

3.24 These effective doses are relatively low and are within the range that the linear dose response with no threshold (LNT) model generally applied in radiological protection (ICRP, 2007). That model assigns detriment-adjusted risk coefficients of $5.5\ 10^{-5}$ per mSv for cancer and $2.0\ 10^{-6}$ per mSv for heritable effects in the whole population

(including infants, children and adults). Thus, the overall risk is $5.7\ 10^{-5}$ per mSv, which may be thought of as equivalent to the risk of death arising from the irradiation. Thus, for a bounding reference accident giving rise to an effective dose of 2 to 17 mSv, the risk conditional on that accident occurring is in the range $1.1\ 10^{-4}$ to $1.0\ 10^{-3}$, i.e. between about one in nine thousand and one in one thousand. Furthermore, as the annual probability of such an accident occurring is less than one in ten thousand, the annual risk of death from accidents up to and including the bounding reference accident in size is no more than about one in ten million (accidents substantially smaller than the bounding reference accident would not have significant off-site consequences).

3.25 For accidents, larger than the bounding reference accident, the effective dose could be doubled, corresponding to a conditional risk of between $2.3\ 10^{-4}$ and $1.9\ 10^{-3}$. However, the annual probability of such an accident is no more than about one in one hundred thousand, so the annual risk of death is no more than one in fifty million.

3.26 The above risks make no allowance for the probability that the wind is blowing towards Tadley or of mitigation of the effective dose through sheltering.

3.27 Thus, overall, the annual probability of death for an individual living in Tadley due to an accident at AWE Aldermaston with significant off-site radiological consequences is assessed as less than one in ten million, and could be substantially less if the probability that the wind is blowing towards Tadley and mitigation of the effective dose through sheltering were taken into account.

3.28 For comparison, the HSE in its report Reducing Risks, Protecting People (HSE, 2001) has given annual risks of death from various causes. These include 1 in 16,800 from all forms of road accident, 1 in 29,000 from lung cancer caused by the radioactive gas radon in dwellings, 1 in 510,000 from a gas incident (fire, explosion or carbon monoxide poisoning) and 1 in 18,700,000 from lightning. From this comparison, it is clear that the annual probability of death for an individual living in Tadley due to an accident at AWE Aldermaston is likely to be similar to or less than the annual probability of being killed by being struck by lightning.

3.29 It is also relevant to note that, when assessing the significance of individual risks the HSE (2001) comments that it 'believes that an individual risk of death of one in a million per annum for both workers and the public corresponds to a very low level of risk and should be used as a guideline for the boundary between the broadly acceptable and tolerable regions. As is very apparent from Tables 1-4 at Appendix 4 [of HSE, 2001], we live in an environment of appreciable risks of various kinds which contribute to a background level of risk – typically a risk of death of one in a hundred per year averaged over a lifetime. A residual risk of one in a million per year is extremely small when compared to this background level of risk. Indeed many activities which people are prepared to accept in their daily lives for the benefits they bring, for example, using gas and electricity, or engaging in air travel, entail or exceed such levels of residual risk.'

3.30 Thus, the annual probability of death for an individual living in Tadley due to an accident at AWE Aldermaston is at least an order of magnitude below the boundary of the tolerable region, i.e. it is well within the region where the risk would be judged broadly acceptable. This conforms with the judgement of the Secretary of State in

respect to the Boundary Hall development close to the southern boundary of the AWE Aldermaston site. In paragraphs 21 to 23 of his judgement, he concludes as set out below.

3.31 '21. [The] Secretary of State agrees … that, with the exception of those general LP policies dealing with pollution and environmental well-being, the application accords with the development plan including the site being identified in a saved LP policy for the type of development currently proposed (IR395). Furthermore, the site is in a sustainable location, the proposal would make good use of the land in both visual and sustainability terms and would provide planning benefits (IR396) including the provision of affordable housing and the replacement of community facilities...'

3.32 '22. Against these benefits, the Secretary of State agrees with the Inspector (IR398) that the sole objection relates to the potential effect on human health of a materially harmful radiation dose. However, while he does not seek to minimise the potential impact of any individual dose, the Secretary of State considers that this should be placed in the context of the probability of such a dose arising which, while unquantified, has been described as 'extremely remote' ... Added to this, he has taken account of the fact that there is no evidence that the Off Site Plan for dealing with such emergencies would fail; and he is satisfied that the intensification of population density is not, in itself, a reason to refuse planning permission.

3.33 '23. The Secretary of State considers that these factors temper the weight to be attached to the risk of a materially harmful radiation dose relative to the benefits of the proposed scheme. No activity can ever be regarded as being risk free, each case has to be considered on its own merits, and the Secretary of State concludes that the potential benefits of this scheme, coupled with the fact that is generally in accordance with the development plan, outweigh the real, but very small, risks attached.'

3.34 Subsequent to the judgement by the Secretary of State, the probabilities of accidents with off-site radiological consequences occurring and the effective doses associated with such accidents have become better quantified than was the case at the time of the Boundary Hall Inquiry, so any concern as to the unquantified probability of the doses arising has been significantly mitigated.

3.35 Notwithstanding the low annual risks incurred by residents of Tadley due to accidents at AWE Aldermaston, it is of interest to set the assessed effective doses in context. These effective doses are from 2 to 17 mSv for the bounding reference accident and up to about double this for a worst-case accident. As the average annual effective dose in the UK, mainly from naturally occurring radioactivity, is around 2.7 mSv, the effective dose from the bounding reference accident corresponds to no more than a few years of normal exposure. Comparisons can also be made with medical exposures. For example, a Computed Tomography (CT) scan of the chest typically delivers 6.6 mSv and a whole-body CT scan typically delivers 10 mSv. There are also considerable regional variations in natural background, with the average annual radon dose to the people of Cornwall being 7.8 mSv, compared with a UK-wide average value of 1.3 mSv (http://www.hpa.org.uk/Topics/Radiation/UnderstandingRadiation/, downloaded 10 February 2014).

3.36 Thus, the radiological impact of the bounding reference accident, if it was to occur, on a resident of Tadley would be:

a. similar to the radiological impact due to exposure to background radiation for a few years in a typical location in the UK;
b. similar to the regional variations in the annual exposure to natural background in the UK;
c. similar to the exposure incurred as a result of a single medical CT examination.

3.37 This is not to argue that such exposures are of no importance. Indeed substantial efforts are being made to reduce high regional exposures to radon and the use of CT scanning in medicine is subject to a requirement for justification and optimisation on a case-by-case basis. However, it does show that the radiation doses that would be likely to arise if a major accident occurred at the AWE Aldermaston site are within the range commonly experienced by members of the public in the course of their everyday life.

3.38 However, as well as considering individual risk, it is appropriate to consider the overall health impact of a major accident at AWE Aldermaston. At the present time, the overall population of Tadley is about 14,000 (rounded sum of values for the Baughurst and Tadley North, Tadley Central and Tadley South Wards at the 2011 census, taken from http://www.basingstoke.gov.uk/, accessed 17 July 2015). If an accident of the size of the bounding reference accident were to occur and the wind was blowing towards Tadley, a substantial fraction of this population would receive effective doses in the range 2 to 17 mSv. Not all of the population of 14,000 would receive a significant dose, as the plume would not spread sufficiently laterally to encompass all of these three wards. To illustrate the potential overall health impact of such an accident in the absence of sheltering, it is reasonable to assume that about 7,000 people might receive an average effective dose of about 10 mSv, corresponding to a risk of death of around $5.7\ 10^{-4}$. Thus, in the absence of sheltering, about four deaths would be projected to occur as a result of such an accident. These would arise over several decades and would not be detectable against the general mortality of the population over that period. Nevertheless, this number of projected deaths emphasises why it is important to have an appropriate off-site emergency plan in place.

# 4. Requirements on the Off-site Emergency Plan

4.1 As demonstrated in Section 3, there is a remote possibility (with a probability of one in ten thousand per year or less) that a major accident could occur at AWE Aldermaston that would result in a few (about four) deaths of residents of Tadley spread over several decades following the accident, but only if no efforts were made to mitigate the effects of the accident. In practice, sheltering indoors with the doors and windows shut for the duration of the period of release of radioactivity from the AWE Aldermaston site would almost entirely eliminate the risk. This is because the main radiological risk from such an accident arises from the inhalation of aerosol particles incorporating plutonium or enriched uranium. On a timescale of a few hours, sheltering, with control of the building ventilation, will maintain indoor radioactive aerosol concentrations at much lower values than those existing outdoors. However, when the radioactive plume has dispersed, which will occur within about an hour of the cessation of the release, it will be appropriate to restore free ventilation between the indoor and outdoor environments, to ensure that any small amount of radioactive aerosol that has penetrated the building

envelope exchanges with, and is diluted in, outdoor air. In the longer-term, there will be some exposure from aerosol particles that have been deposited on surfaces, but this will generally be of limited radiological significance compared with the radiological impact of direct inhalation from the dispersing plume, unless mitigated by sheltering.

4.2 Because of the above considerations, the off-site emergency plan lays considerable emphasis on warning and informing the potentially exposed population within the DEPZ, and advising them to shelter. Specifically, residents within the DEPZ are in receipt of a REPPIR leaflet. This leaflet is updated by AWE (in consultation with the partner agencies) on a three yearly basis. The most recent issue was published in 2013 (West Berkshire Council and AWE, 2013) and an update is scheduled for 2016 (see Richardson, 2015b). It contains details of the hazards that may give rise to an incident and what to do should an incident occur.

4.3 When an incident had caused, or might cause, an off-site emergency, the following warning and informing actions would take place (West Berkshire Council, 2011, Annex 12).

a. AWE would initiate the automatic telephone alerting system to households around the site. By this method, members of the public would be advised to go inside and stay inside the nearest suitable building and to tune into the radio and television to hear public service broadcasts.
b. Information and warnings about the emergency would be broadcast on TV, local and national radio and the Internet, as appropriate. West Berkshire Council has a dedicated webpage ready to be activated should there be an incident.
c. Other activities, such as loud hailers may be employed to ensure messages are going out. The emergency plan states that all means necessary will be employed to get the messages across.

4.4 Specifically, the current issue of the REPPIR leaflet states the following.
‘If there were a radiation emergency that could affect the public, you may be advised to take shelter indoors until checks were made to ensure it is safe. You would be alerted either by:

- Telephone - The telephone alerting system would phone you with a pre-recorded message advising you what action to take. (It should be noted that this system only works with standard ‘landline’ telephones and not with mobile phones)
- Via the media – You may hear an alert on the local radio or TV’

4.5 Self-evacuation is strongly advised against in the REPPIR leaflet. This point is also emphasised in the off-site emergency plan, where the following statement is made (West Berkshire Council, 2011, Section 5.5).

‘The possibility of self-evacuation by members of the public at any time cannot be ignored. The impact of which may cause disruption to the response and may make the situation worse should radioactive particles be resuspended. Case studies show that there is greater risk of accidents during such self-evacuation than a situation of shelter and controlled evacuation if needed.

Public Information and local control will be needed to reduce the risk of this taking place.’

4.6 Persons attempting to return to the sheltering area from outside during this initial phase of the accident would be sent by the police to reception/rest centres where they would be looked after, and get help and information (REPPIR leaflet, page 10).

4.7 In the longer-term, countermeasures other than sheltering might be initiated. These are set out in Section 5.2 of the off-site emergency plan (West Berkshire Council, 2011) and their key aspects are summarised in Table 4.1, below.

| **Countermeasure** | **Description** | **Potential scenarios/areas for which this countermeasure may be implemented** | **Process** |
|---|---|---|---|
| Sheltering | Going and staying inside buildings or other structures with doors and windows closed | Automatic countermeasure in downwind sectors of the DEPZ; exceptionally may be extended across a wider area. | Automated telephone alerting system plus other measures, as described in the text. |
| Immediate evacuation | Evacuation of people without any delay to remove them from an immediate threat to their safety | Potentially required in non-radiological scenarios, but not for radiological scenarios (where immediate self-evacuation is advised against). | Not implemented. |
| Priority evacuation | Evacuation of priority groups (e.g. vulnerable people), which may require extra resource and logistical planning | May be required in the hours and days following declaration of a radiation emergency in downwind sectors of the DEPZ following an initial period of sheltering. | The Local Authorities, Health and other agencies will identify vulnerable people in the area affected. Contact will be made with the clients or carers and, thereafter, the necessary support will be arranged. This may be in the form of extracting the vulnerable to suitable locations or providing help in their own homes. |
| Non-urgent evacuation | Evacuation of other members of the public who do not require special resources or support to evacuate. | May be required in the days following declaration of a radiation emergency in downwind sectors of the DEPZ following an initial period of sheltering. | |
| Subsequent evacuation | Displacement of members of the public from their homes and businesses to facilitate longer-term recovery and remediation of affected areas | May be required in the days and weeks following a radiation emergency where areas are found to have been contaminated with radioactive or other hazardous materials. | May be necessary if people take cover in buildings such as factories, offices and other work places. These sheltering areas may not be suitable in terms of providing support for the people there for any length of time due to lack of facilities, food and bedding. This will need to be considered at an early stage depending on the zones affected. Other subsequent evacuation of the public from their homes may be necessary to facilitate recovery. The process for subsequent evacuation will be communicated via the media to those affected. |
| Restrictions on food and water consumption | Early advice not to eat certain foodstuffs or to drink water from boreholes in a potentially contaminated area to minimise the uptake of radioactive materials in a radiation emergency | May be implemented on a precautionary basis in the early phase of the response to a radiation emergency. Intervention levels for implementing this countermeasure are flexible and would be scenario-dependent. | |
| Restrictions on food production | Advice or specific restrictions on food producers not to produce food sourced from a potentially contaminated area to minimise the potential uptake of radioactive materials following a radiation emergency | May be required following a radiation emergency where areas are found to have been contaminated with radioactive or other hazardous materials. Intervention levels for implementing this countermeasure are flexible and would be scenario-dependent. | Trading Standards, Animal Health and the Food Standards Agency would review the actions and advice required. |
| Restrictions to transport movements | Restricting road, rail and other transport movements in and around the area allows emergency vehicles access and reduces the risk of resuspension of radioactive particles | May be required to facilitate response and recovery. | Any decision to close footpaths should be referred to the Councils' Rights of Way teams in order for them to identify what paths can be closed. Road closures would be handled by the Police, supported by Local Authorities and the Highways Agency. |

**Table 4.1: Countermeasure Options**

4.8 In considering the impacts of proposed developments within the DEPZ on the off-site emergency plan, it needs to be kept in mind that all the provisions described above are already applied to the total population of Tadley (around 14,000 persons), which is considerably more than it would have applied to if the radius of the DEPZ had been set to a realistic value of 2.125 km or 1.925 km rather than the historical value of 3.0 km that has been adopted.

4.9 A key consideration that could influence the off-site emergency plan is whether the population of Tadley might increase substantially in the future if a more relaxed attitude was taken to permitting developments within the DEPZ. However, even with less restrictive planning requirements, there is limited space within the DEPZ for additional developments. Beyond the DEPZ, the greatest growth in recent years has been in the Chineham Ward (7,005 in the 2001 census and 9,240 in the 2011 census) and in the Bramley and Sherfield Ward (4,940 in the 2001 census and 5,875 in the 2011 census, http://www.basingstoke.gov.uk/). Based on these figures, it is plausible to suggest that the population of Tadley within the DEPZ, as currently defined, might increase by no more than about 3,000, or about 20%. If the radius of the DEPZ was reduced to a realistic value of 2.125 or 1.925 km, then the population within the DEPZ would be expected to decrease rather than increase, even with less restrictive planning requirements.

4.10 If the population within the DEPZ was to increase somewhat, the main requirement placed on the off-site emergency plan would be to warn and inform this additional number of people. As to sheltering, it seems likely that new housing stock would have better control on ventilation and be more suitable for sheltering than some of the existing stock, so the gradual replacement of existing stock with new stock would tend to facilitate implementation of the off-site emergency plan, particularly if each proposed development was required to demonstrate that consideration in design had been given to key issues in off-site emergency planning (warning and informing; short-term and longer-term sheltering; urgent evacuation needs; impacts on the vulnerable; access and egress for emergency vehicles and those in the community).

4.11 In particular, individual developments and the pattern of development as a whole would need to ensure that the access for emergency services to the AWE Aldermaston site was not impaired. Indeed, in some contexts, such developments could contribute to improving access.

4.12 It is perhaps worth emphasising that the potential magnitude of accidents at AWE Aldermaston is such that there is not a requirement for the off-site emergency plan to be completely effective. If some individuals were to fail to shelter, the risks that they would be subject to in consequence would be comparable to those arising from exposure to natural background for a few years or from a single CT scan. The situation is different from that arising in some conventional accidents, e.g. gasholder explosions, where failure to evacuate the immediate area and/or shelter could result in an individual almost certainly suffering serious injury or death. It is also different from that arising around commercial nuclear power stations, where potential exposures to much higher radiation doses might lead to a requirement for immediate evacuation.

4.13 Thus whereas less-restricting planning control within the DEPZ might require some detailed changes to the off-site emergency plan, there is no reason to suppose that

substantial qualitative changes would be required. Furthermore, with structured planning of developments and an existing requirement to update the off-site emergency plan every three years, it should be straightforward to ensure that minor alterations to the plan are integrated with the implementation of approved developments.

4.14 Finally, it is noted that the scale of developments that could occur in Tadley would not change the overall nature of the town. Thus, the general policy requirement 'that residential and industrial developments are so controlled that the general characteristics of the [nuclear licensed] site are preserved' (paragraph 2.4) should be readily satisfied.

# 5. Conclusions

5.1 In the past, the location of Tadley within the DEPZ of AWE Aldermaston has placed significant constraints on its development. However, the limited size of accidents with off-site radiological consequences that could occur at AWE Aldermaston (no more than Level 5 on the INES scale, see paragraph 3.13) means that effective doses to residents of Tadley from a bounding reference accident would be relatively low, i.e. in the range 2 to 17 mSv, even if they did not shelter, as they are advised to do under the off-site emergency plan. For worst case accidents, effective doses could be about a factor of two larger, but the frequency of such accidents would be about a factor of ten lower than for bounding reference accidents. These effective doses are similar in magnitude to those arising from natural background radiation or from a single CT scan (paragraph 3.36). This is not to argue that they are of no importance, but they are within the range commonly experienced by members of the public in the course of their everyday life (paragraph 3.37).

5.2 Furthermore, the frequencies of such accidents are low (below one in ten thousand per year for bounding reference accidents and below one in one hundred thousand per year for worst case accidents). This means that the annual risk of death from accidents up to and including the bounding reference accident in size is no more than about one in ten million. For larger accidents, the risk of death is no more than one in fifty million (paragraphs 3.24 and 3.25). These risks are those that would arise in the absence of sheltering, which would substantially mitigate the risks. Even without sheltering, the risks are similar to, or less than, those of being killed by being struck by lightning and are more than a factor of ten below the boundary of the broadly acceptable risk region, as defined by the HSE (paragraphs 3.28 to 3.30).

5.3 If a bounding reference accident was to occur with the wind blowing toward Tadley and mitigation of effective doses by sheltering was not taken into account, about four deaths are projected to occur as a result of the accident. These would arise over several decades and would not be detectable against the general mortality of the population over that period. Nevertheless, this number of projected deaths emphasises why it is important to have an appropriate off-site emergency plan in place (paragraph 3.38).

5.4 The off-site emergency plan properly emphasises warning and informing with a view to achieving short-term sheltering. Such sheltering would very substantially reduce the effective doses incurred by individuals present downwind of the accident. Such sheltering would only be required until the atmospheric release from AWE

Aldermaston had ceased. This would typically be a few hours. Provision of such advice is largely automated and does not place a heavy load on the authorities.

5.5 It is possible that if less restrictive planning requirements were imposed within the DEPZ that Tadley could increase in population relatively rapidly. Nevertheless, there is limited space for development within the current DEPZ. Together with observations of the growth in population of Wards outside the DEPZ between 2001 and 2011, it seems unlikely that the population of Tadley would grow by more than about 3,000 or 20% of the current population (paragraph 4.8). In terms of sheltering, it seems likely that the new housing stock would have better control on ventilation and be more suitable for sheltering than some of the existing stock (paragraph 4.10). Overall, a growth in population of up to 20% might require some detailed changes to the off-site emergency plan, but there is no reason to suppose that substantial qualitative changes would be required. As the off-site emergency plan has to be revised every three years, it should be straightforward to integrate updates with the implementation of proposed residential and other developments (paragraph 4.13). However, it will be important to ensure that the design of these developments gives consideration to key issues in emergency planning (paragraph 4.10) and that access for emergency services to AWE Aldermaston is not impaired, or is enhanced (paragraph 4.11).

5.6 Even if there was a significant increase in the population of Tadley, it seems clear that it would still comply with the general requirement that the general characteristics of the area around a nuclear licensed site should be preserved (paragraph 4.14).

# 6. References

AWE, 2011a, AWE Aldermaston Hazard Identification and Risk Evaluation (HIRE) 2011, AWE/DSDF/B/RP/AD/2627, Issue 1, May 2011.

AWE, 2011b, AWE Aldermaston Hazard Identification and Risk Evaluation (HIRE) 2011, Report of Assessment, AWE Reference DI02/SRG/11/PC/B/061, Issue 1, 28 June 2011.

AWE, 2012, Radiation (Emergency Preparedness and Public Information) Regulations 2001: Report of the Assessment for the AWE Aldermaston Site, Document Ref. No. DI02/SRG/12/PC/A/046, Issue 2, May 2012.

AWE, 2014, Radiation (Emergency Preparedness and Public Information) Regulations 2001: Report of the Assessment for the AWE Aldermaston Site, Document Ref. No. EDMS3/802102DB/SC058/SRG2, Issue 3, November 2014.

Charlesworth, F R and Gronow, W S,1967, A Summary of Experience in the Practical Application of Siting Policy in the United Kingdom, In: Containment and Siting of Nuclear Power Plants, International Atomic Energy Agency, Vienna, 1967, pp.143-164.

Farmer, F R, 1960, The Evaluation of Power Reactor Sites, DPR/INF/266.

Gronow, W S, 1969, Application of Safety and Siting Policy to Nuclear Plants in the United Kingdom, Proc. Int. Symposium on Environmental Contamination by Radioactive Materials, IAEA, Vienna, 1969.

Gronow, W S, 1978, The Development of Siting Policy for Nuclear Power Stations in the United Kingdom, ACSNI(78)P.4, October 1978.

Hansard, 1988, Relevant text reproduced as Table 2 of Highton and Senior (2008).

Highton, J and Senior, D, 2008, The Siting of Nuclear Installations in the United Kingdom, NuSAC(2008)P12, 3 July 2008.

Highton, J, 2008, The Siting of Nuclear Installations in the United Kingdom (Addendum), NuSAC(2008)P12 Addendum, 8 July 2008.

HSE, 2001, Reducing Risks, Protecting People: HSE's Decision Making Process, HSE Books, HMSO, Norwich, ISBN 0 7176 2151 0.

HSE, 2012, ONR Assessment of AWE's 2011 REPPIR Submissions, The Office for Nuclear Regulation, TRIM: Folder 4.4.1.1270., File reference 2012/134624. Also cited as ONR-AWE-AR-2012-001.

ICRP, 2007, ICRP Publication 103, The 2007 Recommendations of the International Commission on Radiological Protection, User's Edition, Annals of the ICRP, 37(2-4).

Marley W G and Fry, T M, 1955, Radiological Hazards from an Escape of Fission Products and the Implications in Power Reactor Location, United Nations First International Conference on the Peaceful Uses of Atomic Energy, Geneva Conference Paper 394.

Nowak, J, 2011, Letter to Douglas C B Bond, Wolf Bond Planning, Town and Country Planning Act 1990 – Section 77: Application by Cala Homes (South) Ltd, Boundary Hall Site, Aldermaston Road, Tadley, RG26 4QH, Application Reference: BDB/67609, Jean Nowak, Decision Officer, Planning Casework Diviswion, Department for Communities and Local Government, 1/J1, Eland House, Bressenden Place, London, SW1E 5DU, 16 June 2011, Ref. APP/H1705/V/10/2124548.

ONR, 2013, Emergency Preparedness and Response Sub Programme: Determination of the Detailed Emergency Planning Zone for AWE, Aldermaston to meet the requirements of the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPIR), Project Assessment Report ONR-AWE-PAR-12-025, Revision 0, 18 March 2013, TRIM: 2013/0102849.

Randles, T, 2014, Proposed development by Hampshire CC in the AWE Aldermaston DEPZ, E-mail to Thorne, M C Friday 7 February 2014. (Tim Randles, ONR – HM Inspector, Desk 5, 4S.G Redgrave Court, Merton Road, Bootle L20 7HS, Telephone 0151 951 3686). See also http://www.onr.org.uk/land-use-planning.htm, accessed 14 August 2015.

Richardson, C, 2015a, E-mail to M C Thorne dated 13 July 2015. This states that 'With respect to the update on the AWE Off-Site plan this is being updated now. It was due earlier in the year however there was the potential, and there still is, that the Detailed Emergency Planning Zone would change. There has been a delay in this process such that we are reviewing the plan based on the current status. I anticipate the updated plan to be approved in Sept at the latest following final consultation with the planning group and the public version of the plan should

be on the website shortly thereafter.' Carolyn Richardson, Civil Contingencies Manager, West Berkshire Council.

Richardson, C, 2015b, E-mail to M C Thorne dated 13 July 2015. This states, in respect of the REPPIR leaflet that 'It will be reviewed in light of the plan details but may not need to change. If however the DEPZ does change then that would trigger a change. Regardless it will be updated in 2016.' Carolyn Richardson, Civil Contingencies Manager, West Berkshire Council.

Tildsley, F C J, 1985, Siting Policy and Emergency Arrangements for UK Nuclear Power Stations, ACSNI(85)P.8., June 1985.

Ware, P J G, 2011, Report to the Secretary of State for Communities and Local Government, Boundary Hall Site, Aldermaston Road, Tadley, File Refs. APP/H1705/V/10/2124548, 22 March 2011.

West Berkshire Council, 2011, Atomic Weapons Establishments: Off-Site Emergency Response Plan, Public Document: Version 1/2011.

West Berkshire Council and AWE, 2013, REPPIR: What to do in the event of an emergency at AWE, REF EDMS3/801AD650, May 2013.

**APPENDIX B**

**A Review of the Policy Approach to Tadley and the Rural Area**

**Rural Solutions**

Rural Solutions
The Nationwide Planning and Development Specialists

# Basingstoke and Deane Local Plan 2011-2029

# A review of the policy approach to Tadley and the Rural Area

Prepared for: Gladman Developments Limited

Prepared by: Rural Solutions Ltd

Rural Solutions

The Nationwide Planning and Development Specialists

Rural Solutions Limited

Registered Office: Brewery Lane, Skipton, North Yorkshire, BD23 1DR



# Contents

Rural Solutions
The Nationwide Planning and Development Specialists

# 1. Introduction

1.1 This paper has been produced by Rural Solutions Limited to inform Gladman Development Limited's (GDL) submissions to the Examination of the Basingstoke and Deane Local Plan 2011-2029. It addresses two issues, the Council's approach to housing development in Tadley and in the rural area.

1.2 The paper will provide the Inspector with information on the appropriateness and effectiveness of the Council's proposed approach towards allocating new housing.

1.3 The paper has been produced following a review of the Pre-Submission Local Plan and its evidence base, including documents submitted in response after the submission of the plan to examination, including to the mid-examination consultation on proposed main modifications during March 2015.

1.4 In producing this paper Rural Solutions has drawn upon its extensive experience in sustainable rural development and particularly on its work into understanding and assessing social and economic sustainability [in general] and the vitality of rural settlements against the context set by national planning policy and guidance. In the last 12 months Rural Solutions has assessed the sustainability and vitality of over 80 individual settlements across England using a methodology and approach that has been tested under cross examination at a series of Public Planning Inquiries.

## Purpose and Contents

1.5 This supplementary document sets out Rural Solutions analysis for the benefit of the Inspector, to inform GDL in the preparation of their submission and to support GDL's participation in the relevant hearing sessions.

## Summary of Key Findings

1.6 The analysis demonstrates that the Plan as currently formed fails to take proper account of the potential of Tadley to host sustainable development, the need for new development in Tadley and the implications of failing to plan positively for Tadley.

1.7 The report also challenges the proposed allocation to the rural area of the Borough. It sets out that it is a requirement of national policy to plan positively for rural areas and demonstrates the risks associated with failing to do so.

1.8 The report recommends that the allocation for the rural area be increased and provision made for the development of new housing in all kinds of settlements in rural areas, including the villages listed and categorized in the Council's 2009 Settlement Study.

## 2. Role, Function and Characteristics of Tadley

2.1 This section of the paper provides a summary of the characteristics of Tadley and its role as prescribed by the emerging Local Plan.

2.2 Tadley is situated within Basingstoke and Deane borough in the county of Hampshire. The town of Tadley is situated at the centre of the Parish of Tadley, which is recorded by the Office of National Statistics as having a population of 11,473 in 2011.

2.3 The town is situated approximately 6.3 miles (10km) north of Basingstoke, 11.7 miles (18.8km) south east of Newbury and 12.3 miles (19.7km) south west of Reading. The Parish of Tadley lies in the north west of Hampshire and is adjacent to the border with Berkshire. It is located just 50 miles from London with good access to the M4 and M23 motorways.

2.4 Basingstoke and Deane Council has categorized the role and function of Tadley as a "Service Centre" in its report "The Sustainability of Settlements in Basingstoke and Deane June 2008"[1]. This report describes Tadley as one of the three larger centres, other than Basingstoke, which were considered to "contain a range of services, facilities and employment opportunities and have high accessibility by public transport. The report concludes that these centres "may be suitable for expansion of an appropriate scale (together with infilling and redevelopment) in order to maintain their services and support their role in the wider hinterland."

2.5 Tadley is also categorized by the Council as a "District Centre" in the retail hierarchy set out in the draft Local Plan. This categorization recognises Tadley's existing range of facilities and services. A review of services in Tadley has identified that the town has a range of services and facilities that provide for the local community. These include a large Sainsbury's, a Co-op supermarket and other small

[1] Basingstoke and Deane Borough Council's Local Development Framework: Core Strategy Evidence Base HO07 - The Sustainability of Settlements in Basingstoke and Deane Borough Council – a Draft Settlement Hierarchy (June 2008)

shops as well as a number of pubs and restaurants. A list of services in included in Appendix 1.

2.6 Tadley hosts a number of schools including Bishopswood Infant School, Bramley Church of England School, Burnham Copse Primary School, Tadley Community Primary School and the fee paying Grantham Farm Montessori School. The secondary school for Tadley is located in the adjacent community of Baughurst (Hurst Community College). With regards to medical services, Tadley is served by two surgeries both of which are part of the Tadley Medical Partnership in addition to two dental practices.

2.7 The town is served by an excellent bus service to Basingstoke with buses running every 15 minutes during peak times. The service runs from Monday to Friday with the first bus at 06:19 and the last bus of the day departing at 21:09 apart from Fridays when it departs at a later time of 22:19. On Saturdays the service runs from 07:14 until 22:29, with regular services running every 20 minutes during the hours of 10:11 to 18:31. There are fewer services on Sunday starting at 08:52 at 1 hour intervals until 10:52 when it runs every 30 minutes with the last bus departing at 19:48. It also provides access to North Hampshire Hospital if residents are unable to drive themselves.

2.8 Tadley supports a vibrant community which benefits from strong leadership and organisations such as the Town Council, schools and churches. Residents of Tadley benefit from good access to a range of community facilities such as the community centre. There are many ways for residents to participate in local activities including sports teams, community events and various PTA fundraising events. Clubs and societies in Tadley cater for different age groups and interests and provide local residents opportunities to engage in the local community.

2.9 Examples include activities hosted in the community centre which is for social and leisure activities including yoga classes, dance classes, badminton, pre-school club-Tadley under 5's Preschool, Cheeky Chimps Mother and Toddler Group and the Community Cinema which takes place monthly.

2.10 Other community groups in the settlement include The Royal British Legion Tadley Branch, Tadley Concert Brass Band, Tadley and District Historical Society (TADS), Tadley Squash Club, Tadley Cricket Club, Tadley Short Mat Bowls, Tadley Youth Drama, 1st Tadley Brownies (Girl-Guiding) and Tadley Scouts group (including Beavers and Cubs).

2.11 However, Tadley's ability to meet the needs of it residents is not comprehensive and areas where investments and improvements are needed have previously been identified.

2.12 Basingstoke and Deane Council's 2009 Sustainability of Settlements Report includes reference to a 2007 Tadley Town Council survey which identified needs for additional services including:

- Household recycling centre
- Additional parking facilities
- Affordable housing
- Nursing homes/sheltered accommodation
- Eco-buildings
- More shops/leisure facilities
- Strong support for a new NHS dentist facility.
- Strong support for more employment opportunities.

2.13 Tadley plays an economic role. The population of Tadley experience good levels of employment, with 61.2% of the population in employment, the same as the District average and higher than the regional and national average.

2.14 The Council's Rural Housing Study reports that the District's labour pool is substantively retained locally and that significant numbers of people living in Tadley work in or around Basingstoke. Travel to work data for the Parish of Tadley supports this conclusions, showing an average distance for travel to work journeys of 14.3 km, less than the national average and better than both the District and regional averages.

2.15 A figure more than double the national average for the population employed in public administration and defence industries likely reflects the proximity to the AWE Aldermaston facility outside the town.

2.16 Within Tadley itself, employment opportunities exist within the public sector such as at the local schools, the medical centre and within the commercial sector in office, retail and services businesses.

2.17 Beyond the village, analysis of data from the Valuation Office Agency (VOA) shows that there are also a significant number of employment opportunities within a 20 minute drive time of Tadley (at peak hours). Floorspace is recorded for some categories of business, with 1,941,966 sq m of floorspace recorded overall and a total Rateable Value of £151 million[2]. Analysis of the type of workspace using space standards suggests that in the 20 minute peak hour drive time catchment of Tadley there are approximately 38,206 office jobs[3] and 10,482 production jobs based upon recorded office space extending to 458,473 sq m and 6419,275sq m of production space. These include rural business parks such as Ash Park Business Centre & Berry Court Farm (Little London), Campbell Court & Cufaude Business Park and Minchens Court (Bramley), Folly Farm (Ramsdell).

2.18 It is clear from the evidence that Tadley is an important local centre within the Basingstoke and Deane District. It hosts services and facilities that meet many of the every-day needs of people that live in the settlement. Tadley also plays a service centre role for other smaller settlements, including larger villages such as Kingsclere. In the normal course of events it would be reasonable to expect a new local plan to seek to enable development of all kinds in and in close proximity to Tadley and to include sites at Tadley in allocations for housing and employment land.

[2] VOA data
[3] Based on ratios of 12 sq m per job for office space and 40 sq m per job for production space (HCA / OffPAT)

# 3. Analysis of Basingstoke and Deane Council's Proposed Policy Approach to Tadley & Implications Arising

3.1 This section of the paper summarises the proposed policy approach for housing distribution and delivery in the District and implications for the sustainability and future health and vitality of Tadley.

Policy Summary

3.2 The emerging Basingstoke and Deane Local Plan was submitted to the Secretary of State for examination on 9th October 2014. Following submission on 21st October the Inspector wrote to the Council expressing some initial concerns with the plan, including on the Councils objective assessment of housing need (OAHN) which he considered fell well short of the figure from the South East Plan and towards the bottom of the figures suggested by Edge consultants in their evidence base work.

3.3 The overall approach to housing development over the plan period is set out in Policy SS1 Scale and Distribution of New Housing. This sets out how within the plan period 2011-2029 the Local Plan would make provision to meet 13.464 dwellings.

3.4 Following on from these initial comments and a subsequent exploratory meeting held in December 2014, the Council undertook some additional exploratory work including the updating of relevant evidence based reports. As a consequence, the Council stated in a report to Cabinet in March 2015 that the decision to increase the OAN need figure to 850 dpa. This thus would increase the overall figure over the plan period to 15,300 dwellings.

3.5 As set out in the Councils' Housing Topic Paper May 2015, the majority of this additional provision was proposed to be met by an additional strategic allocation to the Basingstoke (BAS133 – Hounsome Fields).

Tadley

3.6 Despite Tadley's classification as one of only three higher tier Service Centres after Basingstoke[4], no allocation of development sites or housing numbers are proposed for the town. The Council's Housing Topic Paper states this is due to an agreed approach following engagement with the Office for Nuclear Regulation to not allocate sites for development within the consultation zones, which covers the whole of the town.

3.7 Tadley is therefore excluded from the allocation process and subject to a policy of restraint (Policy SS7 refers). The Plan takes the position that needs [for housing, infrastructure and employment] arising in and associated with Tadley will be met elsewhere in the Borough (LP 3.1).

3.8 It is our view that the justification offered in the Councils EiP Topic Paper 2 Overview and Context (paragraphs 4.30 to 4.31) for this approach is weak and based more on a perceived risk to the soundness of the plan arising from the potential for uncertainty around the deliverability of any allocated sites in Tadley than an objective to plan positively to enable sustainable development and meet current and future housing needs.

3.9 It is not clear whether the Council has explored the implications of this approach despite the clear economic and social impacts arising from the approach identified and acknowledged in the Council's Sustainability Appraisal.

3.10 No detailed assessment of the impact of this policy approach for Tadley and its community appears to have been carried out, nor any scenario planning to consider the outcomes of an alternative approach.

3.11 There appears to be no analysis about the impact of this strategy on the community and vitality of Tadley and other settlements that use it as a service centre, and how to mitigate that impact. For example this is not addressed in the retail or town

[4] Basingstoke & Deane Draft Settlement Sustainability Study 2009

centre policies; or those relating to the importance of services and facilities (LP 5.64 and 5.65).

3.12 Paragraph 3.8 of the LP states that Basingstoke town centre and the District centres at Brighton Hill, Chineham, Overton, Tadley and Whitchurch, together with smaller local centres such as Kingsclere and Bramley will continue to act as the key focus for shopping and other town and village centre uses. These places will play a significant role in maintaining and enhancing the prosperity of the Borough. The implications of restricting housing development and thus population growth in Tadley on this objective has not been discussed, quantified or justified.

3.13 It is our view that this omission makes the plan unsound. Further consideration to the abilities of Tadley to accommodate development is perfectly possible and should have been undertaken to enable commensurate levels of development to be delivered to maintain the role and function and vitality of Tadley. We discuss this further below.

Implications for Tadley

3.14 We are concerned that the Council has not given due consideration to the impact on the vitality and viability of Tadley should there be no planned housing growth through the Local Plan. We have therefore carried out a high level analysis of the possible implications of the proposed policy of restraint on the economic and social sustainability of Tadley and the vitality of its community. This is set out below.

Demographic Change

3.15 Analysis of population change in Tadley over the last ten year inter-censal period shows a slightly decreasing population (-2% or 183 persons), a marked contrast with overall population change across the District (+10%).

3.16 This population change incorporates patterns of ageing with a 19% decrease in the population aged under 16 and a 5% decrease in the working age [16 to 64] population, alongside a 28% increase in people aged 65 and over.

3.17 This demographic change is contrary to the change experienced in Basingstoke in general which, whilst experiencing an ageing population has also experienced growth in all other age groups. It would appear that a lack of growth in Tadley has had a negative impact on the community's demographic balance.

3.18 Population change estimates produced by Experian Limited[5] based on current demographic projections ["policy off"] are forecasting an 11% population increase in Tadley by 2022 and a 14.6% increase by 2027. Despite this the emerging Local Plan contains no strategy for dealing with delivering the additional housing necessary to accommodate this population growth in the Tadley area and instead proposes to displace this population growth elsewhere.

3.19 Population forecasts by Hampshire County Council[6] for the three Tadley wards shows a 'policy on' projection and the implications for the demographic structure of Tadley should the proposed policy position be implemented. This shows a static overall population level with little change; however within this there is a marked ageing of the population. The data forecasts a 5% decrease in the working age population (compared to 7% growth in the District) and a 15% increase in the retirement age population.

3.20 The data also shows that there is a key difference in the population of 5 to 10 year olds, which is forecast to grow by 14% across the District, but only by 1% in Tadley. Given the significant reduction in the school age population experienced in Tadley between the 2001 and 2011 Census reports this forecast of even very slight growth appears optimistic.

3.21 This overall change in the population structure is unhealthy and threatens the future vitality and viability of village life and services, as discussed more below. It cannot be considered to be sound plan making.

[5] Property Development Pack Report, Experian Ltd for Rural Solutions August 2015
[6] Hampshire County Environment Department's 2014 based Small Area Population Forecasts

3.22 It is clear that, without planned housing delivery within Tadley or the local area, the growth in population arising from natural demographic change will need to be displaced to elsewhere in the District or further afield if the full objectively assessed housing need is to be met.

3.23 Whilst the Council suggests growth is planned in other settlements to counter the restriction in Tadley (LP paragraph 3.1) the draft Local Plan does not make it clear where in the District this growth has been apportioned, how that works in terms of the relationship with Tadley and what the implications will be of this enforced displacement on the health of Tadley's services and facilities. We discuss this briefly below.

Education

3.24 As referenced in paragraph 2.6 above, Tadley is served by a number of primary schools. All but one of these schools are operating under capacity in terms of pupil numbers versus capacity; there is an overall capacity of 1606 school places in the town, with current attendance of 1458 pupils, or 90% of capacity. Of the six primary schools in the town, four have been found by Ofstead to be 'requiring improvement'.

3.25 A suppression of house building combined with an ageing population will result in housing not being available, affordable or suitable for people with primary school aged children. This will further reduce demand for primary school places in the town. In the long term this may undermine the ability of all schools to remain open, in the short term it will further undermine the potential of those struggling schools to make improvements.

3.26 A Local Plan which brings forward a strategy which is likely to undermine the future viability of local schools cannot be considered to be consistent with the Framework, specifically with Paragraph 72 which sets out the importance the Government places on providing access to primary schools.

Employment

3.27 Tadley's role, both in terms of the attractiveness to employers and the employment it hosts, and also in terms of the contribution of Tadleys population to the District's labour force and labour supply, particularly to Basingstoke, would be eroded by a restraint on housing development.

3.28 Imposing constraint on the development of new homes in Tadley and the local area will not only undermine the economic role of Tadley but also will reduce the labour supply available to support economic growth in Basingstoke which the Local Plan seeks to enable.

3.29 The survey under taken by Tadley Town Council in 2007 expressed a desire from the town council and the community for support for further employment opportunities. Such opportunities are unlikely to be hosted by a shrinking population with a decreasing working age population, as it would not be an attractive location for employers to relocate. A population with such a demographic profile is also unlikely to generate entrepreneurs and new business start-ups which would further enhance economic activity and employment opportunities.

Retail & Services

3.30 Tadley is categorised as a District Centre in the retail hierarchy in the Local Plan, recognising its existing range of facilities and services. The supporting text to the policy states that "The District centres at Brighton Hill, Chineham, Overton, Tadley and Whitchurch have a significant role in maintaining and enhancing prosperity, serving the day-to-day needs of their local populations but also providing access to services for neighbouring areas across and beyond the Borough".

3.31 The Local Plan fails to address how Tadley's role as District retail centre can be maintained in the face of a static or falling population. The town's convenience offer will become increasingly vulnerable as the finite value of local household expenditure available to local retailers reduces as people age.

3.32 The health of the town centre and its ability to continue to serve this function for not just its own population but also that of its rural hinterland, will be negatively affected by a restrictive growth policy. The demographic profile of a community has

a direct impact and influence on its vitality. Working age and economically active people make a direct positive contribution to local economies through their consumption, economic engagement and investment. Hampshire County Council's population projections show an anticipated decrease in working age population as a consequence of the proposed restrictive policies for Tadley.

3.33 Younger families and working age people are hugely important to vitality. Working age family households have higher available household expenditure than retired households. New residents enhance and maintain demand for key services such as pre-school nurseries, shops, pubs and primary schools.

3.34 The next generation of young families and younger working age people will find it difficult to get on and move up the housing ladder in Tadley if the housing stock is held static with the inevitable impact on house prices. Such restrictions to the housing stock will drive out younger families [note that people classified as aspiring home makers'[7] which currently make up 18% of the local community] from the population and have an impact on the economic health of the population.

Community Services

3.35 Tadley currently hosts a healthy range of community services and facilities including community run sports clubs and the Community Centre which is run and owned by a charitable trust (Tadley and District Community Association) and is used for social and leisure activities including a mother and toddler group, badminton, yoga and a pre-school club.

3.36 An influx of new people and families into a community enhances social capacity, provides an important resource to support community activity and events and to support the management of community assets. This capacity will be threatened by a falling and ageing population.

3.37 The 'vision' within the Local Plan identified as a key challenge ensuring the provision of sufficient "new homes to meet local needs, and bring improved and new local

[7] Mosaic Groups

facilities." Whether these new facilities would be delivered by the private sector as a result of market forces and increased market demand or aided through developer contributions linked to new housing development, neither of these scenarios are going to happen if housing development is limited in the town.

3.38 Similarly, the provision of social housing will be affected if sufficient levels of market housing are not planned for and delivered. The town already suffers from a low incidence of social rented housing vs the District (11.7% compared to 17.4%) and a constraint on new housing will impact as there is no opportunity to meet need for Tadley.

3.39 This high level assessment has identified a range of negative impacts for the town and community at Tadley which are likely to arise from the approach taken in the draft Local Plan. The potential for such negative impacts has been recorded in the Council's Sustainability Assessment, yet no work appears to have been done to assess this impact locally, or any method of mitigating this impact included in the draft Local Plan.

# 4. Analysis of Basingstoke and Deane Council's Proposed Policy Approach to the Rural Area

4.1 This section of the report considers the Council's emerging approach to development in the Borough's Rural Areas.

4.2 The draft Local Plan records that the District is predominantly rural, with over 75% of land within the Borough defined as agricultural or woodland and that the rural dimension is very important in shaping the character of the Borough [paragraph 1.21].

4.3 The plan identifies an ageing population and declining household size, acknowledged housing need and affordability [of housing] as an issue. It acknowledges the affordability is a particular problem in the rural areas where house prices tend to be higher [paragraph 1.22].

4.4 Around 60% of the 167,800 population lives in Basingstoke and Chineham with the remainder [40% or 67,120 people] living in the Borough's large rural areas, including the towns and larger villages of Bramley, Kingsclere, Oakley, Old Basing, Overton, Tadley and Whitchurch, together with smaller villages and hamlets.

4.5 The vision set out in the Plan includes an objective to create inviting places and communities where people want to live and it is easy to meet every day needs.

4.6 The Plan identifies issues that need to be addressed including a growing population, an ageing population, falling household sizes, housing affordability, economic prosperity and the need to manage growth in the AWE Emergency Planning Zone.

4.7 The strategic objectives include the wish to promote a thriving rural economy with a network of vibrant towns and villages which provide homes, services, jobs and infrastructure to respond to the needs and aspirations of local communities [Objective E].

4.8 The spatial development strategy put forward in the draft Local Plan is set out in section 4. The Plan claims to respond to the level of need across the Borough as set out in the 2013 SHMA, which it says has informed the level of growth allocated to smaller settlements and forms part of the rationale for the approach in conjunction with the population of settlements, historic growth, availability of services and facilities, employment opportunities and accessibility.

4.9 The 2013 SHMA reports that there are approximately 71,760 dwellings in the Borough of which 18% are in the private rental sector and 19% are affordable. The District is a net attractor of people, with a migration gain of 1731 people between 2006 and 2010 [p12.14 – 12.16].

4.10 The SHMA also found that a total of 37% of new households would require some form of affordable housing and that this need is expected to increase with changes in affordability [p12.37].

4.11 The SHMA reported the Borough's Rural Housing Study which found that there had been 5405 household moves into the rural area in the previous three years [from the study date 2009]. Of these moves, around half came from within the Borough and half from beyond.

4.12 The study found that there was demand for housing in the rural area from people moving house within the District [51% of all moves to the rural area were from within the District; P2.59].

4.13 The Rural Housing Study also found that 83% of people planning to move wanted to stay within their existing location or Parish – they wanted to find housing more suitable for their needs where they already lived.

4.14 The Rural Housing Study reported requirements for 2,166 houses in the rural area [SHMA Table 10.7] based on its survey responses.

4.15 In the Overall Summary and Policy Recommendations the SHMA does not offer any advice or make any recommendations about the number of houses that should be allocated to the rural area.

4.16 Against this background the draft plan proposes [Policy SS5] allocations that amount to 750 houses in the larger settlements of Bramley, Kingsclere, Oakley, Overton and Whitchurch, and a further 150 houses in the wider rural area. This total allocation amounts to just 6% of the total objectively assessed housing need for the Borough.

4.17 The plan does make provision for additional housing development in rural areas, beyond this 900 house target, but only via small developments of less than 10 units in the larger listed settlements and of less than 5 units in the other settlements.

4.18 It is not at all clear from the Plan where this figure has come from. It is unclear whether it is founded on an evidenced based assessment of opportunity or capacity, not just in terms of available land but also in respect of services, facilities, or of need.

4.19 In this regard we note that the 2009 Rural Housing Study identified a need for 2166 houses in the rural area [as reported in Table 10.7 of the Borough's 2013 Strategic Housing Market Assessment]. In any event we believe that this housing target is far too low for the rural area.

4.20 Our concerns in this regard are compounded by the fact that the Council has had an opportunity to review the numbers in the rural area, arising from the increase in the OAN, but has chosen not to provide even a proportionate increase in the allocation to the rural area.

4.21 Despite the overall proposed increase in housing delivery of 13%, no additional provision is to be allocated to the rural areas. Justification for not increasing the housing numbers in the rural areas is set out in the Councils' Housing Topic paper which states that "there is currently no evidence to support the delivery of a higher number from this source nor an agreed settlement hierarchy set out within the Submission Local Plan that could be used as the basis for any such increase". [refn]

4.22 This is despite the Council's own Sustainability Appraisal acknowledging weaknesses to social and economic well-being of approaches which focus too much delivery in urban areas. The majority of the housing resulting from the proposed increased housing target is focussed on a single allocation to the edge of Basingstoke.

4.23 This approach is negative and does not plan positively for rural areas. It is in conflict with the policy context set out in national policy which supports sustainable development in rural areas.

4.24 The core planning principles set out in Paragraph 17 of the NPPF include the requirement for local plans to proactively drive and support sustainable economic development, to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs. In this context, the paragraph goes on to talk of promoting the vitality of urban areas and supporting thriving rural communities. Paragraph 157 requires local planning authorities to plan positively for the development and infrastructure needed in the area to meet the objectives, priorities and policies set out in the Framework.

4.25 All areas should benefit from positive planning. There is nothing in the Framework which says that rural areas should be excluded or that development should be constrained in rural areas per se. Paragraphs 28 and 55 makes it clear that the Framework envisages that economic and housing development can be sustainable in all kinds of places.

4.26 This positive context has been reinforced by Chancellor George Osbourne's statements when launching the Rural Productivity plan that the Government will deliver housing for future generations, increasing the availability of housing in rural areas to ensure our villages thrive.

4.27 The Government published its Rural Productivity Plan on 20th August 2015. On the day of its publication Chancellor George Osborne and Secretary of State for the Environment and Rural Affairs Elizabeth Truss wrote a joint piece in The Telegraph entitled "With our plan the countryside can become Britain's engine of growth."

4.28 Within this piece the Chancellor of the Exchequer and the Secretary of State for the Environment identified the demand for housing in rural areas arising from the net internal migration of 60,000 people each year into predominantly rural areas. They said "This Government is determined to support the millions that already choose a rural life and those that are joining them."

4.29 In the article the two cabinet ministers made it clear that there is no locational bar to investment or growth when they said, "our determination to build one nation means investing in all parts of the country, building a vibrant economy that promotes growth across the land, in every town and city and every rural area too."

4.30 They specifically addressed the importance of new housing in rural areas when they said, "And if we are going to attract and maintain a dynamic workforce, we need to make it easier for people to stay in their rural communities and for newcomers to settle there too. We'll always want to protect the green belt and beautiful natural environments but the lack of housing in rural areas is a scandal."

4.31 The final paragraph of the piece sums up the Government's approach were it says "Getting this right means people have greater choices about where they live and the jobs they do, businesses no longer need to be tied to our towns and cities and rural communities can flourish, to the benefit of us all."

4.32 This clear exposition of the new Government's approach to rural development backs up the requirements of the Framework. It is not intended to restrict development in, and associated with, rural villages to that which meets the needs only of the present population.

4.33 There is no way that the Council's approach to housing in the rural area can be considered to be positive planning for the District as whole.

4.34 Within the supporting text for Policy SS5 the Council also includes support for 'windfall' sites for small developments of up to 10 dwellings inside settlement boundaries and 5 dwellings outside (adjacent) to settlement boundaries in addition to the numbers in named settlements (paragraph 4.52). It is not clear whether the sites outside to the settlement boundaries referred to in this text also have to comply with the provisions of Policy SS6: New Housing in the Countryside.

4.35 Policy SS6 only allows for exception developments such as development of previously developed land, affordable housing rural exception sites, replacement dwellings, rural workers dwellings or residential proposals advanced with the support of the Parish/Town Council. In relation to the latter, the supporting text for

this policy (para. 4.56) links vitality to meeting local needs; this is not consistent with The Framework.

4.36 It is important to note that in this context Paragraph 54 does not mean that housing should only be provided in rural areas where it responds to locally identified needs. The phrase "local needs" in Paragraph 54 does not mean needs specific to individual settlements or in respect of individual housing schemes, but rather those related to that part of the local authority territory where "local circumstances" have been identified.

4.37 Similarly Paragraph 55 NPPF does not give a veto or control of vitality to Parish Councils yet Policy SS6 seeks to by only allowing development which has their support to come forward, regardless of any proven needs or benefits of development.

4.38 The Framework provides a positive context in which to enable and plan for rural development. The Borough has a range of settlements capable of hosting sustainable development beyond those identified in Policy SS5. An example of these settlements in Sherfield on Loddon.

4.39 Sherfield on Loddon is a large village with a parish population recorded at the 2011 Census of 3,107.

4.40 The village benefits from a range of local services, including shops, pubs and community facilities, and is well connected by public transport to the larger centres of Tadley, Bramley [where there is access to the rail network] and Basingstoke. The village benefits from super-fast broadband. Employment hosting sites are easily accessible in the local area [the village is within easy travelling distance of Basingstoke and Chineham].

4.41 Whilst the village does not have a school it forms part of the catchment of the primary school in Bramley, which is situated in close proximity [and on the bus route]. Access to primary healthcare is also available in Bramley.

4.42 Rural settlements like Sherfield on Loddon have demonstrable vitality and, as such, are well placed to host sustainable rural development [Paragraph 55].

4.43 The approach set out to rural development in Basingstoke and Deane ignores such potential. It seeks to drive development to Basingstoke, preventing development in the rural area that would in all other respects be sustainable. This approach is demonstrably inconsistent with the Framework and the Government's recent statements relating to the need to enable development in rural areas as well as urban areas.

4.44 As proposed, the draft policies seek to prevent the provision of new housing beyond the development boundaries of all settlements [save on allocated sites] regardless of the potential of such sites to host sustainable development and the economic and social benefits that such development might deliver.

4.45 This blanket restraint is not consistent with the Framework and will directly impact on the vitality of many of the District's rural and smaller settlements over the period of the plan, as it constrains population growth and imposes negative demographic change.

4.46 This negative demographic change will impact on vitality as the demand for certain types of services falls, the value of household expenditure available to support local services and business falls over time and the social capacity of villages and smaller settlements erodes over time as the population ages and is not refreshed.

4.47 Imposing low levels of growth will also impact on the affordability and availability of homes in the rural areas. Affordability will worsen as house prices increase, a lack of new stock will add to this pressure. Availability will suffer as under occupancy increases and the lack of new development means that, over time, the rural areas will be able to house fewer and fewer people.

4.48 Further analysis of the position at Sherfield on Loddon bears out this concern.

4.49 During the 10 year inter-censal period the population recorded in the Parish has increased significantly due to the Sherfield Park development. However, the population in the village of Sherfield on Loddon has remained fairly static.

4.50 This has meant that the demographic balance of the village's population has worsened with the result that, by the 2011 Census, the percentage of the population of school and pre-school age is lower than the Borough average [15% vs 18%] and the proportion of people aged 55 and over higher than the Borough average [29% vs 27%].

4.51 A constraint in new housing development over that time has meant that affordability has reduced in the village. Consequently the opportunity for younger working people and families to live within or join the community has reduced.

4.52 This lack of growth and worsening demographic balance has contributed to the low demand for places at the Primary School in Bramley [which is undersubscribed] and will have a negative impact on the future vitality of the community.

4.53 This is exactly the sort of negative outcome from planning policy that Matthew Taylor reported on in his 2007 Living Working Countryside study. It is an issue that will be replicated across the Borough if unnecessarily restrictive policies on rural housing development are put in place.

4.54 The evidence shows that, as communities age, their social capacity erodes over time. This has a negative impact on social well-being and on the ability of a community to maintain activities, events, clubs and societies.

4.55 An erosion of social capacity is contributed to and exacerbated by a reduction in the proportion of the population of school age children and a loss in younger working families. This not only undermines the vibrancy of the village but also reduces the value of household expenditure available to support key local services such as the village shops and pubs.

4.56 A loss of working age people also reduces the economic capacity and contribution of the community, and so that of the Borough. This is particularly important in a

Borough like Basingstoke and Deane which is well placed to benefit from net inward migration of economically active people.

4.57 The outcome of a policy of restraint as put forward in the draft Local Plan will be settlements that are less sustainable, host lower levels of vitality and become less, rather than more, mixed and inclusive over time. Precisely the opposite of the outcome that the Framework seeks of sustainable, mixed and inclusive communities [Paragraph 50] and enhanced vitality [Paragraphs 17 and 55].

4.58 The rural area of Basingstoke and Deane District currently hosts in the region of 40% of the population. It should receive a housing allocation commensurate with this proportion if the vitality of the rural area, and the District as a whole, is to be maintained.

# 5. Summary and Conclusions

5.1 National planning policy requires that local planning authorities take account of demographic balance and community vitality when plan making. Paragraph 50 requires local planning authorities to plan for a mix of housing based on current and future demographic trends. Paragraph 55 states that to promote sustainable development in rural areas housing should be located where it will enhance or maintain the vitality of rural communities.

5.2 Paragraph 152 states that local planning authorities should seek opportunities to achieve each of the economic, social and environmental dimensions of sustainable development and net gains across all three. Paragraph 154 states that Local Plans should address the spatial implications of economic, social and environmental change and Paragraph 158 requires that local planning authorities ensure that their Local Plan is based on adequate, up-to-date and relevant evidence about the economic, social and environmental characteristics and prospects of the area. Paragraph 159 states that local planning authorities should have a clear understanding of the housing needs of their area, including influences such as demographic change, and should identify the scale and mix of housing which address the needs of all types of housing and the needs of different groups in the community.

5.3 This analysis demonstrates that the approach taken by the Council in respect of the borough's rural areas does not meet these requirements. Consequently it is unlikely to be effective. There is little or no evidence that it is justified, nor can it be said to be consistent with national planning policy.

5.4 It is our view that the Local Plan should provide for a far greater provision of housing in the rural area, a level far more consistent with the current distribution of households and population [60% Basingstoke and Chineham, 40% the remainder].

5.5 This housing requirement should be allocated to all types of rural settlement, with the actual numbers allocated to individual settlements determined by an evidence

based assessment which takes account of opportunity, constraints [environmental and practical] and the benefits to vitality that new development can provide.

5.6 It is perfectly possible to identify sites suitable to host development and make allocations to them across the rural area. It is also possible to introduce a housing target to individual settlements and to communities interested or engaged in Neighborhood Planning. It is after all a basic tenant of Neighbourhood Planning that it delivers the strategic approach and scale of development set out in the statutory development plan.

## Appendix 1: Table of local services

| Service or Facility | Provision | Location |
|---|---|---|
| Retail | Loftplan Reviews | Ash Lane |
| Retail | Berkshire Mini Mix Ltd | Health End Road |
| Retail | R&L Preservation | 1 Mulfords Hill |
| Retail | Sainsbury's supermarket | 30A Mulfords Hill |
| Retail | Co-operative Food | Giles Walk |
| Services | Mendem Motors independent repairers and garage | Unit 4 Whitehouse Farm Silchester Road |
| Services | Shell Service Station | Burghfield Road |
| Community Facility | Lloyds TSB Bank | Aldermaston Road |
| Community Facility | Barclays Bank | Aldermaston Road |
| Community Facility | Post Office | 18A Mulfords Hill |
| Community Facility | The Broomsquire Hotel and Restaurant | Silchester Road |
| Community Facility | Fox & Hounds Pub | Mulfords Hill |
| Community Facility | New Inn Pub | Rowan Road |
| Community Facility | The Queens College Arms Pub and Restaurant | Aldermaston Road |
| Community Facility | The Vine country pub at Hannington | Hannington, Tadley |
| Community Facility | Tadley Library | Mulfords Hill |
| Worship | Tadley Community Church | Tadley Community |

| | | |
|---|---|---|
| | | Centre |
| Worship | St Peters and St Lukes Church of England | Church Road |
| Worship | St Pauls Church | The Green |
| Worship | Tadley United Reformed Church | Malthouse Lane |
| Worship | Tadley Methodist Church | Main Road |
| Education | Bramley Church of England School | Bramley Lane |
| Education | Grantham Farm Montessori School | Inhurst Lane |
| Education | Bursham Copse Primary School | New Church Road |
| Education | Tadley Community Primary School | The Green, Tadley |
| Education | Bishopwood Infant and Junior School | Barlows Road |
| Health Care | Tadley Healthcase Ltd Holmwood Pharmacy | Franklin Avenue |
| Health Care | Dentists | New Church Road and Franklin Avenue |
| Health Care | Tadley Medical Partnership-GP services | Franklin Avenue and New Road |
| Sport and Recreation | Tadley Calleva Youth FC | Barlows Park |
| Sport and Recreation | Tadley Swimming Pool | New Road |
| Sport and Recreation | Bishopswood Golf Course | Bishopswood Lane |