

THE PLANNING SYSTEM AND FLOOD RISK MANAGEMENT DRAFT PLANNING GUIDELINES FOR IRELAND

Adamson M. (OPW), Doyle A., Cussen N. (DoEHLG), Cooper J. (JBA), Norton C. (Loc), Brook D. (Independent)

Abstract

A National Flood Policy Review Group was established under the aegis of the OPW (in 2003) to devise a clearly defined and comprehensive national policy approach to flooding and a precise definition of the roles and responsibilities of the various stakeholders involved. The Government in approving the Report of the Review Group (in September 2004) decided that the OPW should be the lead agency in implementing flood management policy in Ireland. The Report's recommendations highlighted the need to proactively manage flood risk, particularly the need to avoid or minimise potential future increases in flood risk. The Report further recognised that planning and development management should be a key component of the strategy for achieving this objective, and set out duties on the OPW, DoEHLG and local authorities in this regard.

Draft Guidelines have recently been developed and published for consultation under Section 28 of the Planning and Development Act, 2000, as amended, to facilitate performance of these duties and meet the stated policy objectives. The aim of the Guidelines is to ensure a more consistent, rigorous and systematic approach to addressing flood risk management in the planning system through the comprehensive consideration of flood risk in preparing development plans and local area plans and in determining applications for planning permission in order to further proper planning and sustainable development.

The key elements of these guidelines include:

- A sequential approach to flood risk management, based on avoidance, reduction and then mitigation of flood risk
- A determination of appropriate development based on flood probability and vulnerability of development type
- A stringent set of criteria against which to test development in floodplains for justification on the basis of wider sustainability grounds and acceptable management of flood risk
- The requirement for a flood risk assessment in relation to spatial planning and planning applications

This paper will outline background to, and the requirements of, the new Guidelines.

BACKGROUND

Review of National Flood Policy

Following some major flood events, and in line with changing paradigm on approaches to managing flood risks in Ireland and internationally, a comprehensive review of national flood policy was initiated by the Minister of State at the Dept. of Finance with responsibility for the Office of Public Works, Mr Tom Parlon T.D.

The review was undertaken by an Inter-departmental group (the Flood Policy Review Group) and focused on roles and responsibilities, and the development of a new policy for managing flood risk into the future.

In September 2004, the Government approved the Report of the Flood Policy Review Group (the 'Report'), setting now current policy in this sector. The Report included a range of recommendations for the development of new approaches to managing flood risk within an overall framework of integrated, catchment-based management of potential future, as well as existing, flood risk. It is with

this emphasis on the potential future flood risk that the Report identified appropriate spatial planning and development as a critical element in managing flood risk.

Development in flood prone areas, such as fluvial floodplains, has the potential to increase flood risk due to:

- the new development itself being at risk from flooding
- loss of flood storage on the floodplain, or other hydraulic changes, increasing flood flows downstream
- restriction of floodplain flow increasing flood levels upstream

Development anywhere within a catchment further has potential to increase flood risks due to increased rates and volumes of runoff from paving of greenfield land (reducing infiltration) and accelerated drainage through piped drainage systems.

Without due regard to flooding, planning and development therefore has the potential to significantly increase the national level of flood risk into the future, possibly to a degree in excess of that which may arise from the foreseen impacts of climate change. The Report duly recommended that standards and guidelines be developed for the area of planning and development management.

EU ‘Floods’ Directive

The Directive on the assessment and management of flood risks (the ‘Floods’ Directive [2007/60/EU], came into force in November 2007. This Directive sets out a common framework for flood risk management for Member States, including the following principal requirements:

- a Preliminary Flood Risk Assessment (PFRA) to screen for, and scope, flood risk to identify Areas of Potentially Significant Risk (APSRs) (to be completed by December 2011), and for such areas
- to undertake flood hazard and risk mapping (to be completed December 2013), and,
- to prepare Flood Risk Management Plans (FRMPs) (to be completed December 2015).

The directive also requires,

- coordination with the implementation of the Water Framework Directive (WFD)
- cooperation and coordination within transboundary catchments / river basins

Spatial planning and land use management is explicitly recognised within the Directive as both a factor of flood risk, and as a means of managing risk.

The PFRA within Ireland will be based on the historic flood event data within national Flood Hazard Mapping website (www.floodmaps.ie), broadscale predictive mapping of (potential) flood risk (as described later in this paper), and consultation with stakeholders.

The flood mapping and FRMPs will be prepared through the national Flood Risk Assessment and Management (FRAM) Programme. This Programme, being delivered through the FRAM Studies, is already underway, with draft floodmaps for the pilot studies in the Dodder and Lee having been produced, and with draft FRMPs due early in 2009. Further studies are underway for the Suir Catchment and the Fingal – East Meath Area, and it is envisaged that the national programme will be initiated in 2009, with flood maps being produced from 2010 through to mapping deadline of the ‘Floods’ Directive of 2013.

Scope of this Paper

This paper cannot provide details and explanation to all aspects of the new Guidelines. It therefore focuses on the hydrological and technical flood risk management aspects of the Guidelines, as considered to be most relevant for the National Hydrology Seminar and its audience.

KEY PRINCIPLES OF THE GUIDELINES

Section 3.2 of the Guidelines sets out a series of key principles upon which the framework contained therein is based. Among these, within the context of this paper as noted above (rather than the Guidelines as a whole), the following are of particular importance:

- I. Flood hazard and potential risk should be identified and considered at the earliest stage in the planning process (within the hierarchy of the planning process)
- II. Development should preferentially be located in areas with little or no flood hazard, thereby avoiding or minimising the risk ...
- V. The risks to development in flood-prone areas should be managed to ensure that development is not subject unacceptable risks.
- VI. A precautionary approach should be applied ... to reflect uncertainties in flooding datasets and risk assessment techniques, ...
- VIII. Land required for current and future flood management ... should be pro-actively identified ... and safeguarded from development.

Principles I., V., and VIII. above are discussed below under the 'Flood Risk Assessment' Section of this paper, while Principle II. is discussed under the Section entitled 'sequential approach'.

Principle VI. will not be discussed in detail herein, but it should be noted that application of the precautionary approach is relevant across all aspects of the Guidelines. It has particular relevance to the early stages of the flood risk assessment, as records of historic flooding may often be incomplete, predictive methods for assessing hazard or risk carry varying degrees of uncertainty, and there are very significant uncertainties associated with the potential impacts of climate change.

It is therefore essential that *any* areas that could *potentially* be at hazard (in particular those that are being considered for development), or *any* proposed developments that could *potentially* give rise to additional hazard or risk, should be identified as such. A more detailed assessment (a Scoping or Appropriate Risk Assessment – see below) should then be undertaken in such cases to determine with more certainty what degree of hazard or risk there might be, or that might arise as a result of development.

It is reiterated that the other principles set out in the Guidelines, but not noted above, are of at least equal importance to those noted above, in particular within the broader planning context.

FLOOD RISK ASSESSMENT

Principle I. above sets out that flood hazard and potential risk should be identified and considered, and that this should be at the earliest stage in planning process.

Identification and consideration of flood hazard and risk is provided for within the Guidelines through a staged process of Flood Risk Assessment (FRA), as set out in Sections 2.19 – 2.22 and Appendix A of the Guidelines. A FRA can be undertaken at a range of spatial scales, and is intended to:

- assess whether flood risk (from all sources – see Section 2 of the Guidelines) is an issue for the area or site, and if so, to what degree
- identify flood zones, if not already available, (see Section 2.23 to 2.26 of the Guidelines)

- inform decisions in relation to planning policy, zoning and planning applications, with regard to the identified flood zones and the vulnerability of different types of land use or development
- develop appropriate flood risk mitigation and management measures, where it is intended to site development in flood risk areas

The early timing of the FRA, at each hierarchical level of the planning process, is essential to ensure that flood risk forms one of the key planning considerations in the preparation of the spatial strategy, guidelines or plan, to guide the location of development rather than being undertaken late in the process to simply identify obstacles to be overcome once the spatial planning strategy has been set.

A staged process for the FRA has been defined within the Guidelines, as set out below, and each of these stages are then discussed in more detail:

- Screening Assessment
- Scoping Assessment
- Appropriate Risk Assessment

This staged approach, which should be linked to the various stages of the Strategic Environmental Assessment as appropriate, aims to ensure that only sufficient assessment is undertaken on a step-wise basis in terms of level of detail (and associated expenditure), with progression to the following step (and commitment of further resources) only required where the outcomes of the current step indicate that the issue of flood risk may require further assessment (again noting the need to apply the precautionary approach).

The progression through the FRA stages should however also be limited as relevant to the spatial scale of assessment. For example, at the broad strategic scale of the National Spatial Strategy or Regional Planning Guidelines, decisions on the general location of development will not require as much detailed assessment as the site-specific zoning of land in development or local area plans. These in turn may not require as much detailed assessment or modelling as will be required for master planning or the design of individual developments, where there is a need to demonstrate that flood risk will be managed to an acceptable level during and following the development.

Screening Assessment

The purpose of the Screening Assessment is to identify whether there *may* be any flooding or surface water management issues related to a plan area or proposed development site that should influence the decision-making process and warrant further investigation. Such further investigation would be by undertaking a Scoping or Appropriate Risk Assessment, as discussed below. The ‘may’ that is highlighted in this sentence reiterates the importance of the application of the precautionary approach. In screening for areas that could potentially be at flood hazard, the following should be considered:

- the history of flooding, as recorded in the National Flood Hazard Mapping website (see Figure 1 below), or, equally importantly, as known locally (from discussions with local staff and residents),
- indicative maps on potential flood hazard, such as from the OPW maps of ‘Benefiting Lands’ (see www.floodmaps.ie) or soil data (for example, alluvial soils, which some initial OPW research has shown to be a reasonable indicator of high-medium probability fluvial flood hazard areas)
- assessment as to whether relevant areas are low-lying lands adjacent to rivers, lakes, estuaries or the sea, or other relatively low areas through which overland flow may be channelled or in which it might pond,

An inspection of relevant areas is advised to assess the potential for flooding issues, even if they are not identified as being at risk from other sources as noted above.



Figures 1 & 2: Sample views from www.floodmaps.ie

A parallel may be drawn between the Screening Assessment as set out within the Guidelines and the initial stage of the PFRA as required under the 'Floods' Directive. As such, ongoing and imminent work to implement the PFRA will provide further information sources that could be of use for the Screening Assessment. Foreseen work of this nature would include a national pluvial flood risk screening assessment (to identify, at a broad scale, areas that might be prone to inundation from intense rainfall events), and an assessment of areas prone to flooding from groundwater. An indicative assessment of areas that could be prone to flooding from rivers based purely on GIS manipulation of DTM data is also currently under development by the OPW for the purposes of the PFRA (and also as an indicator of potential floodplain attenuation for the Flood Studies Update). While still at an early stage of development, tests are showing that while there is certainly not a perfect match with the 1% Annual Exceedance Probability predictive flood maps from the Lee FRAM Study (see Figure 3), the assessment, subject to ongoing refinements and improvements, could be used for the PFRA, and might also be of use with respect to screening for flood risk.

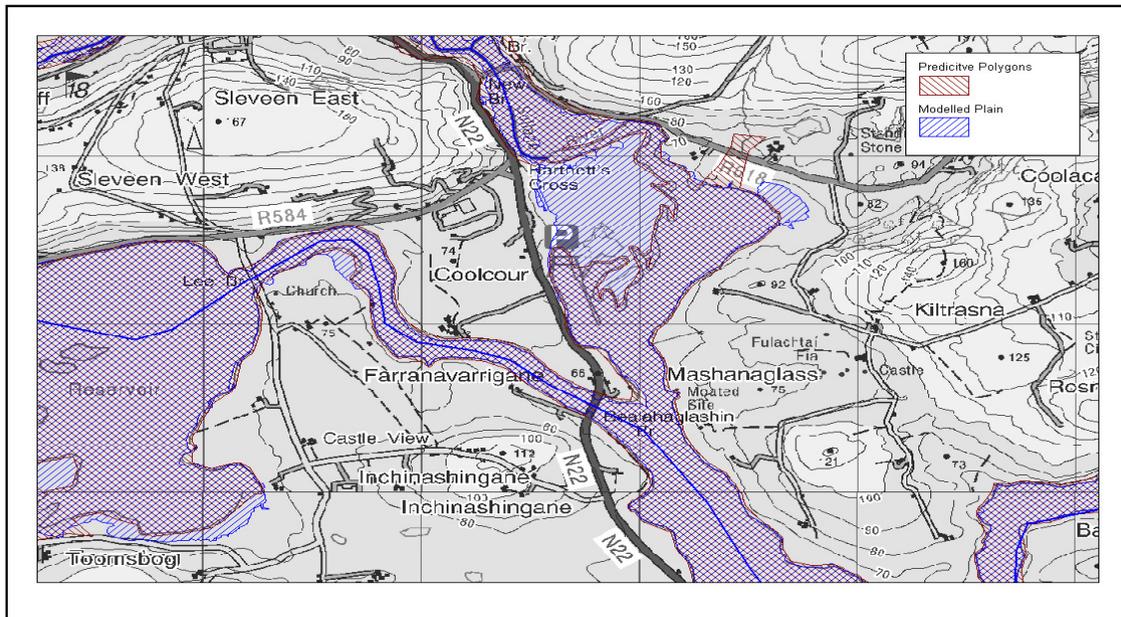


Figure 3: Example of comparison of DTM-based indicative flood map vs. Lee FRAM Study flood map

The outputs of strategic or detailed flood maps, such as those currently being developed for coastal areas by the Dept. of Agriculture, Fisheries and Food, or those that will be produced through the FRAM studies (see below), should also obviously be considered where available in the Screening Assessment.

Scoping Assessment

The purpose of the Scoping Assessment, which should be linked to the scoping stage of the Strategic Environmental Assessment to be undertaken for the review of a development plan, is to:

- confirm sources of flooding that may affect a plan area or proposed development site,
- appraise the adequacy of the existing information,
- scope the extent of the risk of flooding and potential impact of a development on flooding elsewhere, and,
- scope and assess possible mitigation measures.

As part of the confirmation and appraisal of flood risk and associated information, some new, but preliminary, analysis may be appropriate, to build on existing information. This might include basic hydrological analysis and simple hydraulic modelling and / or manual (spreadsheet) assessment of local hydraulic conditions, supplemented, if necessary, by some low-cost survey. The appropriate degree of detail of a Scoping Assessment might be similar to that of a pre-feasibility study for the development of a flood relief scheme, and would generally need to be undertaken by experienced flood risk assessment and management professionals. Again, it is essential that the precautionary approach is applied at this stage.

Appropriate Risk Assessment

The purpose of the Appropriate Risk Assessment is to assess in sufficient detail and provide a quantitative appraisal of:

- flood risk issues to a proposed development,
- the potential impact of the proposal on flood risk elsewhere, and,
- assess the effectiveness of any proposed mitigation measures.

The Appropriate Risk Assessment should, as stated, be of *sufficient detail*, as relevant to the scale of the potential risk that the plan or proposed development could be subject to, or cause (i.e., it should be proportionate). For example, the type of assessment required for the zoning of large areas potentially prone to flooding for vulnerable developments, or of major developments in flood prone areas would be of a similar level of detail as a feasibility study for a flood relief scheme, or a FRAM study, as currently being piloted.

Where reliable information on flood zone extents has not been identified as being available at an earlier stage in the FRA process, it is within the Appropriate Risk Assessment stage that such zoning would need to be defined. This Assessment should also provide more quantitative assessments of the degree and nature of risk within the flood zones (flood depths, velocities, rate of onset, etc.) as well as of flooding from other sources, such as overland runoff or groundwater.

The Appropriate Risk Assessment will need to quantitatively assess the impacts the proposal will have in terms of its potential impact elsewhere, such as through a loss of storage, restriction to flow and, for all development, whether inside or outside of floodplains, the additional runoff the development could generate.

Having assessed the potential risk to, and from, the proposal, the critical decisions need to be made as to whether the proposal is appropriate from a flood risk perspective, in conjunction with an assessment as to whether the proposal is essential from a broader perspective of sustainable planning and

development (see Part 1 of the Justification Test, Section 3, of the Guidelines), or whether, in accordance with the sequential approach (see below), a lower vulnerability land use could be substituted to reduce the risk at, or from, the proposal in question.

If it is decided that the proposal should proceed, and that it is justifiable in accordance with the Test, then the risks to and from the proposal will need to be mitigated (reduced) and managed. This process forms the final part of the Appropriate Risk Assessment, and is necessary to meet the requirements of Part 2 of the Justification Test, and is also required under **Principle V.** of the Guidelines.

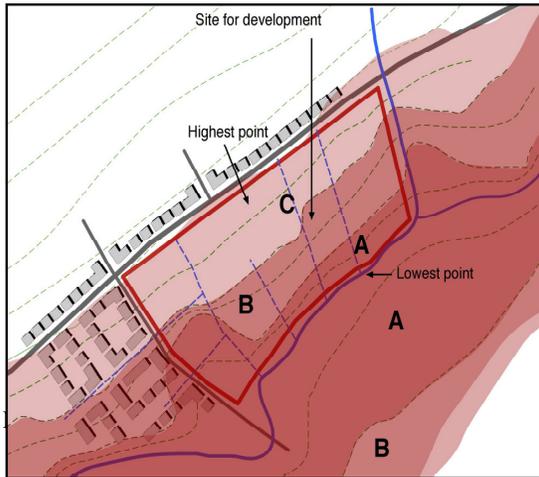


Figure 4: flood zone maps

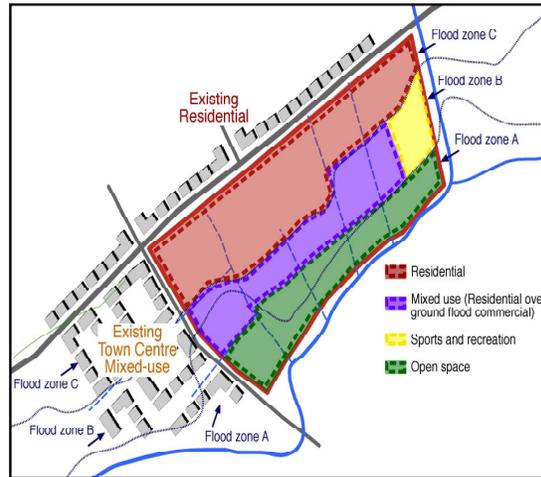


Figure 5: Flood-sensitive urban layout

A wide range of techniques can be used to mitigate and manage the risk to a proposed development, but this can best be achieved through a coordinated planning and design process, which responds to the character and context of the site and/or area in question. This requires the involvement of both spatial planners and flood risk management professionals in balancing the need for appropriate urban and landscape form, traditional protection measures and non-structural risk management approaches. Appendix B of the Guidelines provides further advice on this approach. Figures 4 and 5 indicate how this approach can be applied to make full use of a site while ensuring sustainable development and good urban structure.

An important consideration that should form part of this stage of the Assessment is the management of urban surface water drainage and runoff, which should be assessed early in the design process and at a broad, local area level to ensure that it is provided for within the overall urban structure, rather than fitted around individual developments on a site-by-site basis. This issue, which includes the application of Sustainable Drainage System, or ‘SuDS’ techniques, is further discussed in Appendix B of the Guidelines.

Role of the FRAM Studies

As the FRAM Studies are completed in line with national policy and the ‘Floods’ Directive, further information will become more readily available to assist with all stages of the FRA process. The FRAM Studies will produce detailed flood maps for most areas where major development exists or is being considered, and where flood risk is likely to be an issue, and such maps will assist the process of zoning and quantitatively assessing flood hazard and risk.

It is foreseen that these maps will be displayed using the National Flood Mapping Website, presenting extents for two or three event frequencies (including those specified as the basis of the flood zones under the Guidelines) along with supplementary information on flows and depths (as required under the ‘Floods’ Directive). Figure 6 provides a ‘mock-up’ of the anticipated presentation of this information on the website.

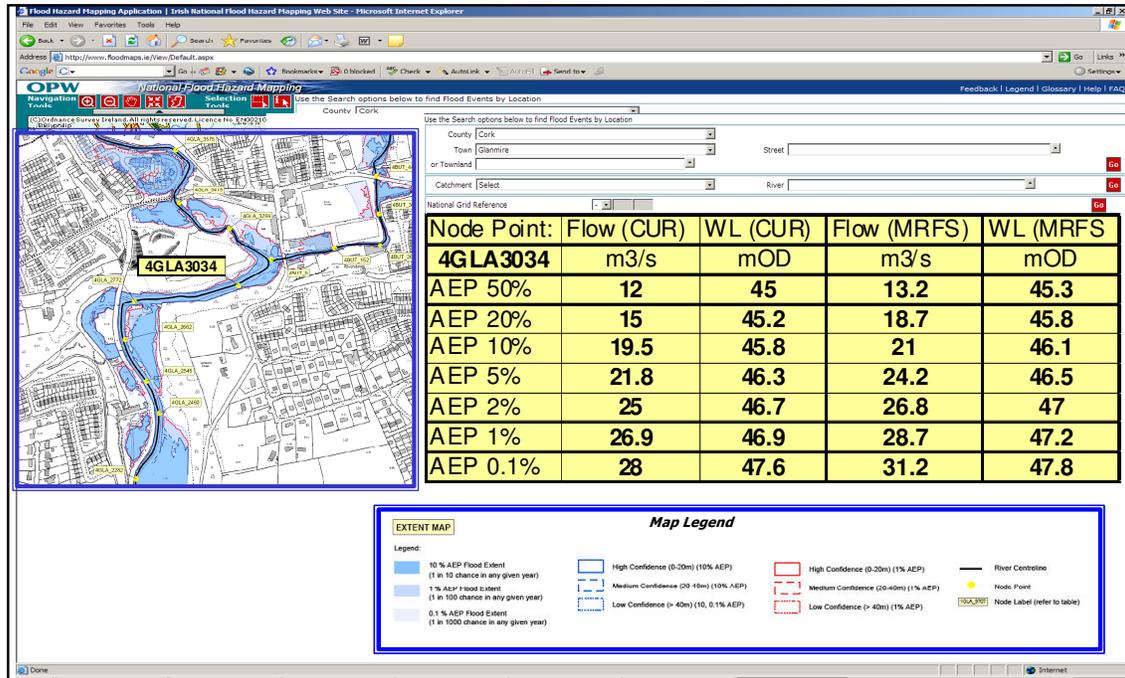


Figure 6: ‘Mock-up’ of foreseen presentation of flood maps produced under FRAM Studies

The studies, in preparing the FRMPs (which planning authorities should have regard to in the preparation of Development Plans), will also need to assess land use management, and will necessitate dialogue and cooperation between spatial planners and flood risk management professionals. This assessment is required in line with **Principle VIII**. of the Guidelines, and the requirements of the ‘Floods’ Directive. It will be a two-way process, whereby land serving a critical flood risk management function, or land that would be required for such a purpose, should be protected under statutory spatial plans, as well as FRMPs taking account of spatial planning objectives and requirements. This constructive cross-sectoral interaction should help to achieve sustainable development and effective management of existing and potential future flood risk.

SEQUENTIAL APPROACH

Principle II of the Guidelines, which promotes the ‘sequential approach’ is fundamental to the overall objectives and structure of the framework. Under this approach, the promotion of development, through spatial planning or proposals for development, should seek first to exploit areas with little or no flood hazard, as identified through the FRA process. Only if no such areas are available or suitable for the required development, should areas of higher hazard be considered, with areas of high hazard only being considered as a last resort. The land use of areas where there is more than little or no hazard should similarly be reviewed under the sequential approach, with lower vulnerability land use being preferred over those of higher vulnerability.

This approach follows the classical risk management approach, whereby the risk should be avoided in the first instance, and where this is not possible, then the risk should be reduced as far as reasonably possible, in this instance through substitution of lower vulnerability land uses. Any residual risk should then be mitigated and managed, as set out under the FRA process.

It should be noted that the sequential approach is applicable to the layout and location of development within individual sites, as well as for spatial planning and zoning processes. Within a site where flood hazard varies, development (particularly higher vulnerability development) should preferably be located in those areas of lower hazard, and it might be noted that this can apply vertically, as well as horizontally, with ground floor or basement uses being specified for lower vulnerability uses and higher vulnerability uses on upper floors.

The importance of using the sequential approach in the spatial planning process for the zoning of land for particular types of development cannot however be over-emphasised, since this is crucial to subsequent decisions in development management. Appropriate zoning decisions in spatial planning will avoid the need to seek ways to reduce, rather than avoid, flood risk within an inappropriately zoned site.

ROLE OF REGIONAL AND LOCAL AUTHORITIES

The publication of the draft guidelines introduce a formalised methodology for the incorporation of flood risk assessment and the mechanisms described above into the existing arrangements for the development planning and management processes under the Planning Acts. The process above also builds on the longstanding acknowledgement in the planning legislation of flooding as a very important planning issue. Following on from the introduction of the draft guidelines, the following arrangements are being put in place.

Regional Authorities prepare Regional Planning Guidelines (RPG's) as overall co-ordinating spatial planning frameworks at the regional level, consistent with the National Spatial Strategy (NSS) at national level. RPG's are a key implementation element of the process of implementing the NSS and as such the integration of flood risk assessment into the RPG function of Regional Authorities will significantly strengthen the degree to which implementation of the NSS takes flood risk into account.

Regional Authorities will be reviewing their Regional Planning Guidelines (RPG's) beginning towards the end of 2008 and into 2009 with a view to completing the review process by mid 2010. Under the draft guidelines regional authorities are now required to prepare regional level strategic flood risk assessments as an integral input to the preparation of the next RPG's and as a framework for ongoing co-ordination of the development plans of local authorities in their areas focusing at a high level on identifying those parts of their regions where flood risk is an important issue for the development plans of constituent local authorities to address.

The FRA dimension in preparing the next round of Regional Planning Guidelines will also be co-ordinated with the work ongoing in preparing River Basin Management Plans (RBMP's) under the EU Water Framework Directive and future work required to prepare Flood Risk Management Plans under the EU Floods Directive and the existing requirements to subject the process of preparing RPG's to Strategic Environmental Assessment (SEA) under the relevant EU directive.

City and County level Planning Authorities will introduce flood risk assessment carried out in accordance with the draft guidelines as an integral and leading element of the development planning functions under the Planning and Development legislation. The outputs from such assessments will be required to be in place before decisions are taken regarding the location and pattern of new development including zoning decisions in preparing draft development plans and adopting development plans.

In addition, the new flood risk assessment system will be integrated into the existing Strategic Environmental Assessment (SEA) process introducing processes for screening for flood risk, scoping any flood risk assessment required and carrying out such assessments in the overall system for screening and scoping under SEA provision.

City and County development plans will also establish the overall flood risk assessment context for all development plans of other planning authorities, such as town councils and any Local Area Plans (LAP's) within their functional areas but may also be supplemented by any more detailed site specific flood risk assessment required to comply with these guidelines within town plans/LAP's.

Planning authorities will assess planning applications for development in accordance with the provisions of the draft guidelines following the guidance of their own or any OPW strategic flood risk assessment whether within their development plans and or at a site specific level and the application of the sequential approach and if necessary the justification test required by the draft guidelines.

SUMMARY

The Guidelines for Planning Authorities on 'The Planning System and Flood Risk Management' represent a major step forward in the implementation of the new national flood policy, and put in place a framework for the effective consideration of flood risk within the planning process to promote sustainable development and the management of existing and, in particular, potential future, flood risk.

The framework is founded upon a series of principles, including the application of the sequential approach, which forms the foundation of the framework. The principles also require the assessment of flood hazard and potential risk at an early stage, through a staged process of Flood Risk Assessment, to inform decision-making within the planning process, and the application of the precautionary approach to avoid creating risk through uncertainty or an initial absence of information.

The Office of Public Works and Dept. of Environment, Heritage and Local Government consider the implementation of these Guidelines to be of high importance in achieving relevant Government objectives, and will work with the planning authorities to assist with the effective and efficient implementation of the Guidelines, such as through the delivery of awareness, development and training workshops, and the ongoing preparation of flood maps and of other useful information and documentation related to flood hazard and risk.