



## Lower Parramatta River



### FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN

#### Volume 2 - Planning

- Final
- August 2005



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- Final
- August 2005

Prepared for

**Sinclair Knight Merz**

on behalf of **Parramatta City Council**

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# 1. INTRODUCTION

## 1.1 Background and Study Scope

This Volume – Volume 2, relates primarily to the planning aspects of the overall Lower Parramatta River Floodplain Risk Management Study. Volume 1 provides a description of the all aspects of the study and a summary of the planning issues which are covered in more detail in this volume.

The Upper Parramatta River catchment rises on the eastern side of Prospect reservoir and includes parts of Blacktown, Holroyd, Baulkham Hills and Parramatta Local Government Areas (LGA), see Figure 1.1 in Volume 1. The major tributaries include Blacktown Creek, Toongabbie Creek and Darling Mills Creek. This catchment is known as the Upper Parramatta River catchment and activities relating to the waterways are co-ordinated on behalf of the three Councils by the Upper Parramatta River Catchment Trust (UPRCT). The eastern boundary of the Upper Parramatta River is the Charles Street Weir in the Central Business District (CBD) of Parramatta.

Lower Parramatta River commences at the Charles Street Weir and extends eastwards to about the suburb of Birchgrove where the river joins Lane Cove River and becomes Port Botany or Sydney Harbour. However for the purposes of this study, the eastern extent of the study area is Ryde Bridge. As the Parramatta River flows eastwards, a number of creeks join the river including Vineyard Creek, Subiaco Creek, Duck River Haslams Creek and Powells Creek. These creeks are in the LGAs of Parramatta, Auburn and Ryde.

Don Fox Planning Pty Ltd has been engaged by Sinclair Knight Merz SKM to form part of a consultant team to prepare a Floodplain Risk Management Study (FRMS) and options for a Floodplain Risk Management Plan (FRMP).

This study has been specifically commissioned by Parramatta City Council (with partial funding from the DLWC) and covers an area predominantly within the Parramatta LGA. Accordingly, while some discussion of issues associated with the Ryde and Auburn LGAs is provided, the report and its outcomes are relevant primarily to the Parramatta LGA.

The purpose of this component of the study is to undertake the following tasks:

- Describe the characteristics of the study area with regard to land use, building form and population characteristics with particular regard to implications for the management of the flood risks.
- Discuss the role of planning in the preparation of the FRMS and the implications and the choice of an appropriate flood planning level (FPL) standard or standards.



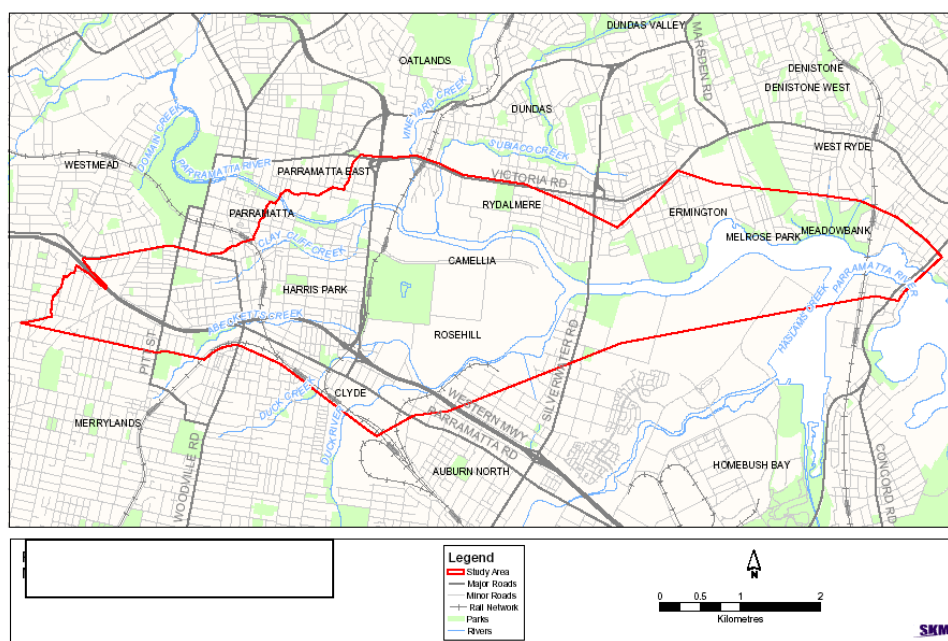
- Review the existing framework of planning and development controls that are relevant to the formulation of planning instruments and the assessment of development applications within the study area.
- Discuss the proposed approach and philosophy to floodplain planning and how it may be implemented within the study area, particularly having regard to the planning responsibility of Council and planning controls emanating from this FRMS.
- Discuss options and review strategic planning issues to guide the formulation of appropriate planning controls ultimately for inclusion within a Floodplain Risk Management Plan (FRMP).
- To make specific planning recommendations in regard to the above, including an outline of suggested planning controls.

It is recognised that the flood hazard is one component for consideration in any town planning exercise. It is not considered appropriate to recommend a variety of planning controls for inclusion within a FRMP which responds to the planning hazard identified by hydraulic studies in isolation to this strategic planning context. Accordingly, this component of the FRMS considers the strategic planning context for the study area as a prelude to formulating planning recommendations for the FRMP.

## 1.2 Study Area

The study area comprises the Lower Parramatta River Catchment as depicted in **Figure 1-1**

### ■ Figure 1-1 Lower Parramatta River Catchment



## **2. THE PLANNING CONTEXT**

### **2.1 Introduction**

The planning system in NSW can be broadly dichotomised into policy formulation (plan making) and development assessment (determining development applications). A significant outcome of this study is the recommendation of policy for the adoption of Council, and endorsement of the state government where necessary, that will ultimately assist Council in addressing the issue of flooding when assessing development proposals. There are various statutory and general planning considerations relevant to the formulation of planning policy in this context and these are outlined and discussed in this section of the report.

This study also identifies general environmental attributes of the study area, particularly the vegetation, heritage and population and housing characteristics of the corridor proximate to the Parramatta River and its tributaries. This information is important in providing an understanding of the social economic and environmental context of the floodplain when preparing planning policy to address flood risks. The review of this information is also relevant in identifying factors relevant to the formulation of other non- structural measures such education programs appropriately targeted at the affected community and the evaluation of structural flood mitigation measures. Heritage and population characteristics are discussed below while the main report prepared by SKM provides an analysis of vegetation issues.

### **2.2 Heritage**

The issue of heritage is of significance in regard to the forming and understanding of the social and cultural context of the floodplain and to ensure that any flood mitigation measures do not impact upon the heritage of the study area. Each of the councils' LEPs provide listings of heritage items, as does the Parramatta Regional Environmental Plan.

It is envisaged that parts of the river and creek system retains potential Aboriginal archaeological relics and sites. There remains evidence today of Aboriginal occupation within the boundaries of Lake Parramatta Reserve in the form of remnant shelters, hand stencils, flaking scars and deposits.

### **2.3 Parramatta Archaeological Management Study**

Archaeological resources within the Parramatta Centre have been documented in detail in the Parramatta Historical Archaeological Landscape Management Study (PHALMS, August 25, 2004). The Study also sets out a detailed policy for managing those resources.

The PHALMS report identifies areas of known or potential archaeological significance. Both areas known to have archaeological resources, and areas that potentially contain such resources, require certain procedures to be followed as set out within Council's Heritage LEP and the Heritage Act 1977, prior to undertaking any site works. The Heritage Act, 1977 contains comprehensive legal obligations requiring any persons who is excavating a site where there is

known to be “relics” (or where there is likelihood of disturbing or uncovering ”relics”) to make an application to the Heritage Office of NSW for an excavation permit. A “relic” is defined as any object that is more than 50 years old. There is also an obligation under the Heritage Act to stop work and contact the Heritage Office if relics are unexpectedly disturbed or uncovered.

The study area of the lower Parramatta River has been occupied by Aboriginal communities for thousands of years and is the second oldest European settlement in Australia. The PHALMS report identifies and catalogues a number of sites within the study area with the following descriptions:-

- Archaeological assessment and heritage Council approval required (Various permits and approvals under the Heritage Act are cited),
- Heritage Council approval required (relevant provisions of the Heritage Act were again cited),
- No archaeological requirements (but if relics are discovered during excavation processes, then works must stop and necessary approvals obtained).

The significance of the archaeological resources in the study area, to the objectives of the Flood Plain Risk Management Plan relate generally to an understanding of the heritage context of the floodplain and more specifically to ensure that any flood mitigation measures do not have an unacceptable impact upon these resources. The sites identified as either possessing or potentially possessing archaeological relics are substantially widespread through the study area. Accordingly, any flood mitigation works will, in the majority of cases require an archaeological assessment to be undertaken as part of the environmental review process of the proposal. Reference to the PHALMS mapping data would be relevant for the purposes of confirming the necessity for such an assessment.

## **2.4 Changing Population Characteristics**

Census data for the Parramatta LGA compared to the Sydney statistical division overall has been reviewed to determine general trends within the study area. **Table 2-1** provides a summary of population change within the LGA (and compared to the Sydney statistical division overall) between the 1986 and 2001 Censuses.

■ **Table 2-1 Summary of Population Change**

Area	1986 Census	1991 Census	1996 Census	2001 Census	Change 1991-01	% Change 1991-01	Compound Rate 1991-96	Compound Rate 1996-01
<i>Number of Persons</i>								
<b>Parramatta (C) LGA</b>	130 783	132 810	139 157	144 490	11 680	8.8%	0.9%	0.8%
<b>Sydney SD</b>	3 364 858	3 538 448	3 741 290	3 997 321	458 873	13.0%	1.1%	1.3%

Salient conclusions drawn from Census data generally, of particular relevance to this study, are outlined below:

**Age of Residents**

The Parramatta LGA has had a relatively stable proportion of older persons since 1991 with around 12.3% of the population being aged 65 or more years (compared to 11.7% for the Sydney region overall). The increased proportion of older persons is an issue associated with the ability of the population to self-evacuate, if required during periods of extreme flood. Such difficulties are heightened in situations where older and frail persons are concentrated in specifically constructed aged persons accommodation. Accordingly consideration should be given to excluding such development which is sensitive to flood risk due to evacuation difficulties, from all parts of the floodplain, such special consideration being consistent with the approach taken within the recently published bushfire guidelines “*Planning for Bushfire Protection, 2002*” prepared by Rural Fire Service.

**Origins of Population**

The percentage of the population who are overseas-born from non-English speaking countries has also increased significantly, particularly in comparison to the Sydney statistical division overall (about a 5% compound annual growth rate in comparison to less than 1% compound annual growth rate for the Sydney statistical division). The percentage of overseas born considered to be poor English speaking at the 2001 Census was 6.1% (in comparison to 4.4% for the Sydney region overall). This has some implications in regard to community awareness programs, to ensure that multi-lingual information is distributed or access to interpretative facilities is provided.

### **Household Incomes**

Median household incomes, in comparison to the Sydney statistical division are lower in the Parramatta LGA. This variation is also reflected in households owning or purchasing properties in comparison to renting, with a lower proportion of homes being owned or purchased in the LGA in comparison to the Sydney Region. Consistently, median mortgages, in comparison to the Sydney statistical division, are also lower in the LGA.

Generally, this reflects a reduced capacity for the population of the Parramatta LGA to recover financially subsequent to losses incurred during a major flood event. The present absence of comprehensive domestic insurance against riverine flood damage prevents the safeguarding against such financial loss, and increases reliance on government and community assistance.

### **Types of Housing**

The number of occupied private dwellings in the Parramatta LGA has increased by 11.7% between the 1991 and 2001 Censuses, to 51,433 dwellings. The majority of dwelling types are separate houses (61%) although the proportion of medium density housing is steadily increasing, being approximately 26% in 1986 and 39% of housing stock in 2001.

Household sizes have also been declining, consistent with trends throughout Sydney generally, with average occupancy ratios for dwellings being at 2.85 in 1986, decreasing to 2.68 persons per dwelling in 2001. The percentage of households being either owned or being purchased has also steadily declined from 64.2% in 1986 to 56.6% in 2001.

Generally, these changing household characteristics reflect an increase in the proportion of dwellings in a multi-unit housing form, and where located in the floodplain may either have reduced potential flood damages in the form of multi-level residential flat buildings, or higher flood damages where in the form of villas and townhouses which provide greater floor area at lower levels. Small households have the nominal effect of reducing the concentration of persons within the floodplain, but this is offset by increased housing densities. A trend towards reduced home ownership increases potential difficulties with establishing effective flood education programs due to the tendencies for rental occupants to relocate at a greater frequency (which may be in and out of a floodplain) and alternate priorities in regard to protection of property from flood damage.

The study area forms of part of western Sydney which is projected to provide for substantial increase in population growth for the Sydney region over the next 10 years (refer to DUAP “*Shaping Western Sydney*”, 1998). Population growth will vary between LGAs in Western Sydney, but will be higher within outer LGAs such as Baulkham Hills and Blacktown LGAs and

lower in the Parramatta LGA. The majority of Growth in the Parramatta LGA will occur as redevelopment of established areas. In addition to population growth, employment opportunities within the Parramatta CBD are expected to almost double within approximately the next 20 years.

These trends and pressures for future growth and population change need to be taken into consideration when making decisions in regard to the use of floodplains and the level of risk the community is willing accept in the use of the floodplains.

## **2.5 Existing Planning and Development Controls**

### **2.5.1 Introduction**

This section of the report identifies and examines various forms of planning instruments and associated controls which apply to the study area and may have potential for use for the purposes of implementing planning controls to guide future development within the study area. Not all of these planning instruments will be applicable, but are reviewed for the purposes of completeness and to provide a general overview of potential planning controls and strategic planning direction for the area. A broad overview of existing relevant planning controls in the Ryde and Auburn LGA are provided but recommended changes to these controls are beyond the scope of this study.

### **2.5.2 State Environmental Planning Policies**

A State Environmental Planning Policy (SEPP) is a planning document prepared in accordance with the Environmental Planning & Assessment Act (EPA Act) by planningNSW and eventually approved by the Minister, which deals with matters of significance for environmental planning for the State. Examples of SEPPs that have been prepared include SEPP No. 19 - Bushland in Urban Areas, and SEPP No. 35 - Maintenance Dredging of Tidal Waterways. No State Environmental Planning Policy has been prepared dealing specifically with the issue of flooding.

State Environmental Planning Policy (Seniors Living) 2000 (Seniors Living SEPP) has recently replaced SEPP 5 and applies to urban land or land adjoining urban land where dwellings, hospitals and similar uses are permissible. Seniors Living SEPP would apply to the majority of the study area, and would effectively override Council's planning controls to permit residential development for older and disabled persons to a scale permitted by the SEPP. Notwithstanding, Clause 4(2)(a) of this Policy restricts its application from land identified as "floodways" or "high flooding hazard" in another environment planning instrument such as a REP or LEP (as described below).

### **2.5.3 Regional Environmental Plans (REPs)**

A Regional Environmental Plan (REP) is prepared in accordance with EPA Act by the planningNSW and eventually approved by the Minister. An REP provides objectives and controls for environmental planning for a region, or part of a region. The extent of a region will vary depending upon the issue to be addressed but normally refers to more than one LGA.

The LPRC is affected by the following REPs:

- Sydney Regional Environmental Plan No. 22 – Parramatta River 1998
- Sydney Regional Environmental Plan No. 28 – Parramatta 1999

Sydney REP No. 28 is of particular relevance to the FRMS and FRMP as it contains a number of planning controls which relate to addressing flood risk. Accordingly, this REP has recently been reviewed by Don Fox Planning, as part of a separate exercise undertaken on behalf of the Upper Parramatta River Catchment Trust, Parramatta City Council and PlanningNSW.

This exercise has resulted in recommendations for amendments to the REP, to be pursued as part of the process of the overall review of the REP undertaken in 2002. The amendments will provide for changes to definitions and objectives to ensure consistency with the approach recommended at the conclusion of this report.

#### **2.5.4 Advisory Circulars**

PlanningNSW is responsible for providing advice to local councils to ensure that best practice is maintained in the planning process. A Planning and Environment Commission (PEC) Circular was issued in 1977 advocating prescriptive floodplain planning controls and the adoption of the 100 year ARI flood standard. Subsequently, a Departmental Circular (No. 122) was issued by the former Department of Planning (DOP) and more recently as Circular No. C9 to assist Councils to relate the current flood policy of the State Government and the earlier Floodplain Development Manual (FPDM) (now superseded by the 'Floodplain Management Manual'), to the requirements of the EPA Act and the Department's general approach to floodplain planning.

The current State Flood Policy (2001) disbanded the 100 year ARI flood standard and requires local Councils to implement floodplain management based on a merits based approach. The Circular states that in accordance with the FMM, Councils should prepare single comprehensive local environmental plans to implement their FRMPs, and so avoid an ad hoc, piecemeal approach to planning within floodplains.

In recognition that the preparation of such LEPs may take some time, Councils were advised that in the interim, adequate supporting data for decision making should be obtained inclusive of:

- any relevant FRMPs or interim policy;
- details of flooding in the area;
- social and economic impact of flooding;
- environmental impacts of development in the floodplain (eg. on water quality, flood behaviour, etc);

- the availability of alternative flood free sites and reasonable alternative uses for the subject site;
- cumulative adverse impacts;
- matters of state and regional significance (eg. the impact of development on a floodplain beyond local government boundaries); and
- increased risk of flood damage to regional infrastructure, reduction in flood storage capacity, etc.

### 2.5.5 Section 117 Directions

Ministerial directions pursuant to Section 117(2) of the EPA Act specify matters which local councils must take into consideration in the preparation of LEPs. Section 117(2) Direction No G25 (in regard to ‘flood liable land’) is relevant.

This direction is aimed specifically at enforcing the principles contained within the FMM, and specifies a number of matters including the following:-

- LEPs should not rezone flood liable land from a zone such as rural, open space or special uses - flood, to a higher potential zone such as residential or industrial;
- the LEP should not, in respect to flood liable land, permit a significant increase of development potential or create a necessity for structural flood mitigation measures, and should require development consent for the majority of uses (other than minor development and additions);
- land defined as *high hazard flood liable or floodway* in accordance with the FMM should be zoned Special Uses - High Hazard Flood Liable (or Floodway) Rural, Open Space, Scenic Protection, Conservation, Environmental Protection, Water Catchment, or Coastal Land Protection or a zone with a similar description.

The firm application of this latter principle would result in a proportion of the study area being considered within a ‘high hazard’ area and accordingly required to be zoned in a highly restrictive manner. This is likely to capture primarily open space zoned land but would be inclusive of land currently zoned residential and industrial. It is noted that no land within the study area is currently identified within a specific flood zone.

Section 117(2) directions were reviewed within a report prepared by PlanningNSW (“*Review of Section 117(2) Directions*”, 1997). Only minor changes to Direction G25 were proposed within the revision by PlanningNSW. However, the recommendations of the review have not yet been implemented.



### **2.5.6 PCC Local Environmental Plans (LEPs)**

A Local Environmental Plan (LEP) is a plan prepared in accordance with the EPA Act which defines zones, permissible uses within those zones and specific development standards and other special matters for consideration with regard to the use or development of land. The study is affected by the provisions of separate local environmental plans for each of the Local Government Areas (LGAs) within the catchment, as discussed below.

Parramatta LEP 2001 applies to the LPRC, within the Parramatta LGA. This LEP deals with management of flood risk in various ways, inclusive of identifying this task as an objective of the plan, defining flood liable land, outlining special considerations for development within flood liable land, the exclusion of development from being considered as exempt and complying development where located on flood liable land or areas within proximity to creeks and rivers.

The Parramatta LEP was reviewed on behalf of Council, as part of a separate exercise. The recommendations of this review are included within later sections of this report, for completeness.

The review of the LEP is appropriate in order to ensure consistency with the more detailed controls proposed to be implemented through a development control plan, as discussed later in this report.

There are components of the study area, particularly within the vicinity of the Parramatta CBD and the Harris Park locality, subject to pressures for urban growth and change. These areas have many attributes providing incentives for growth including substantial public transport (eg. both existing and programmed railway lines), commercial/retail activities and associated employment opportunities, and community facilities and services. In accordance with the objectives of the FMM, flood risk required to be balanced with social and economic criteria to determine on balance what the appropriate planning outcome should be for different localities and individual sites. That is, for example it may be appropriate to allow a particular site to be exposed to greater flood risk if its development for a particular use was considered to be a highly desirable planning outcome for the community for economic and social reasons due to proximity of the site to a railway station.

The current planning controls for the Parramatta LGA incorporate a residential 2(e) zone which primarily relates to residential zoned land identified as having some flood or drainage affectation. The objectives of the 2(e) zone are as follows:-

- “(a) To limit the erection of structures on land subject to flood inundation, and*
- (b) To identify land that is subject to flood inundation and is considered to be unsuitable for intensification of development, and*
- (c) To ensure that the adverse affect of inundation is not increased through development, and*

- (d) *To maintain the amenity and existing characteristics of areas predominantly characterised by dwelling houses, and*
- (e) *To permit only large scale development which has regard to the residential amenity of the locality, and*
- (f) *To provide opportunities for people to carry out a limited range of activities from their homes where such activities will not adversely affect the amenity of the neighbourhood.”*

The above zone was imposed upon different localities within the Parramatta LGA prior to the completion of any specific FRMS or FRMP. Council has recognised that the 2(e) zone was intended effectively act as a holding zone until such time as an FRMP has been prepared for individual localities. The FRMS and consequent FRMP would subsequently provide the opportunity to evaluate the broader economic social and environmental issues together with flood risk to determine the appropriate planning outcome for land within the 2(e) zones.

### **2.5.7 PCC Development Control Plans (DCPs)**

A Development Control Plan (DCP) is a plan prepared in accordance with Section 72 of the Environmental Planning & Assessment Act which provides detailed guidelines for the assessment of development applications. Various DCPs of some relevance apply in the study areas, as discussed below.

Parramatta DCP 2001 is a comprehensive Development Control Plan applying to the whole LGA. This document outlines the majority of Council’s controls in regard to planning and development. Clause 4.1.3 of the DCP provides Council’s primary controls in regard to floodplain risk management. These controls basically refer to the need for compliance with Council’s FRMPs, Policy for the Development of Buildings on Flood Prone Land and the Floodplain Management Manual. Some additional general performance criteria and design solutions are provided in regard to filling, cumulative impacts and adverse impacts on other properties in the floodplain.

Council has expressed a preference to retain a structure which adopts an independent flood policy which is not embodied within the DCP, but referred to by the DCP. It is envisaged that the policy could also incorporate other governance issues such as the management and dissemination of flood data, flood awareness and criteria for the assessment of rezonings.

The overall approach should, therefore, be to provide for minimal change to Council’s DCP (incorporating provisions which relate only to controls on development) and to provide for a new Flood Prone Land Policy which adopts the more comprehensive recommendations of this study, as outlined and discussed later in this report. Some peripheral provisions within the DCP will also need to be review to provide for consistent definitions and overall approach to flood risk management.

### **2.5.8 Council Policies**

In addition to formal regulations such as a DCP or an LEP, Councils may from time to time adopt specific policies with regard to their long term vision for development within the floodplain or to deal with specific matters such as flooding. Normally, such policies are translated into DCPs or other planning instruments such as an LEP.

The State Government Flood Policy introduced in 1984 specifically abandoned the application of the 100 year ARI flood standard as the designated flood standard for the State of New South Wales, and required each LGA to determine their flood standard or standards based on merit. The FPDM introduced in 1986 and the more recent FMM released in 2001 provide guidelines to assist councils in determining the relevant standards and policies, through the preparation of FRMSs and FRMPs.

Until the adoption of an FRMP, Councils under the 1986 FPDM were required to produce interim flood policies, which were adopted by three of the four Catchment Councils. The ability to rely on interim policies was removed from the 2001 FMM which increases the urgency to prepare FRMPs for flood affected areas in the LGAs.

The procedures now outlined within the 2001 FMM provide Council with indemnity pursuant to the limitations provided by Section 733 of the Local Government Act 1993, and accordingly is very important to Council's overall risk management procedures. The eventual outcome of all FRMPs, including this FRMP will be to translate relevant planning recommendations of these documents into the instruments available through the EP & A Act, principally the LEP and DCP (or referenced by these documents). Recommendations for translating relevant recommendations of these documents into these instruments are made later within this report.

It is recommended that Council adopt appropriate detail planning controls in a development control format, as outlined and discussed later in this report. The most comprehensive of the flood policies is that adopted by Parramatta City Council. As outlined previously, Council wishes to review this policy to bring it into conformity with the provisions of the current FMM. As discussed previously, Council wishes this document to contain the body of the development controls to deal with the issue of floodplain risk management, as well as incorporating other provisions to deal with policy issues such as flood awareness information management and rezonings. A revised policy, consistent with the DCP is outlined and discussed later in this report. Provision is made for inclusion of issues extraneous to development control by council at a later date, as required.

### **2.5.9 Development Application Assessment**

Development applications for proposals which are permissible with consent must have regard to the relevant 'Matters for Consideration' contained in Section 79C of the Environmental Planning and Assessment Act 1979.

Section 79C(1)(a)(i) of the Act requires the consent authority to take into consideration, when determining a development application, the provisions of any environmental planning instrument. Accordingly, Council is required to have regard to the provisions of the applicable LEPs which specify various matters to consider with respect to flood liable land.

Section 79C(1)(a)(iii) requires that Council also consider any DCP in force. Such an instrument would provide a desirable mechanism for Council to comprehensively assess development applications with respect to the issue of flooding. In the case of Parramatta, the preference is for the formal adoption of development controls in a policy document to be referred to within Council's comprehensive DCP. It is recommended that the preparation, public exhibition and adoption process of the policy be consistent with that required for DCPs, under the provisions of the Act and Regulation, to ensure that appropriate weight is able to be given to the document in the consideration of development applications.

The Environmental Planning and Assessment Act 1979 and accompanying Regulations 2000 also identify certain developments which are deemed to be "designated development". Designated developments are generally large scale developments which have been identified as potentially causing greater impacts on the environment. Hence, designated development proposals require the preparation of an Environmental Impact Statement (EIS) and more specialised assessment procedures including statutory notification of the development application with third party rights of appeal for any objectors.

Schedule 3 of the Environmental Planning and Assessment Regulation 2000 identifies those developments which are designated development by virtue of their processing capacity, site requirements or location near environmentally sensitive features. Developments such as certain industries, local works, extractive industries, mines and the like are permissible in the zoning of the study area and adjoining land. Some of these developments may be regarded as designated development when located within a certain distance of a natural water body or wetlands or on flood prone land or a floodplain.

Schedule 3 of the EPA Regulation 1994 defines floodplain as follows:

*"Floodplain means the floodplain level nominated in a Local Environmental Plan or those areas inundated as a result of a 100 year flood event if no level has been nominated."*

Accordingly, there are a number of potential outcomes of the FRMP process which may have implications in regard to the manner in which Development Applications are dealt with.

### 2.5.10 Section 149 Certificates

A Section 149 Certificate is basically a zoning certificate issued under the provisions of the EPA Act which can be obtained to confirm zoning controls pertaining to individual properties, and must be attached to a contract prepared for the sale of property.

The matters to be contained within the Section 149(2) Certificate are prescribed within Schedule 4 of the Environmental Planning and Assessment Regulation, 1994, which includes the following specific matters in regard to flooding.

*“12. Whether or not the Council has by resolution adopted a policy to restrict the development of land because of the likelihood of landslip, bushfire, **flooding**, tidal inundation, subsidence or any other risk”. [Our emphasis]*

The wording of the above prescribed matter is such that inconsistencies arise between local councils in regard to the extent of information they provide on flooding. It has been argued that on literal interpretation, councils are only required to provide a ‘yes’ or ‘no’ answer as to whether such a policy exists. Further, there is potential equivocation when a council is aware of a flood risk, (eg. that a property is known to be located between the 100 year ARI and PMF extents), and there are no policies restricting development subject to the risk. A principal issue which arises is whether there is a legal or moral obligation for council to advise of the risk.

A certificate issued under Section 149(5) of the Act simply requires that Council “include advice on such other relevant matter affecting the land of which it may be aware”. While this certificate type would necessitate Council advising of all flood information it holds, it is a more expensive certificate and is not mandatorily attached to property sale contracts.

Council may have flood information and policies for different properties at various standards, including:

- a) No flood studies or preliminary assessment by an engineer.
- b) No flood studies but a preliminary assessment by an engineer indicates the property may be affected by flooding but this will need to be determined by a site specific flood study.
- c) A flood study has been completed but has not yet been adopted by the Floodplain Risk Management Committee and/or Council.
- d) A flood study has been completed and has been adopted by the Floodplain Risk Management Committee and/or Council.
- e) A floodplain risk management study and plan has been completed but has not yet been adopted by the Floodplain Risk Management Committee and/or Council.
- f) A floodplain risk management study and plan has been completed and has been adopted by the Floodplain Risk Management Committee and/or Council.

At present, Parramatta has completed a Floodplain Risk Management Study and Plan for a subcatchment (North Wentworthville) and for the Upper Parramatta River Catchment (in association with the UPRC Trust and other constituent Councils) covering a part of its area. The LPRC FRMS will divide the area within the mapped extent of the PMF (being that area defined as the floodplain by the Floodplain Management Manual) into High, Medium and Low Flood Risk precincts.

*The Floodplain Management Manual* now defines flood prone land as all land potentially affected by inundation during PMF. This includes both riverine flooding and now flooding from major overland flow paths.

The mapping being undertaken will identify the majority of areas subject to riverine flooding. However this typically does not extend to the ultimate top of the catchment where watercourses and overland flow paths are located within pipes or narrowly formed channels or are not evident except during major storms. While Councils generally may have additional flood information for the top catchment areas, some have maps or local knowledge of these affected areas (e.g. through a history of complaints) we would expect that all Councils will never be able to unequivocally confirm that they have mapped all areas subject to potential flooding (mainly due to the unreasonable resources that would be required to map all overland flow paths), although they would be able to say that they confidently believe they have identified the majority of properties affected by significant flooding.

There are a number of notations for Section 149 Certificates on flood affected land. These Section 149 notices should ultimately be reviewed upon adoption of the FRMP, to recognise the existence of the FRMP and any policies emanating from that document, as well as the findings of the flood study preceding the FRMP. Generally, the recommendations of this study are to advise all persons, through the use of Section 149 Certificates (and other methods) of all potential flooding (ie. up to the PMF). This is consistent with the current provisions of the Floodplain Management Manual and the recommended new definition for flood liable land to be incorporated within LEPs. It should be recognised that this revised approach for notifications on Section 149 Certificates, inclusive of the definitional change in LEPs, DCPs and Policies will not lead to any significant alteration to the permissibility of development but is more directed towards increasing awareness of the potential flood risk known to Council and the relative degree of such risk.

A detailed outline of appropriate 149 Certificate notations is provided later in this report. The various options for notations will need to take into consideration flooding from both riverine and overland flow situations. These notations are to be the subject of separate legal advice to be obtained by the Trust, to ensure that the interests of Council are appropriately covered.

### **2.5.11 Section 94 Contributions Plans**

Section 94 Contributions Plans under the EPA Act provide a basis for the levying of development contributions to construct drainage and flood mitigation works required as a result of future development. Section 94 contributions can only be applied to fund works associated with the new development and cannot be applied for the purposes of rectifying past inadequacies.

As structural flood mitigation options are limited and potential development growth in the subject floodplain is also minimal, it is unlikely that a Section 94 Contributions Plan would be a feasible fund raising mechanism for such measures. This should however be monitored by Council and reviewed should expected development rates increase or if large individual developments would warrant a site specific Section 94 Contributions Plan.

## **2.6 Changes to Environmental Plan Making in NSW**

The State Government had committed funding for the first stage rollout of a major review of the plan making provisions of the NSW Environmental Planning and Assessment Act, 1979 and associated Regulation, although recently stalled pending reassessment by the new Minister for Planning.

Notwithstanding the above, this review was to be based on a discussion paper which described a proposed new approach to plan making termed “planFIRST”. The approach basically involves rationalising planning controls into two document sources. The first document is to be a regional environmental plan produced by Department of Infrastructure, Planning & Natural Resources for a number of local government areas (a “region”) which addresses major planning issues that can only effectively be dealt with at a regional level (eg. public transport) and to provide broader planning principles to guide local plans. The second document source is the local environmental plan produced by local government and combines all previous SEPP, REP, LEP and DCP controls which affects local development into a “place based” focused planning document, similar to that produced by Warringah Council.

At this stage, it is understood that the “planFIRST” approach is not to be proceeded with, subject to a further review of plan making processes in NSW. Notwithstanding, it is not appropriate to delay current plan making projects, to provide for their integration into a “planFIRST” style document or some other preferred alternate plan format which may arise from the review of the plan making processes. Planning controls recommended as part of this FRMP can be translated into the structure of alternate LEP frameworks at a later date, if required.

## 3. Approach to Floodplain Planning

### 3.1 General Philosophy

Council will need to ensure that the planning outcomes derived from this study are integrated with all other existing and future FRMPs currently under preparation in their LGA to provide a consistent platform for dealing with the issue of flooding with future development.

Accordingly, it is considered appropriate to provide a general discussion regarding an appropriate approach to floodplain planning generally which can be adopted by each Council, before identifying how the Lower Parramatta River floodplain specifically fits into this framework. The following sub-sections of this report describe both the traditional approach to floodplain planning and an alternate preferred approach which was first introduced with the Eastern Creek and Tributaries Floodplain Management Plan (Blacktown City Council) and has since been adopted by many other councils in NSW, is being considered by some of the other Catchment councils at present, and which is adopted in this study.

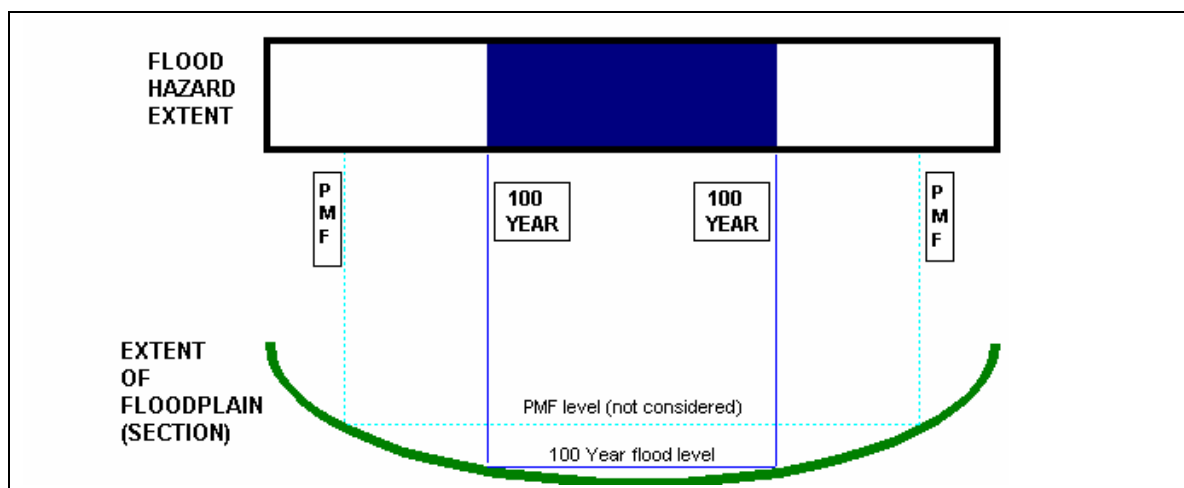
#### 3.1.1 Traditional Approach to Floodplain Planning

In general terms, the real flood hazard within floodplains is poorly understood and appreciated by the community. Often the community considers there to be a flood hazard only on land below the flood planning level (FPL) which is the level below which councils place restrictions on development. This FPL is commonly the 100 year ARI flood. In fact, floods can occur well above this level within the study area. A 100 year ARI is a probability - it is not a measure of hazard. For planning purposes we can identify the existence of various hazards such as bushfire and landslip and when identified proceed to manage their potential consequences. Ironically, because probabilities are able to be calculated for flooding, planners have traditionally only selectively managed the hazard based on a nominal FPL based on one probability.

**Figure 3-1** presents the view of flood hazard generally held by the community. The flood hazard extent relates only to the FPL (in this case the 100 year ARI flood). In the community's mind, there is no flood hazard above the 100 year ARI flood level.



■ **Figure 3-1 Typical View of Flood Hazard Currently Held by Community**



Confusion over the nature of the flood hazard has not been helped by the current procedures for flood notations on Section 149 Certificates and the wording of flood related controls produced under the EPA Act. These controls are often misinterpreted by the community as a statement of whether or not a flood hazard exists at the property. Most importantly, when a council does not mention flooding on a Section 149 certificate or specify that flood planning controls apply, the community may incorrectly assume that there is no flood hazard when in fact (eg. for properties just above the FPL), the flood hazard may be significant in dimension albeit slightly more rare in occurrence.

### 3.1.2 Objectives of Floodplain Planning

Floodplain risk management is about occupying the floodplain and optimising its use in a manner which is compatible with the flood hazard and at a level of risk which is accepted by the community.

Risk can be simply defined as a product of frequency and consequence. The frequency (or probability of a flood) is a natural phenomenon which cannot be controlled by structural mitigation works to any substantial degree in the LPRC floodplain. The consequence of a flood varies with the nature of the hazard (depth, velocity, warning time, etc) and what it impacts (property and people). The control and management of land use provides the most effective means of managing the consequences of flood and, hence, minimising flood risks. For example, the consequences of a hospital being subject to increased depths of fast moving floodwaters with no

warning could be an unacceptable risk to the community, while shallow backwater flooding of a plant nursery with adequate warning times may be an acceptable risk.

Floodplain risk management involves more than setting a FPL. It is about comprehensively managing the risk to people and assets (both below and above the FPL if it is lower than the PMF) by applying and integrating a range of available measures.

There are different types of flood risks and a range of ways in which each type of flood risk can be managed. This includes floor level controls, flood awareness and warning, evacuation facilities, building design, distributing land uses in a flood compatible manner, subdivision design (eg. road layouts), structural works, etc.

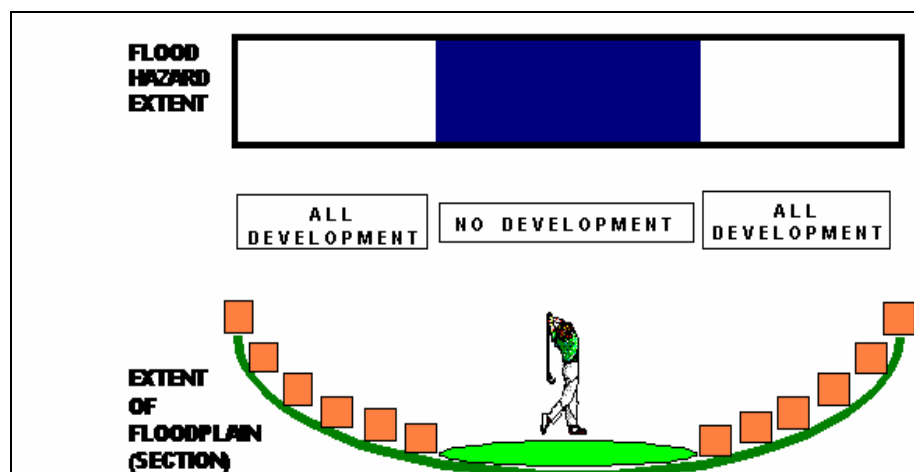
Traditional floodplain planning has relied almost entirely on the definition of a singular FPL, which has usually been the 100 year ARI flood level for the purposes of applying floor level controls. While such an approach has often been adequate, the approach has not worked well everywhere and has led to a number of problems including:

- creation of a 'hard edge' to development at the FPL;
- distribution of development within the floodplain in a manner which does not recognise the risks to life or the economic costs of flood damage;
- unnecessary restriction of some land uses from occurring below the FPL, while allowing other inappropriate land uses to occur immediately above the FPL;
- polarisation of the floodplain into perceived 'flood prone' and 'flood free' areas;
- lack of recognition of the significant flood hazard that may exist above the FPL (and as a result, there are very few measures in place to manage the consequences of flooding above the FPL);
- creation of a political climate where the redefinition of the FPL (due to the availability of more accurate flood behaviour data, or for other reasons) is fiercely opposed by some parts of the community, due to concern about significant impacts on land values. ie. land which was previously perceived to be 'flood free' will now be made 'flood prone' (despite the likelihood that such concerns may only be short term). Councils have a undeniable duty to disclose such knowledge. There is a reasonable expectation by people with an interest to be fully advised of such risks by Council, and flood awareness and preparedness is recognised as a significant measure in reducing flood damages and risk to life.

Accordingly, continuation of the sole reliance on the 100 year ARI FPL is inappropriate if a generic flood risk management approach is to be developed for the LPRC.

The current approach to floodplain planning discussed above may be typified by the example shown in **Figure 3-2**, which flows from the inappropriate view of flood hazard presented in Illustration 1. No development is permitted below the FPL (ie. 100 year ARI flood) because of an acknowledgment of some degree of flood hazard. Above the FPL, no flood hazard is perceived and therefore there are no flood-related controls on development. Thus an abrupt change in development control occurs at the FPL.

■ **Figure 3-2 Current Floodplain Planning**



*(Derived from an inappropriate view of flood hazard and the use of a singular flood planning level)*

In addition, it is rare to find councils which have determined their FPL using the procedures suggested in the State Government's FMM (2001) or previous FPDM (1986). That is, by balancing the social, economic and ecological considerations against the consequences of flooding, with a view to minimising the potential for property damage and the risk to life and limb.

By default, most councils have adopted the 100 year ARI FPL, given that this FPL has been widely used across the State and internationally. Having regard to the NSW Flood Prone Land Policy and the FMM, the use of the 100 year ARI as the FPL, or in the formulation of various FPLs, together with other criteria, does not in itself warrant criticism provided that the implications associated with residual risk, or the sterilisation and constraining of land for alternate uses, is understood and accepted by the community. Unless the PMF is chosen as the singular and only FPL, then some decisions will need to be made by the community in regard to what residual risks they are willing to accept.

### 3.1.3 Flood Planning Levels (FPL's)

The flood planning level (FPL) is the level below which a Council places restrictions on development due to the hazard of flooding. FPL is the current preferred terminology in place of the flood standard or the designated flood, which were used by the previous FPDM (1986).

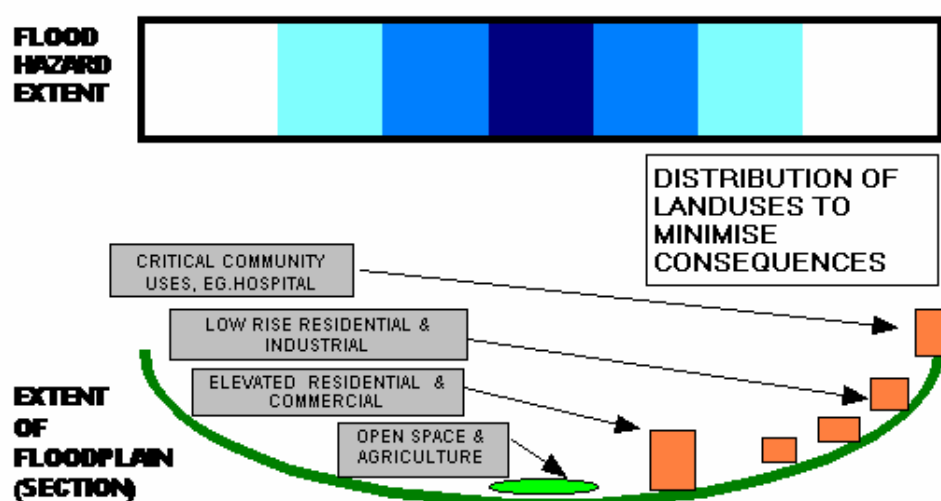
Consistent with the above philosophy, the danger in adopting FPL's below the PMF is that they are recognised by the community as definitive advice as to whether a flood hazard exists or not. Further, there has traditionally been an approach where a singular FPL (or flood standard) has been chosen which creates significant limitations on a holistic approach to managing the flood risk in the floodplain. The reality is that various land uses are subject to alternate consequences (risks) from the flood hazard. Accordingly, there needs to be a simplistic approach of reflecting the different flood risk to different land uses within the floodplain, while maintaining an understanding that flood risks still occur, regardless that flood controls may not be imposed. The planning matrix approach discussed below is one such methodology of addressing these issues.

### 3.1.4 The Planning Matrix Approach

Given that some floodplains have an extensive flood range, and given the difficulty in addressing the associated variability in flood risks with simple rules, the use of the planning matrix approach (D. Bewsher and P. Grech, 1997) is recommended.

The approach distributes land uses within the floodplain and controls development to minimise the flood consequences as depicted in **Figure 3-3** below.

#### ■ **Figure 3-3 Distributing Land Uses under the Planning Matrix Approach**

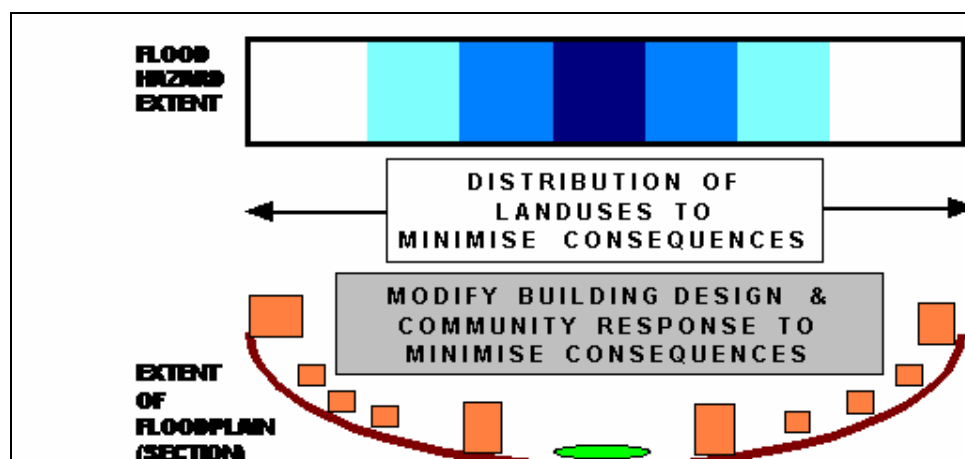


Using this approach, a matrix of development controls, based on the flood hazard and the land use, can be developed which balances the risk exposure across the floodplain. This approach has

been adopted as part of the Hawkesbury–Nepean Flood Management Strategy (1997). After its original application in the Eastern Creek and Tributaries Floodplain Management Plan, this approach has also now been applied within the Upper Parramatta River Catchment (4 Councils), Blacktown, Narrabri, Cabramatta Creek, Patterson River, North Wentworthville, Haslams Creek (Auburn), Towradgi (Wollongong), Georges River (4 Councils) and Molong Floodplain Management Studies, and the resulting matrix of planning controls has been pivotal in the new draft DCPs and LEPs recommended for implementation as part of these FRMPs.

The approach is summarised in Figure 3-4. It is fully consistent with the Floodplain Management Manual.

■ **Figure 3-4 The Planning Matrix Approach to Floodplain Planning**



### 3.2 Preparing a Planning Matrix

#### 3.2.1 Step 1 – Categorising the Floodplain

The first stage in developing a matrix of flood planning controls is to identify each of the floodplains to which the overall policy document is to be applied, while the second stage is to divide the floodplains into different areas subject to similar levels of risk.

In regard to the first stage, it is noted that this FRMP relates only to the LPRC Floodplain. Notwithstanding, it is our approach that each Council within the study area would benefit

considerably by having a singular policy document which applies to all floodplains within its LGA, consistent with the approach being pursued by some of the Councils at present.

The approach intended to be adopted to satisfy the above objective, is to prepare singular DCP/Policy controls which have a common preamble, objectives and general policies, while specific controls for each floodplain are reflected within a planning matrix prepared for each individual floodplain and annexed to the principal document.

The second stage in the preparation of the planning matrix is to identify different flood risk precincts (FRPs), reflective of the variable flood risk within each of the separate floodplains. Flood risk precincts (then referred to as hazard bands) have previously been identified for those parts of the Eastern Creek and Tributaries Floodplain located north and south of the Castlereagh Freeway Reservation and for the North Wentworthville area. These can be inserted into the DCP/Policy document by the relevant Council.

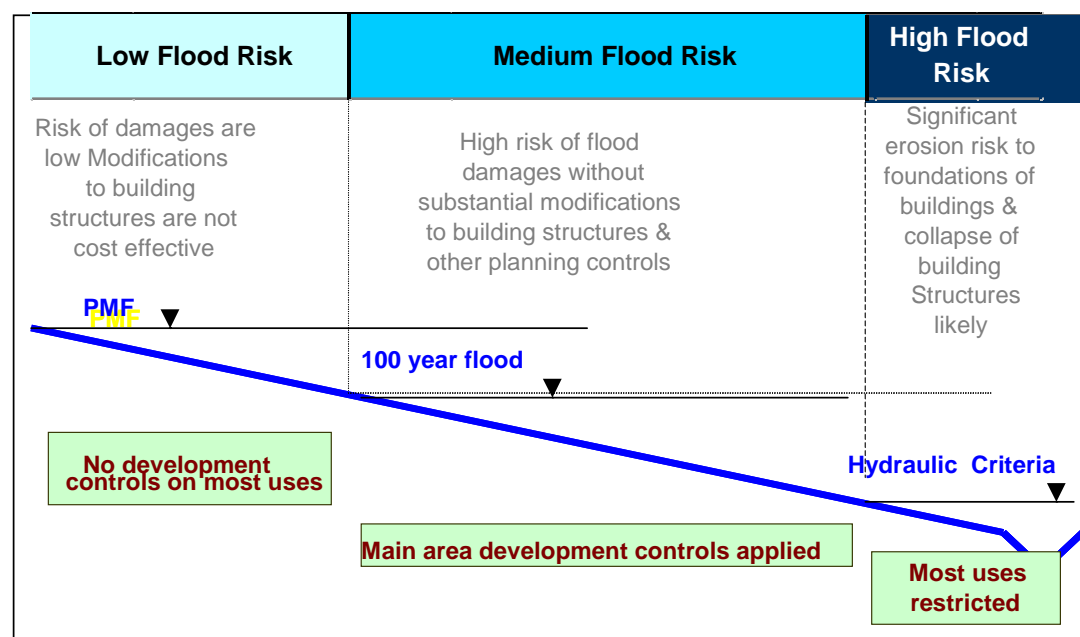
In regard to the subject study, the following three FRPs are proposed:

- **High Flood Risk** This has been defined as the area within the envelop of land subject to a high hydraulic hazard (in accordance with the provisional criteria outlined in the Floodplain Management Manual) in a 100 year flood event. The high flood risk precinct is where high flood damages, potential risk to life, or evacuation problems would be anticipated. Most development should be restricted in this precinct. In this precinct, it would be difficult to achieve a substantial reduction in significant risk of flood damages or to ensure safe evacuation with reasonable flood related building and planning controls.
- **Medium Flood Risk** This has been defined as land below the 100 year flood level subject to low hydraulic hazard (in accordance with the provisional criteria outlined by the Floodplain Management Manual). In this precinct there would still be a significant risk of flood damage or risk to life, but these damages or risk to life can be minimised by the application of appropriate development controls.
- **Low Flood Risk** This has been defined as all other land within the floodplain (ie. within the extent of the probable maximum flood) but not identified as either a high flood risk or medium flood risk Flood Risk Precinct. There will be a low cost benefit to compulsorily apply flood related development controls, where risk of damages are low for most land uses. The low flood risk precinct is that area above the 100 year flood and most land uses would be permitted within this precinct.

The FRPs delineated above have been formulated to provide a basis for strategic planning and development control having regard to the specific characteristics of the LPRC Floodplain.

The Low Flood Risk FRP is that area above the 100 year ARI flood which is potentially subject to flooding, but is not included in any of the other FRPs. This area is still subject to some flood-related risk and those uses which may be considered critical or should be afforded maximum protection against risk from flooding, are to be identified as undesirable land uses in this precinct. The other major purpose for this FRP is to identify and recognise the potential flood risk for all persons and properties affected by the PMF, regardless of whether any specific development controls are to be applied. This provides a basis for flood awareness programs, evacuation and emergency planning and to maximise the preparedness of the community. The diagrammatic definition of the precincts and their implications for planning controls are depicted on **Figure 3-5**.

■ **Figure 3-5 Definition of Planning Precincts**



**3.2.2 Step 2 – Prioritising Land Uses in the Floodplain**

The next component in the preparation of the planning matrix is to prioritise land uses within the floodplain. This is achieved by identifying discreet categories of land uses, of similar levels of sensitivity to the flood hazard. In this case the following categories have been adopted:

- Sensitive Uses and Facilities
- Critical Utilities and Uses
- Subdivisions
- Filling

- Residential
- Commercial or Industrial
- Tourist Related Development
- Open Space or Non-urban Uses
- Concessional Development

These categories are subsequently listed under each FRP in the planning matrix dependent upon the level of flood risk which is considerable acceptable. This provides a basis to specifying whether certain categories are unsuitable land uses in different parts of the floodplain or whether they are suitable subject to varying degrees of development control. This approach is basically the application of the philosophy previously described within this report.

### **3.2.3 Step 3 – Controls to Modify Building Form and Community Response**

The next component in the preparation of the planning matrix is to assign different planning controls to seek to modify building form and the ability of the community to respond in times of flooding, depending upon the type of land use and the location of that land use within the floodplain. The type of controls can be categorised under seven main headings, being:

- Floor Levels
- Building Components
- Structural Soundness
- Flood Affection
- Car Parking and Driveway Access
- Evacuation
- Management and design.

There should be variance to the stringency of development controls reflecting the attitudes of the community, the sensitivity of the land use category to the flood hazard, and the location of the land use within the floodplain. This has been determined having regard to the characteristics of the study area and with reference to existing research.

### **3.3 Implementation of the Planning Matrix Approach**

The most appropriate mechanism for the implementation of the proposed flood policy is its adoption by Council as a DCP or associated Policy documents.

A singular planning matrix will be prepared as a component of this FRMS for the LPRC Floodplain and incorporated into the draft DCP/Policy for each. Council could incorporate a



separate matrix for floodplains for which other FRMPs are being prepared and residual floodplains.

The residual floodplains, being those floodplains for which FRMPs have not been prepared to date, should be the subject of interim guidelines incorporated into the DCP. Notwithstanding, we note that the current FMM does not now recognise interim policies adopted while awaiting the preparation of a FRMP and Councils should seek further legal advice regarding the status of such guidelines for the purposes of Section 733 of the Local Government Act, 1993.

In addition to the preparation of the DCPs, each Council will need to undertake discreet changes to its LEP in order to ensure consistency with definitions, special flood development control clauses, and to restrict development within the High Risk FRP. These changes are outlined and discussed further in a later section of this report.

### **3.3.1 Multiple Matrices**

Due to the broad range of land uses and intensity of development within the study area, some special consideration was given to whether multiple planning matrices should be adopted, which reflected the characteristics of different components of the study area. The purpose of producing different planning matrices can be summarised as follows:

- To identify areas which had special planning considerations (eg. proximity to a train station or having a CBD locational context), which would warrant planning controls with a greater weight placed on maximising exploitation of these planning attributes as opposed to minimising flood-related risk. This in effect would be taking the philosophical position that the community is willing to bear greater risk associated with flooding arising from the development of such an area, in order to achieve some greater alternate planning goal.
- Identify areas where specific development or redevelopment activity is likely to occur which had different planning and design considerations to the area overall, warranting specific floodplain risk management development controls. Such a matrix would enable the imposing of the development controls to meet the specific development issues likely to arise within the development of any discreet planning area.

The potential for the need for such additional matrices was reviewed by the consultants, together with relevant officers of Council. Council officers identified two particular areas where the potential need for additional matrices may exist. These additional areas are outlined and discussed below:

- **Area 1:** This area represents the commercial car park adjacent to the old David Jones building in Smith Street, fronting the Parramatta River. While this site is located within the Upper Parramatta River Catchment, the flood risk management process for that catchment is effectively complete, but its review could be undertaken in conjunction with this study.
- **Area 2:** This area is the land generally comprising Crimea, Lennox, Lansdowne, Cowper and Anderson Streets. This is an area comprising substantially older housing stock in close proximity to the city centre and railway stations of Harris Park and Parramatta.

Having reviewed the application of recommended controls (as discussed later) to all areas, it was considered that the proposed controls will provide a balanced outcome to achieving appropriate flood-risk management together with planning and development goals. Therefore, it was concluded that separate planning matrices for these sub-areas were not necessary. Notwithstanding, it is recognised that the flood-related planning controls will require ongoing monitoring and review, and may ultimately require amendment to meet the specific characteristics of these and other areas.

## 4. Planning Options and Actions

### 4.1 General

There are a number of alternate mechanisms by which land use planning may have a role in implementing non-structural measures for the control of development within the floodplain. These measures may vary from a fairly broad strategic overview of future and intended development or detailed building and development controls applicable to various forms of development in different zones.

Town planning can also have an input in regard to providing appropriate mechanisms for the implementation of structural measures, such as the adoption of a Section 94 contributions plan to provide developer funding towards broader scale flood mitigation works (although not likely to be a worthwhile mechanism in this case). Town planning can also assist in regard to flood awareness initiatives through notations on Section 149 Certificates (zoning information certificates).

The following is an outline of planning measures considered appropriate for consideration for the study area.

### 4.2 State Environmental Planning Policies (SEPPs)

As the State Government's FMM is aimed at encouraging a merit based approach to floodplain planning for individual areas, it is unlikely to be desirable to establish a global policy for floodplain development through the application of a SEPP. Accordingly, the pursuance of this option is not discussed further.

### 4.3 Regional Environmental Plans (REPs)

As outlined previously, it is considered appropriate that some of the provisions and terminology adopted by Sydney REP No. 28 – Parramatta, should appropriately be amended to provide a consistent framework for flood planning controls existing or proposed for each of the Council's LEPs. The recommended changes to this REP, as previously discussed with planningNSW, is included as **Appendix A**.

### 4.4 Local Environmental Plans (LEPs)

#### 4.4.1 General

There are various aspects of Council's LEP which can be appropriately restructured to form a component in the application of the FRMP. It is noted that the structure of the LEP should be

such that it provides the necessary flexibility for the adoption of other FRMPs and their associated planning recommendations which may be prepared from time to time elsewhere within the LGA. In this regard, the importance of the LEP can be summarised as follows.

- To provide objectives for the application of floodplain management principles in the assessment of development applications.
- To appropriately identify areas subject to flooding in order that development applications in such areas may be specially considered and that Council has a basis for notifying the public of the potential for flooding on individual parcels of land in accordance with Section 149 Certificates issued under the Act.
- To outline general matters for consideration with more detailed controls being the subject of a DCP in accordance with accepted practice.
- To clearly define terminology used in the LEP, which relates to floodplain management.
- To ensure that the permissibility and prohibition of uses is consistent with the FRMP, in order that flood sensitive land uses are clearly prohibited within areas subject to significant and hazardous levels of flooding. In this regard we note that the prohibition of land uses is a matter that must be clearly outlined within the LEP as this function cannot legally be transferred to a DCP.

There are various standard refinements to the Council LEP which would be appropriate to ensure consistency with the potential outcomes of all FRMPs prepared under the ambit of the current FMM, including that for the LPRC. These inclusions are generally outlined as follows:

- An objective within the initial clauses of the plan would reinforce the intent of the plan to deal with flood risk management, and the weight given to such provisions if challenged in the Court. For the purposes of simplicity, it would generally be preferable for LEPs to adopt a singular objective regarding the management of all natural hazards, inclusive of flood risk management.
- Include or replace definitions of flood liable land and associated terms. It is recommended that a definition of flood liable land be adopted which includes the whole of the floodplain, that is, up to the probable maximum flood. This would be consistent with the provisions of the current FMM, would resolve issues of confusion with the public in regard to why there is land not deemed to be flood liable (ie. above the FPL but still at risk of flooding), and provide a more appropriate framework for more detailed planning controls to be embodied within a development control plan.

- The addition or replacement of existing clauses which outlines matters for consideration in the assessment of development applications on flood liable land. The proposed clause is effectively an updated version of what most councils in NSW presently provide within their LEPs, which is consistent with the FMM, flags the need for the assessment of general issues such as cumulative impact if ever challenged in the Court, and provides an appropriate framework for more detailed controls to be embodied within a development control plan.
- A refinement of Council's exempt development provisions to retain the status quo in regard to such minor development. That is, it is recommended that the exempt development provisions of Council be amended to exclude from being classed as exempt development, only that part of the flood liable land (to be redefined as up to the PMF) that is affected by the 100 year ARI flood. Exempt development generally includes minor development such as pergolas, barbecues, minor additions and alterations, awnings, garden sheds, etc, for which there would be minimal consequence in regard to flood risk management within the low risk part of the floodplain.
- The final matter to be dealt with by Council's LEPs is the restriction of most forms of development within that part of the floodplain considered to be high risk. An approach is to identify the High Risk Flood Precinct through the LEP and to insert a special clause within the LEP to exclude the majority of forms of development within that area. An alternate approach is to adopt or refine Council's existing foreshore building lines to accord with the outer extent of the High Flood Risk Precinct. In the majority of cases, the High Flood Risk Precinct represents a narrow band along the river and creek foreshores, would not endorse the construction of new buildings. In this regard, the use of the foreshore building line can have multiple objectives inclusive of flood risk management, riparian corridor conservation, public access and scenic protection.

This latter approach of using the foreshore building line, is preferred, but this will be a matter for further consideration by Council having regard to broader planning matters. The use of the Foreshore Building Alignment is further discussed in **Section 4.6**. This process should also involve a review of the appropriateness of the zoning of individual land parcels, should the combined flood risk and environmental criteria result in a FSBL/restricted development area which substantially affects reasonable development expectations.

The standard recommended LEP changes, as discussed above, are outlined within **Appendix B**. More detailed discussion in regard to the changes required is provided below.

#### 4.4.2 Structural Amendments to Parramatta LEP 2001

A review of Parramatta LEP 2001 was undertaken to identify any provision which may require review with regard to flooding matters. The outcome of this review is outlined as follows:

- **Clause 3 – Objectives of Plan**

Includes an objective to minimise risks to the community due to hazards such as floods.

- **Clause 16 – Zoning Table, Residential 2(e) Zone**

Objectives (a), (b) and (c) refer to “flood inundation” or “inundation”, and particularly “land subject to flood inundation”. This could be construed as identifying all residential land possibly subject to potential flooding. This may be misleading for the following reasons:

- It does not identify all land in the LGA subject to flooding because it relates to residential land only;
- It does not identify all residential land subject to flooding because the zone boundary relates to old flood studies, and it is understood that some changed flood extents have been subsequently identified;
- We assume that flood studies have not been prepared to cover all residential zoned land;
- It is understood that the zone boundary was originally determined based on the 100 year ARI extent and therefore, floods between the 100 year ARI to PMF may potentially occur beyond the zone boundary, albeit at diminishing probabilities

A review is recommended to achieve the following:

- In the short term, provide an explanatory note within the LEP as to the limitations of the zone boundary in identifying the extent of flood risks;
- In the medium to long term, delete the 2(e) zone as FRMPs are prepared. We would suggest that the land be placed within a residential zone which would have been applied if not identified as flood affected, and that known flood affected areas across all zones be identified by “flood liable” by distinctive graphics on a map and the high flood risk precinct dealt with as described above. This would need to be qualified as a reference to “known” flood affected areas at the time of the preparation of the plan.

- **Clause 17 – Exempt Development**

This clause notes that exempt development is that as listed at Section 6.1 of Parramatta DCP 2001. Clause 6.1 of the DCP excludes flood liable land from being considered as exempt

development. This exclusion should be refined in accordance with the recommended inclusions outlined at **Appendix B**.

- **Clause 21 – General Considerations for Flood Liable Land**

Update with clause provided at **Appendix B**.

- **Clause 30(5)(d) – Masterplans**

This clause the masterplans that are required for certain development and may be required to address various matters including proposals involving “*flood mitigation*”. More appropriate terminology may be “*flood risk management*” because not all appropriate actions would involve mitigating the flood itself. It is recommended that this clause be reviewed by Council in conjunction with the other recommended amendments.

- **Clause 46(2)(d) – Open Space Zones**

Outlines matters to consider when assessing a proposal in open space zones, including “*whether the height and bulk of any proposed building or structure has regard to ... stormwater flow*”.

Factors other than the height or bulk of buildings would be relevant to the effects of stormwater flow. Recommend review of provision. One would be to change the provision to include a separate criteria, being “*whether the development has regard to stormwater flow or flooding*”. Such a review is not an imperative as the necessity for such considerations are nonetheless caught by other provisions.

- **Dictionary**

The dictionary provides the following definition:

“*Designated flood means:*

- (a) *the flood planning level adopted by the council in accordance with the principles contained in the FMM and contained within a development control plan approved by the council, or*
- (b) *the 100 year Average Recurrent Interval (ARI) flood event where no development control plan referred to in paragraph (a) has been prepared.”*

“*Flood liable land means land which may be inundated by the designated flood and that is indicated as flood liable land on a map marked “Flood Liable Land Map” deposited in the office of the council.*

Floodplain Development Manual has been defined, making reference to the Floodplain Management Manual, should and when it be released.

While not necessary, it would be appropriate when undertaking a general review of the LEP, to review this definition, to refer specifically to the new Floodplain Management Manual and any subsequent successor, the new Manual now being adopted.

It is recommended that these definitions be replaced with those of flood liable land and the probable maximum flood outlined at **Appendix B**.

- **Clause 6** of the LEP provides for the adoption of foreshore building lines in accordance with the provisions of Clause 7 of the Model Provisions. It is recommended that this provision be utilised to delineate the extent of the High Flood Risk Precinct, as discussed previously.

#### **4.4.3 Review of Areas Zoned 2(e)**

Accordingly, a major planning outcome is to review the areas currently zoned 2(e) within the confines of the study area in the Parramatta LGA, and to provide recommendations in regard to their preferred zoning. This review has commenced as part of this study but is to be completed by Council as separate exercise to enable the consideration of all relevant planning issues, of which only one is flooding. The criteria that may be employed in the review of land currently zoned 2(e):-

- Determine what the desired zoning of the land would be, should flood or drainage affectation not be identified as an issue. That is, in general the preferred zoning of the land would fall within one of the other remaining residential zones 2(a) to 2(d), depending of the density and typology of housing desired for individual locations. It may be that this current review would identify sites suitable for alternate zonings to the existing residential zones for associated planning reasons (eg. a business zone which would provide for mixed use development due to proximity to a railway station).
- Determine whether the site would be constrained from any further intensification of development due to environmental constraints such as ecological (flora and fauna), visual amenity or heritage considerations. The FRMS investigations undertaken by SKM include identification of important ecological units and heritage sites. These factors together with general visual amenity considerations associated with the river corridor, contribute to the formulation of appropriate setback criteria from the lower Parramatta River and its tributaries. As discussed elsewhere, it is proposed that this setback could be eventually formalised as a foreshore building line. Areas located within this setback area should not be identified for further intensification of development and the future development of land affected should encourage redevelopment outside of the identified setback.
- Areas located within a high flood risk precinct should be excluded from rezoning to permit intensification of urban development, if no site specific or external works can be



implemented to reduce the risk to low or medium for the future inhabitants of the site. Such works could include for example the filling of the land, but this would need to be subject to engineering assessment to ensure that no impact upon other properties within the floodplain would arise. Such development would also need to comply with the relevant development controls for individual land uses within either the medium or low flood risk precinct to minimise potential danger to property and life.

- The development of land within areas considered to remain to have potential for further development intensification is then to be evaluated to determine whether such development could proceed in a manner which achieves compliance with the recommended flood risk related management planning controls in a practical manner which does not give rise to inter-related conflicts. As discussed later in this report, those areas within the floodplain where the development is considered suitable, may still require to comply with various development controls to be embodied within Council's DCP and flood policy. For example, it may not be appropriate to rezone land within a 2(e) zone to an alternate residential zone which would provide for more intense urban infill development where such development would need substantially elevated floor levels to address flooding constraints, resulting in development forms incongruous with the existing character of the locality, inconsistent with the objectives of the new zone.
  
- Subsequent to a review of the above criteria, those lands which are considered to have potential for rezoning from 2(e) to a zone which would permit development intensification, will need assessment as to whether any additional site or locality specific controls are required, in addition to those which would apply to the whole catchment. These site specific controls would ultimately require to be embodied within Council's comprehensive DCP to deal with specific issues. For example, while development may be considered desirable for economic and social reasons, flood risk considerations may necessitate elevated floor levels which may have amenity impacts such overlooking and overshadowing, unless accompanied by increased side boundary setbacks.

#### **4.5 Foreshore Building Alignment**

The objective of the foreshore building line would be to incorporate three areas where planning controls are desirable, these being:

- To identify, preserve and enhance important vegetation communities by the restriction of development and consequent clearing within these areas and associated buffer areas.
- To provide an open setback area from the waterway corridors, within which minimal development occurs and a predominance of landscaping prevails, to provide for the preservation and enhancement of the scenic qualities of these corridors.
- To identify the areas of high flood risk within which new development is generally undesirable and redevelopment and alterations and additions to existing buildings must be stringently controlled to minimise potential damages to property and risk to human life.

Flood risk precinct maps have been prepared by the consultant in consultation with the Council and Floodplain Management Committee, which reflects the application of evacuation and other considerations to flood hazard mapping undertaken in accordance with the FMM. Further refinement of the flood risk precinct maps may be undertaken by Council to reflect changes to the study area which have occurred since initial mapping was undertaken (such as the filling of land and implementation of flood mitigation works). Further, on application of the flood risk precinct maps to the process of defining a foreshore building line, further adjustments may be undertaken by Council which are relevant to the definition of the foreshore building line (eg. excluding high flood risk precincts along public roads where future building activity is irrelevant).

The environmental investigation undertaken as part of this study by the consultant, included the identification and mapping of important vegetation communities. An additional process was undertaken which provided the delineation of buffer areas for critical areas of vegetation, which are considered desirable to ensure the long term preservation and enhancement of these communities. This mapping will provide an appropriate basis to identifying those areas along the waterways of the Parramatta River and its tributaries within the study area, which should be protected by the application of a foreshore building line. Those areas mapped by the consultant may require refinement during the process of defining the foreshore building line to take into consideration on-site practical difficulties in implementing buffer areas where they extend into areas of existing extensive development.

Having regard to the above resources made available through the undertaking of this study, it is recommended that Council initiate a process of redefining the foreshore building lines within the study area to achieve the above objectives. It is envisaged that this would entail the production of a separate LEP map which identifies foreshore building lines which will represent the greater

extent of Council's existing foreshore building lines, important vegetation areas and their buffers and the high flood risk precinct boundary. It is also recommended that as part of this LEP-making process, Council introduce an objective for the foreshore building line within its LEP to clearly outline the purpose of the foreshore building line. The recommended objective is as follows:

*“To minimise impact on existing and potential riparian corridors, to reduce possible risks associated with flooding and to preserve and enhance the scenic quality of the waterways of Parramatta.”*

It is recognised that the foreshore building line effectively represents a development standard, and Council may from time to time need to exercise appropriate flexibility in varying the setback restrictions of the foreshore building line, through the application of State Environmental Planning Policy No. 1 - Development Standards. The provision of an objective will be important in assessing any objections to the standard.

## **4.6 Development Control Plans (DCPs)/Policies**

### **4.6.1 General**

The appropriate mechanism for specifying detailed controls, to be applied for new development to manage floodplain risk management issues would be a DCP. This document could form an overall comprehensive and broader flood management policy such as the approach preferred by Parramatta City Council. The DCP should be accompanied by a map which identifies all FRPs, which are provided as an outcome of the FRMP.

The particular intricacies and format relevant to Parramatta City Council are outlined and discussed further in the following sections.

### **4.6.2 Parramatta Flood Policy**

A draft Flood Prone Land policy for the Parramatta LGA was initially prepared as part of the Upper Parramatta River Catchment FRMP. The policy was partially incomplete, awaiting review of certain issues to be undertaken as part of this study. The policy intends to incorporate broader corporate government issues for Parramatta City Council in relation to flood risk management, than relevant to a development control plan. For example, the document is to provide policies in regard to information management, plan making (preparation of LEPs and amending LEPs) and community awareness.

A copy of the recommended local floodplain risk management policy for Parramatta City Council is included as **Appendix C**. Those provisions of the Policy which relate specifically to development control are to be extracted and embodied within Parramatta DCP 2001, as discussed below.

### 4.6.3 Alterations to Parramatta DCP

As outlined previously, the overall intention for the Parramatta LGA is to produce a stand alone flood prone land policy which incorporates relevant development controls and other related policies of Council, and to amend Parramatta DCP 2001 to be consistent with and refer to this document.

In order to provide a comprehensive outline of Council's requirements, in association with Flood Risk Management in the assessment of Development Applications, relevant provisions of Council's policy are to be incorporated within Parramatta DCP 2001. Section 4.1.3 of the DCP currently provides criteria in regard to water management, including issues associated with flooding and drainage. It is recommended that the relevant provisions of this section of the DCP be reviewed to include relevant components of the proposed draft policy, in the manner depicted within **Appendix C**.

The specific recommendations regarding amendments to the existing related provisions of the existing related provisions of Parramatta DCP 2001 are as follows:

- Map 2 on page 12 of the DCP identifies a number of environmental constraints including "flood liable land" and notes that the map is "indicative only". This map should be reviewed to indicatively identify the extent of the PMF, as this flood is to be adopted as the definition of "flood liable land". A notation should be included on the plan clearly stipulating that not all flood affected land has been identified, particularly with regard to overland flow.
- Clause 6.1 provides that development is not exempt if located on flood liable land. This provision should be refined to make reference to only that part of the area of flood liable land affected by the 100 year ARI flood.
- The required contents of a flood impact report required by Clause 9, should be cross-referenced to the proposed flood policy.
- "Flood planning level" is defined within the Glossary of Terms. This could be deleted as it is superfluous due to the adoption of the PMF to the define the extent of flood prone land.
- Refine "flood risk management plan or study" defined in the Glossary of Terms so that the term used is "floodplain ....." consistent with the current Manual terminology.
- Refine the performance criteria and design solution and controls provided in Section 4.2.3 (page 39 of the DCP), to refer to compliance with the performance criteria and prescriptive solutions provided within the proposed local flood risk management policy.

The main seven criteria, with which proposed developments require to comply with in accordance with the proposed draft inclusions for the DCP, are outlined to discuss within the following section of this report.

#### **4.6.4 Specific DCP Considerations**

There are seven areas of development control consideration relevant to floodplain planning which may be applied to development in the study area. The following provides a discussion of the controls that would be appropriately considered under each of these headings.

##### **4.6.4.1 Floor Levels**

All habitable floor levels of dwellings should be no lower than the 100 year ARI flood level plus freeboard. Additionally, where practical, extended floors associated with minor additions to existing development should be provided at the 100 year ARI flood level plus freeboard but should never be at a level lower than the existing floor level where that does not comply with the standard.

Less “flood sensitive” land uses such as buildings associated with *recreation areas* or *non-urban uses* (where permitted outside of the High FRP) could have buildings located with floor levels at the 5 year ARI flood level sufficient to avoid nuisance flooding. (In some circumstances, it may be appropriate to vary this requirement and where a site specific analysis was carried). Critical utilities should have floor levels above the PMF as these will be essential to ensuring minimal disruption to the community during major floods. Essential community facilities (such as public halls, etc) should be located outside of the floodplain to provide for potential refuge during major floods and minimal impact to the community.

##### **4.6.4.2 Building Components**

All structures below the design flood level for individual land uses should be constructed of flood compatible materials. With regard to the identification of appropriate flood compatible materials, an appropriate general list of materials and fittings is provided within the recommended DCP. However, we note that the DIPNR is currently having a detailed study undertaken by the CSIRO and the University of Newcastle which will identify appropriate flood compatible materials (including methods of construction) applicable to Australian conditions (in particular, the Hawkesbury-Nepean Floodplain). This study is not yet completed. It is recommended that the DCP be reviewed upon completion and availability of this study.

##### **4.6.4.3 Structural Soundness**

An engineer’s report is considered to be appropriate to ensure structures located within High FRPs are capable of withstanding the forces of floods including debris and buoyancy factors.

##### **4.6.4.4 Flood Affection**

An appropriate principle in floodplain management is to ensure that development within the floodplain does not increase the flood affection or hazard upon other properties or persons. Hence, it is recommended that an engineer’s report is provided for any development within the High FRP or for any subdivision works and filling in the Medium FRP to prove that the development will not increase flood affection elsewhere. This matter will also need to be

considered with regard to other land uses in the floodplain but an engineering report may not be necessary in each case.

#### **4.6.4.5 Car Parking and Driveway Access**

#### **4.6.4.6 Evacuation**

Having regard to the short warning time and the relatively narrow floodplain corridors throughout the study area, regional evacuation is not a major issue. Notwithstanding, the structure of the DCP provides for this issue to be addressed within other floodplains as appropriate and general matters associated with access are addressed within appropriate controls.

#### **4.6.4.7 Management and Design**

Special consideration of the design and management of individual proposals can also reduce the flood risk and potential damage to property and persons. These measures may involve the provision of a flood plan for individual sites which ensures that individuals consider and plan means to minimise the likelihood of flood damage, including providing for the movement of goods above the flood level within the likely available flood warning time. Other specific considerations are for the storage of certain goods above the design flood level and requiring the implementation of mitigating measures to prevent pollution of the floodplain potentially occurring during floods.

### **4.7 Section 149 Certificates**

Section 149 (s149) certificates should not be used as broad community education tool as they have only limited circulation. The majority of flood-affected properties would not be reached in a given year. Further, with the existing system of notifications on S149 (2) certificates, if no notification appears, then it is often misunderstood to mean that property is “flood-free” rather than it has no development controls.

It is important that all properties in the floodplain (i.e. up to the probable maximum flood) be notified. Notification should include the Flood Risk Precinct if known and the existence of the relevant DCP. If the property is thought to be flood affected this should also be notified. A notation should be provided that states that while all reasonable efforts are employed to identify lands subject to any potential flood risk, all properties so affected not have been identified. While it is considered that the majority of potentially flood affected properties have been identified, Council may determine that a site-specific flood study is required on land not currently identified as flood affected, for the purposes of assessing a development application.

There are two potential sources of inundation that need to be addressed on the S149 certificate notifications. These are listed below. ‘Inundation’ refers to inundation in any flood up to the probable maximum flood (PMF):

- Inundation from creeks and rivers
- Inundation from stormwater and overland flow. (Generally inundation from “local drainage”, as defined in Section 1.9 of the 2001 Floodplain Management Manual, would not be included here).

It should be recognised that inundation could occur from either or both sources and the S149 certificates should reflect this. Usually the most severe form of inundation will dominate the planning controls to be applied to new development.

For each of the two types of inundation listed above, it is recommended that the inundation status be defined in one of three ways:

**Category A** Inundation of property has been defined by a flood study, ie. the flood behaviour at the property has been quantified and velocities and depths are known for a range of floods. Sufficient information is available to define the flood risk as ‘low’, ‘medium’ or ‘high’

**Category B** The property is thought to be inundated but the flood behaviour has not been quantified to the extent noted in Category A above. For example, there may be anecdotal evidence of flooding but no formal flood study has yet been carried out;  
or

**Category C** The property is not thought to be inundated having regard to available information.

*Guidance on the wording of Section 149(2) and 149(5) certificates is provided in Appendix L of the 2001 Floodplain Management Manual. The wording proposed S149 (2) certificates for the overall LGA has been addressed in the UPRC FRMP. For any point property within an LGA, one of the three categories A, B or C will apply in respective of flooding from creeks/ivers and another of the categories for stormwater/overland flow*

For S149 (5) certificates, it is recommended that a flood certificate be appended to the S149 (5) certificate, as discussed within the main FRMP report. In addition, where Category B applies (for creek/river flooding or stormwater/overland flow) the certificate should provide additional details of the potential flood affectation and/or suggest that the Applicant contact Council’s Stormwater/Flooding Engineer for further details.

## 5. Conclusion and Summary Recommended Planning Measures

Having regard to the above discussion, the following planning measures are recommended:

- (a) That a graded set of planning controls for different land uses relative to different levels of flood risk within the study area, be adopted, consistent with the requirements of the current NSW Floodplain Management Manual,
- (b) That FPM Committee and Council formally endorse the recommended changes to Parramatta REP 28 provided at **Appendix A**.
- (c) That Council considers amending their LEP in the manner outlined above and summarised in **Appendix B**, to provide a consistent framework for more detail controls to be provided in a DCP.
- (d) That Council give force to discouraging building in the High Flood Risk Precinct by utilising foreshore building line provisions embodied within LEPs or by some other approach determined in conjunction with the review of broader planning issues.
- (e) That Council amends the current DCPs and Policy in the manner outlined above and so to generally accord with the Model DCP/Policy appended to this report (refer to **Appendices C** ).
- (f) That Council incorporates notations upon Section 149(2) Certificates consistent with the approach discussed above and endorsed by the UPRC FRMP.

It is considered that the above recommendations provide appropriate responses to the issues raised and evaluated within the context of the FRMP and the legislative framework associated with planning.



## REFERENCES

Bewsher, D. & P. Grech, May 1997, '*A New Approach to the Development of Floodplain Controls for Floodplains*'. Paper presented to the 37th Annual Floodplain Management Conference - Maitland.

Don Fox Planning, May 2000, '*Upper Parramatta River Catchment Model Floodplain Management Policy*' prepared for the UPRC Trust (Project No. P4178).

NSW Government, December 1986, '*Floodplain Development Manual*', Department of Water Resources, Sydney.

NSW Government, 1984, '*Review of Flood Prone Land Policy*', discussion paper, Floodplain Management Review Committee, Sydney.

NSW Government, January 2001, '*Floodplain Management Manual*', Sydney.

Smith, D., '*Beyond the Design Flood - Implications for Urban Floodplains*

## Appendix A Recommended Changes to Sydney REP No. 28

### A.1 Definitions

The following definitions are recommended for insertion into the Dictionary at Schedule 1.:

***Flood liable land*** (being synonymous with ***flood prone land*** and ***floodplain***) is the area of land which is subject to inundation by floods up to and including an extreme flood such as a probable maximum flood (PMF) level.

***Probable maximum flood (PMF)*** is the largest flood that could conceivably occur at a particular location.

### A.2 Standard Clauses

The following clause is recommended to replace the existing Clause 76:

#### **Development on Flood Liable Land**

20(1) Notwithstanding any other provisions of this plan, consent may be refused to the carrying out of any development on flood liable land where, in the opinion of the consent authority, the development may:

- (a) be inconsistent with any policy or floodplain risk management plan adopted by Council in accordance with the principles contained in the Manual entitled “Floodplain Management Manual” dated January 2001 or any subsequent manual relating to the management of flood liable land, notified in the Gazette by the Minister for Planning.
- (b) detrimentally increase the potential flood affectation on other development or property;
- (c) result, to a substantial degree, an increased risk to human life;
- (d) be likely to result in additional economic and social cost which could not reasonably be managed by potentially affected persons and the general community; or
- (e) adversely affect the environment of the floodplain by causing avoidable erosion, siltation, unnecessary destruction of river bank vegetation, a reduction in the stability of the river bank;

(2) When undertaking an assessment required by this clause, Council shall take into consideration the impact of the development in combination with the cumulative impact of development which is likely to occur, within the same floodplain.

....(3) For the purposes of this plan, the consent authority may consult with and take into consideration, any advice of the Department of Land and Water Conservation the Upper Parramatta River Catchment Trust (for its Catchment) and the State Emergency Service in relation to the nature of the flood hazard, the necessity and capacity to evacuate persons, and the consequence and suitability of the development.

### **A.3 Exempt Development**

Insert as clause 59(3) in respect to exempt development the following:

(3) is within that part of flood liable land that is affected by the 100 year average recurrence interval (ARI) flood.

## Appendix B Recommended LEP Inclusions

### B.1 Definitions

**Flood liable land** (being synonymous with **flood prone land** and **floodplain**) is the area of land which is subject to inundation by floods up to and including an extreme flood such as a probable maximum flood (PMF).

**Probable maximum flood (PMF)** is the largest flood that could conceivably occur at a particular location.

### B.2 STANDARD CLAUSE

#### ... Development in Flood Prone land

(1) Notwithstanding any other provisions of this Plan, the Council may refuse consent to the carrying out of any development on flood prone land where, in its opinion, the development may:

- (a) be inconsistent with any floodplain risk management plan adopted by Council in accordance with the Manual entitled “Floodplain Management Manual” dated 2001 (as published by the State Government);
- (b) detrimentally increase the potential flood affectation on other development or property;
- (c) result, to a substantial degree, an increased risk to human life;
- (d) be likely to result in additional economic and social cost which could not reasonably be managed by potentially affected persons and the general community; or
- (e) adversely affect the environment of the floodplain by causing avoidable erosion, siltation, unnecessary destruction of river bank vegetation or a reduction in the stability of the river bank;

(2) When undertaking an assessment required by this clause, Council shall take into consideration the impact of the development in combination with the cumulative impact of development which is likely to occur within the future, within the same floodplain.

(3) For the purposes of this Plan, the Council may consult with and take into consideration, any advice of the Department of Land and Water Conservation, the Upper Parramatta River Catchment Trust if the land is within that catchment), and the State Emergency

Service in relation to the nature of the flood hazard, the necessity and capacity to evacuate persons, and the consequence and suitability of the development.

### **B.3 exempt development**

Amend exempt development provisions so as to exclude the following from being classed as exempt development:

*“..... within that part of the flood liable land that is affected by the 100 year average recurrence interval (ARI) flood ....”*

## Appendix C Recommended Local Floodplain Risk Management Policy

### C.1 Foreword

This document outlines Council's Policies that relate to the following areas of floodplain risk management:

- Plan making
- Development assessment
- Information management
- Community awareness.

These policies have been prepared to ensure that Council's actions and decisions provide for the management of flood liable land in Parramatta, in a manner that reflects local economic, environmental and social factors and that consequent flood risks are those that are acceptable to the community.

#### C.1.1 Record of approval and amendment

Version	Date prepared	Prepared By	Date Adopted

This Policy Replaces Council previous Flood Policy known as:

*E5 – Policy for Development and Building on Flood Prone Land*

#### **Enquires:**

*Parramatta City Council*

*30 Darcy Street, Parramatta*

*PO Box 32 NSW 2124*

*Web: [www.parracity.nsw.gov.au](http://www.parracity.nsw.gov.au)*

For Development Enquires:

*Ph: 02 9806 5000 (main switch)*

SINCLAIR KNIGHT MERZ

For information on this document:

*Ph: 02 9806 5000 (Waterways Systems Manager)*

## **C.2 About this Policy**

### **C.2.1 Objectives of the Local Floodplain Risk Management Policy**

This Plan aims to:-

- a) To minimise the potential impact of development and other activity upon the aesthetic, recreational, flood behaviour and ecological value of the waterway corridors.
- b) Increase public awareness of the hazard and extent of land affected by all potential floods, including floods greater than the 100 year average recurrence interval (ARI) flood and to ensure essential services and land uses are planned in recognition of all potential floods.
- c) Inform the community of Council's policy for the use and development of flood prone land.
- d) Document Council's systems and policies for the management of flood related information.
- e) Reduce the risk to human life and damage to property caused by flooding through controlling development on land affected by potential floods.
- f) Provide detailed controls for the assessment of applications lodged in accordance with the Environmental Planning and Assessment Act 1979 on land affected by potential floods.
- g) Provide different guidelines, for the use and development of land subject to all potential floods in the floodplain, which reflect the probability of the flood occurring and the potential hazard within different areas.
- h) Apply a "merits-based approach" to all development decisions which takes account of social, economic and ecological as well as flooding considerations.
- i) To control development and other activity within each of the individual floodplains within the LGA having regard to the characteristics and level of information available for each of the floodplains, in particular the availability of FRMSs and FRMPs prepared in accordance with the FMM and its predecessor, the FDM.
- j) Deal equitably and consistently with applications for development on land affected by potential floods, in accordance with the principles contained in the FMM, issued by the NSW Government.

### **C.2.2 When Does this Policy Apply?**

The Policy applies to whole of the Local Government area.

There are a number of floodplains within the LGA, and this Policy will provide general provisions relating to all the floodplains and specific provisions relating to individual floodplains.

This Policy should be read in conjunction with the relevant provisions of the NSW Government Flood Prone Lands Policy and Floodplain Management Manual (FMM 2001), the Environmental Planning and Assessment Act, 1979, and Regulations thereto, applicable Environmental Planning Instruments (particularly Parramatta Local Environmental Plan 2001) and other relevant Development Control Plans and policies adopted by Council.

### **C.3 Policy framework**

#### **C.3.1 Key Principles**

##### **Risk management**

- Floodplain risk management is about occupying the floodplain and optimising its desired use in a manner which is compatible with the flood hazard and at a level of risk which is accepted by the community.
- Risk can be simply defined as a product of frequency and consequence. The frequency (or probability of a flood) is a natural phenomenon which cannot be controlled by structural mitigation works to any substantial degree in the floodplains of the Parramatta LGA. The consequence of a flood varies with the nature of the hazard (depth, velocity, warning time, etc) and what it impacts (property and people).
- The control and management of land use provides effective means of managing the consequences of a flood and, hence, minimising flood risks.
- Community awareness, preparedness and ability to recover post-flooding is also an important means of managing the consequences of a flood, in regard to minimising economic costs, social disruption and personal trauma.
- Floodplain risk management involves comprehensively managing the risk to people and assets (both below and above the FPL if it is lower than the PMF) by applying and integrating a range of available measures.
- There are different types of flood risks and a range of ways in which each type of flood risk can be managed. This includes floor level controls, flood awareness and warning, evacuation plans and facilities, building design, distributing land uses in a flood compatible manner, subdivision design (eg. road layouts), structural works, etc.

##### **Liability**

During the 1970's and early 1980's, the State Government actively assumed responsibility for floodplain management within New South Wales. In 1984, the decision of the State Government changed with the adoption of the Flood Policy at that time, which in particular, assigned responsibility for floodplain management to local government and adopted a merits-based approach.



The merits-based approach was adopted in place of the previous State Government flood planning level, being the 100 year ARI Flood (effectively disbanded in 1984) to allow councils to develop policies based on the economic, social and environmental characteristics of the individual floodplains, so that flood risks were managed in a manner which was acceptable to local communities. The abandonment of the singular flood planning level of the 100 year ARI, was also in recognition that floods of greater magnitude could occur, and these would need to be recognised, but not necessarily to form a basis for restricting development, so that all risks associated with potential flooding could be understood and consequent management decisions accepted by the community

As a compensatory measure to the assignment of flood risk management responsibilities to local government, and to deal with the potential outcomes of a merits-based approach (where not all development may be protected by all potential floods), the State Government established the basis for ensuring that local government had exemption from liability through the provisions of the Local Government Act. Such exemptions were to be obtained on the basis that local government adhered to the State Government's Flood Policy and any associated manuals, in exercising their duties. The provisions of the Local Government Act which provided such indemnities currently exist as section 733 of the Local Government Act, 1993 (LG Act).

In summary, Section 733 of the LG Act provides that councils do not incur any liability in respect of advice furnished or anything done or omitted to be done in good faith by council which relates to the nature and extent of flooding provided that council acts in good faith. Unless the contrary is proved, council is taken to have acted in good faith if those acts are substantially in accordance with the Floodplain Management Manual.

### **Types of flooding**

Flooding can be separated into two categories depending on the cause of the flood:

- **Mainstream flooding:** where water enters the creeks or channels and rises until the water levels break the banks and flow either side of the channel. Water may then flow along other low points such as roads.
- **Local drainage flooding:** where the capacity of the pits and pipes along streets can not hold all the water (due to blockages or low capacity) resulting in water backing up and overflowing; AND/OR overland flow where water may pass over the land along low points to the waterway or drainage system.

Local drainage is often divided into major drainage where the water may be deeper than 30cm and results in danger to property or personal safety and those with shallow depth (less than 30cm) with little danger to personal safety.

### **C.3.2 NSW Government Flood Prone Lands Policy**

In 1984, the State Government introduced a Flood Prone Land Policy applicable to New South Wales. While the intent of the Policy remained ostensibly unaltered, a reviewed Policy was published by the State Government in January 2001 with the release of the current Floodplain Management Manual. The primary objective of the Policy is:

*“To reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods wherever possible.”*

The Policy provides for its implementation in the following manner:

- The management of flood prone land is the responsibility of councils, requiring standards and implementation arrangements to accord with the policies, procedures and management plans determined by councils.
- The Department of Planning, Infrastructure and Natural Resources and State Emergency Service will provide technical assistance on all flooding matters, while the Floodplain Management Manual will assist councils in the preparation of Floodplain Risk Management Plans.
- Local Floodplain Risk Management Committees are to be established by councils and include community representatives to enable the communication of their views regarding management of flood risk.
- The State Government will continue to subsidise Floodplain Risk Management Studies, works and measures.

The Policy is provided at Appendix A of the Floodplain Management Manual and includes a number of specific provisions to explain the government Policy.

### **C.3.3 NSW Floodplain Management Manual**

The first *Floodplain Development Manual* (FDM) was published in 1986, providing guidelines for the implementation of the government’s flood prone land policy and the merit approach which underpins its application.

Revised guidelines were released in 2001 and are now embodied in the *Floodplain Management Manual* (FMM).

The FMM continues to support the NSW Government’s Flood Prone Land Policy. To achieve the primary objective of the Policy, the FMM acknowledges a broad risk management hierarchy of:

- avoidance of flood risk;
- minimisation of flood risk using appropriate planning controls; and
- flood risk mitigation.

Flood risk mitigation can provide some effective reduction in flood risks to a point, but is the least preferred option in the long term, being costly, limited in potential to remove flooding risks and most likely to adversely affect the natural environment. Avoidance and minimisation of flood risk are the options most likely to be acceptable and are primarily reliant on land use planning and development control for implementation.

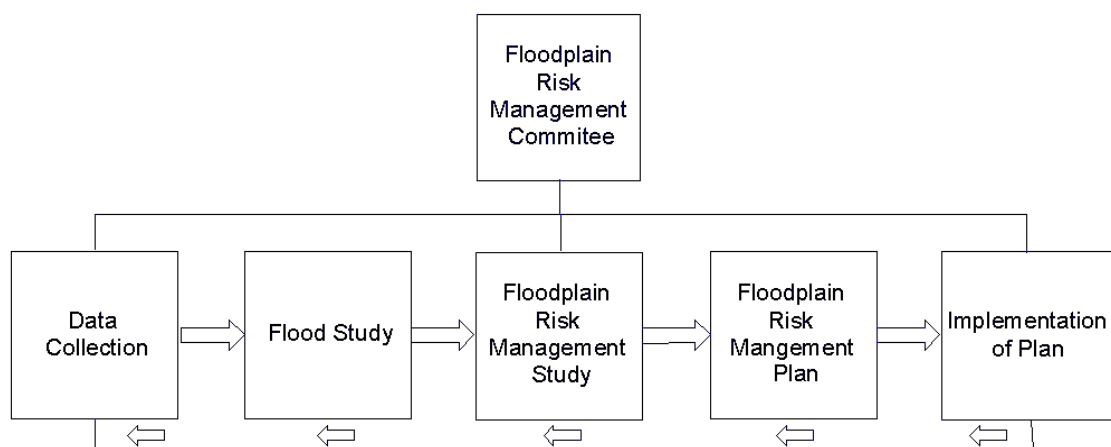
Local Government is the primary authority responsible for both flood risk management and land use planning in New South Wales. The State Government’s flood policy provides for a flexible merits-based approach to be followed by local government when dealing with planning, development and building matters on flood prone land, in order to facilitate development wherever practicable. For Council to fully carry out its responsibilities for management of flood prone land, it is necessary to prepare a local “*Floodplain Risk Management Plan*” (FRMP).

The FMM requires that Councils prepare *Floodplain Risk Management Studies* (FRMS) as a prelude to the formulation of a FRMP which, among other things, would control development and other activity within the floodplain. The process for preparing a FRMS and FRMP is depicted by Figure 1

Where Council is yet to prepare a FRMP, council will nonetheless seek to minimise flood related risks associated with new development by the application of controls contained in this Policy.

This Policy is consistent with the State Government’s “Flood Prone Land Policy” and the FMM. This Plan is an application of the State Policy which reflects local circumstances.

**Figure 1: Floodplain Risk Management Process (FMM, 2001)**



### C.3.4 Managing Parramatta's Waterways

In order to manage Parramatta's waterways and address their complex and interrelated issues, Parramatta City Council has developed a Strategy and Plan, titled '*Rivers of Opportunity*', which sets out both where we want to be in 2020 and how we are going to get there. For each waterway issue Council is developing master plans, forward works programs and targeted actions to address them.

A component of this is the development of strategic planning documents including:

- Stormwater Management Plans
- Waterways Maintenance and Rehabilitation Master Plans
- Floodplain Risk Management Plans
- Sub-Catchment Management Plans (drainage)

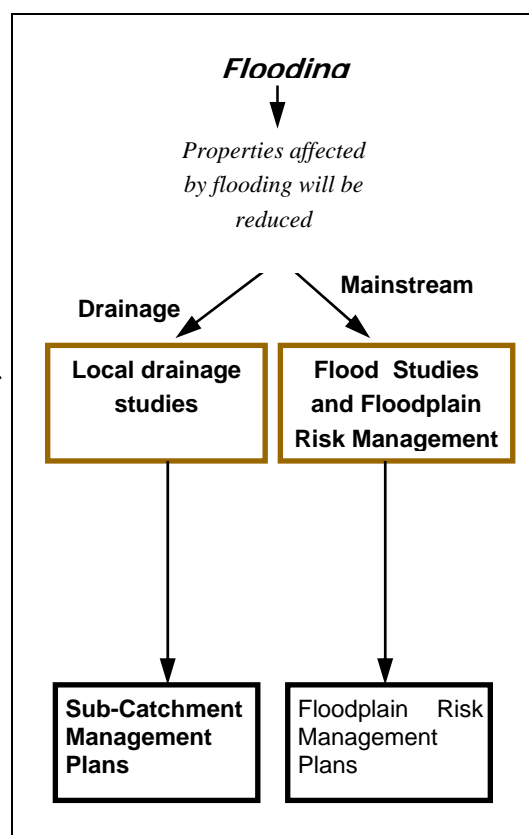
Each of these plans are prepared for specific areas. The Plans assist in determining specific actions, priorities and their benefits to both the community and natural environment. They will set us down the path of developing a comprehensive and coordinated approach to the management of our waterways for the future.

Floodplain Risk Management Plans are the key strategic planning documents that assist managing mainstream and major overland flooding, and comply with the NSW Government Flood Policy Council.

Flood Studies provide critical information on floods such as flood levels, velocity and hazard. They are generally undertaken prior to the development of a Floodplain Risk Management Plans or Sub-Catchment Management Plans.

Floodplain Risk Management Plans provide recommendations on:

- Flood Modification Measures (ie capital works)
- Property Modifications Measures (ie planning controls)
- Response Modification Measures (ie flood warning)



### **C.3.5 Planning Instruments**

Section 79C of the Environmental Planning and Assessment Act, 1979 provides that a consent authority, such as Council, must take into consideration various matters when determining development applications inclusive of regional environmental plans (REPs), local environmental plans (LEPs) and development control plans (DCPs).

An REP provides objectives and controls for environmental planning for a region, or part of a region, and is prepared by the State Government. Sydney REP No. 22 – Parramatta River 1998 and Sydney REP No. 28 – Parramatta 1999, apply to development within some of the floodplains in the Parramatta LGA.

A local environmental plan is prepared by Council, and eventually requires endorsement by the State Government, which defines zones, permissible uses within those zones, specific development standards and other special matters for consideration with regard to the use or development of land. The Parramatta LGA, and the floodplains within it, are covered by the provisions of the Parramatta LEP 2001.

A development control plan is a plan prepared and adopted by Council, which provides detail guidelines for the assessment of development applications. Parramatta DCP 2001 is a comprehensive plan applying to the whole of the LGA. Clause 4.1.3 of the DCP provides primary controls in regard to floodplain risk management and refers to the need for compliance with Council's Local Floodplain Risk Management Policy. This DCP effectively gives force to the need to consider this Policy when determining development applications.

Council is required to consider all of the above documents when determining development applications, and accordingly must be read in conjunction with this Policy for that purpose.

## **C.4 Plan Making**

### **C.4.1 Key Principles**

In the process of making various plans for which Council has responsibility, the following key principles will be applied to address floodplain risk management issues:

- The accumulative impact of all potential development occurring within a floodplain, and the consequent effect that any change to the potential flooding regime would have on other properties.
- Any development, work or other activity should not result in any increased risk to human life.
- Any development, work or activity should not create the potential for damage to property from flooding greater than that which can reasonably be managed by the property owner, property occupants and general community, and should not significantly increase the potential flood damages to other property.

- A comprehensive assessment of the flood hazard should be made, which takes into consideration the probability of all floods (ie. up to the PMF), depth and velocity of floods, available warning time, the likely necessity and potential for evacuation and the duration of floods, relative to different locations within each floodplain.
- Recognition that different land uses may have different levels of vulnerability to flooding due to the consequences arising (eg. a hospital would have greater vulnerability than a plant nursery to flooding).
- Any development, work (including flood mitigation structures) or other activity should not give rise to unreasonable impacts upon the amenity or ecology of an area, and must be consistent with ESD principles.
- All plans shall provide the community a clear and unambiguous understanding of all potential flood risks within the floodplain (ie. up to the PMF) irrespective of whether any control is proposed on development or other activity.

Generally, the desirability of different land uses within different parts of the floodplain, as reflected within the planning control matrices provided at Section 6.3 of this Policy, will be taken into consideration in the various plan making processes.

#### **C.4.2 Flood Maps**

Maps identifying the extent of various floodplains in the LGA categorise differentiating precincts of varying flood risk, are provided in Volume 1. These maps identify the majority of areas subject to riverine flooding. These maps generally depict differential flood risks in different parts of the floodplain.

However, riverine flooding maps typically do not extend to the ultimate top of a catchment where watercourses and overland flow paths are located within pipes or narrowly formed channels, or are not evident except during major storms. Accordingly, while Council is consciously applying itself to confidently identify the majority of properties affected by significant flooding, some areas subject to local drainage flooding may not be identified on the flood maps. In some cases, although identified as flood affected on existing maps, development proposals may be required to be accompanied by site specific flood studies where flood related risks are suspected.

The flood precinct maps may not provide all detail information regarding flood hazards available within Council and more details can be provided by contacting Council's Catchment Management Engineers.

The flood maps have been developed from the Lower Parramatta River Flood Study, localised flood studies or where available, flood studies and flood risk management studies prepared in accordance with the process established under the Floodplain Management Manual. Flood mapping within the Upper Parramatta River Catchment has been undertaken and provided to Council by the Upper Parramatta River Catchment Trust. Flood risks are calculated to occur across the whole of the floodplain as defined,

being that land up and including the PMF extent. The extent of the PMF and other chance floods have been estimated for some parts of the LGA, but not all, and Council can provide information of known flood extents upon request.

Flood maps are currently the subject of review and will be updated progressively as further investigations are carried out. Refer to **Section 7 of Volume 1** for more information.

#### **C.4.3 Floodplain Risk Management Plans**

Floodplain Risk Management Plans are prepared in accordance with the requirements of the Floodplain Management Manual to specify the manner in which Council intends to manage flood risk within its LGA, having regard to local economic, ecological and social considerations. These plans are to reflect the extent of usage and activity in the floodplains of the LGA which Council is prepared to allow, having regard to the risks the community are willing to accept as well as other matters such as flood awareness programs. This is to be determined by the floodplain risk preparation process outlined by the Manual, which provides for extensive community involvement through both the floodplain risk management committee and the exhibition of Floodplain Risk Management Plans and consideration of submissions.

Council has substantially progressed or is in the process of preparing Floodplain Risk Management Plans for the following areas:

- North Wentworthville\*
- Lower Parramatta River Floodplain
- Upper Parramatta River Floodplain\*
- Vineyard/Terry's Creek Floodplain
- Subiaco Creek Floodplain
- Duck River Floodplain (in conjunction with Auburn Council)

\* Completed

These plans will ultimately contribute to the formulation of local policies for the majority of potentially flood affected areas in the LGA, with residual parts of the catchments subject to overland flow flooding being separately dealt with in similar policy outcomes.

The Flood Risk Management Plans are to be implemented in accordance with the priorities set and the timetable established within the individual plans. Consistent with the State Government Flood Prone Land Policy, financial assistance from the NSW Government is expected to provide for works to reduce potential flood damage and personal danger across the LGA. Within the floodplains of the Upper Parramatta River Catchment, flood mitigation works and associated programs are to be undertaken by Council with the assistance and co-operation of the Upper Parramatta River Catchment Trust.

#### **C.4.4 Planning Instruments**

Part 3 of the Environmental Planning and Assessment Act, 1979 provides the process for the making of environmental planning instruments (eg. REPs, LEPs and DCPs) in NSW. This process involves extensive consultation with relevant government agencies and the community, and would need to take into consideration relevant guidelines, advisory documents and policies of both state and local government. In this regard, Council will need to take into consideration the following documents when preparing environmental planning instruments:

- The NSW Government Flood Prone Land Policy
- The NSW Government Floodplain Management Manual
- Any floodplain risk management plan adopted by Council
- This local policy for floodplain risk management.

#### **C.5 Development Assessment**

##### **C.5.1 Key Principles**

Development applications for proposals which are permissible with consent must have regard to relevant matters for consideration contained in Section 79C of the Environmental Planning and Assessment Act, 1979. Section 79C(1) of the Act effectively requires the consent authority to take into consideration, when determining a development application, any environment planning instrument, draft environmental planning instrument, development control plan (and therefore also this policy document referred to in the relevant DCP) or relevant matter such as flood risk. These documents provide objectives and controls for the assessment of development in a floodplain which in summary include the following key principles:

- The source of potential flooding – being it either mainstream or local flooding.
- A determination of whether the land is within a high hazard area in the floodplain, within which the majority of new development and buildings are considered undesirable.
- Whether development, considered generally desirable in other parts of the floodplain, requires special assessment and ameliorative measures in order to ensure its acceptability.
- Development should not increase the risk of damages on other property or risk to life.
- The assessment of the acceptability of development should take into consideration the cumulative impact of the overall development potential of the floodplain.
- Development should only be permitted where effective warning time and reliable access is available for the evacuation of an area potentially affected by floods, if likely to be required.
- The additional economic and social costs which may arise from damage to property from flooding should not be greater than that which can reasonably be managed by the property owner, property occupants and general community.



- Development should not result in significant impacts upon the amenity or ecology of an area and should be consistent with ESD principles.

### **C.5.2 Decision Process for Development Assessment**

The process for the preparation, lodgement and consideration of a development application would include the following primary stages:

- Determine flood affectation of property (preferably obtain Section 149 Certificate and/or Flood Certificate).
- Determine whether property is potentially flood affected if not identified on existing flood maps (review site characteristics and consult Council Catchment Management Engineers).
- Identify the land use category within which the proposed development falls
- Determine whether the proposed development is suitable having regard to the applicable flood risk precinct over part or all of the site, having regard to the planning control matrices provided at **Section C6.4**.
- If a desirable land use, determine appropriate assessment requirements and ameliorative measures to address flood risk, as provided within the planning control matrices at **Section C6.4**.
- Review relevant requirements within applicable environmental planning instruments (REPs and DCPs) and Parramatta DCP 2001.
- Determine whether development is exempt or complying and, therefore, a formal development application is not required (refer to Parramatta LEP 2001 and Parramatta DCP 2001).
- Determine whether the proposed development is designated and, therefore, requires the preparation of an EIS in accordance with the Act and Regulation (refer to Schedule 3 of the Environmental Planning and Assessment Regulation 2000), noting that some developments are specifically designated due to their location in a floodplain or proximity to a watercourse.
- Determine other setback criteria from rivers, creeks and other watercourses as may be determined through the imposition of a foreshore building line.
- Prepare preliminary development plans having regard to above considerations and other development control requirements of Council (refer to DCP 2001).
- Attend pre-lodgement meeting with Council to discuss application.
- Review and finalise application in regard to comments provided at pre-lodgement meeting.
- Submission of development application to Council in the prescribed form.
- Assessment, consideration and determination of application by Council.

### **C.5.3 Conditions of Consent**

Development proposals which are granted approval will normally be granted consent subject to conditions. These conditions are those which relate to the development and are considered necessary to ensure that development is acceptable. Conditions which may relate to flood issues could include requirements such as minimum floor levels, use of flood compatible materials or the establishment of a site emergency flood plan.

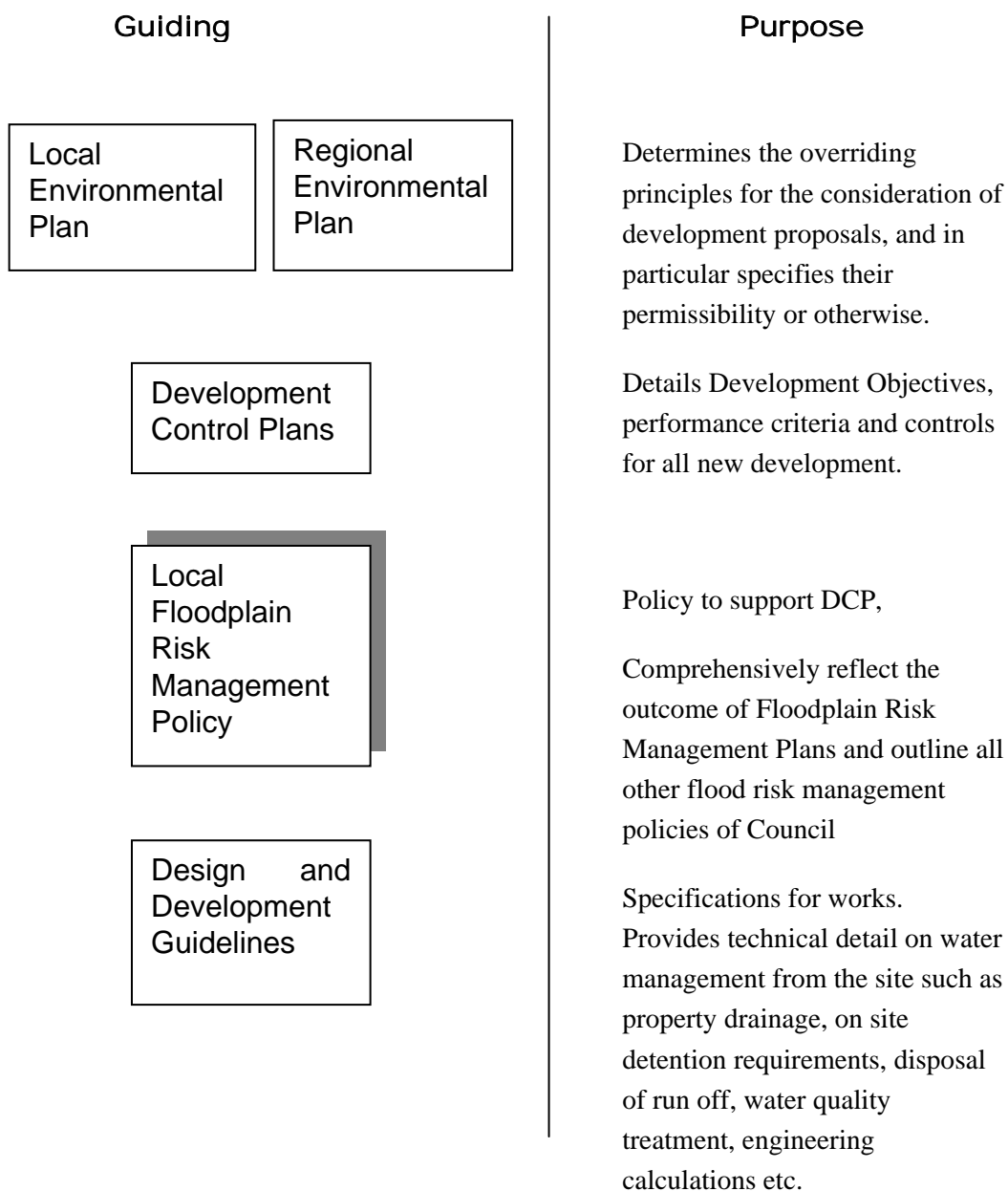
### **C.5.4 Information Required with an Application to address this Policy**

Developments adjacent to any waterway, drainage channel, overland flow path or enclosed drainage system, or within the extent of the probable maximum flood (PMF) as identified on Council's flood maps or determined to be potentially affected, shall provide a full hydrologic and hydraulic assessment report, as required by Appendix 9 of Parramatta DCP 2001. The requirements of such a report shall include:

- General catchment plan and location of site in the catchment.
- Survey information to the Australian Height Datum (AHD) – min 0.5 metre intervals) extended to adjoining properties.
- Hydrological and hydraulic analyses of external and internal catchment for rainfall events up to PMF (Probable Maximum Flood) as determined by Council.
- Assessment of flood extents, flood contours, predicted extents of flood inundation.
- Tables of Council adopted flood levels and flood velocities and assessment of the hydraulic hazard categorisation (including floodway, flood fringe and outer as defined in the Floodplain Management Manual) due to the design flood event.
- Comparison of existing and proposed extents of inundation.
- Determination of applicable flood risk precincts as may be defined by any relevant Floodplain Risk Management Plan.
- Existing and proposed drainage systems.
- Building design compatible with flood hazard.
- Impact on flood behaviour.
- Cumulative impact report (where necessary).
- Flood risk management measures.
- Maintenance methodology and schedule.
- The proposed waterways enhancement and protection measures to be implemented.
- Quantitative and qualitative details of proposed earthworks.

In assessing the impact of proposed developments on flooding behaviour elsewhere, it is incorrect to consider the impacts of individual developments on an ad hoc basis. Their effects should be considered on a cumulative basis within the context of the floodplain risk management plan.

Development should be assessed in terms of their potential impacts on hydraulic hazard, both within and external to the site, in events up to an including the probable maximum flood (PMF).



## C.6 Development Controls

### C.6.1 General

Parramatta City Council has set the following objectives within its Development Control Plans for the City:

- **Flooding** - Reduce the impact of flooding, in particular public risk and flood liability on the residents of Parramatta and ensure land use and development are compatible with predicted flood hazard.
- **Local Drainage** - Minimise surcharge from the existing drainage systems, provide relief drainage wherever appropriate and minimise run-off due to the development.

To address these objectives the Development Control Plans specify the performance criteria to be achieved and the design solutions for new development.

The criteria for determining applications for proposals potentially affected by flooding are structured in recognition that different controls are applicable to different land uses and levels of potential flood inundation and hazard.

The procedure to determine what controls apply to proposed development involves:

- firstly, identifying the land use category of the development;
- secondly, determine which floodplain and what part of the floodplain the land is located within ;  
and
- then apply the controls outlined at Section C6.4.

Section C6.5 provides specific requirements for fencing in the floodplain, while Section 6.6 identifies special considerations which will apply only to some development in specific circumstances.

These sections provide controls for development and fencing in the floodplain contain objectives, performance criteria and prescriptive controls, with the following purpose:

- **The objectives** represent the outcomes that the Council wishes to achieve from each control.
- **The performance criteria** represent a means of assessing whether the desired outcomes will be achieved.
- **The prescriptive controls** are preferred ways of achieving the outcome. While adherence to the prescriptive controls may be important, it is paramount that the objectives and the performance criteria are clearly satisfied.

Where a proposal does not comply with this DCP, Council may:

- (a) Consider alternative methods for the development provided that the objectives of the DCP are met. It is the responsibility of the developer to satisfy Council that the objectives have been met; or
- (b) Modify the proposal through the application of conditions so that it is consistent with the provisions of this DCP; or
- (c) Defer determination of the application and consult with the applicant to achieve consistency with the requirements of this DCP; or
- (d) Refer the application to an approved Floodplain Management Consultant for a report.  
Note: The applicant will be required to meet any expenses incurred; or
- (e) Refuse the application.

### **C.6.2 Land Use Categories**

Nine major land use categories have been adopted. The specific uses, as defined by the applicable Environmental Planning Instruments, which may be included in each category, are listed in Appendix 7.

### **C.6.3 Flood Risk Precincts**

Each of the floodplains within the local government area can be divided based on different levels of potential flood hazard. The relevant Flood Risk Precincts (FRPs) for each of the floodplains are outlined below.

#### **■ High Flood Risk**

This has been defined as the area within the envelope of land subject to a high hydraulic hazard (in accordance with the provisional criteria outlined in the Floodplain Management Manual) in a 100 year flood or potentially subject to evacuation difficulties.

#### **■ Medium Flood Risk**

This has been defined as land below the 100 year flood level subject to low hydraulic hazard (in accordance with the provisional criteria outlined by the Floodplain Management Manual).

#### **■ Low Flood Risk**

This has been defined as all other land within the floodplain (ie. within the extent of the probable maximum flood) but not identified as either a high flood risk or medium flood risk Flood Risk Precinct, where risk of damages are low for most land uses.

#### **C.6.4 Development Controls**

The development controls apply to all land within a Flood Risk Precinct described above. The type and stringency of controls have been graded relative to the severity and frequency of potential floods, having regard to categories determined by the relevant Floodplain Risk Management Study and Plan or, if no such study or plan, council's interim considerations. The categories applicable to each floodplain are depicted on the planning matrices contained in Error! Reference source not found..

#### **Objectives**

- (a) To ensure the proponents of development and the community in general are fully aware of the potential flood hazard and consequent risk associated with the use and development of land within the floodplain.
- (b) To require developments of high sensitivity to flood risk (eg. critical public utilities) be sited and designed such that they are subject to no or minimal risk from flooding.
- (c) Allow development with a lower sensitivity to the flood hazard to be located within the floodplain, subject to appropriate design and siting controls, provided that the potential consequences that could still arise from flooding remain acceptable having regard to the State Government's Flood Policy and the likely expectations of the community.
- (d) To prevent any intensification of the use of floodways, and wherever appropriate and possible, allow for their conversion to natural waterway corridors.

To ensure that design and siting controls required to address the flood hazard do not result in unreasonable impacts upon the amenity or ecology of an area.

#### **Performance Criteria**

- (a) The proposed development should not result in any increased risk to human life.
- (b) The additional economic and social costs which may arise from damage to property from flooding should not be greater than that which can reasonably be managed by the property owner, property occupants and general community.
- (c) The proposal should only be permitted where effective warning time and reliable access is available for the evacuation of an area potentially affected by floods. Evacuation should be consistent with any relevant flood evacuation strategy where in existence.
- (d) Development should not detrimentally increase the potential flood affectation on other development or properties, either individually or in combination with the cumulative impact of development that is likely to occur within the same floodplain.

- (e) Development should not result in significant impacts upon the amenity of an area by way of unacceptable overshadowing of adjoining properties, privacy impacts (eg. by unsympathetic house-raising) or by being incompatible with the streetscape or character of the locality.
- (f) Proposed development must be consistent with ESD principles.

**Figure 5-1** on the next page shows a summary of the planning considerations for each land use.

The sections following outline the controls relevant to each of the floodplains to which this Plan applies.

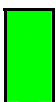


■ **Figure 5-1 Planning Matrix**

## Floodplain Matrix of the Lower Parramatta River Catchment

Planning & Development Controls

Planning Consideration	Flood Risk Precincts (FRP's)																												
	Low Flood Risk						Medium Flood Risk						High Flood Risk																
	Sensitive Uses & Facilities	Critical Utilities & Uses	Subdivision	Filling	Residential **	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development	Sensitive Uses & Facilities	Critical Utilities & Uses	Subdivision	Filling	Residential **	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development	Sensitive Uses & Facilities	Critical Utilities & Uses	Filling	Subdivision	Residential **	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development		
Floor Level		3			2 5	2 5	2 5							2 5	2 5	2 5	1 5	4 5									1 5	4 5	
Building Components		2													1	1	1	1	1									1	1
Structural Soundness		2													1	1	1	1	1									1	1
Flood Affection		2	2	1	2	2	2					1			1	1	1	2	1									1	1
Car Parking & Driveway Access		1 3 5 6			1 3 5 6	1 3 5 6	1 3 5 6 7							1 3 5 6 7	1 3 5 6 7	1 3 5 6 7	2 4 6 7	1 5										2 4 6 7	1 5
Evacuation		2 4 6	5		3 4	4	4					5 3 4		3 4 6	3 4 6	3 4 6	1 4	3 6										1 4	3 4 6
Management & Design		2 3 4	1									1		2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2									2 3 4	2 3 4



Not Relevant



Unsuitable Land Use

\*\*

For redevelopment of an existing dwelling refer also to 'Concessional Development' provisions

**NOT  
ES**

1. *Freeboard* equals an additional height of 500mm.
2. The relevant environmental planning instruments (generally the Local Environmental Plan) identify development permissible with consent in various zones in the LGA. Notwithstanding, constraints specific to individual sites may preclude Council granting consent for certain forms of development on all or part of a site. The above matrix identifies where flood risks are likely to determine where certain development types will be considered "unsuitable" due to flood related risks.
3. Filling of the site, where acceptable to Council, may change the FRP considered to determine the controls applied in the circumstances of individual applications.
4. Any fencing that forms part of a proposed development is subject to the relevant Flood Affection and Structural Soundness planning considerations of the applicable land use category.
5. Some developments will need to have regard for the Foreshore Building Line and all its objectives, as per the relevant environmental planning instrument.
6. Terms in italics are defined in the glossary of this plan and Schedule 2 specifies development types included in each land use category. These development types are generally as defined within Environmental Planning Instruments applying to the local government area.

**Floor Level**

- 1 All floor levels to be equal to or greater than the 20 year *ARI flood level plus freeboard*.
- 2 Habitable floor levels to be equal to or greater than the 100 year *ARI flood level plus freeboard*.
- 3 All floor levels to be equal to or greater than the *PMF* level plus *freeboard*.
- 4 Floor levels to be equal to or greater than the 100 year *ARI flood level plus freeboard*. Where this is not practical due to compatibility with the height of adjacent buildings, or compatibility with the floor level of existing buildings, or the need for access for persons with disabilities, a lower floor level may be considered. In these circumstances, the floor level is to be as high as practical and, when undertaking alterations or additions, no lower than the existing floor level.
- 5 A restriction is to be placed on the title of the land, pursuant to S.88B of the Conveyancing Act, where the lowest *habitable floor area* is elevated above finished ground level, confirming that the subfloor space is not to be used in any form.

**Building Components & Method**

- 1 All structures to have *flood compatible building components* below the 100 year *ARI flood level plus freeboard*.
- 2 All structures to have *flood compatible building components* below the *PMF*.

**Structural Soundness**

- 1 Engineers report to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year *ARI flood level plus freeboard*.
- 2 Engineers report to certify that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a *PMF* level.

## Flood Affection

1	Engineers report required to certify that the development will not increase <i>flood affection</i> elsewhere, having regard to: (i) loss of flood storage; (ii) changes in flood levels, flows and velocities caused by alterations to flood flows; and (iii) the cumulative impact of multiple potential developments in the same catchment.
2	The impact of the development on flooding elsewhere to be considered, having regard to the three factors listed in consideration 1 above.

## Car Parking and Driveway Access

1	The minimum surface level of open spaces or carports shall be as high as practical, but no lower than 0.1m below the 100 year ARI flood level. In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 100 year ARI flood level.
2	The minimum surface level of open parking spaces or carports shall be as high as practical, but no lower than 0.3m above the 20 year ARI flood level.
3	Garages capable of accommodating more than 3 motor vehicles on land zones for urban proposes, or enclosed car parking, must be protected from inundation by floods equal to or greater than the 100 year ARI flood. Ramp levels to be no lower than 0.5m above the 100 year ARI flood level.
4	The driveway providing access between the road and parking spaces shall be as high as practical and generally rising in the egress direction.
5	The level of the driveway providing access between the road and parking shall be no lower than 0.2m below the 100 year ARI flood level.
6	Enclosed car parking and car parking areas accommodating more than 3 vehicles, with a floor below the 100 year ARI flood level, shall have adequate warning systems, signage, exits and evacuation routes.
7	Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year ARI flood.

## Evacuation

1	Reliable access for pedestrians required during a 20 year <i>ARI peak flood</i> .
2	Reliable access for pedestrians and vehicles required to a publicly accessible location during the <i>PMF peak flood</i> .
3	Reliable access for pedestrians and vehicles is required from the site to an area of refuge above the <i>PMF level</i> , either on site (eg. second storey) or off site.
4	Applicant to demonstrate the development is consistent with any relevant <i>flood evacuation strategy</i> or similar plan.
5	Applicant to demonstrate that evacuation in accordance with the requirements of this DCP is available for the potential development resulting from the subdivision.
6	Adequate flood warning is available to allow safe and orderly evacuation without increased reliance upon SES or other authorised emergency services personnel.

## Management and Design

1	Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with the relevant FRMS and FRMP.
2	Site Emergency Flood Response Plan required where the site is affected by the 100 year ARI flood level, (except for single dwelling-houses).
3	Applicant to demonstrate that area is available to store goods above the 100 year <i>ARI flood level plus freeboard</i> .
4	No storage of materials below the 100 year <i>ARI flood level</i> .



### **C.6.5 Are There Special Requirements for Fencing?**

#### **Objectives**

- (a) To ensure that fencing does not result in the undesirable obstruction of the free flow of floodwaters.
- (b) To ensure that fencing does not become unsafe during floods and potentially become moving debris which threatens the integrity of structures or the safety of people.

#### **Performance Criteria**

- (a) Fencing is to be constructed in a manner which does not affect the flow of floods so as to detrimentally increase flood affection on surrounding land.
- (b) Ability to be certified by a suitably qualified engineer, that the proposed fencing is adequately constructed so as to withstand the forces of floodwaters, or collapse or open in a controlled manner to prevent the undesirable impediment of flood waters.

#### **Prescriptive Controls**

Fencing within a high hazard FRP will not be permissible except for security/ permeable/safety fences of a type approved by Council.

Council will require a Development Application for all new solid (non-porous) and continuous fences above 0.6m high, in a High Hazard FRP unless otherwise stated by exempt and complying development provisions which may be incorporated into Council's Environmental Planning Instruments and other DCPs from time to time.

An applicant will need to demonstrate that the fence would create no impediment to the flow of floodwaters. Appropriate fences must satisfy the following:-

- (a) An open collapsible hinged fence structure or pool type fence; and
- (b) Fencing panels may be attached by galvanised or other screws, bolts, tech screws, etc, or be attached to a swivel system capable of being opened up during times of flooding;
- (c) Not less than 90% in High FRPs and 50% in other areas, of all fence panels shall be permanently open or capable of being removed when they are located at right angles to the flow of flood waters;
- (d) Any other fence type and design and siting criteria as prescribed by Council.

Other forms of fencing will be considered by Council on merit.

### **C.6.6 Special Considerations**

When assessing proposals for development or other activity within the area to which this Policy applies, Council will take into consideration the following specific matters.

- (a) The proposal does not have a significant detrimental impact on:
  - i) water quality;
  - ii) native bushland vegetation;
  - iii) riparian vegetation;
  - iv) estuaries, wetlands, lakes or other water bodies;
  - v) aquatic and terrestrial ecosystems;

- vi) indigenous flora and fauna; or
  - vii) fluvial geomorphology.
- (b) Development pursued to mitigate the potential impact of flooding (eg. house raising) must be undertaken in a manner which minimises the impact upon the amenity and character of the locality.
- (c) The proposal must not constrain the orderly and efficient utilisation of the waterways for multiple purposes.
- (d) The proposal must not adversely impact upon the recreational, ecological, aesthetic or utilitarian use of the waterway corridors, and where possible, should provide for their enhancement, in accordance with ESD principles.
- (e) Proposals for house raising must provide appropriate documentation including a report from a suitably qualified engineer to demonstrate the raised structure will not be at risk of failure from the forces of floodwaters and the provision of details such as landscaping and architectural enhancements which ensure that the resultant structure will not result in significant adverse impacts upon the amenity and character of an area.



## **C.7 Information Management**

### **C.7.1 Introduction**

The controlled release of flood data between and within different parts of Council, Government agencies and the community is essential in exercising Council's duties. In the management and release of this information, Council must be conscious of its need to provide this flood information in an accurate, comprehensive and consistent manner. By maintaining a formal approach to the release and dissemination of data, Council can demonstrate that it is:

- Conscientiously applying itself in the exercise of its duties;
- Reducing delays in providing flood information;
- Fulfilling its obligations provided by section 733 of the Local Government Act, 1993 (LG Act);
- Limiting Council's liability in future damages claims through the legal system;
- Decreasing possible insurance costs;
- Safeguarding the release and dissemination of flood related data; and
- Effectively increasing public awareness of flood hazards and potentially reducing risks to persons and property.

### **C.7.2 Objectives**

1. To ensure that those handling or receiving flood information understand the distinction between risks associated with flooding and controls imposed by Council to mitigate against the consequences of flood events.
2. To maximise flood awareness amongst the general community and Council personnel involved in land management and development processes.
3. To ensure that flood related information released is consistent, and released in an orderly and efficient manner.
4. To ensure that flood related information released accurately communicates the flood risks known to Council at the time.

5. To advise the public of restrictions that may be imposed by Council on development due to flood affectation.
6. To provide a flood related information service to all relevant sections of Council.
7. To minimise any constraint to achieving public awareness of flood risks, to minimise consequences of flooding, by increasing the preparedness of the community and to increase the capacity of the community to recover subsequent to being flooded.
8. To ensure that Council meets its statutory obligations in regard to the dissemination of flood related information.

### **C.7.3 Process for the Maintenance of Information and Responding to Requests**

The flow diagram (Figure 2) on the following page represents the process to be followed in regard to the receipt of information requests, the maintenance of an information system, and the release of information.

There are two levels of flood related information to be made available, being:

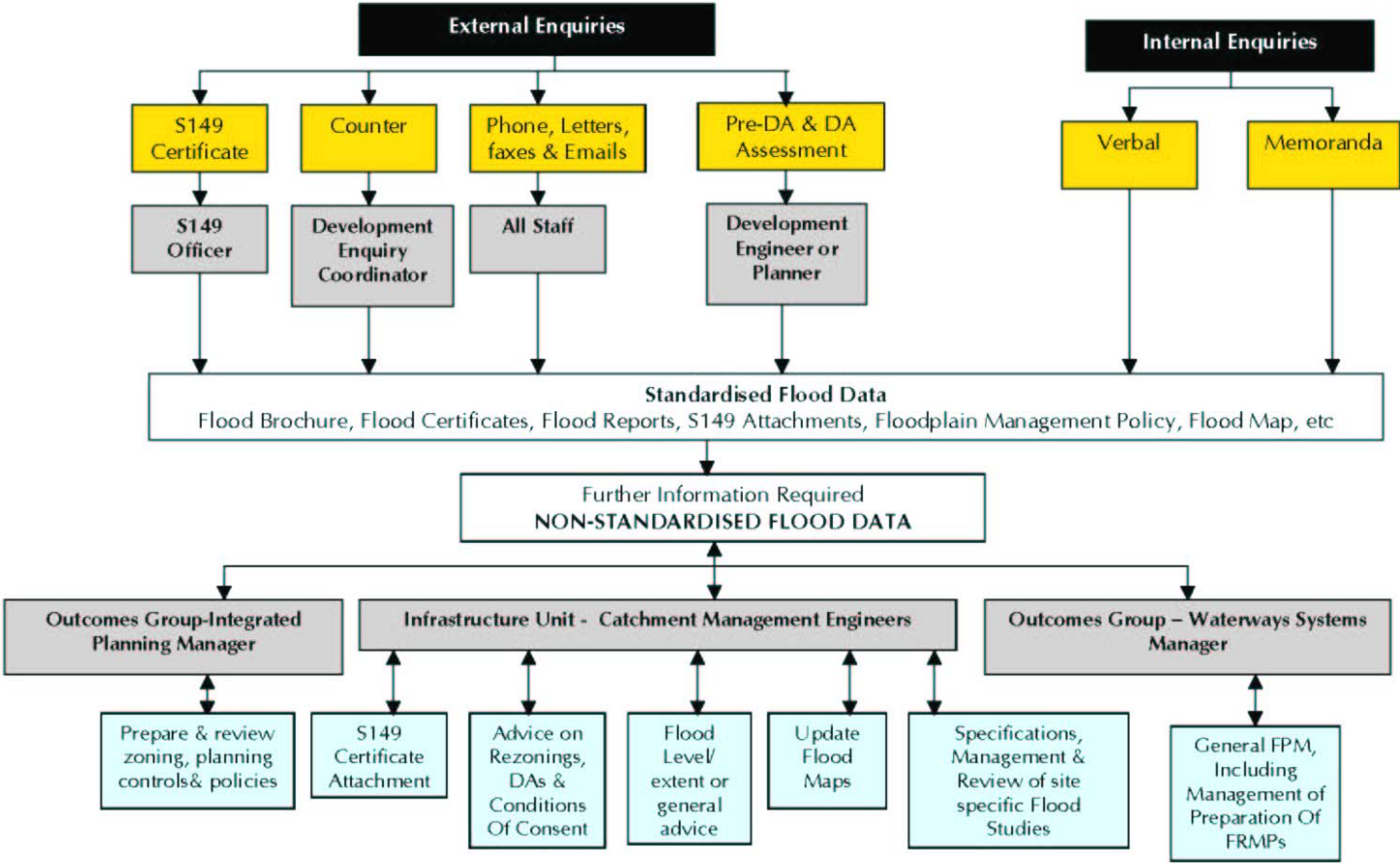
**Standardised flood data** – which refers to documented information prepared by the Catchment Management Engineers and Waterways Systems Manager and may include a flood information brochure, flood reports, flood certificates, attachments to S149 Certificates, flood policies and floodplain risk management plans, flood studies, standard conditions of consent, and relevant DCP/LEP provisions.

**Non Standardised flood data** – this refers to information requests which are not able to be satisfied by reference to documented data (standardised flood data) and will require a specialised response by the Catchment Management Engineers or Outcomes Group.

#### **C.7.4 Ownership of Data**

The Catchment Management Engineers are responsible for the gathering and maintenance of flood risk related information, as well as providing it in formats accessible to the public and others in the organisation required to obtain and disseminate the information.

**Figure 2 - Flood Data Management Process**



### C.7.5 Updating of Information

The following list indicates the core information and the Group responsible for the care, control and updating of the information.

Data/Information	Responsibility for Updating and Management
Local Flood Studies	Infrastructure – Design Services. Information to be collected by Infrastructure where appropriate.
Catchment Flood Studies	Outcomes Group – Information to be collected by Outcomes Group (or the Upper Parramatta River Catchment Trust) and forwarded to Infrastructure on adoption by Council.
Floodplain Risk Management Plans	Outcomes Group – Information to be collected by Outcomes group and forwarded to Infrastructure and Development Unit on adoption by Council.
Flood Data	Infrastructure – Information from Local and Catchment Flood Studies to be updated on Council’s Flood Inundation mapping located in the Design Services Section within Council’s Infrastructure Unit no later than 4 months after being received and reported to Council.
149 Certificates	Development Unit – Information to be provided from Infrastructure on a 6 monthly basis to Section 94 Officer – Development Unit to modify Certificates within 1 week of receipt of new data.
Zonings	Outcomes Group – Information to be collected on a 12 monthly basis to determine whether flood related zone boundaries or planning controls require review process to commence.

### C.7.6 Access to and use of Information

- To be in accordance with the flow diagram headed Figure 2.
- All relevant personnel to have read-only access.

- Access for maintenance purposes to be available to only the Catchment Management Engineers, with the assistance of IT staff or others as required.

The overall responsibility for the compilation, management and release of flood data will be vested with the Catchment Management Engineers. Catchment Management Engineers will be responsible for setting up various mechanisms to allow release of standardised information without their involvement, which would include:

- Flood brochure;
- Standard question and answers booklet for staff;
- Flood certificates;
- Flood reports;
- Attachments for Section 149 Certificates;
- Input into the GIS system
- Specifications for site/development specific flood studies and management, control and acceptance of the study;
- Catchment-wide flood studies, floodplain risks management studies and floodplain risk anagement plans prepared in accordance with the FMM; and
- Standard conditions of consent.

The availability of standardised information will increase efficiencies and consistency of data released and should be continually monitored and reviewed with the objective of minimising the involvement required of Catchment Management Engineers in satisfying individual flood related information requests. However, where standardised information outputs are not sufficient to handle the specific nature of a flood related question, then this question must be referred on to the Catchment Management Engineers.

Those positions within Council involved in the dissemination of flood related information are to exercise their duties in regard to the extent of authority and responsibility specified within **Appendix 8**.

Catchment Management Engineers will be responsible for the provision of comments and advice in regard to all development proposals on flood prone land (ie. up to the probable maximum flood if defined). Notwithstanding, Catchment Management Engineers may delegate authority to other personnel within Council to deal with certain classes of development proposals within the floodplain and may nominate standardised conditions of consent which would apply in such cases.

### **C.7.7 Means of Information Release**

- To be in accordance with the flow diagram headed Figure 2.

The General Manager to delegate through the owners vested in the Local Government Act, appropriate delegation to the nominated Unit below.

<b>Data Type</b>	<b>Format</b>	<b>Release of Data</b>
Standard Flood Data	Community education material, explanation of terminology (Flood Brochure)	Customer Service, Development Unit, Infrastructure, Outcomes.
Standard Flood Data	Adopted flood maps	VIEW ONLY – Customer Service, Development Unit, Infrastructure.
Standard Flood Data	Flood certificates	With S149 Certificates or otherwise on request at a fee.
Standard Flood Data	149 Certificates	Attachments to be prepared by Catchment Management Engineers.
Standard Flood Data	Specifications for site/ development applications	Catchment Management Engineers.
Standard Flood Data	Standard conditions of consent	Development Engineers
Non-standard Flood Data	Interpretation and viewing of Adopted Catchment wide flood studies, floodplain risk management studies and floodplain risk management plans	Infrastructure
Non-standard Flood Data	Interpolation of flood data/levels to individual properties	Infrastructure
Non-standard Flood Data	Identify and indicate technical issues associated with development applications, rezonings	Development, Infrastructure
Non-standard Flood Data	Draft or future Catchment wide flood studies, floodplain risk management studies and floodplain risk management plans	Outcomes, Infrastructure
Non-standard Flood Data	Review, implementation of flood data into flood policy, Development Control Plans and Local Environmental Plans	Outcomes

## **C.8 Community Awareness**

Community awareness programs should be developed in accordance with the recommendations contained in **Section 8 of Volume 1**.

## **C.9 Monitoring and Review of Policy**

- This Policy should be monitored by the Outcomes Group (Waterways Systems Manager) of Council.
- The policy should be reviewed on a 5 year basis.
- Any changes to the Policy should be the subject of a public consultation process involving exhibition, review of submissions and consideration by Council as if the Policy was involved in the preparation of a development control plan, as specified by the Environmental Planning and Assessment Regulation 2000.

Key considerations in the review of the policy include effectiveness of flood plain management issues with respect to development eg:

- Level of filling, construction methods, fencing, storage of goods, carports, accessibility
- Effectiveness of community awareness
- Quality of flood data provision and advice
- Simplicity and practicality of DCP/Policy
- Flood level changes associated with implementation of flood modifications and real events
- Anecdotal evidence of Private or Public losses for recent developments.



## Appendix 1: Definitions

For the purpose of this Policy, the following definitions have been adopted:

**Australian Height Datum (AHD)** is a common national plain of level corresponding approximately to mean sea level.

**Average Recurrence Interval (ARI)** means the long-term average number of years between the occurrence of a flood as big as, or larger than, the selected event. For example, floods with a discharge as great as, or greater than, the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.

**Design floor level or ground level** means the level specified in this Plan which applies to the relevant land use type within the relevant Flood Risk Precinct.

**Ecologically sustainable development (ESD)** is using, conserving and enhancing natural resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be maintained or increased. A more detailed definition is included in the Local Government Act 1993.

**Effective warning time** is the time available after receiving advice of an impending flood and before the floodwaters prevent appropriate flood response actions being undertaken. The effective warning time is typically used to move farm equipment, move stock, raise furniture, evacuate people and transport their possessions.

**Extreme flood** means an estimate of the probable maximum flood, which is the largest flood likely to ever occur.

**Flood** is a relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage as defined by the FMM before entering a watercourse.

**Flood awareness** is an appreciation of the likely effects of flooding and a knowledge of the relevant flood warning and evacuation procedures.

**Flood compatible building components** means a combination of measures incorporated in the design and/or construction and alteration of individual buildings or structures subject to flooding, and the use of flood compatible materials for the reduction or elimination of flood damage.

**Flood compatible materials** include those materials used in building which are resistant to damage when inundated. A list of flood compatible materials is attached in **Schedule 1**.

**Flood evacuation strategy** means the proposed strategy for the evacuation of areas within effective warning time during periods of flood as specified within the Bankstown State Emergency Service Operational Plan, the relevant FRMP, by advices received from the State Emergency Services (SES) or as determined in the assessment of individual proposals.

**Flood prone land** (being synonymous with **flood liable** and **floodplain**) is the area of land which is subject to inundation by floods up to and including an extreme flood such as a probable maximum flood (PMF).

**Floodplain Management Manual** (FMM) refers to the document dated January 2001, published by the New South Wales Government and entitled “*Floodplain Management Manual: the management of flood liable land*”.

**Floodplain Risk Management Plan (FRMP)** means a plan prepared for one or more floodplains in accordance with the requirements of the FMM or its predecessor.

**Floodplain Risk Management Study (FRMS)** means a study prepared for one or more floodplains in accordance with the requirements of the FMM or its predecessor.

**Freeboard** is a factor of safety expressed as the height above the flood used to determine the design floor level or ground level. Freeboard provides a factor of safety to compensate for uncertainties in the estimation of flood levels across the floodplain, such as wave action, localised hydraulic behaviour and impacts that are specific event related, such as levee and embankment settlement, and other effects such as “greenhouse” and climate change.

**Habitable floor area** means:

- in a **residential situation**: a living or working area, such as a lounge room, dining room, rumpus room, kitchen, bedroom or workroom;
- in an **industrial or commercial situation**: an area used for offices or to store valuable possessions susceptible to flood damage in the event of a flood.

**Hazard** is a source of potential harm or a situation with a potential to cause loss. In relation to this manual, the hazard is flooding which has the potential to cause damage to the community.

**Local overland flooding** means inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.

**Merit approach** is an approach, the principles of which are embodied in the FMM which weighs social, economic, ecological and cultural impacts of land use options for different flood prone areas together with flood damage, hazard and behaviour implications, and environmental protection and well being of the State’s rivers and floodplains.

**Outbuilding** means a building which is ancillary to a principal residential building and includes sheds, garages, car ports and similar buildings.

**Probable maximum flood (PMF)** is the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation.

**Probable maximum precipitation (PMP)** is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year, with no allowance made for long-term climatic trends (World Meteorological Organisation, 1986). It is the primary input to the estimation of the probable maximum flood.

**Probability** is a statistical measure of the expected chance of flooding (see ARI).

**Reliable access** during a flood means the ability for people to safely evacuate an area subject to imminent flooding within effective warning time and without a need to travel through areas where water depths increase.

**Risk** means the chance of something happening that will have an impact. It is measured in terms of consequences and probability (likelihood). In the context of this plan, it is the likelihood of consequences arising from the interaction of floods, communities and the environment.

**Site Emergency Response Flood Plan** is a management plan prepared in consultation with the State Emergency Services (SES) and approved by Council which demonstrates the means to minimise the likelihood of flood damage, including demonstrated ability to move goods above flood level within the likely available flood warning time and a requirement for flood drills for larger commercial/industrial premises. This could be in the form of an individual Flood Plan.

**Survey plan** is a plan prepared by a registered surveyor which shows the information required for the assessment of an application in accordance with the provisions of this Policy.

## **Appendix 2: NSW Flood Prone Land Policy**

### *The Policy Statement*

The primary objective of the policy is to reduce the impact of flooding liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods wherever possible. That is:

- a merit approach shall be adopted for all development decisions, which takes into account social, economic and ecological factors, as well as flooding considerations;
- both mainstream and overland flooding shall be addressed, using the merit approach, in preparation and implementation by councils of floodplain risk management plans;
- the impact of flooding and flood liability on existing developed areas identified in floodplain risk management plans shall be reduced by flood mitigation works and measures, including ongoing emergency management measures, the raising of houses where appropriate and by development controls; and
- the potential for flood losses in all areas proposed for development or redevelopment shall be contained by the application of ecologically sensitive planning and development controls.

To achieve its primary objective, the policy provides for:

- financial assistance by the NSW Government for works to reduce potential flood damage and personal danger in existing developed areas;
- the provision of technical support to local government in ensuring that the management of flood prone land is consistent with flood risk and that such development does not cause undue future distress to individuals nor unduly increase potential flood liability to them or to the community;
- emergency management and flood recovery programs and their linkage with the floodplain risk management process;
- the protection of councils, government agencies and their staff against claims for damages resulting from their issuing advice or granting approvals on floodplains, providing such action was taken in accordance with the principles and guidelines in the Floodplain Management Manual.

The policy shall be implemented in the following manner:

- The management of flood prone land is, primarily, the responsibility of councils. As such, the standards and implementation arrangements shall be in accordance with the policies, procedures and management plans determined by councils.
- The NSW Government, through the Department of Land and Water Conservation, the Department of Urban Affairs and Planning and the State Emergency Service, shall provide specialist technical assistance on all flooding matters. The Floodplain Management Manual shall be provided to assist council in the preparation of floodplain risk management plans.
- The establishment of local floodplain risk management committees by councils, through which local community groups and individuals can effectively communicate their aspirations concerning the management of the flooding problem.
- The State Government continuing to subsidise floodplain risk management studies, works and measures.

### ***Policy Provisions***

The policy provides for:

- a flexible merit based approach to be followed by councils, when dealing with flood prone land management;
- high government priority for floodplain risk mitigation programs;
- recognition of the need to consider the full range of flood sizes, up to and including the probable maximum flood and the corresponding risks associated with each flood;
- councils to be responsible for the determination of flood planning levels and appropriate planning and development controls based on social, economic and ecological, as well as flooding considerations;
- an emphasis on the importance of developing and implementing floodplain risk management plans based on an integrated mix of management measures that address the existing, future and continuing risk;
- the provision of NSW government technical and financial support to councils in relation to flooding matters;
- floodway definition to be based on hydraulic, hazard and potential damage considerations, with provision for restricted development depending on circumstances;
- inclusion of a local Catchment Management Board representative on council's floodplain risk management committee;
- explicit recognition that floodplain risk management needs to take into consideration government policies and legislation allowing for the sustainable usage of the floodplain as a natural resource, and that the planning and assessment requirements laid down in those policies and legislation must be complied with by all agencies associated with the use, development and management of the floodplain;

- an emphasis on the need to consider ways of maintaining and enhancing the riverine and floodplain ecology in the development of floodplain risk management plans;
- recognition of the importance of the continuing flood risk addressed in the State Emergency Service Act 1989 and State Flood Plan, and the close relationship between the emergency management and floodplain risk management processes;
- recognition of the potential implications of climate change on flooding behaviour (global warming);
- the policy and detailed arrangements for implementation to be included in the Floodplain Management Manual;
- protection of councils and other public authorities and their staff against claims for damages, providing they act in accordance with the government's policy at the time; and
- relief from land tax, council rates and water and sewerage rates where vacant land cannot be developed because of its flood prone nature.

### ***Enquiries***

General enquiries on the policy, and its currency, should be directed to relevant public authorities, viz, Department of Land and Water Conservation, Department of Urban Affairs and Planning (planning matters) and State Emergency Service (flood warning, evacuation and community education matters).

Enquiries regarding the flood liability of individual properties and proposal for development should be directed to the relevant council.

(Source: NSW Government, January 2001 "*Floodplain Development Manual*" Appendix A)



## APPENDIX 3: NOTATIONS ON S.149 CERTIFICATES

### Status of Inundation from Creeks and Rivers

		Category 'A' and 'Low' Flood Risk	Category 'A' and 'Medium' Flood Risk	Category 'A' and 'High' Flood Risk	Category 'B' (ie. potentially inundated)	Category 'C' (ie. not thought to be inundated)
<b>STATUS OF INUNDATION FROM STORMWATER AND OVERLAND FLOW</b>	Category 'A' And 'Low' Flood Risk	Part or all of the property is located within a Low Flood Risk area. [Plus Note 1]	Part or all of the property is located within a Medium Flood Risk area. [Plus Note 1]	Part or all of the property is located within a High Flood Risk area. [Plus Note 1]	Part or all of the property is located within a Low Flood Risk area due to overland flow. The property is also potentially affected by creek/river flooding. [Plus Note 1]	Part or all of the property is located within a Low Flood Risk area due to overland flow. [Plus Note 1]
	Category 'A' and 'Medium' Flood Risk	Part or all of the property is located within a Medium Flood Risk area due to overland flow. [Plus Note 1]	Part or all of the property is located within a Medium Flood Risk area. [Plus Note 1]	Part or all of the property is located within a High Flood Risk area. [Plus Note 1]	Part or all of the property is located within a Medium Flood Risk area due to overland flow. The property is also potentially affected by creek/river flooding. [Plus Note 1]	Part or all of the property is located within a Medium Flood Risk area due to overland flow. [Plus Note 1]
	Category 'A' And 'High' Flood Risk	Part or all of the property is located within a High Flood Risk area due to overland flow. [Plus Note 1]	Part or all of the property is located within a High Flood Risk area due to overland flow. [Plus Note 1]	Part or all of the property is located within a High Flood Risk area. [Plus Note 1]	Part or all of the property is located within a High Flood Risk area due to overland flow. The property is also potentially affected by creek/river flooding. [Plus Note 1]	Part or all of the property is located within a High Flood Risk area due to overland flow. [Plus Note 1]
	Category 'B' (ie. potentially inundated)	Part or all of the property is located within a Low Flood Risk area. The property is also potentially affected by overland flow. [Plus Note 1]	Part or all of the property is located within a Medium Flood Risk area. The property is also potentially affected by overland flow. [Plus Note 1]	Part or all of the property is located within a High Flood Risk area. The property is also potentially affected by overland flow. [Plus Note 1]	Part or all of the property is potentially affected by creek/river flooding and overland flow. [Plus Note 1]	Part or all of the property is potentially affected by overland flow. [Plus Note 1]
	Category 'C' (ie. not thought to be inundated)	Part or all of the property is located within a Low Flood Risk area. [Plus Note 1]	Part or all of the property is located within a Medium Flood Risk area. [Plus Note 1]	Part or all of the property is located within a High Flood Risk area. [Plus Note 1]	Part or all of the property is potentially affected by creek/river flooding. [Plus Note 1]	Based on the information available to Council, the property is not affected by creek/river flooding or overland flow from major drainage.





## Appendix 4: FLOOD CERTIFICATE APPLICATION & Specimen formats

### PARRAMATTA CITY COUNCIL

### APPLICATION FOR FLOOD CERTIFICATE

Date received: \_\_\_/\_\_\_/\_\_\_

FC no: \_\_\_\_\_

You can lodge your application at Parramatta City Council Offices. Contact details are at the end of this form.

**To minimise delay in receiving a decision about your application, please ensure you submit all relevant information.**

When your application has been processed, you will receive a Flood Certificate.

#### 1. Details of the applicant

NAME

Mr  Ms  Mrs  Dr  Other

First Name

Family Name

Company/organisation

ABN

STREET ADDRESS

Unit/street no.

Street name

Suburb or town

State

Postcode

SINCLAIR KNIGHT MERZ

POSTAL ADDRESS (or mark 'as above')		
<input type="text"/>		
Suburb or town	State	Postcode
<input type="text"/>	<input type="text"/>	<input type="text"/>
CONTACT DETAILS		
Daytime telephone	Fax	Mobile
<input type="text"/>	<input type="text"/>	<input type="text"/>
Email		
<input type="text"/>		
How would you prefer to be contacted?		
<input type="text"/>		

## 2. Identify the land for which you require a flood certificate

Unit/street no.	Street or property name
<input type="text"/>	<input type="text"/>
Suburb, town or locality	Postcode
<input type="text"/>	<input type="text"/>
Lot No.	DP/SP No.
<input type="text"/>	<input type="text"/>

## 3. Describe what you know about flooding on the property

Have you previously experienced or seen flooding at the above address?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Have you been advised by others that the property at the above address has previously flooded?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

## 4. Application fee

A fee of \$..... is payable for each application lodged. Please enclose payment in either of the following ways

Cheque	<input type="text"/>	Money Order	<input type="text"/>
Credit Card No.	<input type="text"/>	Expiry Date	<input type="text"/>

## 5. Signatures

**The owner(s) of the land for which the certificate is requested must sign the application.**

If you are not the owner\* of the land, you must have all the owners sign the application. If the land is Crown land, an authorised officer of the Department of Land and Water Conservation must sign the application.

As the owner(s) of the above property, I/we consent to this application:

Signature	Signature
-----------	-----------

Name	Name
<input type="text"/>	<input type="text"/>
Date	Date
<input type="text"/>	<input type="text"/>
<b>The applicant, or applicant's agent, must sign the application.</b>	
Signature	In what capacity are you signing if you are not the applicant
<input type="text"/>	<input type="text"/>
Name, if you are not the applicant	Date
<input type="text"/>	<input type="text"/>

## 6. Lodgement

### Where to lodge your application

You can lodge your completed form, together with attachments and fees at the offices of Parramatta City Council, listed below:

Parramatta City Council

30 Darcy Street

Parramatta

PO Box 32, NSW, 2124

Web: [www.paracity.nsw.gov.au](http://www.paracity.nsw.gov.au)

Enquiries: ph. 02 9806 5000 (main switch)

*SAMPLE*

## **PARRAMATTA CITY COUNCIL**

### **Flood Certificate**

**Certificate Issued For Property At:** 16 Jones Street, Riverville  
Lot 14, DP 25843

**Owners Name:** Mr & Mrs John Smith

#### 1. Classification of Flood Risk

**Part or all of the property is located within a Medium Flood Risk area.**

*Council's Development Control Plan "Managing Our Flood Risks" applies to this property.*

#### 2. Known Floor and Ground Levels

**The lowest floor level of the main building on this property is: 4.6m AHD**  
**Source of information: Council Survey**

**The lowest ground level on this property is: Not known**  
**Source of information is: Not known**

*If the floor level and/or ground level are currently unknown and you would like to know what the levels are; this can be surveyed by a registered surveyor. Alternatively, Council can arrange this for a fee of \$90.*

#### 3. Estimated Flood Levels

**Flood levels in the vicinity of the property have been extracted from the "Addendum to ..... Creek Flood Study Following August 1998 Flood" report (Bewsher Consulting Pty Ltd, February 2001).**

## Appendix 5: Flood Risk Precinct Maps

<b>Types of Maps held by Council</b>	<b>Where located</b>	<b>Type of document</b>	<b>How to obtain</b>
<b>Flood maps</b>	Design Services Branch of PCC	All hard copies except for Upper and Lower Parramatta River catchments	All maps available for viewing within areas of PCC (1)
<b>Drainage maps</b>	Design Services Branch of PCC	All hard copies	All maps available for viewing within areas of PCC (1)

Note 1. Only hard copies available for viewing by external customers

Maps are only available for viewing in the presence of a Council Officer

## APPENDIX 6: Flood Compatible Materials

<b>Building Component</b>	<b>Flood Compatible Material</b>	<b>Building Component</b>	<b>Flood Compatible Material</b>
<b>Flooring and Sub-floor Structure</b>	" concrete slab-on-ground monolith construction  " suspension reinforced concrete slab.	<b>Doors</b>	" solid panel with water proof adhesives  " flush door with marine ply filled with closed cell foam  " painted metal construction  " aluminium or galvanised steel frame
<b>Floor Covering</b>	" clay tiles " concrete, precast or in situ " concrete tiles " epoxy, formed-in-place " mastic flooring, formed-in-place " rubber sheets or tiles with chemical-set adhesives " silicone floors formed-in-place " vinyl sheets or tiles with chemical-set adhesive " ceramic tiles, fixed with mortar or chemical-set adhesive " asphalt tiles, fixed with water resistant adhesive	<b>Wall and Ceiling Linings</b>	" fibro-cement board " brick, face or glazed " clay tile glazed in waterproof mortar " concrete " concrete block " steel with waterproof applications " stone, natural solid or veneer, waterproof grout " glass blocks " glass " plastic sheeting or wall with waterproof adhesive



<b>Building Component</b>	<b>Flood Compatible Material</b>	<b>Building Component</b>	<b>Flood Compatible Material</b>
<b>Wall Structure</b>	" solid brickwork, blockwork, reinforced, concrete or mass concrete	<b>Insulation</b>  <b>Windows</b>	" foam (closed cell types)  " aluminium frame with stainless steel rollers or similar corrosion and water resistant material.
Roofing Structure (for Situations Where the Relevant Flood Level is Above the Ceiling)	" reinforced concrete construction  " galvanised metal construction	<b>Nails, Bolts, Hinges and Fittings</b>	" brass, nylon or stainless steel  " removable pin hinges  " hot dipped galvanised steer wire nails or similar
<p><b>Electrical and Mechanical Equipment</b></p> <p>For dwellings constructed on land to which this Policy applies, the electrical and mechanical materials, equipment and installation should conform to the following requirements.</p>		<p><b>Heating and Air Conditioning Systems</b></p> <p>Heating and air conditioning systems should, to the maximum extent possible, be installed in areas and spaces of the house above the relevant flood level. When this is not feasible every precaution should be taken to minimise the damage caused by submersion according to the following guidelines.</p>	
<p><b>Main power supply -</b></p> <p>Subject to the approval of the relevant authority the incoming main commercial power service equipment, including all metering equipment, shall be located above the relevant flood level. Means shall be available to easily disconnect the dwelling from the main power supply.</p>		<p><b>Fuel -</b></p> <p>Heating systems using gas or oil as a fuel should have a manually operated valve located in the fuel supply line to enable fuel cut-off.</p>	

<b>Building Component</b>	<b>Flood Compatible Material</b>	<b>Building Component</b>	<b>Flood Compatible Material</b>
<p><b>Wiring -</b></p> <p>All wiring, power outlets, switches, etc., should, to the maximum extent possible, be located above the relevant flood level. All electrical wiring installed below the relevant flood level should be suitable for continuous submergence in water and should contain no fibrous components. Earth core linkage systems (or safety switches) are to be installed. Only submersible-type splices should be used below the relevant flood level. All conduits located below the relevant designated flood level should be so installed that they will be self-draining if subjected to flooding.</p>		<p><b>Installation -</b></p> <p>The heating equipment and fuel storage tanks should be mounted on and securely anchored to a foundation pad of sufficient mass to overcome buoyancy and prevent movement that could damage the fuel supply line. All storage tanks should be vented to an elevation of 600 millimetres above the relevant flood level.</p>	
<p><b>Equipment -</b></p> <p>All equipment installed below or partially below the relevant flood level should be capable of disconnection by a single plug and socket assembly.</p>		<p><b>Ducting -</b></p> <p>All ductwork located below the relevant flood level should be provided with openings for drainage and cleaning. Self draining may be achieved by constructing the ductwork on a suitable grade. Where ductwork must pass through a water-tight wall or floor below the relevant flood level, the ductwork should be protected by a closure assembly operated from above relevant flood level.</p>	
<p><b>Reconnection -</b></p> <p>Should any electrical device and/or part of the wiring be flooded it should be thoroughly cleaned or replaced and checked by an approved electrical contractor before reconnection.</p>			

## Appendix 7: Definition of Land Use Categories

<b>LAND USE CATEGORIES</b>				
<b>Sensitive Uses and Facilities</b>	<b>Critical Utilities and Uses</b>	<b>Subdivisions</b>	<b>Filling</b>	<b>Residential</b>
Community facility or public building which may provide an important contribution to the notification and evacuation of the community during flood events; centre based child care service; Hospitals; and Housing for older persons or persons with a disability; Educational establishments; Institutions; and Nursing Homes.	Hazardous industry or storage establishment; Offensive industry or storage establishment; Liquid fuel depot; Public utility undertaking (including generating works) which may cause pollution of waterways during flooding, are essential to evacuation during periods of flood or if affected during flood events would unreasonably affect the ability of the community to return to normal activities after flood events; Telecommunication facilities; Transfer stations; waste facility and waste processing facility.	Subdivision of land which involves the creation of new allotments.	<p>The net importation of fill material onto a site, except where the final surface levels are raised by no more than 100mm over no more than 50% of the site;</p> <p>Balancing earthworks, involving cut and fill, is not considered to be filling provided that:</p> <p>(i) there is no net importation of fill material onto the site; and</p> <p>(ii) there is no net loss of flood storage at all flood levels.</p>	Backpackers' accommodation; Bed and breakfast establishment; Boarding houses; Business; Community facility (other than sensitive uses and facilities); Dual occupancies; Dwelling-houses; Group homes; High density housing; Home based child care service; Home occupation; Local shop; Medical consulting rooms; Multi-unit housing; Professional consulting rooms; Recreational establishment; Residential flat building; Serviced apartments; Special home activity; terrace housing; and Utility installations (other than critical utilities)



<b>LAND USE CATEGORIES</b>			
Commercial or Industrial	Tourist Related Development	Open Space or Non-urban Uses	Concessional Development
Brothel; Bulky goods retailing; Car parking stations; Car repair station; Church; Club; Commercial premises; Community drop-off centre; Depot; Entertainment facility; Equipment hire centre; Health care professional; High technology industry; Hotel; Industry; Light industry; Materials recycling depot; Medical centre; Motel; Motor showroom; Panel beating shop; Place of worship; Public building (other than an essential community facility); Public transport facility; Recreational facility; Remote distribution centre; Restaurant; Resource Recovery facility; Restricted premises; Road transport Terminal; Service station; Shop; Television station; Vehicle rental centre; Veterinary establishment; Transport and Warehouse or distribution centre	Kiosk; Market and Tourist facilities.	Animal establishment; Boatshed; Extractive industry; Forestry; Grain transport depot; Helipad; Jetty; Mine; Mineral sand mine; Recreation areas and minor ancillary structures (eg. Toilet blocks or kiosks); Retail plant nursery; Roadside stall; and Slipway	Concessional development is any development or redevelopment that would normally not be permitted under this Plan, but may be permitted as a concession provided it: <ul style="list-style-type: none"> <li>(i) is kept clear of any floodway; and</li> <li>(ii) involves an acceptably small (see below for limits) addition or alteration to an existing development that will not cause any considerable increase in potential flood losses or risks or adverse impact on adjoining properties; or</li> <li>(iii) redevelopment for the purposes of substantially reducing the extent of flood affectation to the existing building; provided that such redevelopments incorporate to the fullest extent practical, design features and measures to substantially reduce the existing potential for flood losses and personal risks, and avoid any adverse impacts on adjoining properties – especially obstruction or diversion of floodwaters and loss of flood storage.</li> </ul> <p>In the case of residential development, the maximum size of a concessional</p>



<b>LAND USE CATEGORIES</b>			
Commercial or Industrial	Tourist Related Development	Open Space or Non-urban Uses	Concessional Development
			<p>development is:</p> <p>(i) a once-only addition or alteration to an existing dwelling of no more than 10% or 30m<sup>2</sup> (whichever is the lesser) of the habitable floor area which existed at the date of commencement of this Policy or Plan; or</p> <p>(ii) The construction of an outbuilding with a maximum floor area of 20m<sup>2</sup>.</p> <p>In the case of other development categories, the maximum size of a concessional development is a once- only addition to existing premises of no more than 10% of the floor area which existed at the date of commencement of this Policy or Plan.</p>



## Appendix 8: Summary of Duties

### Development Engineer

**Department:** *Development Assessment Team (DCU)*

**Reporting to:** *Program Manager, Development Assessment*

### General Duties Relevant to Flood Data:

- Assessment of development applications with regard to engineering issues such as flooding;
- Committee representation (eg. Flood Risk Management Committee);
- Providing information to the general public and specifically, development applicants in regard to engineering issues such as flooding relevant to potential development proposals;

### External Enquiries:

#### Counter:

- Explanation of potential flood affectation by reference to standardised flood information documents, inclusive of discussion in regard to implications for development having regard to Council's Policy;
- Advise applicants of availability of flood certificates for a specified fee;
- Refer to Catchment Management Engineers for specialised non standardised flood data, as required.

#### Phone:

- Enquirer invited to view flood map information at the Enquiry Counter or to apply for a Section 149(2) or (5) Certificate;
- Enquirer invited to apply for flood certificate;
- Flood brochure available to mail out, if appropriate.

**Letters:** (as above)

**Fax/e-mail:** (as above)

**S.149:** Not relevant



**Internal:**

**Verbal Advice:** Refer to General Duties

Provide comments to planners for incorporation for the assessment of development application.

Memoranda: *(as above)*  
Reports: *(as above)*

**Development Planner**

**Department:** *Development Assessment Team (DCU)*

**Reporting to:** *Program Manager, Development Assessment*

**General Duties Relevant to Flood Data:**

- Incorporation of flood risk assessment undertaken by Development Engineer into overall assessment of development applications;

**External Enquiries:**

**Counter:**

- Provide advice in regard to flood affectation by reference to standardised flood data documents;
- Refer to Catchment Management Engineers if required for non standardised flood data, as required.

**Phone:**

- Enquirer invited to view flood map information at the Enquiry Counter or to apply for a Section 149(2) or (5) Certificate;
- Enquirer invited to apply for flood certificate or flood report;
- Flood brochure available to mail out, if appropriate.

Letters: *(as above)*  
Fax/e-mail: *(as above)*  
S.149: *Not relevant*

Internal:

Verbal Advice: *Not relevant*

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Memoranda: *Not relevant*  
Reports: *(incorporate comments from the Development Assessment Engineer)*

**Program Manager**

**Department:** *Development Assessment Team (DCU)*

**Reporting to:** *Manager, Development*

**General Duties Relevant to Flood Data:**

- Manager of Development Assessment (Development Applications), inclusive of those with flood related issues;
- Input into strategic planning projects;
- Customer service;

**External Enquiries:**

- Involvement is similar to that as for the Assessment Planner, but restricted to more complex and significant projects, or as resources require.

**Phone:**

- Enquirer invited to view flood map information at the Enquiry Counter or to apply for a Section 149(2) or (5) Certificate;
- Enquirer invited to apply for flood certificate or flood report;
- Flood brochure available to mail out, if appropriate.

Letters: *(as above)*  
Fax/e-mail: *(as above)*  
S.149: *Not relevant*

Internal:

Verbal Advice: *(as above)*  
Memoranda: *Not relevant*  
Reports: *Not relevant*





**Development Inquiry Coordinator**

**Department:** *Development Control Unit (DCU)*

**Reporting to:** *Program Manager, Development Assessment*

**General Duties Relevant to Flood Data:**

- Responding to general enquiries regarding developments, inclusive of where flooding may be of relevance or an issue.

**External Enquiries:**

**Counter:**

- Provide copy of relevant flood map for viewing;
- Assist in understanding the flood map by referring to written information (standardised flood data) for the enquirer to interpret;
- Further information requested or other details requiring explanation are referred on to the Catchment Management Engineers;
- No copies of information are provided to take away, except for standardised flood brochure;
- Enquirer invited to apply for flood certificate or flood report.

*Phone:*

- Enquirer invited to view flood map information at the Enquiry Counter or to apply for a Section 149(2) or (5) Certificate;
- Enquirer invited to apply for flood certificate;
- Flood brochure available to mail out, if appropriate.

Letters: *Not relevant*  
Fax/e-mail: *Not relevant*  
S.149: *Not relevant*

*Internal:*

Verbal Advice: *Not relevant*  
Memoranda: *Not relevant*  
Reports: *Not relevant*



**s149 Coordinator and s149 Processing Officer**

**Department:** *Development Control Unit (DCU)*

**Reporting to:** *Regulatory Compliance Team Program Manager*

**General Duties Relevant to Flood Data:**

- Production of Section 149 Certificates inclusive of notations regarding flooding and drainage issues.

**External Enquiries:**

**Counter:** *Not relevant*

**Phone:**

- Refer enquirer to flood brochure provided with certificate if enquiries made requiring explanation of flood or drainage related notations. If further explanation required, refer to Catchment Management Engineers.

Letters: *Not relevant*

Fax/e-mail: *Not relevant*

S.149: *Check flood maps and obtain flood related attachments from Catchment Management Engineers and prepare Section 149 Certificates*

Internal:

Verbal Advice: *Not relevant*

Memoranda: *Not relevant*

Reports: *Not relevant*

**Catchment Management Supervisor/Engineers**

**Department:** *Design Services*

**Reporting to:** *Design Program Manager*

**General Duties Relevant to Flood Data:**

- Implementation of overall water management matters inclusive of drainage, flooding pollution, etc, involving preparation of policies, provision of advice and review of development proposals.

Specific duties relevant to flooding include:

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- Awareness of existing and draft flood studies and those under preparation;
- Interpolation of flood data/levels for individual properties;
- Transfer of flood data onto the flood maps;
- Assistance in the establishment of the flood information upon Council's GIS system;
- Preparation of attachments for Section 149 Certificates;
- General internal and external enquiries;
- Establishment and maintenance of Council's Flood Awareness Program;
- Implementation of catchment flood studies and floodplain risk management studies and plans, as required by the FMM;
- Preparation of standardised flood data for use by other relevant personnel.

**External Enquiries:**

**Counter:**

- Identify property and potential flood affectation;
- Explain meaning of various defined terms such as "100 year flood", "20 year flood" and "PMF";
- Identify and indicate likely technical issues which may be encountered by a development proposal;
- Identify any other risks which may be encountered due to flooding;
- Provide copies of flood studies, floodplain risk management studies and plans and other information for viewing;
- Outline availability of flood certificates and flood reports, and provide as required.

*Phone:*

- No information provided over the phone;
- Enquirer invited to examine flood maps and documents at Council or apply for a Section 149 Certificate or flood certificate;
- Enquirer asked if they would like a flood brochure forwarded to them.

*Letters:*

- Respond to written advice regarding flood data by generally advising information obtainable by viewing flood maps and documents at Council or by applying for a Section 149 Certificate, flood certificate, flood report, and/or by mailing flood brochure;
- If clarification of the information viewed or obtained required, then written correspondence provided to explain origin of data, meaning of data, etc.

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Fax/e-mail: *(As above, for Letters)*

S.149:

- Refer to General Duties;
- Provide attachments for Section 149 Certificates based on interpretation of existing flood maps, flood studies, etc;
- Advise of availability of flood certificates.

Internal:

Verbal Advice:

- General advice, regarding available information, clarification of terms, etc, provided;
- Flood levels and other specific information provided by memoranda.

Memoranda:

- Specifications and review and endorsement of site-specific flood studies;
- Advice regarding flood levels, velocities, etc;
- Attach flood level data (same format as for flood certificates);

Reports: *Preparation of reports to Council with regard to all above matters.*

### **Waterways Systems Manager**

**Department:** *Outcomes Group*

**Reporting to:** *Group Manager*

### **General Duties Relevant to Flood Data:**

- Community representation (eg. Floodplain Risk Management Committee);
- Responsible for the preparation of catchment flood studies and flood risk management plans;
- Management of overall water management matters inclusive of drainage, flooding, pollution, etc. involving preparation of policies.

### **External Enquiries:**

#### **Counter:**

- Generally limited to explanation of the basis for Council policy and assistance in interpretation thereof.

Internal:

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- Memoranda and verbal advice in regard to flood related Council policies and associated documents such as flood risk management plans and flood studies.

**Project Officers**

**Department:** *Outcomes Group*

**Reporting to:** *Land Use and Transport Planning Manager*

**General Duties Relevant to Flood Data:**

- Interpretation of flood data for planning purposes;
- Preparation and review of zoning controls associated with management of flood risks;
- Preparation and interpretation of planning policies regarding floodplain risk management.

**External Enquiries:**

**Counter:**

- Limited to advice and interpretation of Council's controls and policies regarding floodplain risk management.

Internal:

- Memoranda and verbal advice in regard to flood related Council policies and associated documents such as flood risk management plans and flood studies.



## **Appendix 9: Guidance for Developing in the floodplain**

**To be prepared in consultation with Council upon confirmation of controls to be adopted, as user friendly brochures, describing:**

- A description of the social and economic implications of developing in the floodplain.
- Impacts of flooding on a development likely to occur
- Describe general issues for consideration for each of the development below. These will appear as separate sheets to give to people undertaking development as a guide on what the policy means and what they can and cant do.

[Separate brochures to be prepared for each of the following:

- Additions to existing Dwellings
- Residential subdivision/rezoning
- Medium density/Multi Unit Housing
- Aged/disabled Housing
- Commercial or industrial buildings
- Basement parking