

**Proposals for revised policies for HSE advice on
development control around large-scale petrol storage
depots and land use planning Objectives and
Principles**

Responses to an HSC/E Consultation Document

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Introduction

1 The explosion and fire at Buncefield Oil Storage Depot in 2005 challenged existing perceptions about the scale and nature of risks from sites storing large quantities of petrol. A large vapour cloud explosion, as occurred at Buncefield, had not previously been considered credible. Up till then a large fire had been considered to be the most likely 'worst-case scenario'.

2 There are some 50-60 petrol storage depots similar to Buncefield in Great Britain (this number having been established by the HSE (Health and Safety Executive) based on its considered view of the factors that led to the overfill of the tank with petrol supplied through a pipeline, and subsequent generation of the vapour cloud). As with other major hazards sites, one of the ways in which off-site risks are mitigated is through restricting, to some degree, development around them through the land use planning system. As part of this system the HSE gives advice to Local Planning Authorities (LPAs) on proposed developments in the vicinity of these sites.

3 In its statement in May 2006, the Buncefield Major Accident Investigation Board (MIIB) referred to the importance it attached to HSE reviewing the advice it gives to LPAs in relation to sites such as Buncefield. As part of HSE's response to this request it published, in February 2007, a consultation document (CD211) seeking views on proposals for revised policies on the advice it gives to LPAs on land development around large-scale petrol storage depots.

4 In its consultation HSE sought stakeholders' views on the following issues:-

- Whether HSE's land use planning Objectives and Principles remain a sound basis for its land use planning advice – **(Question 1 in consultation document)**.
- Whether the area around large scale petrol storage depots, within which HSE applies its land use planning advice, should be extended – **(Question 2 in consultation document)**.
- Whether HSE should change its assumptions about the vulnerability of individuals who are likely to be affected by a major incident a large-scale petrol storage site. **(Question 3 in consultation document)**.
- Which of the four options presented in the consultation document best balanced the risks to individuals with social and economic development. **(Question 4 in consultation document)**.
- Stakeholders were also asked for any additional comments on proposed Options 3 and 4.

5 The consultation ran from 27 February until 22 May 2007. Copies of the consultation document were sent to interested stakeholders such as the operators of large-scale petrol storage depots and the local authorities for the areas in which they were located. Other local authorities, as well as organisations and individuals who had previously expressed an interest in the issues, were notified of the consultation exercise. In addition, the consultation document and Regulatory Impact Assessment were made available on the HSE website. During the period of the consultation almost 5000 copies of the consultation document were downloaded from the website.

6 In all, 72 responses were received - from employers, developers, industry associations, consultants, safety representatives, trade unions, charitable and voluntary organisations, members of the public and local authorities. A list of respondents can be seen in Annex 1. All respondents were asked if they were content for their views to be made public – copies of those responses can be obtained on request from HSE's Information Centre.

7 We are grateful for the comments received. This report tries to reflect the views offered but, inevitably, it is not possible to describe all the responses in detail.

8 In undertaking this consultation exercise and drawing up this report, the issues raised and responses received have not lent themselves to a simple statistical analysis. Some respondents did not specify which questions they were replying to and some comments were wide ranging and general in nature. As far as possible we have broken down the responses to each question and indicated the overall level of support, but there have been elements of subjective analysis in doing so.

9 You can obtain copies of this report from HSE's website.

Executive Summary

10 Most respondents supported the Objectives and Principles as a sound basis for HSE's advice but some commented that they could be improved in a variety of ways. For example, review them as and when circumstances change (particularly if the various post-Buncefield research projects identified any relevant issues) and include factors such as societal risk, etc.).

11 A large majority (83%) of respondents were in favour of extending the consultation distance around large-scale petrol storage depots. Of these, all but a few thought that it should be extended to the area of damage seen at Buncefield.

12 The large majority (79%) of respondents also agreed that the nature of the incident and the extent of damage seen meant that HSE should change its assumptions about the vulnerability of individuals living and working in the vicinity of large-scale petrol storage depots.

13 Analysis of answers to question 4 (on options for future land use planning advice policies) shows that most respondents favoured options that include extending the existing consultation distances around large-scale petrol storage depots. Furthermore, a large majority favour options which supplement the extended consultation distances with more restrictive advice from HSE on the type of developments that should be permitted close to these sites.

14 Some respondents were concerned that extending consultation distances could have a negative impact on property values and land development/regeneration.

HSE position

15 HSE will use the Objectives and Principles as the basis for its land use planning advice policy. They will be kept under review and updated if knowledge/circumstances change.

16 Buncefield proved that a major release of unleaded petrol can result in a violent explosion. The views of stakeholders who responded to the consultation exercise were that consultation distances should be extended and that the vulnerability of people living and working around large scale petrol depots should be reassessed. HSE has therefore decided to adopt Option 4 from the consultation document as the basis for its land use planning policy around large-scale petrol storage depots. This option involves extending the consultation distance and introducing a new inner Development Proximity Zone (at a distance of 150 metres), within which HSE would provide more restrictive advice on land development.

17 The new policy will come into effect in the summer of 2008. Until then, where planning applications come forward, HSE will provide LPAs with cautious advice.

18 This is a precautionary approach and is being adopted by HSE as an **interim** policy. More research is required to investigate the mechanisms that led to the vapour cloud explosion – without it there will continue to be uncertainty on their frequency and effects. However it may be a number of years before research delivers the necessary answers and HSE believes it would be imprudent to delay making changes to its land use planning advice in the meantime. Greater understanding of the explosion mechanism at Buncefield may enable HSE to further review its policy in due course.

Views expressed on specific questions

Question 1 - Do you think that in the light of the Buncefield incident, the Objectives and Principles remain a sound basis for HSE's land use planning advice to planning authorities?

19 The land use planning Objectives and Principles had been reviewed in the recent past as part of a fundamental review of HSE's role in land use planning and some revision had been undertaken in consultation with external stakeholders including industry and LPAs. However, given the unexpected nature of the incident at Buncefield, HSE decided it was sensible to look at them again to ensure they were still fit for purpose.

20 The consultation document set out the Objectives and Principles and (through Question 1 in the document) sought stakeholders' views on whether they remained a sound basis for HSE's land use planning advice. Of the 72 responses received to the consultation document 61 specifically answered this question. Of these, 43 (71%) supported the Objectives and Principles and 18 (29%) did not.

21 Of those that supported the Objectives and Principles as a sound basis for HSE's advice, 30 respondents provided additional comments. 9 restated support for the Objectives and Principles. The remaining 21 comments covered the following points:

- The Objectives and Principles should be kept under review and revised as necessary – for example, once the results of further research into the Buncefield incident is known and/or when the Buncefield MIIB makes its findings known.
- There should be more discussion and consultation with other interested organisations.
- There should be more explanation/clarification of how they are applied.
- Other factors, such as societal risk, should be taken into account.
- HSE advice needs to be clearer and there should be a system in place to monitor take up of this advice by planning authorities.
- Any changes to policy should only apply around large-scale petrol storage depots and should not be extended to sites storing other types of substances.
- Any requirement for further separation of petrol storage depots and public developments should concentrate on ensuring that petrol storage is at an appropriate distance from existing development.

22 Of those respondents that did not support the existing Objectives and Principles, 15 provided additional comments covering the following points:

- That the explosion and extent of damage at Buncefield demonstrated that the existing Objectives and Principles were not a sound basis.

- Issues such as societal risk, evacuation routes and emergency procedures should be taken into account.
- HSE should have a greater say in (or power to make/overrule) planning decisions.
- HSE does not apply/enforce/resource them sufficiently.

HSE position

23 HSE's will use the Objectives and Principles as the basis for its land use planning advice policy. However, they will be kept under review and updated (in consultation with other stakeholders) if knowledge/circumstances change (for example, if further relevant information becomes available on the incident at Buncefield). The objectives and principles will be published, and available for scrutiny, on the HSE website. Consideration of whether and how to take account of societal risk is the subject of a separate Government consultation exercise – the outcome of this consultation will be announced in due course.

Question 2 – Is it right to extend the consultation distance to the area of damage observed in the Buncefield explosion?

24 The consultation distance (within which HSE provides advice to the LPA on land development) around Buncefield was based on what was considered to be the most likely worst-case scenario - a large fire. An unconfined vapour cloud explosion, such as the one that occurred during the incident, had not previously been considered as a credible scenario. The consultation document posed the question of whether, as a result of the explosion and the extent of damage seen at Buncefield, consultation distances should be extended around large scale petrol storage depots.

25 58 respondents answered this question. Of these, 48 (83%) answered that yes, it was right to extend the consultation distance to the area of damage seen at Buncefield and 10 (17%) answered no.

26 Of those that answered yes to the question, 25 provided comments which qualified their support. 14 comments restate support for extending the consultation distance. 5 respondents agreed with extending consultation distances but not to the extent of the damage seen at Buncefield as follows:

- 4 commented that the size of the extended consultation distances should be based on site specific risk assessments and/or scientific evidence.
- 1 commented that consultation distances should be extended but that this should be to three times the area of damage seen at Buncefield.

27 The remainder of the comments provided covered the following points:

- Extended consultation distances would only apply to new planning decisions and existing occupiers of premises might be concerned about their safety.
- Surrounding businesses and populations may have little/no awareness of what proximity to a major hazard site means and are vulnerable as a result.
- The comment that HSE's advice should never be ignored.
- Inclusion of societal risk could dilute HSE's advice.
- 2 respondents suggested that the major hazards consents system (which permits the storage of hazardous substances) should be changed where petrol storage is involved. In particular, consent should be automatically revoked when petrol is no longer stored and that consultation distances should be measured from existing off-site developments if proposals are made to reintroduce petrol storage.

28 8 of the respondents who answered no to this question provided further comments to support their answer, as follows:

- Consultation distances should not be extended purely on the basis of what may be a one-off incident and extending consultation distances to the extent of the damage seen at Buncefield could be disproportionate and impact on development around petrol storage depots.
- Extending consultation distances around sites could impact on businesses which may be seeking planning permission for replacement/redevelopment of their existing premises.
- One respondent answered no to the question but then commented that consultation distances should be extended to a greater distance than the damage area at Buncefield.
- It might be justifiable to extend consultation distances around large scale petrol storage depots but not around sites storing other types of substances pending the outcome of the further research.
- Some extension of consultation distances may be inevitable, but this should be limited to the distances at which significant damage occurred.
- The emphasis should be on further measures to reduce risks within petrol storage depots themselves.

HSE position

29 HSE and Industry are working together to improve, where necessary, safety measures at large-scale petrol storage depots. However a residual off-site risk, albeit extremely small, will always remain and it is important that this is mitigated by land use planning policies including appropriately sized consultation distances. The view of a large majority of respondents was that the consultation distance around large-scale petrol storage depots should be extended. This view was taken into account by HSE when deciding which option for future land use planning advice to take forward.

Question 3 – Should we change our assumptions about the vulnerability of individuals likely to be affected by such an incident?

30 The consultation document also asked if HSE's previous assumptions about the vulnerability of people living and working around large-scale petrol storage depots were still valid following the type of incident that occurred at Buncefield and the extent of the damage seen.

31 In total, 56 respondents answered this question. Of these 44 (79%) answered that HSE should change its assumptions about the vulnerability of individuals. 12 respondents (21%) did not.

32 23 respondents provided additional comments. 15 comments restate support (to varying degrees) for changing our assumptions. The remaining 8 used their comments to qualify their answer as follows:

- The assumptions should be informed by site specific/individual risk data.
- It was important to consider the design and construction of modern buildings when considering vulnerability.
- The Buncefield MIIB was concerned that any change of policy will only be applied to Buncefield type sites when the implications are wider than this.
- Consideration should be given to particularly vulnerable groups who may be present in general development, such as housing, not just those in schools, hospitals, care homes, etc.
- Focusing on vulnerable groups should not be done at the expense of others – all were at risk from a VCE.

Breakdown of 'no' responses

33 7 respondents provided additional comments to support their answer as follows:

- There was no need to change the assumptions.
- A simply hazard based system (rather than a risk based one) should not be used to determine requirements for the storage of all flammables.
- Changing assumptions on vulnerability would exclude more development from within consultation distances.

HSE position

34 The view of a large majority of respondents was that the HSE should reconsider the vulnerability of people living and working around large-scale petrol storage depots in the advice it provides to LPA's on land development around these sites. This view was taken into account by HSE when deciding which option for future land use planning advice to take forward.

Question 4 – Which option best strikes the right balance between reducing the risk of harm to individuals and allowing economic and social development in the vicinity of these sites?

35 In its review of the advice it gives to LPAs on development around large scale petrol storage depots HSE considered possible changes to the setting of consultation distances and the constituent inner, middle, and outer planning 'zones'. Events leading to the kind of vapour cloud explosion that happened at Buncefield can develop rapidly, giving people little time to respond and escape from buildings. So HSE also considered the nature of the developments that might be allowed (not advised against) within each of the three zones within the consultation distance.

36 The consultation document contained four options that included changes to the size of consultations distance, planning zone boundaries and the advice that is given by HSE on land development within them. The proposals only applied to future development around large scale petrol storage depots.

37 These options were:

- **Option 1 – No change to LUP advice** - No change to HSE's land use planning advice system – HSE would assume that improvements to on-site safety arrangements at petrol storage depots would reduce the risk of such an incident happening to such an extent that the off-site risks could be considered acceptable without further planning restrictions.
- **Option 2 – Change size of consultation distance and zones, based on hazard** – Extend the current consultation distance and planning zones around petrol storage depots, based on the observable levels of damage from the explosion at Buncefield. HSE's advice on what development should be permitted would not change.
- **Option 3 – Change size of consultation distance (as Option 2) and development sensitivity levels** – Extend the consultation distance and zones around petrol storage depots, and limit development in the inner zone more than at present (i.e. allow only buildings that are not 'normally occupied').
- **Options 4 – Change size of consultation distance informed by risk, and adopt new Development Proximity Zone (DPZ) to give more restricted advice** – Extend the consultation distance and planning zones as in Options 2 and 3, and introduce a new Development Proximity Zone at a distance of 150 metres. Within the DPZ HSE would advise against development other than that involving 'not normally occupied' structures.

38 64 respondents expressed a specific preference for one of the options – broken down as follows:

- Option 1 – 5 (8%)
- Option 2 – 8 (13%)
- Option 3 – 25 (39%)
- Option 4 – 26 (40%)

Two further respondents preferred either option 3 or 4.

39 Of the 66 responses to this question 90% were in favour of the options that increased the size of consultations distances around petrol storage depots and 80% were also in favour of HSE providing more restrictive advice on developments close to such sites. In terms of numbers there was little to choose between those who preferred Option 3 and those who preferred Option 4.

40 A small number of respondents were concerned about adopting a more restrictive approach to land use planning. In particular, the effect that this might have on land prices, property redevelopment and development and regeneration of land around large scale petrol storage depots.

41 The main reasons given by those who chose Option 1 as their preference were:

- This option did not include an increase in consultation distances and thus avoided the potential negative impact on surrounding development.
- Additional on-site protection measure will mean that stricter LUP controls are not needed.

42 The respondents who chose Option 2 did so because:

- It provided an appropriate balance between controlling risk and allowing development
- It should be used, with additional on-site controls to reduce consultation distances.

43 Most respondents who supported option 3 did so because it provided the best level of safety. Additional comments provided were:

- That it gave better clarity than Option 4.
- That the consultation distances should be larger than that proposed.
- That proposals should be suspended until regulators can show that public warning and informing is effective.
- That brownfield development around sites should be suspended until post Buncefield research is concluded.

44 Most respondents who supported option 4 did so because it provided the best level of safety and/or that it provided a reasonable compromise between safety and land development. Other comments were:

- The safety of people should come first.
- The requirements of Option 4 were less onerous than for Option 3 as a smaller area of land would be subject to more restrictive planning advice on what could be built close to sites.

- The DPZ should be larger than that suggested in the proposals and measures should be taken to avoid incremental development.
- Concern that changes in building use over time might erode safety.
- Car parks should not be permitted in the DPZ as this could encourage people to enter a hazardous area during an incident in order to retrieve their vehicles.

45 Analysis of responses to this question showed that all but 5 of the respondents favour an option that includes doubling the existing consultation distances (and the constituent inner, middle and outer planning zones) around large-scale petrol storage depots – 90% were in favour of such an approach. In addition there was a large majority (80%) in favour of either Option 3 or Option 4. Both options combine extended consultation distances with more restrictive advice from HSE on the kinds of development that might be built close to these sites – in effect this would mean HSE advising against anything other than 'not normally occupied' development. The number of respondents in favour of Option 3 and Option 4 were split almost 50/50.

46 However some respondents did have concerns about adopting a more restrictive approach to land use planning. These concerns centre on:

- More restrictive land use planning could mean that existing premises might not be able to be rebuilt/redeveloped and that land value could reduce as a result.
- There could be a financial impact (reduced property values, etc.) on existing buildings.
- There could be an impact on local regeneration/development plans and on larger land development initiatives.
- Any restrictions on land development should be confined to the areas around large-scale petrol storage depots and should not be applied around sites storing other substances.

HSE position

47 HSE carefully considered the responses to the consultation. A large majority were of the opinion that consultation distances should be extended (83%) and that the vulnerability of people living and working around large scale petrol depots should be reassessed (79%). A large majority (80%) were also in favour of adopting either Option 3 or Option 4, which both include increase consultation distances (and planning zones) with more restrictive advice on what kind of development should be permitted close to these sites.

48 HSE has therefore decided to adopt Option 4 from the consultation document as the basis for its land use planning policy around large-scale petrol storage depots. This will involve increasing (approximately doubling) consultation distances (and planning zones) and introducing a new inner DPZ (at a distance of 150 metres), within which HSE will provide more restrictive advice on land development. HSE has chosen to adopt Option 4 rather than Option 3 as it believes that, given the current state of knowledge, restricting

development within the smaller DPZ (rather than the entire inner zone under Option 3) provides an appropriate balance between the health and safety of people and economic and social development around petrol depots. This revised policy will apply around the 50-60 petrol depots that HSE has identified as being operationally/physically similar to Buncefield.

49 HSE recognises that this is a precautionary approach. However in view of the continuing uncertainty on the frequency and effect of incidents such as the one that took place at Buncefield it also believes it to be a pragmatic one. It may be a number of years before research is completed and sufficient knowledge becomes available on the mechanisms leading to vapour cloud explosion to allow a more accurate risk-based approach to land use planning to be adopted. HSE believes it would be imprudent to delay making changes to its land use planning advice in the meantime.

50 It is important to understand that HSE is adopting this new policy as an interim approach (albeit one which may be in place for a number of years.) However, once greater understanding of the explosion mechanism at Buncefield is achieved, HSE may be able to further review its policy on land use planning around these sites. It may then be possible to revise consultation distances and relax planning advice, in the light of the additional information.

51. The new policy will come into effect in the summer of 2008. Until then, where planning applications come forward, HSE will provide LPAs with cautious advice.

Annex 1

Responses to consultation

A total of 72 responses to the consultation were received from the following groups:

- Member of public 14
- Employer 13
- Local Authority 14
- Industry Association 5
- Trade Union 1
- Charitable/voluntary organisation 1
- Other (including consultants, developers, etc.) 24

A Abdelkhalek
AB Graphic International Ltd.
Association of Chief Police Officers
Atkins Consultants
Basildon Council
Blackstone Property Management
BP Oil UK
BPB
Buncefield Major Incident Investigation Board
Byrne O Cleirigh
C Doyle
Castlepoint Borough Council
Copper Development Association
Crown Estate
D Williams
Dacorum Borough Council
Dane and Co. Ltd
Ellesmere Port & Neston Borough Council
Emergency Planning Society
Entec UK Ltd.
Environment Agency
Fareham Borough Council
Fire Brigades Union
Health Protection Agency
Heathrow Hydrant Operating Co.
I Bo
Institute of Civil Defence and Disaster Studies
J Clark
Kent Fire and Rescue Service
Kodak Ltd.
L Moore

LP Gas Association
M Goose
North Warwickshire Borough Council
Northern Police Constabulary
People Against Methane
Petro-Canada Ltd
Planning & Environmental Services, Falkirk Council
Planning Inspectorate
Port of London Authority
R Hannah
R Hazelgrove
R Pryce-Jones
RO Developments Ltd
S Brogan
Scottish Environmental Protection Agency
Shell UK
Shetland Island Council Planning Department
South Gloucester Council
St Albans Council
Stockport Borough Council
Tank Storage Association
TDG Ltd.
Thurrock Council
Thurrock Thames Gateway Development Corporation
UK Onshore Pipelines Operator's Association
UK Petroleum Industry Association

15 further respondents asked that their comments remain confidential.