



Caerphilly County Borough Local Development Plan

Areas Susceptible to Surface Water Flooding and Revised TAN 15 Development Advice Maps

Examination 2010

Caerphilly County Borough Council submission

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Background Paper 13
Papur Cefndir 13

**BROAD LEVEL FLOOD
RISK ASSESSMENT**

*DEPOSIT LOCAL DEVELOPMENT PLAN
UP TO 2021*

**Supplementary Paper 1:
Areas Susceptible to Surface Water
Flooding and Revised TAN 15 Development
Advice Maps**

January 2010

**ASESIAD RISG
LLIFOGYDD LEFEL EANG**

*CYNLLUN ADNEUO DATBLYGU LLEOL
HYD AT 2021*

**Papur Atodol 8:
Mapiau Ardaloedd sy'n Dueddol i Ddioddef
Llifogydd Dŵr Wyneb a Chyngor Datblygu
TAN 15 Diwygiedig**

Ionawr 2010

1 Introduction

- 1.1 An exploratory meeting into the Caerphilly LDP was held on 8 December 2009. At this meeting the Inspector raised a number of issues in respect of the LDP that either required clarification or further explanation to provide appropriate information against which the Inspector can draw conclusions when undertaking the examination of the LDP. The Council agreed to prepare supplementary papers on these issues to provide the relevant information for the examination.
- 1.2 One of the issues identified by the Inspector related to the need for review of sites allocated in the Deposit LDP in light of Areas Susceptible to Surface Water Flooding Maps published by the Environment Agency in November 2009. The Council has had the opportunity to undertake a review of the maps identifying susceptible areas against existing surface water flooding records for sites allocated for development in the LDP. This Supplementary Paper highlights the findings of this assessment and considers how this information can be taken forward.
- 1.3 Flood risk, including surface water flooding, was originally considered in Background Paper 13: Broad Level Flood Risk Assessment (October 2008), which identifies the national policy context for flood risk and how the precautionary principle advocated in national planning guidance to avoid development in the flood plain has been embraced in the LDP site selection process. The Background Paper includes an assessment of allocated sites located within Zone C of the flood plain based on the Development Advice Maps prepared as part of Technical Advice Note 15: Development and Flood Risk (TAN 15).
- 1.4 The Development Advice Maps were updated in December 2009, replacing those originally published in 2004. Given the availability of this new information, it is appropriate to update the information on allocated sites within Zone C of the floodplain originally included within Background Paper 13 and consider whether there are any implications that result from the publication of this new information.
- 1.5 A draft copy of this Supplementary Paper was provided to the Environment Agency Wales for their comments, although it should be noted that, due to the timescales involved they were unable to provide detailed comments, particularly in respect of site-specific information. However, where comments have been made, these have been taken into account wherever possible.

2 Areas Susceptible to Surface Water Flooding

2.1 Purpose of Areas Susceptible to Surface Water Flooding maps

2.1.1 In November 2009, the Environment Agency Wales (EAW) made maps available for use in land use planning departments showing areas susceptible to surface water flooding (ASSWF). The maps were supplemented by guidance for Local Planning Authorities in Wales on the appropriate use of the Areas Susceptible to Surface Water Flooding maps focusing on land use planning purposes.

2.1.2 This guidance defines surface water flooding as follows:
“A surface water flood event that results from rainfall generated overland flow before the runoff enters any watercourse or sewer. Usually associated with high intensity rainfall (typically >30mm/hr) resulting in overland flow and ponding in depressions in the topography, but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen, developed or otherwise has low permeability. Urban underground sewerage/drainage systems and surface watercourses may be completely overwhelmed, preventing drainage. Surface water flooding does not include sewer surcharge in isolation.”

2.1.3 The map provides three bandings, indicating areas ‘less’ to ‘more’ susceptible to surface water flooding. The ‘more’ band identifies the sites that would flood first, flood deepest and/or flood for relatively frequent, less extreme events when compared with other bands.

2.1.4 The guidance advises that for the purposes of LDPs, maps can be used to highlight areas where more detailed studies of surface water may be appropriate, for example, within SFCAs. The EAW do, however, recognise that some LDPs have been submitted for examination, as is the case in Caerphilly and, in this situation the guidance indicates that it is anticipated that Inspectors will wish each LPA to confirm that it has taken the information in the maps into account and can advise of the implications for all sites allocated in the LDP.

2.2 Limitations of ASSWF maps

2.2.1 The EAW guidance makes it clear that caution is required in the use of the maps. The guidance categorically states *“because of the way they have been produced and the fact that they are indicative, the maps are **not appropriate to act as the sole evidence for any specific planning decision at any scale without further supporting studies or evidence.** Their use in planning will be to highlight areas where more detailed study of surface water flooding may be appropriate as part of, for example, a strategic flood consequence assessment (SFCA)”*.

2.2.2 In addition the maps should not be used to identify individual properties susceptible to surface water flooding nor rely on the maps alone to show expected areas of surface water flooding. It is advised that the maps should not be used with a more detailed base map scale than 1:50,000.

2.3 Assessment of allocated sites against ASSWF maps

- 2.3.1 As set out in Background Paper 13, the Council's Land Drainage section was previously consulted on localised flooding issues and the position of culverts and watercourses as part of the candidate site process. Where constraints are present on the sites taken forward as allocations, these were identified in the Appendix of the LDP. Where the level of constraint was considered to preclude development, sites have not been taken forward for further consideration. The need for a culvert locational survey on sites where culverts are present was also identified in Appendix 8 of the LDP.
- 2.3.2 However, given the publication of the ASSWF it was deemed necessary to review this new information. Recognising that the Caerphilly LDP had already been submitted to the Planning Inspectorate for examination, EAW undertook a screening exercise to indicate which sites they believed to be susceptible to surface water flooding. The purpose of this screening exercise was to assist the Council's drainage engineers with the consideration of the maps against existing information held by the local authority.
- 2.3.3 To corroborate that the sites identified by the Environment Agency represented an appropriate screening framework, the Council have overlaid the surface water flooding maps against the LDP allocations to determine both whether sites are susceptible to surface water flooding and whether the sites were 'more,' 'intermediate' or 'less' susceptible. This assessment has identified broadly the same sites as the Environment Agency screening exercise, although there were slightly fewer sites as part of the Council's more robust assessment.
- 2.3.4 All allocated sites identified as being within an ASSWF were considered by the Council's land drainage section to determine whether local authority records indicated that there were any concerns with regards to surface water flooding on these sites. The results of this assessment are identified in Appendix 1.
- 2.3.5 At a 1:50,000 scale it will be noted that areas of Caerphilly are covered by areas 'more,' 'intermediate' and 'less' susceptible to surface water flooding. The susceptible areas broadly follow a similar pattern to the areas identified within the TAN 15 Development Advice Map (DAM) zones. As the site selection approach sought to follow the precautionary principle by locating development outside of Zone C of the flood plain where possible, this would also mean that some areas susceptible to surface water flooding would also be avoided.
- 2.3.6 Appendix 1 demonstrates that the land drainage department records indicate that there are no known problems with flooding on the majority of sites identified. On the few sites where flooding has been identified as an issue, it is considered that the most appropriate time to consider this in more detail is at planning application stage, when more detail on the type and nature of development will be known.
- 2.3.7 It is recognised that on the few sites where surface water flooding has been identified as a concern, it may be necessary for appropriate attenuation such as ponds to be provided. It is recognised that the onsite provision of attenuation measures may have an impact on the developable area of a site. However, it should be noted that the capacities on sites are based on an average density

of development and are therefore only indicative. The reasoned justification of Policy HG1 identifies that higher or lower densities may be acceptable where the proposed development addresses other policy considerations. As such, if the need to address surface water flooding on a few sites does result in the loss of a developable part of the site, it would not undermine the soundness of the plan, particularly when it is considered that this would only apply to a very small number of sites, if any.

- 2.3.8 It is also recognised that the additional cost associated with the attenuation of surface water flooding may have an impact on viability. However, this is a matter that cannot be addressed at a strategic stage and would need to be considered properly at planning application stage when details of the development are known.

2.4 Consideration of Surface Water Flooding at Planning Application stage

- 2.4.1 It is routine practice for the Development Control section to consult the Land Drainage section on applications for residential development and, on the basis of their advice, land drainage conditions will be placed on planning consents where appropriate requiring that no development should take place until a scheme for the surface water has been submitted to and approved in writing by the Local Planning Authority. Such a scheme shall be implemented prior to the construction of any impermeable surfaces draining to the system unless otherwise agreed in writing by the Local Planning Authority. The purpose of this condition is to reduce the risk of flooding.

- 2.4.2 Given that the consideration of surface water flooding is already an integral part of the consideration of planning applications, due consideration will be given to the issue at the most appropriate time to ensure that development does not exacerbate surface water flooding problems.

2.5 The Role of Supplementary Planning Guidance

- 2.5.1 Policy CW26 of the Deposit LDP indicates that Supplementary Planning Guidance (SPG) will be prepared where appropriate for a number of purposes, including to provide detailed procedures and requirements for specific planning issues and matters. Surface water flooding is one planning issue where detailed guidance for developers may be appropriate to ensure that the issue is given due consideration in advance of any planning applications being submitted. Based on consultation with EAW, it was determined that the production of SPG on surface water and drainage may be an appropriate and effective way of progressing the work and providing more detail on the relevant matters.

3 2009 Development Advice Maps

3.1 Assessment of sites

- 3.1.1 The assessment of sites for inclusion in the LDP was based on the latest Development Advice Maps produced as part of TAN 15. These maps, which were published in 2004, identify three development advice zones illustrating the extent to which flooding is a risk and which should inform decisions on the location of development. All sites allocated for built development were assessed to determine whether they were located in a Zone C flood risk area, the findings of which are included in Background Paper 13. In relation to a small number of sites were wholly or partially within flood risk areas, the paper sets out the justification for this.
- 3.1.2 Paragraph 4.3 of TAN 15 states that it is expected that the development advice maps will remain in place for 3 years and that future versions of the map would supersede earlier versions. New DAMs to replace the original flood maps made available in 2004 were not actually issued until December 2009, which was after the date of the submission of the LDP for Examination.
- 3.1.3 However, given that these maps now supersede the original ones, it is appropriate to consider all allocations for built development – community facilities, commercial, employment and housing to determine how the 2004 maps compare to the 2009 maps. This information is provided in Appendix 2. The Appendix also includes information on the planning status of sites, whether a Flood Consequences Assessment has been carried out and the comments of the EAW in respect of each site.

3.2 Difference between 2004 and 2009 Development Advice Maps

- 3.2.1 One notable difference between the 2004 and 2009 maps is how C1 and C2 extents are shown. On the 2004 maps, a number of areas were covered by both C1 (areas of the floodplain which are developed and served by significant infrastructure, including flood defences) and C2 (areas of the floodplain without significant infrastructure) flood extents.
- 3.2.2 This anomaly has been overcome on the 2009 map, where land is either shown within Zone C1 or Zone C2, removing the potential of sites lying within both zones.
- 3.2.3 In light of this, it is now the case that many sites that were previously in Zone C1 and Zone C2 are now only in C1. Whilst noting that TAN 15 states that new development should be directed from zone C, the TAN states that highly vulnerable development such as housing, community facilities or emergency services should not be permitted in Zone C2. The reclassification of sites from Zone C2 to C1 means that, provided it can be justified based on the tests set out in Section 6.2 of TAN 15, highly vulnerable development would now be permitted in accordance with the TAN on these sites.
- 3.2.4 In addition to this, the extent of areas defined as Zone C has been reduced on a number of sites, as identified in Appendix 2. This may be due to more detailed modelling on flooding being undertaken as part of any Flood Consequences Assessments undertaken to support any planning applications.

3.2.5 There are, however, two allocated housing sites where flood risk was not identified as a concern on the basis of the 2004 Development Advice Maps, that now lie within Zone C on the 2009 maps. These sites are HG 1.05 Maerdy Garage adjacent to Maerdy House in Rhymney and HG1.60 Tyn Y Waun Farm, Machen.

3.3 Maerdy Garage, Rhymney

3.3.1 The 2004 DAMs indicated that the Maerdy Garage site was located outside of Zone C. The Environment Agency raised no objection to the inclusion of this site as an allocation in the Deposit LDP.

3.3.2 At the time of allocation, which reflected the position of site in 1st April 2007 Joint Housing Land Availability Study, the site had been subject to an outline consent, granted in 2002, with reserved matters consent being granted for 4 individual plots in 2005/6. As the site did not lie within a flood zone, Flood Consequences Assessments were not undertaken to support these applications. The reserved matters consents on these plots have now expired.

3.3.3 The 2009 DAMs indicated that approximately 60% of the site now lies within Zone C2 of the floodplain. It is therefore appropriate to give further justification for its inclusion within the plan.

3.3.4 In justifying the proposed development, TAN 15 states that development “*will only be justified if it can be demonstrated that:*

- *Its location in zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement; or,*
- *Its location in zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region;*

And

- *It concurs with the aims of PPW and meets the definition of previously developed land (PPW fig 2.1); and,*
- *The potential consequences of a flooding event for the particular type of development have been considered, and are found to be acceptable.”*

3.3.5 In respect to the first criterion of the justification test, the site is located within the Key Settlement of Rhymney within the Heads of the Valleys Strategy Area (HOVRA). The LDP Development Strategy allows for development opportunities in the HOVRA and seeks to target development to reflect the role and function of individual settlements. Rhymney is identified as an area where residential development should be concentrated in order to provide a wider range of housing. In this context, the allocation of this site for housing would conform with the local authority strategy as set out within the LDP as a means of sustaining this settlement.

3.3.6 In addition, as a former industrial site, the area meets the definition of previously developed land as set out within PPW.

- 3.3.7 The final criterion requires a Flood Consequences Assessment (FCA) or Strategic Flood Consequences Assessment (SFCA) to be undertaken to demonstrate that the consequences of flooding can be acceptably managed.
- 3.3.8 As part of work undertaken to consider options for the regeneration of the Capital Valley and Maerdy Industrial Estates in Rhymney, a Strategic Flood Consequences Assessment was produced by Entec to provide a strategic assessment of flood risk on the industrial estates. The EAW was consulted on the SFCA and identified that concerns still remain in respect of the culvert capacity/hydrograph volume identified in the modelling. However, due to the timescales and resource implications, it was not possible to resolve these minor issues.
- 3.3.9 The other comments received on the SFCA were focused on the significant risk of flooding identified on the Capital Valley/Maerdy industrial estate sites. Whilst not specifically undertaken for the Maerdy Garage site, the housing site was included within the modelled areas by virtue of its proximity to the industrial estates. Although it is recognised that there are still minor areas of concerns with the modelling, the SFCA forms the most up to date information available on flooding in this areas. The results of this SFCA can therefore be used for the purposes of determining the risk of flooding on the housing site, whilst recognising that further work may still be necessary to refine the model.
- 3.3.10 The modelling undertaken as part of the SFCA demonstrates that the site is free from flooding in a 1 in a 100 year (1%) flood event, but in a 1 in 100 year scenario with an assumption for climate change and a 1 in a 1000 year (0.1%) flood event, part of the site is at risk of flooding.
- 3.3.11 Paragraph A1.14 of TAN 15 states that development should be designed to be flood free during the 1% fluvial flood. Maerdy Garage adheres to the requirement. However, paragraph A1.15 of TAN 15 goes on to state that beyond the threshold frequency (1% for residential) consideration should be given to the tolerable conditions should a site flood under extreme conditions. The indicative guidance on what is considered to be tolerable conditions for different types of development indicates that for residential use, the maximum depth of flooding is 600mm (0.6m) for both properties and access, with the maximum velocity of floodwater being 0.15 (m/s) for property and 0.3 (m/s) for access.
- 3.3.12 The Entec study shows the flood depth in a 1% with Climate Change flood event to be less than 0.05m for the small part of the site actually within a flooding extent. A very small part of the site falls within the 0.05 - 0.2m extent in this scenario. An even smaller part again lies within a 0.2m - 0.5m extent. However, all of these depths fall well within the tolerable conditions set out in the TAN 15.
- 3.3.13 In terms of flood velocities, in a 1% with climate change scenario, the velocity is primarily less than 0.5 m/s, although a very small area is between 0.5m/s – 1 m/s. It is therefore the case that a very small part of the site is above the TAN 15 tolerable conditions. However, this part of the site could be avoided as part of any future development proposals.
- 3.3.14 Overall, in the 1% plus climate change scenarios, the SFCA concludes that the area of the site at risk of flooding is a very low hazard.

- 3.3.15 In the 1 in a 1000 flood year event (0.1%) the depth of flooding for the majority of the area affected by flooding is less than 0.05. There are, however, very small areas fall within the 0.05 - 0.2m extent and the 0.2m - 0.5m extent. However, all of these depths fall well within the tolerable conditions set out in the TAN 15.
- 3.3.16 In terms of velocity in the 0.1% event, the majority of the site that is affected by flood risk has a velocity of under 0.5 m/s but there are small parts of the site that are affected by velocities of between 0.5-2.0 m/s. Overall, the vast majority of the site is identifies as a very low flood risk hazard.
- 3.3.17 The River Rhymney is culverted through part of the modelled area. The study therefore considered the effect of 50% and 80% culvert blockages, and the situation if the culvert were removed. In both culvert blockage scenarios for a 1% plus climate change event, the flood depth for a small part of the site is greater but is still within the tolerable conditions identified by the TAN. Flood velocity on a small part of the site is greater than the tolerable conditions, but, as previously stated, this part of the site could be excluded from built development. Alternatively, the study identifies that if the culvert were to be removed the site would no longer be at risk of flooding. However, further analysis would need to be undertaken at planning application stage in order to consider the potential impacts upstream.
- 3.3.18 Overall, the SFCA has indicated that the risk of flooding on Maerdy Garage is very low and therefore it is not considered that, for the purposes of the LDP, there is any need for further work to be undertaken to support this allocation. It is accepted, however, that more detailed work on modelling would need to be undertaken at planning application stage. Whilst the requirement for a Flood Consequences Assessment to be undertaken is not identified specifically in the Appendix 8 of the LDP on Survey Requirements for Housing Sites, the text does specify that on future applications or renewals of sites that previously had planning consent, it may be necessary for additional survey information to be submitted. It is advised that developers enter into pre-application discussions with the local authority to determine whether additional surveys will be required. This would include a Flood Consequences Assessment in relation to this site.
- 3.3.19 In terms of site capacity, the Deposit Plan identifies the number of units that are likely to be accommodated on the site to be 16 dwellings based on the layout provided as part of the 2002 application. The plot sizes as part of this application were large, equating to 20 dwellings/hectare. If the same indicative density of 35 units per hectare used to calculate the capacities of other sites were used, the overall capacity of the site would be 23 dwellings. Just over a third of the site is free from flooding based on the TAN 15 flood maps. This would equate to approximately 8 dwellings based on average densities. If it was determined that avoidance of the flood plain was the best way forward, rather than mitigation, the site could still accommodate some development, although this may be under the threshold of 10 used to determine whether a site is large enough to be allocated in the plan.

3.4 Tyn Y Waun Farm, Machen

- 3.4.1 The second housing site identified as now being at risk of flooding is Tyn Y Waun Farm in Machen. The 2004 DAM maps indicated that approximately

15% of the site was within Zone C2. The EAW raised no objection to the inclusion of this site as an allocation in the Deposit LDP.

- 3.4.2 The site was granted outline planning consent for housing in 2002, with reserved matters for 10 dwellings being granted in 2005. This consent has now expired, but full applications were granted in 2007 and 2008 for 3 and 1 dwellings respectively. These consents are still valid.
- 3.4.3 The EAW was consulted on the outline planning application where advice was received that the extent of the developable area should be reduced to remove the area that formed part of the flood plain. Subsequent applications have also avoided development in this part of the floodplain and the EAW have raised no objections to these applications.
- 3.4.4 The 2009 maps have indicated that over 90% of the site now lies within Zone C2. Given that these maps were not made available to the local authority until after the submission of the LDP for Examination, there has been insufficient time to undertake a detailed flood risk assessment of this site. Given the Environment Agency's lack of objection to both past planning applications and the allocation of the site in the Deposit LDP, it is considered that to make any amendment to the allocation in light of this new information would be wholly inappropriate, particularly when further work would be required to determine more accurately the extent of the flood risk area.
- 3.4.5 Given the fact that two parcels of land on the site still have a valid planning consent, it may well be the case that they are implemented prior to any opportunity to review the extent of the flood plain in any event.
- 3.4.6 The EAW raise concerns that in the absence of any assessment on what the risk and consequences of flooding are, it is not possible to determine whether any more development would be possible. However, the Council consider that the most appropriate time to consider how to apply this new information will be at planning application stage or the review of the plan. Appendix 7 of the LDP identifies the need for a Flood Consequences Assessment to accompany any future application.

3.5 Other Allocated Sites in Zone C

- 3.5.1 With regards to the other allocated housing sites identified in Zone C, it should be noted that four are under construction or completed (Penallta Colliery in Ystrad Mynach, Old Barrell Store in Rhymney, Land west of A467 and River Ebbw in Abercarn, and Jeremy Oils in Llanbradach). With the exception of Navigation Colliery and St Ilans, all other housing sites have planning consent where flood risk has been considered as part of Flood Consequences Assessments, where it was concluded that flooding could be managed acceptably.
- 3.5.2 The St Ilan site in Caerphilly is now recommended for removal as a housing allocation on the grounds that its inclusion in the LDP may constrain the Council's emerging education strategy. However, based on a Strategic Flood Consequences Assessment, it has been demonstrated that the flood risk on the site can be acceptably managed and the EAW have withdrawn their original objection to the inclusion of the allocation in the Deposit LDP.

- 3.5.3 Navigation Colliery is also recommended for removal as a housing site, although it is considered that the site should remain within this settlement boundary. A Strategic Flood Consequences Assessment was undertaken on this site, although, due to time constraints it was not possible for the Council and the Environment Agency to reach agreement in advance of the submission of the LDP for Examination. The flood risk position and other factors supporting the removal of the allocation from the LDP are discussed in detail within the Navigation Colliery Supplementary Paper prepared after the Exploratory Meeting.
- 3.5.4 With respect to other land uses, it is not considered that the publication of the revised DAM maps identifies any further areas of concerns.

4 Conclusions

- 4.1 This Paper provides a consideration of the implications of the ASSWF maps on allocated sites. It is clear from the guidance that it is not appropriate to draw conclusions on the ASSWF maps alone and therefore, whilst a large number of sites are identified as lying within a susceptible area, when this is assessed against the Council's own evidence, only a few sites have a known flooding concern. These surface water flooding concerns will be most appropriately considered at planning application stage through the submission of comprehensive drainage schemes and therefore, from the perspective of the LDP, it is not considered that the inclusion of any sites on the ASSWF maps would undermine the soundness of any allocations.
- 4.2 The consideration of the implications of the December 2009 TAN 15 Development Advice Maps has identified very little change from the 2004 maps, although there are now significantly fewer sites in Zone C2.
- 4.3 There are now two allocated housing sites within Zone C that were previously wholly or primarily outside of the flood plain – Maerdy Garage in Rhymney and Tyn Y Waun Farm in Machen. An SFCA undertaken on an adjoining site has indicated that flood risk on the Maerdy Garage site is a very low hazard with flood depths falling well below tolerable conditions in extreme flood events. It is recognised that flood velocities exceed tolerable conditions across a small part of the site, but this could be accommodated in the detailed site design, subject to more detailed work being carried out.
- 4.4 A detailed consideration of flooding has not been undertaken on Tyn Y Waun Farm as previous consultations with the EAW on both planning applications and the LDP have not identified any issues of concern. Furthermore, the site currently has valid consent for 4 dwellings. The Council consider that the most appropriate time to reconsider flooding given the lateness of this new information in the LDP process would be at future planning application stage or at the review of the plan. Provision is made in Appendix 7 of the Deposit LDP for further survey work to be undertaken.
- 4.5 In the worst-case scenario where flood risk on both sites results in difficulties in them coming forward for development, it should be noted that the combined capacity of both sites only equates to 26 units. There has been a substantial over-allocation of land for housing in the Deposit LDP to allow for choice and flexibility and it is therefore considered that the loss of these two sites would have no impact on ability to meet the total housing requirements. Furthermore, it is not anticipated that the sites would contribute to affordable housing on the grounds that Maerdy Garage is in an area where affordable housing provision would not be viable without grant funding and Tyn Y Waun Farm already has planning consent.
- 4.6 Overall, taking into account all the available information, it is considered that the new TAN 15 flood maps do not undermine the soundness of the plan.

Appendix 1 – Consideration of Areas Susceptible to Surface Water Flooding Maps

The land drainage section will be consulted on all applications within areas susceptible to surface water flooding and it is a standard procedure for conditions to require comprehensive drainage schemes to be submitted. The table below identifies additional comments made by the land drainage section on a site-by-site basis.

Susceptibility Level – Less		
Policy Ref.	Site Name	Comments
Community Facilities		
CF1.1	North of Rhymney Cemetery, Rhymney	Some sewer drainage problems.
CF1.7	Adj. to Ysgol Bro Sannan, Aberbargoed	No known problems. No known culverts. Possible private sewer in place.
CF1.8	Aberbargoed Primary School	No known problems. No known drains, however, at bottom of hill.
CF1.9	South of Aberbargoed Plateau	No SWF. No known problems.
CF1.11	Gilfach Street, Gilfach	No known problems.
CF1.15	Ysgol Penalltau, Ystrad Mynach	No known problems.
CF1.16	Oakfield Street, Ystrad Mynach	No record of flooding.
CF1.18	Memorial Hall and Institute, Newbridge	SWF shown at eastern edge. Flooding occurs 60m south of site's southern edge at southern end of Meredith Terrace.
CF1.21	West/East of Abercarn Cemetery, Abercarn	SWF shown on east and west of site. Comprehensive drainage plan required.
CF1.22	Pencerrig Street, Llanbradach	SWF known at west of site. No previously known problems.
CF1.33	Workmen's Hall and environs, Bedwas	No SWF shown although site bordered to east, north and south by SWF.
Commercial		
CM4.4	Car park, rear of High Street, Blackwood	Site surrounded by SWF although no known flooding at this location.
CM4.13	Cardiff Road, Caerphilly	SWF shown at southern end of site difficult to appreciate with railway below. Site falls to the north.
CM4.14	Castlegate, Caerphilly	No SWF shown. No known problems.
Employment		
EM1.8	Land at Hawtin Park, Gellihaf	SWF shown at northern edge. No known problems.
EM1.9	Hawtin Park South, Gellihaf	No SWF shown. No known problems.
EM1.15	Land at Western, Caerphilly	SWF shown to northeast and southwest.
Housing		
HG1.02	East of Llechryd Bungalow	No SWF shown. No known problems.

HG1.09	Greensway, Abertysswg	Bounded to southeast by SWF. No known problems.
HG1.10	South west of Carn y Tyla Terrace, Abertysswg	Steeply sloping site. No SWF showing. No known problems.
HG1.11	Adj. to Brynglas, Pontlottyn	Culvert alignment altered.
HG1.12	Land off Railway Terrace, Fochriw	Some SWF shown. No known problems. SWF most probably on Southern/Eastern edge.
HG1.52	Land at Hillary Rise, Pontywaun	Some SWF shown. Culvert to south of site.
HG1.65	St. James' Primary School, Caerphilly	SWF shown to south end of site. No previous complaints.
HG1.69	Cardiff Road/Pentrebane Street, Caerphilly	No known previous concerns of surface water flooding.
HG1.70	Land btwn. Van Road/Maesglas and railway, Caerphilly	SWF shown. No previous concerns but flooding has occurred at Goodrich Street & rear of Maes Glas.
HG1.75	Cwm Ifor Primary School, Caerphilly	School for redevelopment. Comprehensive drainage details will be required.
HG1.76	East of Coedcae Road, Abertridwr	SWF shown but difficult to appreciate as old railway in cutting. No previous knowledge of flooding encroachment issue here.

Susceptibility Level – Intermediate

Policy Ref.	Site Name	Comments
<i>Community Facilities</i>		
CF1.2	The Lawn, Rhymney	No knowledge of flooding. Industrial area likely to hold drains. Known culverts present.
CF1.4	Fochriw Youth Centre, Fochriw	Stream on SW boundary. No SWF predicted.
CF1.6	Hangar 81, Aberbargoed	Culvert under site access. No predicted SWF.
CF1.24	Ysgol Ifor Bach, Senghenydd	SWF shown here. Unsure of flood path. Existing drainage in this area. Existing industrial drainage. School location altered to suit.
CF1.25	Cwm Ifor Primary School, Caerphilly	School to be redeveloped. Comprehensive drainage details sought.
CF1.28	St. Ilan's School, Caerphilly	Comprehensive drainage details will be required and TAN 15 considerations. Predicted SWF.
CF1.29	St. James' Primary School, Caerphilly	No SWF shown locally.
CF1.34	Bedwas Colliery Site, Bedwas	Comprehensive drainage plan would be required as there are many drainage systems. There are problematical locations of erosion and deposition. Contaminated land. Several culverts cross-site. Major

		drainage scheme sought. No SWF indicated.
Commercial		
CM4.1	The Lawn, Rhymney	No knowledge of flooding old industrial estate area likely to hold drains, known culvert present.
CM4.5	Gateway site, Newbridge	No known problem. No SWF shown. TAN 15 may be a concern.
CM4.11	Gallagher Retail Park, Caerphilly	No SWF. TAN 15 concern.
Employment		
EM1.1	Land at Heads of the Valleys, Rhymney	No SWF shown. No known problems.
EM1.2	Ty Du, Nelson	Many local culverts. Very boggy. Comprehensive drainage scheme required.
EM1.3	Plateau 1, Oakdale Business Park, Oakdale	No known problems or drainage under former colliery. Comprehensive drainage drawings would be required. No SWF.
EM1.5	Plateau 3, Oakdale Business Park, Oakdale	No SWF shown or known problems.
EM1.7	South Extension, Penylan, Croespenmaen	No SWF shown. No known problems.
EM1.10	Land at Dyffryn Business Park, Ystrad Mynach	No SWF shown. Some TAN 15. Some existing drainage to consider.
EM1.13	Land at Caerphilly Business Park, Caerphilly	No SWF. Culverts to consider. No known problems. Railway drainage?
EM1.14	Land at Trecenydd, Caerphilly	No known problems. SWF shown.
Housing		
HG1.01	South of Merthyr Road, Princetown	No SWF shown. Locations of streams.
HG1.05	Maerdy Garage, adj. to Maerdy House, Rhymney	No SWF shown. TAN 15 to west. Culvert to NW.
HG1.07	Former depot south of Pontlottyn link road, Pontlottyn	No known problem of surface water flooding.
HG1.08	Heol Evan Wynne, Pontlottyn	No known problems of surface water flooding.
HG1.16	Bedwellty Road, Aberbargoed	Culvert. No known problems or SWF shown.
HG1.19	Aberbargoed Plateau, Aberbargoed	Possible former working abandoned drainage. No SWF shown. No known problems other than ditching on eastern flank.
HG1.28	Blackwood Ambulance Station, Blackwood	Culvert under site. No SWF shown. No known problems.
HG1.32	Land at Hawtin Park, Pontllanfraith	No SWF shown. No known problems, except where stream passes under road near Ty Nant.
HG1.34	Tiryberth, Hengoed	Comprehensive drainage scheme required. No SWF shown.

		Culvert present.
HG1.36	Penallta Yard, Ystrad Mynach	Comprehensive details required. Drainage down old railway line. No SWF.
HG1.42	Former cattle market site, Nelson	Site developed. Comprehensive drainage plans sought.
HG1.49	Chris Bowen Garage, Newbridge	Local flooding September 2008. Developments would need to consider local upgrading of culverts and attenuation. Ownership of culvert A-A is in dispute with Welsh Water.
HG1.56	Rom River, Risca	Site under development.
HG1.64	Bedwas Colliery, Bedwas	Comprehensive drainage plan would be required many drainage systems here are problematical, lots of erosion and deposition. Contaminated land. Several culverts cross the site. Major drainage scheme sought from WAG, Assembly have declined twice. Problem shown on at 1 - 7 indicated on CF1.34
HG1.66	Land at Venosa Trading Estate, Caerphilly	Comprehensive details sought. No known problems. No SWF shown. Drains and culvert present.
HG1.75	Cwm Ifor Primary School, Caerphilly	School for redevelopment. Comprehensive drainage details will be required.
HG1.77	Windsor Colliery, Abertridwr	No SWF shown. No known problems. Steep site down to stream.
HG1.79	Jeremy Oils, Llanbradach	Comprehensive drainage details required.

Susceptibility Level – More

<i>Policy Ref.</i>	<i>Site Name</i>	<i>Comments</i>
<i>Community Facilities</i>		
CF1.5	Leisure Centre, New Tredegar	Protected by EA Flood Scheme constructed June 2009.
CF1.17	Ystrad Fawr, Ystrad Mynach	New hospital site protected by EA Flood Protection Scheme at 1 in 100 status as confirmed by EA 07/12/09.
CF1.20	Adj. to Recreation Ground, Hafodyrynys	Area elevated above surround. Flooding occurs on playing field.
CF1.35	Cray Valley Paintworks, Waterloo	Flooding has occurred here in past. A comprehensive drainage scheme would be required.
CF1.36	Former Bus Depot, Crosskeys	No local knowledge of flooding but local highway drainage listed for upgrade. The area is protected by existing river flood protection

		works. No history of flooding or complaints from adjacent properties.
CF1.37	Palace Cinema, Risca	No specific history of flooding although area is low lying and suffers from difficulty in discharging surface water when river is in flood condition. River flood protection in place.
CF1.38	Brooklands, Risca	No specific history of flooding although area is low lying and suffers from difficulty in discharging surface water when river is in flood condition. River flood protection in place.
Commercial		
CM4.7	Former Palace Cinema, Risca	No history of flooding although area is low lying and suffers from difficulty in discharging surface water when river is in flood condition. River flood protection in place.
CM4.8	Adj. to Lidl, Pontymister	No history of flooding although area is low lying and suffers from difficulty in discharging surface water when river is in flood condition. River flood protection in place.
CM4.9	Foundry site, Pontymister	Not suitable for housing.
Employment		
EM1.4	Plateau 2, Oakdale Business Park, Oakdale	Some local SWF shown. No known problems.
EM1.6	Plateau 4, Oakdale Business Park, Oakdale	SWF. No known problems.
EM1.11	Land at Dyffryn Business Park, Ystrad Mynach	Some SWF shown and TAN 15.
EM1.12	Penallta Extension	No local knowledge of flooding but eastern end likely to be affected by high stream flows. This water course is protected by attenuation pond in its upper reaches.
Housing		
HG1.03	Old Barrel Store, Rhymney	No previous knowledge of flooding or concerns from existing properties. Western edge shown as potential river flooding but river in deep valley.
HG1.06	Maerdy Crossing, Rhymney	No known problems. TAN 15. SWF at west.
HG1.25	Navigation Colliery, Crumlin	No known knowledge of flooding although pit shafts are submerged up to ground level. Workings a consideration. No complaints from private owners going to or

		from site.
HG1.35	Penallta Colliery, Ystrad Mynach	Only concerns at eastern edge close to stream. Comprehensive drainage details sought. Significant fall west to east.
HG1.41	East of Handball Court, Nelson	SWF shown. No existing flooding noted or complaints registered, except for A-A.
HG1.43	Land at Gellideg Heights, Maesycwmmmer	Previous concerns for coal depot and watercourse. No reason why an attenuated drainage scheme could not be considered.
HG1.47	Land at Fields Park, Newbridge	Local flooding in the area in Sept 2008 but not on site itself.
HG1.48	Pennar Lane, Newbridge	Local flooding in the area in Sept 2008 but not on site itself.
HG1.50	West of A467 and River Ebbw, Abercarn	No recent concerns for flooding. Site under development. Thought to be above river flood level.
HG1.57	Brooklands Road, Council service site, Pontymister	No local history of flooding. Areas protected by river flood protection, which will hold SWF back in high river flows. High demand on combined sewerage system.
HG1.58	Eastern land adj. to River Ebbw, Pontymister	No local history of flooding. Areas protected by river flood protection, which will hold SWF back in high river flows. High demand on combined sewerage system.
HG1.59	Suflex factory, Pontymister	Adjacent to river and will rely on EA Flood Protection. No complaints from adjacent developments.
HG1.60	Tyn y Waun Farm, Machen	Possible concern for proximity of river. No knowledge of previous flooding.
HG1.61	Waterloo Works, Machen	Culvert concern as culvert destroyed by groundwork.
HG1.67	Land at Pontypandy Industrial Estate, Caerphilly	No known flooding, area is boggy some filling or raising of the site to be considered.
HG1.68	St. Ilan's Comprehensive, Caerphilly	Some parts higher than others. No greater risk than adjacent properties. No known history of flooding.
HG1.71	Gas Works site, Mill Road, Caerphilly	No history of flooding.
HG1.73	Castlegate, Caerphilly	No known problems. Design for this has attenuated drainage scheme. Watercourse runs down eastern boundary with development plateau several metres higher than watercourse.

Appendix 2 – Consideration of 2009 TAN 15 Flood Maps

LDP Ref	Site Name	Prop. Use	C1 04	C1 09	% of Site	C2 04	C2 09	% of Site	FCA Completed	Planning Status	Water-course	EA Comments	Addressing Concerns
CF 1.5	Leisure Centre, New Tredegar	Youth centre	N	N	N/A (both)	Y	Y	100 (both)	No	Consent for construction of flood defences, granted 08	River Rh'mney		Conversion of existing building – change is within same use class so planning permission not required.
CF 1.17	Ystrad Fawr, Ystrad Mynach	Hospital	Y	Y	75 (both)	Y	Y	100 (04), 25 (09)	Yes (as part of P/06/0164)	Outline consent granted 07, reserved matters 08	River Rh'mney	FCA acceptable. Land drainage consent required for works in, under or over river	Addressed through planning application. Flood risk constraint identified in Appendix 14 of the Deposit LDP.
CF 1.35/ HG 1.61	Former paint-works, Waterloo	School and housing	Y	Y	100 (both)	Y	N	100 (04), N/A (09)	Yes (as part of P/06/0037)	Outline consent, subject to S.106	River Rh'mney	EA objections addressed by FCA, due to provision of new information	Addressed through planning application, Flood risk constraint identified in Appendix 7 of the Deposit LDP.
CF 1.36	Former Bus Station, Crosskeys	College extension	Y	N	25 (04), N/A (09)	Y	N	25 (04), N/A (09)	No	Consent for campus redevelopment, granted 08	River Ebbw	FCA not deemed to be required – development in Flood Zone A	No longer in Zone C on 2009 maps.
CF 1.37/ CM 4.7	Former Palace Cinema, Risca	Library	Y	Y	100 (both)	Y	N	100 (04), N/A (09)	Yes (as part of P/06/0045)	Consent for food store, office, retail and library use, granted 06	River Ebbw	No objection subject to specified min. floor level	Addressed through planning application, Flood risk constraint identified in Appendices 10 and 14 of the Deposit LDP.

LDP Ref	Site Name	Prop. Use	C1 04	C1 09	% of Site	C2 04	C2 09	% of Site	FCA Completed	Planning Status	Water-course	EA Comments	Addressing Concerns
CM 4.5	Gateway site, Newbridge	Offices	N	N	N/A (both)	Y	N	20 (04), N/A (09)	No	Consent for office and restaurant use, partly developed	River Ebbw	No objection to consent subject to conditions. Site lies above 1 in 1000 yr level. As a result of LDP consultation, EA have no objections to allocation of site	No longer in Zone C on 2009 maps.
CM 4.8	Adj. to Lidl, Risca	Retail	Y	Y	100 (both)	Y	N	100 (04), N/A (09)	Yes (as part of 07/1261/OUT)	Outline consent granted 08	River Ebbw	EA considers FCA to be acceptable – min. floor level of 1 m above 1 in 100 yr level and 4 m buffer zone recommended	Addressed through planning application, Flood risk constraint identified in Appendix 10 of the Deposit LDP.
CM 4.9	Foundry site, Risca	Food superstore	Y	Y	<20 (both)	Y	Y	<20 (04), 75 (09)	Yes (as part of 08/0568/FULL)	Full consent granted subject to S.106	River Ebbw	08/0568/FULL – original objection but applicant submitted revised FCA containing re-assessment and additional measures which EA found acceptable	Addressed through planning application, Flood risk constraint identified in Appendix 10 of the Deposit LDP.
CM 4.11	Gallagher Retail Park, Caerphilly	Retail, w'house	N	N	N/A (both)	Y	Y	>90 (04), 55 (09)	Yes (as part of P/05/1369)	Consent for retail warehousing, granted 06	Nant yr Aber	P/05/1369 – original objection but applicant submitted further assessment which EA found acceptable	Addressed through planning application, Flood risk constraint identified in Appendix 10 of the Deposit LDP.

LDP Ref	Site Name	Prop. Use	C1 04	C1 09	% of Site	C2 04	C2 09	% of Site	FCA Completed	Planning Status	Water-course	EA Comments	Addressing Concerns
EM 1.10	Dyffryn Business Park North, Ystrad Mynach	Primary employ't site	Y	Y	30 (04), 20 (09)	Y	Y	<10 (04), <5 (09)	No	Extant consent for industrial development from 1969, estate partially developed as a result	River Rh'mney	Requirement to undertake FCA in line with any subsequent allocation has been identified in LDP Appendix	Less of the site is affected by flood risk on TAN 15 2009 maps. Site has an extant consent but need for FCA to be undertaken is identified in Appendix 9 of the plan.
EM 1.11	Dyffryn Business Park South, Ystrad Mynach	Primary employ't site	Y	Y	50 (04), 75 (09)	Y	Y	60 (04), <10 (09)	No	Extant consent for industrial development from 1969, estate partially developed as a result	River Rh'mney	Requirement to undertake FCA in line with any subsequent allocation has been identified in LDP Appendix	Less of the site in Zone C2 on TAN 15 2009 maps, although more in Zone C1. Site has an extant consent but need for FCA to be undertaken is identified in Appendix 9 of the plan.
EM 1.12	Penallta Extension, Hengoed	Housing and Sec. employ't site	N	N	N/A (both)	Y	Y	<10 (both)	No	Consent for housing, industrial, shop and pub uses, granted 03 (P/99/0768)	Nant Cylla		Only a small part on the edge of the site. Does not affect the developable area.
HG 1.03	Old Barrell Store, Rhymney	Housing	N	N	N/A (both)	Y	Y	15 (04), <5 (09)	No	Consent for housing, granted 06	River Rh'mney	Min. risk of fluvial flooding, no EA objection. Consent should be conditioned to require provision and implementation of a surface water regulation system	Addressed through planning application, Flood risk constraint identified in Appendix 7 of the Deposit LDP. Only a very small part of the site now in Zone C.

LDP Ref	Site Name	Prop. Use	C1 04	C1 09	% of Site	C2 04	C2 09	% of Site	FCA Completed	Planning Status	Water-course	EA Comments	Addressing Concerns
HG 1.05	Maerdy Garage, Rhymney	Housing	N	N	N/A (both)	N	Y	N/A (04), 60 (09)	Yes (as part of an SFCA completed for Capital Valley/ Maerdy industrial sites)	Site had consent for housing but this has now	River Rh'mney		Flood risk identified as part of new maps. Even in an 80% culvert blockage scenario at 1% CC the flood hazard is classed as very low hazard and with the depths and velocity below the maximum levels identified in TAN 15.
HG 1.06	Maerdy Crossing, Rhymney	Housing	N	N	N/A (both)	N	Y	N/A (04), <5 (09)	No	Outline application approved subject to S106.	River Rh'mney		No impact of the developable area.
HG 1.35	Penallta Colliery, Ystrad Mynach	Housing	N	N	N/A (both)	Y	Y	<5 (both)	No	Consent for housing, industrial, shop and pub uses, granted 03 (P/99/0768)	Nant Cylla		Only a small part on the edge of the site. Does not affect the developable area.
HG 1.50	Land west of A467 and River Ebbw, Abercarn	Housing	N	N	N/A (both)	Y	Y	70 (04), 15 (09)	Yes (as part of 06/0068/ FULL)	Consent for housing (06/0068/FULL and 06/0716/RM), granted 06	River Ebbw	FCA demonstrated that site is above 1 in 1000 yr flood level. Deemed acceptable by EA	Addressed through planning application, Flood risk constraint identified in Appendix 7 of the Deposit LDP. Only a very small part of the site now in Zone C.

LDP Ref	Site Name	Prop. Use	C1 04	C1 09	% of Site	C2 04	C2 09	% of Site	FCA Completed	Planning Status	Water-course	EA Comments	Addressing Concerns
HG 1.55	Land at Station Approach, Risca	Housing	N	Y	N/A (04), <5 (09)	N	N	N/A (both)	No	Consent for housing (P/02/0412 and P/05/0262), although this has now expired	River Ebbw		Addressed through planning application, Flood risk constraint identified in Appendix 7 of the Deposit LDP. Only a very small part of the site now in Zone C.
HG 1.58	Eastern part of land adj. to River Ebbw, Pontymister	Housing	Y	Y	100 (both)	Y	N	>90 (04), N/A (09)	Yes (as part of 06/0472/OUT)	Outline consent granted (06/0472/OUT) subject to S.106	River Ebbw	EA have considered FCA to be acceptable, although a min. floor level of 600mm above 1:100 yr flood level recommended	Only a very small part of the site affected – would not impact on the developable area.
HG 1.59	Suflex factory, Pontymister	Housing	Y	Y	100 (both)	Y	N	95 (04), N/A (09)	Yes (as part of 07/1524/FULL)	Consent granted 08	River Ebbw	No EA objection, provided consent conditioned to require provision and implementation of a surface water regulation system	Addressed through planning application, Flood risk constraint identified in Appendix 7 of the Deposit LDP. Site no longer in Zone C2.
HG 1.60	Tyn y Waun Farm, Machen	Housing	N	N	N/A (both)	Y	Y	15 (04), >90 (09)	No	Outline consent (P/01/1269) and reserved matters (P/05/0367)	River Rh'mney	Issue of flood risk addressed provided that dev't area conforms with that in outline permission	Addressed through planning application, Flood risk constraint identified in Appendix 7 of the Deposit LDP.
HG 1.66	Land at Venosa TE, Caerphilly	Housing	N	N	N/A (both)	Y	Y	100 (04), 50 (09)	Yes (as part of 07/0447/FULL)	Outline consent (07/0447/FULL) subject to S.106	Porset Brook	No objection on basis of information included in FCA. Flood risk can be managed, even though in C2	Addressed through planning application, Flood risk constraint identified in Appendix 7 of the Deposit LDP.
HG 1.67	Land at Pontypandy IE, Caerphilly	Housing	N	N	N/A (both)	Y	Y	<5 (04), 5 (09)	No	Consent granted, subject to S.106	Nant yr Aber		Only a very small part of the site affected – would not impact on the developable area

LDP Ref	Site Name	Prop. Use	C1 04	C1 09	% of Site	C2 04	C2 09	% of Site	FCA Completed	Planning Status	Water-course	EA Comments	Addressing Concerns
HG 1.71	Gas Works site, Mill Road, Caerphilly	Housing	N	N	N/A (both)	Y	N	25 (04), N/A (09)	No	Application pending – deferred for S.106	Nant yr Aber	No objections although site investigation required. Requirement to undertake FCA in line with any subsequent allocation has been identified in LDP Appendix	No longer in Zone C on 2009 maps.
HG 1.79	Jeremy Oils, Llanb'dach	Housing	Y	Y	65 (04), 100 (09)	Y	N	50 (04), N/A (09)	No	Outline consent (P/04/0873) and reserved matters (P/06/0695)	River Rh'mney	P/06/0695 – no objection subject to conditions. Requirement to undertake FCA in line with any subsequent allocation has been identified in LDP Appendix	Addressed through planning application, Flood risk constraint identified in Appendix 7 of the Deposit LDP.