Prepared for the Georges River Floodplain Management Committee

GEORGES RIVER FLOODPLAIN RISK MANAGEMENT STUDY & PLAN

Volume 2 – Planning Issues

Final Report

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Bewsher Consulting Pty Ltd

Don Fox Planning Pty Ltd

GEORGES RIVER

FLOODPLAIN RISK MANAGEMENT STUDY AND PLAN

VOLUME 2

PLANNING ISSUES

Prepared for
Bewsher Consulting Pty Ltd
on behalf of
Bankstown City Council
Fairfield City Council
Liverpool City Council
Sutherland Shire Council

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1.0 INTRODUCTION

1.1 Background and Study Scope

Don Fox Planning Pty Ltd has been engaged by Bewsher Consulting Pty Ltd to form part of a consultant team to prepare a Floodplain Risk Management Study (FRMS) and ultimately a Floodplain Risk Management Plan (FRMP). The FRMP is to be prepared for the Georges River floodplain within the Local Government Areas (LGAs) of:-

- Bankstown
- Fairfield
- Liverpool
- Sutherland

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

- Broadly 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 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 recommended 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.

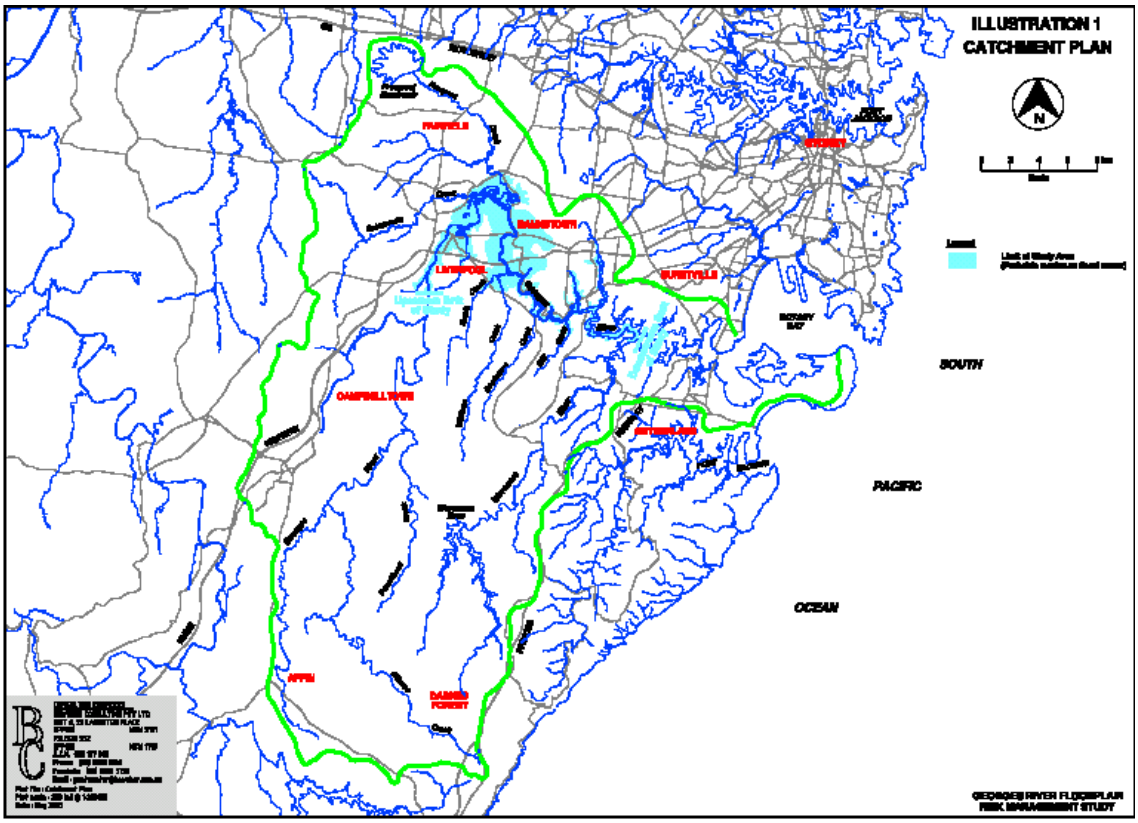
The Study will review Floodplain planning controls generally, and not just for the Georges River, as this is essential to establishing an appropriate planning framework for all floodplains in each LGA. Further, the current Floodplain Management Manual (FMM) published by the State Government, requires major stormwater flooding (not just riverine flooding) to be assessed within the ambit of floodplain management. Accordingly, this study will aim at firstly, producing

broad recommendations to establishing an appropriate philosophical and statutory planning basis for all forms of flooding throughout each LGA; and secondly, more detail planning recommendations to manage flood risks within the Georges River Catchment.

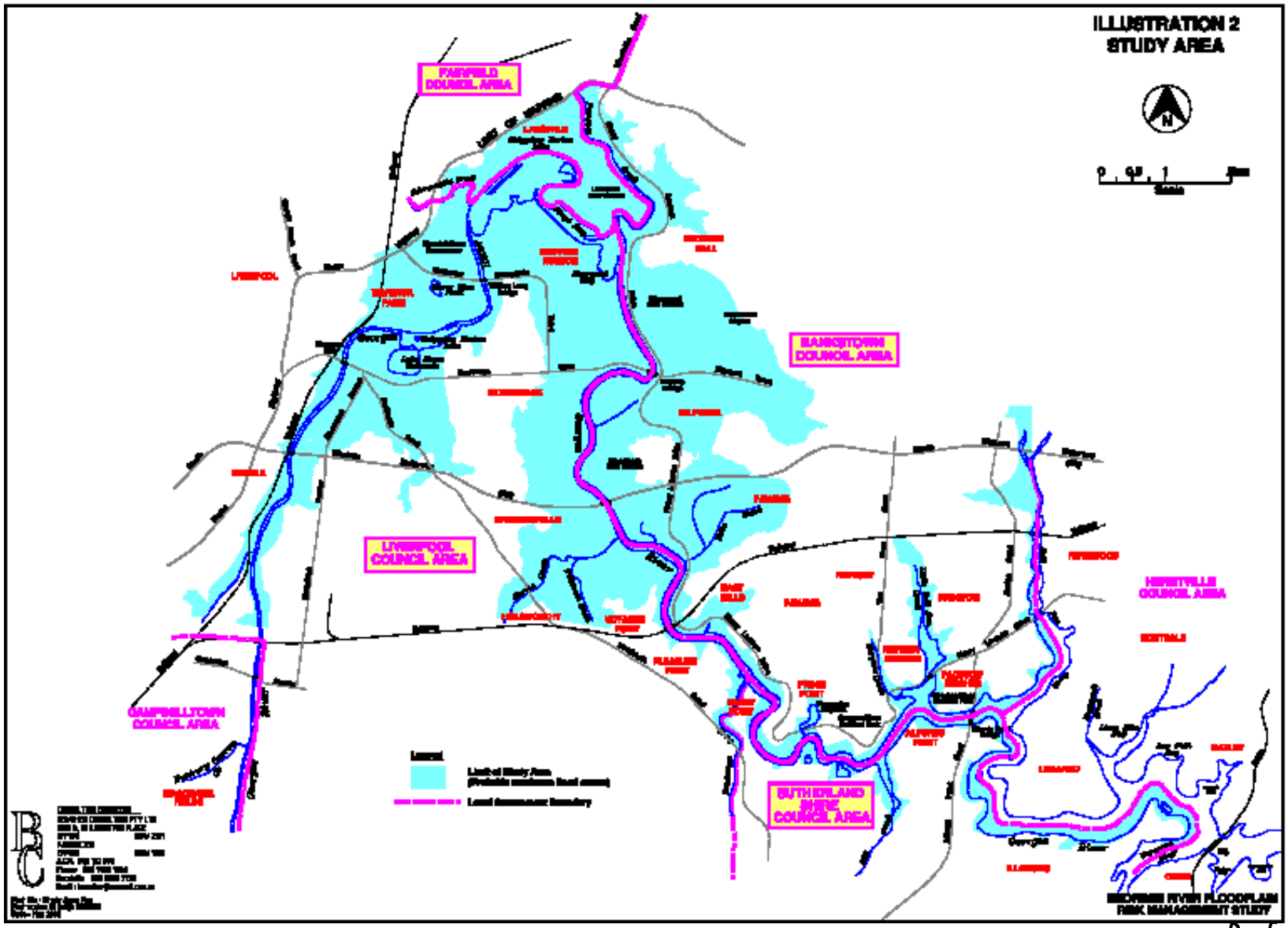
It is recognised that the flood hazard is one component for consideration in any town planning exercise. It is not considered appropriate to recommend a variety of planning controls for inclusion within a FRMP which responds to the planning hazard identified by hydraulic studies in isolation to this 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 Georges River catchment is depicted upon **Illustration 1**.



The Georges River Catchment area extends as far north as Prospect Reservoir and south to Appin and Darkes Forest. The catchment study area is primarily relevant to the estimation of flows for flood modelling purposes, with the primary focus for the study being the actual floodplain. Not all of the floodplain extents of the overall catchment are the subject of this study and as depicted upon **Illustration 2** the upper limit of flood mapping is delineated by the Hume Highway crossing of Cabramatta Creek and Prospect Creek, while the lower limit of flood mapping is at the junction of the Georges and Woronora Rivers.



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2.0 THE PLANNING CONTEXT

2.1 Characteristics of the Study Area

2.1.1 Topography

The topography of the Lower Georges River Catchment is varied, primarily influenced by the geology of the region. The catchment comprises predominantly gently undulating hills but local variations occur including broad valleys, dissected plateaus, narrow, steep-sided valleys and gorges and high exposed ridges. Within the Liverpool, and parts of the Fairfield and Bankstown LGAs, Wianamatta Shales have influenced the low, flat plains, gentle undulating slopes and broad valleys. Towards the lower end of the catchment, within the Sutherland and parts of the Bankstown LGAs, the sandstone terrain has resulted in narrow, steep-sided sandstone valleys or gorges.

As a consequence of topographic variations, the upper portion of the floodplain within the study area, concentrating around Warwick Farm, Lansvale, Chipping Norton, Moorebank, Georges Hall, Milperra, Hammondville, Holsworthy and Panania, is broad and extensive. Conversely, the lower section of the floodplain, inclusive of the areas of East Hill, Pleasure Point, Picnic Point, Revesby Heights, Padstow, Padstow Heights, Alfords Point, Riverwood, Lugarno, Illawong and Como, is narrow and confined. Similarly, the far upper reaches of the study area (within the Casula area) has a relatively confined floodplain, reflective of the transition of the topography into Hawkesbury Sandstone terrain. A detailed "Urban Capability Assessment of Fairfield City" has been undertaken by Fairfield City Council (July 2002) which provides further information regarding the physical characteristics and human resources of the Fairfield LGA.

2.1.2 Existing Vegetation

Various detailed investigations regarding vegetation within the river corridor have been undertaken by individual Councils or as part of broader studies such as the "*Preliminary Regional Environmental Improvement Plan: Southern Sydney"* (EPA, 1994) and "*The Georges River Catchment Regional Environmental Study"* (DUAP, 1998). For the purposes of this report, a broad overview only will be provided.

Vegetation of the river corridor within the study area varies from an urbanised edge to freshwater vegetation (inclusive of wetlands and aquatic plants) to estuarine vegetation and, more broadly, riparian eco-systems. That part of the study area between the Liverpool Weir and the upper reaches of the flood mapping near Glenfield is freshwater. That part of the river corridor system downstream of Liverpool Weir is estuarine.

Freshwater wetlands are primarily in existence within the upper reaches of the Georges River Catchment outside of the subject study area. Freshwater aquatic plants occur throughout the river system upstream of the Liverpool Weir, and include a variety of algae and flowering plants. While not directly related to this project, past studies have identified a need for water quality controls to avoid

nutrient enrichment of the waterways and associated excessive algal and macrophyte growth and spread of water-borne noxious weeds.

The riparian corridor along the Georges River is bordered by urban development on the western side and by the Holsworthy Military Training Area on the eastern side. North of Holsworthy, urban areas border both sides of the corridor. The urban edges of this corridor are affected by edge effects, such as weed invasion, micro-climate changes, increased competition and rubbish dumping associated with urban bushland. The western edge is also disturbed by development including buildings and cleared areas associated with the Holsworthy Military Training Area and sand extraction from the river bank.

Semi-rural and urban bushland occurs downstream of Liverpool along the river to Pleasure Point. Conditions of these corridors range from diverse to degraded. This area within the Bankstown LGA has been identified to contain Shale/Sandstone Transition Forest, Cooks River Clay Plain Scrub Forest, Sydney Coastal River Flat Forest and Cumberland Plain Woodland.

A continuous corridor of riparian vegetation has been retained between Pleasure Point and the Woronora River. The ecological values of the Georges River Catchment in the vicinity of Liverpool and Bankstown and between the Woronora River and Captain Cook Bridge have been significantly reduced through intensive urban development. Notwithstanding, these areas form an important component of the vegetative corridor of the Georges River and its tributaries, and its ongoing management and enhancement are important initiatives in the long term management of the river system. Maintenance, management and rehabilitation of riparian eco-systems will contribute to river health and total catchment management goals.

Estuarine vegetation includes mangroves, which are highly productive ecological systems. Mangroves occur from the lower end of the river system within the study area upstream to Milperra. Grey Mangrove (*Avicennia marina)* and River Mangrove (*Aegiceras corniculatum*) dominate the mangrove community. They occupy estuarine mudflats that experience regular tidal inundation, inclusive of Saltpan Creek and Mill Creek, within the Bankstown and Sutherland LGAs.

2.1.3 Existing Land Use

Generally, the floodplain within the study area comprises predominantly residential development, and to a lesser extent commercial and industrial areas. Additionally, recreational areas are located along the river and its tributaries including a cluster of golf courses and recreational reserves within the central section of the study area, including Chipping Norton Lakes, Lake Gillawarna Reserves, the Georges River National Park and a number of other smaller municipal reserves The study area does not have the potential for any further major urban releases, and additional residential development would be primarily limited to strategic infill sites.

Industrial land is situated in pockets throughout the catchment. The largest area of industrial land is located along Prospect Creek at Smithfield, north of the study area boundary. An industrial area is situated in Bankstown adjacent to the Georges River, while smaller pockets are located in the Sutherland and Liverpool LGAs. These industrial areas have been substantially developed, and Councils are required to continuously address issues associated with redevelopment and alterations and extensions to existing industrial development, particularly within the Bankstown industrial area. New industrial development may potentially occur within areas filled within the Bankstown Aerodrome site, under Commonwealth planning control. This has been the subject of specific assessment and discussions between Council and Bankstown Airport Limited.

The history of extractive industry has had close association with the Georges River Catchment. Chipping Norton Lakes are the product of over 30 years of sand extraction, although now ceased. The river channel in this area has been greatly altered and the volume of water storage greatly increased.

The Georges River Catchment has also had a major role in waste disposal in the Sydney Metropolitan Area, in the past. Until the 1950s, local and state government authorities saw landfill as a convenient way to convert low-lying, swampy or excavated land, perceived to be of low value to more economically desirable uses such as sporting fields, housing and industrial estates. Sites which have recently been or are currently used as landfill include those located at Riverside Road, Chipping Norton, the Glenfield Waste Depot located north of Cambridge Avenue, and the Bankstown Council Tip at Kelso Swamp.

The Holsworthy Training Area comprises approximately 20% of the upper reaches of the catchment, with the Georges River forming its western boundary. While the training area is a major component of the upper catchment, it is only partly within the subject floodplain of the Lower Georges River, being that area to the west of Moorebank Avenue between East Hills Railway Line and the South-Western Motorway (M5).

The Georges River National Park forms a significant nature conservation area within the Georges River Catchment, and in particular the study area. The Georges River National Park is located on the shores of the Georges River west of Saltpan Creek. That part comprises 326 hectares of open woodland, eucalypt forest and developed picnic areas. It offers picnic facilities, boating, water skiing, fishing, bushwalking and boat launching facilities.

2.1.4 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 Council's LEPs provide listings of heritage items. A number of these heritage items are particularly relevant to the river corridor inclusive of the following:

- Sutherland LGA – Como Railway Bridge, Alfords Point Bridge, numerous boat sheds and associated baths, cottages, boat houses and sea walls, various oyster workings remains at Illawong and a number of waterfront cottages and gardens.

- Bankstown LGA - Bankstown Aerodrome at Georges Hall, Caird's Wharf at East Hills, Cattle Duffers Flat at Revesby and Lansdowne Bridge on the Hume Highway at Lansvale.

- Fairfield LGA - Lansdowne Bridge at the Hume Highway at Lansvale (multiple LGAs), the railway viaducts at Cabramatta Creek, Cabramatta, and the site of toll houses and gates on the Hume Highway at Lansvale.

- Liverpool LGA - Glenfield Farm at Casula, the Voyager Point Precinct at Voyager Point, an avenue of trees at Chipping Norton on Riverside Road, the weir at Liverpool, the railway viaduct at Mill Road, Liverpool, the Power House Regional Arts Centre at Casula, and the Warwick Farm Racecourse Group on the Hume Highway at Liverpool.

The above items are located within or within proximity to the floodplain study area. It is also envisaged that parts of the river and creek system may retain potential Aboriginal archaeological relics and sites. These matters are relevant to the management of the river system generally by Councils, and in particular in the assessment of any potential structural mitigation measures examined as part of the Floodplain Risk Management Study.

2.2 Population and Development Trends

2.2.1 Changing Population and Characteristics and Projections

The floodplain study area (ie. within the PMF extent) would have a resident population in the order of 20,000 persons. The population within the overall catchment study area would be substantially greater.

Census collector district boundaries do not correlate with the study area to the extent that would allow for analysis of Census statistics on this basis. Accordingly, Census data for the four LGAs in the study area (and compared to the Sydney Statistical Division overall) has been reviewed to determine general trends. **Table 2.1** provides a summary of population change within the four LGAs (and compared to the Sydney Statistical Division overall) between the 1986 and 2001 Censuses:

Table 2.1
Summary of Population Change – Total Persons

Area	1986 Census	1991 Census	1996 Census	2001 Census	Change 1991-01	% Change 1991-01	Compound Rate 1991-96	Compound Rate 1996-01
TOTAL PERSONS								
Bankstown LGA	151570	153867	157735	165604	11737	7.6%	0%	1%
Fairfield LGA	153522	175145	181785	181936	6791	3.9%	1%	0%
Liverpool LGA	93215	98162	120197	154287	56125	57.2%	4%	5%
Sutherland LGA	175191	184402	194105	203089	18687	10.1%	1%	1%
Sydney Region	3364858	3538448	3741290	3997321	458873	13.0%	1.1%	1.3%
TOTAL PRIVATE DWELLINGS								
Bankstown LGA	50173	51921	54897	58204	6283	12.1%	1%	1%
Fairfield LGA	46238	52494	55732	57717	5223	9.9%	1%	1%
Liverpool LGA	29131	32068	40620	50879	18811	58.7%	5%	5%
Sutherland LGA	60313	65695	72365	78454	12759	19.4%	2%	2%
Sydney Region	1225257	1314294	1426266	1546691	232397	17.7%	2%	2%

Source: ABS Census Data extracted via CASAS Census Program

Salient conclusions drawn from the Census data, of particular relevance to this study are outlined as follows:

- The Liverpool LGA has been subject to substantial growth over the last 15 years, of which a significant proportion would be within the Georges River Catchment, and in particular the Cabramatta Creek Sub-Catchment.

- The Sutherland LGA has also been subject to a reasonably high rate of growth, commensurate with the average for the Sydney Region overall, however most of this growth would have occurred in areas outside of the Georges River Floodplain, closer to the coast and within the Menai release area.

- The growth in Bankstown and Fairfield has been relatively lower, with growth in Fairfield declining substantially after 1991 with the completion of many of its release areas, and a resurgence of growth in Bankstown being a relatively recent occurrence likely associated with redevelopment opportunities.

- Accordingly, pressures for further growth within the floodplain study area would be most likely focussing upon new urban release area growth in Liverpool and redevelopment opportunities within the remaining three LGAs. Development of new areas provides the opportunity to minimise the exposure of property and people to flood risk, while redevelopment opportunities provide the opportunity to decrease existing exposure to risk.

- The Fairfield and Liverpool LGAs have a greater proportion of youth than the remaining LGAs and the Sydney Region overall (15.4% and 16.4% of the total

population aged 5 to 14, respectively, compared to 13.4% for the Sydney Region). Conversely, Bankstown and Sutherland LGAs have a higher proportion of their population in the older age groups in comparison to the remaining LGAs and the Sydney Region overall (14.1% of the Bankstown LGA population and 12.1% of the Sutherland LGA population is aged 65 or greater, compared to 11.7% for the Sydney Region).

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 specially 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 the Rural Fire Service and PlanningNSW.

- The percentage of the population in each of the four LGAs who are overseas born from non-English speaking countries has increased. The Fairfield LGA is particularly significant in this regard, with 49.6% of its population at the 2001 Census being overseas born from non-English speaking countries and 16.6% of the total population of Fairfield LGA are overseas born and poor English speaking. Bankstown and Liverpool LGAs also have a relatively high percentage of their population which are overseas born and poor English speaking (7.9% and 6.8%, respectively) in comparison to the Sydney Region overall (4.4%), while the Sutherland LGA had a low representation (0.8%) at the 2001 Census.

  The above trends have significant implications in regard to community awareness programs, requiring that multi-lingual information is distributed or access to interpretative facilities is provided, with the exception of Sutherland Shire.

- Median household incomes, in comparison to the Sydney Statistical Division, are low in each LGA with the exception of the Sutherland Shire. The Fairfield LGA has the lowest median household income of the four LGAs ($39,500) in comparison to the Sydney Region ($51,500). This variation is also reflected in households owning or purchasing properties in comparison to renting, with a high proportion of homes being owned or purchased in the Sutherland LGA in comparison to the remainder of the catchment. Consistently, median mortgages in comparison to the Sydney Statistical Division are higher in the Sutherland LGA, only marginally less in the Liverpool LGA and relatively lower in the Fairfield and Bankstown LGAs.

  Generally, this reflects the reduced capacity for a substantial proportion of the population of the study area, particularly Fairfield, Liverpool and Bankstown LGAs, 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 increased reliance on government and community assistance.

The study area forms a diverse cross-section of the Sydney Region. The eastern portion of the study area comprising the Sutherland LGA and components of the Bankstown LGA are older, established areas with little further development opportunities and a more affluent and aging population. The western extent of the study area has a newer and developing population, with some potential for further urban growth specifically within the Liverpool LGA. Population projections by Department of Infrastructure, Planning & Natural Resources estimate a growth in the order of 45,000 persons within the Liverpool LGA in the next 20 years. Growth within the remaining LGAs in the study area over the same period is projected to be relatively less, in the order of 20,000 persons.

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 to accept in the use of the floodplain.

2.3 Existing Planning and Development Controls

2.3.1 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 planning controls and strategic planning direction for the area.

2.3.2 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 Department of Infrastructure, Planning & Natural Resources 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 No. 5 – Housing For Older Persons or Persons with a Disability (SEPP 5) applies to urban land or land adjoining urban land where dwellings, hospitals and similar uses are permissible. SEPP 5 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 SEPP 5. Notwithstanding, Clause 4(2)(a) of this Policy restricts its application from land identified as floodways or high flood hazard in another environment planning instrument such as a REP or LEP (as described below).

2.3.3 Regional Environmental Plans (REPs)

A Regional Environmental Plan (REP) is prepared in accordance with the EP&A Act by Department of Infrastructure, Planning & Natural Resources 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 study area lies wholly within the area of application of the Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment (Georges River REP). This plan prevails over any other regional environmental plan or local environmental plan where there is an inconsistency. The plan contains planning principles to help councils prepare local environmental plans that apply to land within the catchment, and provides specific development controls in regard to various land uses.

While the Georges River REP is substantially focussed on water quality issues, it does address floodplain risk management. To this extent, the following objectives provided at Section 5 of the REP are relevant to the subject study:

> *"(d) To establish a consistent and coordinated approach to environmental planning and assessment for land along the Georges River and its tributaries and to promote integrated catchment management policies and programs in the planning and management of the catchment."*

The above objective is a general expression of intent which could broadly cover many detailed considerations, but does not specifically focus upon floodplain risk management. Having regard to the nature of the REP being specific to a river and its tributaries, it is considered desirable that the objectives of the REP be expanded to specifically identify floodplain risk management as an important outcome.

The dictionary to the REP provides a number of definitions relative to floodplain risk management, inclusive of the following:

> *"**Floodplain** means the floodplain nominated in a local environmental plan or those areas inundated as a result of a 1 in 100 flood event, if no such level has been nominated.*
>
> ***Flood liable land** means land identified in an environmental planning instrument as flood liable land.*
>
> ***Floodprone land** means land susceptible to inundation by the probable maximum flood event.*
>
> ***Floodway** means those areas of a floodplain where a significant discharge of water occurs during floods. Floodways are areas which, even if partially*

blocked, would cause a significant redistribution of flood flow, or a significant increase in flood levels."

The above definitions are not wholly consistent with the provisions of the current Floodplain Management Manual or the preferred approach to the restructuring of planning controls at the local level for each individual Council (as discussed later in this report). Further, anecdotal comments received from individual councils suggest that these definitions have created difficulties in the implementation of the REP. Accordingly, a rationalisation of these definitions is considered an important outcome and appropriate recommendations are provided later in this report.

Clause 11 of the REP provides particular restrictions on the permissibility of various forms of development within the Georges River Catchment. In particular, the provisions of Clause 11 prohibit certain development within different parts of the floodplain identified in accordance with the above definitions. These controls on land use within the floodplain are not, in all cases, consistent with the preference for land use distribution within the floodplain, as identified within the individual development control plans prepared for each council, as discussed later in this report. These development control plans have been prepared as part of the floodplain management process outlined within the Floodplain Management Manual and integral to the State Government Flood Policy and will ultimately be finalised by each council having regard to the specific nature of the floodplain within each of their LGAs.

Having regard to the above, it is considered desirable that some refinement be undertaken to the Georges River REP to provide definitions consistent with current best practice and the Floodplain Management Manual, provide an objective which is specifically focused on floodplain risk management, and review the planning controls contained within Clause 11 so that they would be consistent with the controls adopted by each individual council, through the floodplain risk management process. Appropriate recommendations are made later within this report.

2.3.4 Advisory Circulars

Department of Infrastructure, Planning & Natural Resources 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 (1984) 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 FPDM, Councils

should prepare single comprehensive local environmental plans to implement their Floodplain Risk Management Plans, 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 Floodplain Risk Management Plan 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.

2.3.5 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 (previously being Floodplain Development Manual, which was relevant at the time the direction was made), which was relevant at the time the direction was made) 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 Floodplain Development Manual 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.

2.3.6 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 area is affected by the provisions of 4 separate Local Environmental Plans. LEPs are normally, and in this case, specific to individual LGAs, as discussed below.

2.3.6.1 Bankstown LGA

Bankstown LEP 2001 applies to the Georges River Catchment within the Bankstown LGA. This LEP deals with the management of flood risk in many ways, inclusive of 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.

We note development is only excluded from being exempt and complying if located on land mapped in a planning instrument or a DCP as flood liable. Such maps have been prepared so far only for some specific locations within Bankstown, so there are large areas of flood liable land that are not mapped and where these provisions do not apply at present. However, Council requires a Stormwater Systems Report (SSR) in accordance with Clause 11.2 of DCP 30, for all developments that impinge on Council's stormwater system or are affected by local or main river flooding. Should the SSR have the effect of mapping the site as flood liable up to the 100 year flood level, a development application would normally be required.

It will be recommended that Council consider modifications to the LEP to accord with current best practice management of floodplains. These modifications will include the insertion of an objective and review of flood related clauses. Specific recommendations are outlined at Section 4.4.1. of this report.

2.3.6.2 Fairfield LGA

The study area is affected by the provisions of Fairfield LEP 1994. The provisions of this LEP are similar to the Bankstown LEP in regard to the areas of floodplain risk management addressed and controls provided. Fairfield LEP 1994 also provides a definition of floodway. It is recommended that this LEP also be reviewed consistent with the approach outlined for the Bankstown LEP.

2.3.6.3 Liverpool LGA

Liverpool LEP 1997 applies to the study area, within the Liverpool LGA. The Liverpool LEP 1997 is similar to the above LEPs, providing a definition of flood liable land and a clause which provides general considerations in regard to development on flood liable land. There are a number of other clauses which make some reference to flooding.

Consistent with other councils within the study area, it is recommended that the objectives of the LEP make reference specifically to floodplain risk management and the definitions and clauses associated with flooding be reviewed and updated.

2.3.6.4 Sutherland LGA

Sutherland LEP 2000 applies to the study area within the Sutherland LGA. This LEP effectively has no provisions regarding the management of flood risk, although the LEP is currently under review. Council has recently placed on exhibition Sutherland Shire Draft Local Environmental Plan 2003 which is a comprehensive document, providing one plan to deal with all planning issues, thereby effectively encapsulating all existing LEP and DCP provisions. This draft plan will incorporate provisions regarding floodplain risk management but is still within the draft stage of its preparation.

Discussions with Council officers have concluded with the recommendation that we proceed to prepare planning controls based on their ultimate incorporation into Council's existing LEPs (and DCP system). The format of our proposed changes could be efficiently incorporated within the Sutherland Draft LEP 2003 when eventually adopted by Council, whether in its present or in some future amended form. In this regard, it is anticipated that the draft planning controls, including any amendments to Sutherland LEP 2000, will be exhibited and processed in a parallel process to Draft LEP 2003, with the two being merged at some future date as appropriate.

It is considered appropriate that the eventual LEP be modified to include relevant definitions, objectives and assessment criteria, to provide a general framework for more detailed planning controls to be embodied either within a development control plan, or the detailed planning controls section of Sutherland Draft LEP 2003. An outline of recommended amendments and conclusions, as they relate to the existing DCP 2000, is provided later within this report.

Clauses 17 and 18, and Schedules 4 and 5 of Sutherland LEP 2000 provide provisions regarding exempt and complying development. These provisions will require review so as not to increase the administrative burden on Council as a result of widening the definition of floodprone land to be inclusive of all land affected up to the PMF. This is a potential unwanted consequence of the redesign of the review of definitions discussed later in this report.

2.3.7 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 area, as discussed below.

2.3.7.1 Bankstown LGA

There are a number of DCPs which have some relevance to floodplain risk management, within the Bankstown LGA, inclusive of the following:

- DCP No. 9A – Bankstown Floodprone Land
- DCP No. 9B – Kelso Park, East Hills Levee Area Floodprone Land
- DCP No. 9C – East Hills Floodprone Land
- DCP No. 9D – Carinya Road Area, Picnic Point
- DCP No. 30 – Engineering Requirements for Development
- DCP No. 35 – Exempt and Complying Development

The first mentioned DCP (DCP No. 9A) provides general floodprone land planning provisions for the overall LGA. The following three DCPs (DCP No's 9B, 9C & 9D) provide specific controls for floodprone land within discreet localities along the Georges River. A number of controls contained within these DCPs are now superfluous having been implemented or made redundant by other events. It is important, in our view, that floodplain management risk issues be dealt with in a comprehensive and consistent manner, and accordingly it is recommended that all four DCPs be reviewed and rationalised. Accordingly, a recommended format for a new DCP is outlined later, to encapsulate all current floodprone land specific DCPs in the Bankstown LGA and the outcome of this study, into one document to provide a basis for the review of all flood planning issues associated with development throughout the LGA.

While the DCP recommended as part of this report provides an overall framework to deal with flood risk issues across the LGA, the controls provided in the DCP at this stage focus on the Georges River floodplain. Specific development controls for other floodplain areas can be inserted at a later date as prepared. While the other 3 Council's involved in this study have elected to incorporate interim controls for stormwater flooding in the recommended draft DCP, Bankstown City Council is undertaking specific studies for stormwater flooding in various catchments, and therefore intends to incorporate controls for these floodplain areas as a separate exercise at a later date.

The provisions of DCP 30 relate to specific engineering design issues. While the provisions of this DCP do not specifically focus on planning matters, they nonetheless overlap with planning issues in a number of areas. In discussions with Council officers and in our view, it is not considered appropriate to review the provisions of DCP 30 with regard only to flood planning issues, but it is recommended that the DCP be reviewed holistically. Such review could be targetted at the reworking of the DCP to effectively produce a technical specification, removing reference to planning matters which would be more appropriately incorporated within the recommended comprehensive Floodplain Risk Management DCP. If this holistic review is not completed in the short term, an interim amendment may be required of Section 11 of DCP 30, to minimise areas of conflict with planning controls proposed in this Study.

In addition to the above, a review of DCP 35 dealing with exempt and complying development, is recommended. Bankstown LEP 2001 (Clauses 9(d) and 10(c)) excludes development being considered as "exempt" or "complying" if carried out on "flood liable land". The redefinition of floodprone land to encompass the effective extent of land at risk of flooding (ie. up to the PMF) would inadvertently decrease the range of minor development which is excluded from being exempt and complying development. This would have the undesired consequence of increasing the administrative burden on Council. The increased administrative burden on Council can be minimised by:

- not excluding any development from being exempt on the basis of being on flood liable land, as such development is very minor in nature and of minimal consequence to managing flood risks; and

- tailoring complying development provisions.

We recommend that to exclude development from being "complying" only within the 100 year floodplain and where the SSR report concludes that a development should not be excluded from being considered complying, as discussed later in this report.

2.3.7.2 Fairfield LGA

While Fairfield City Council has a flood policy, it has no specific floodplain management risk DCP. It is recommended that a comprehensive floodplain risk management DCP be adopted by Council which would effectively supersede its current policy requirement. Additionally, a review of DCP 29 regarding exempt and complying development should also be undertaken for the reasons outlined above.

2.3.7.3 Liverpool LGA

Similar to the Fairfield situation, Liverpool City Council does not have a floodplain risk management related DCP and relies on interim policy provisions. Notwithstanding, Liverpool City Council has embarked on the preparation of a comprehensive floodplain risk management DCP some years ago, which has not yet been adopted by Council, pending the outcome of other studies such as the

Georges River study. The recommended floodplain risk management DCP for the Liverpool LGA, discussed later in this report, is effectively a more advanced version of Council's original draft DCP, being also authored by Don Fox Planning in association with Bewsher Consulting. Additionally, a review of DCP 33 regarding exempt and complying development should also be undertaken for the reasons outlined above.

2.3.7.4 Sutherland LGA

As alluded to previously, Sutherland Shire Council does not have a specific floodplain risk management DCP in existence, but has incorporated relevant provisions within its new single plan, Draft LEP 2003. As discussed above, it is intended to progress a specific flood risk management DCP for the Sutherland LGA under the current planning instruments of the Sutherland LGA, on the understanding that it may be incorporated within Draft LEP 2003 at some later date.

2.3.8 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 DCP's 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 each of the four subject 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 LGA.

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 are 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 LEPs and DCPs. Recommendations for translating relevant recommendations of these documents into these instruments are made later within this report.

2.3.9 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. While no DCP is presently in force which deals specifically with the issue of flooding in three of the four Councils, such an instrument would provide a desirable mechanism for Council to comprehensively assess development applications with respect to the issue of flooding.

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.

2.3.10 Section 149 Certificates

A Section 149 Certificate is basically a zoning certificate issued under the provisions of the EPA Act, 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 (Mawson J, Prior N, and Bewsher D, 1994).

A Section 149(5) Certificate, being a more complete but more expensive certificate, requires Councils to advise of "other relevant matters affecting the land of which it may be aware". These more complete certificates are not mandatory for inclusion with property sale contracts – a Section 149(2) Certificate being the minimum required. Where a Section 149(5) Certificate is obtained, this would more clearly require a Council to notify of flood risks of which it is aware.

Each of the four Councils 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 is likely to be affected by flooding but the extent of flooding will need to be determined.

(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, none of the Councils have completed a Floodplain Risk Management Study and Plan for the Georges River. Two of the Councils, Liverpool and Fairfield, have (e) and (f) for areas outside of the subject study area, including tributaries of the Georges River.

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

The mapping being undertaken by Bewsher Consulting as part of this study, will identify the majority of areas subject to riverine flooding in the study area. However this typically does not extend to contributing local catchments where water courses and overland flow paths are located within pipes or narrowly formed channels or are not evident except during major storms. Some Councils may have additional detailed flood mapping for the top catchment areas, some have maps or local knowledge of these affected areas (e.g. through a history of complaints) and some have no specific documented knowledge of potentially affected areas. Whilst it is desirable, 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.

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). Each of the four Councils have 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. 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.

While there may be some concern about property owners having such a notation, there is an expectation by prospective purchasers that it would be provided, as indicated by the legislation and Manual. Further, 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.

Suggested Section 149 Certificate notations for consideration by each Council are provided later in this report. The various options for notations will need to take into

consideration flooding from both riverine and overland flow situations. Such notations should be ultimately determined by each Council having regard to their particular circumstances and the subject of separate legal advice obtained by each Council, to ensure that the interests of individual Councils are appropriate covered.

2.3.11 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 minimal in most areas except the Liverpool LGA, it is unlikely that a Section 94 Contributions Plan would be a feasible fund raising mechanism for such measures, other than for Liverpool. 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. The incorporation of any flood mitigation works within any Section 94 Plans is beyond the scope of this report and should be pursued separately, particularly with regard to the Liverpool LGA.

2.4 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 approximately 2 years ago.

The details of the "planFIRST" approach are yet to be produced, debated and gazetted and a timeframe has not been publicised. Regions are also not yet formally defined. Accordingly, it is not possible or appropriate to delay current plan making projects, to provide for their integration into a "planFIRST" style document. However, having reviewed the current Warringah LEP which is considered to be a model for future planFIRST LEPs, it is considered that the planning controls

recommended as part of this FRMP can be translated into the structure of this alternate LEP framework at a later date, if required.

At this stage, the planning controls outlined later in this document have been integrated into draft recommended changes to the subject Councils' existing LEP and DCP structures (see **Appendix G**). The Sutherland Draft LEP 2003 adopts this one plan approach, and the planning controls recommended later in this report will be related to existing instruments, for incorporation at a later date into Draft LEP 2003 depending on its outcome. It is desirable to continue the environmental plan making process concurrent with the FRMP process required by the FMM to resolve community expectations for floodplain risk management rather than merge the processes at this stage and complicate any future potential planFIRST focused plan making projects.

3.0 APPROACH TO FLOODPLAIN PLANNING

3.1 General Philosophy

Each 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 Georges 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 determined for any 12 month period - 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.

Illustration 3 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.

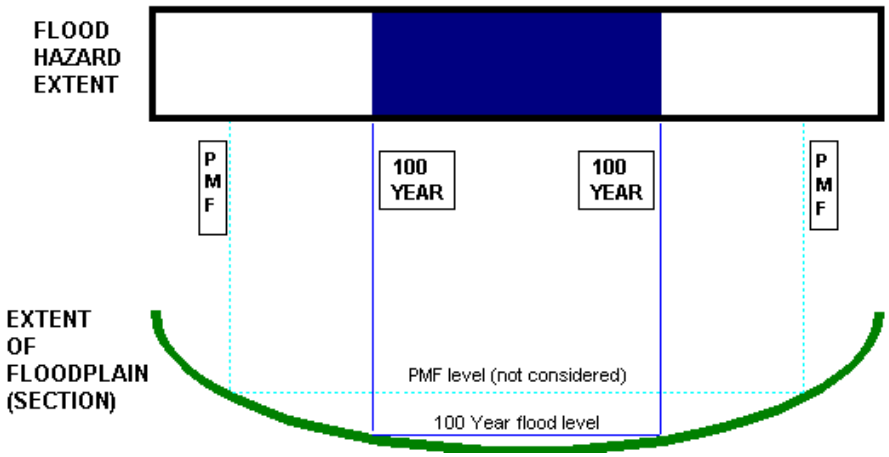

Illustration 3: Typical View of Flood Hazard Currently Held by Community

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 Georges River 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 subject Georges River Councils.

The current approach to floodplain planning discussed above may be typified by the example shown in **Illustration 4** which flows from the inappropriate view of flood

hazard presented in **Illustration 3**. 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.

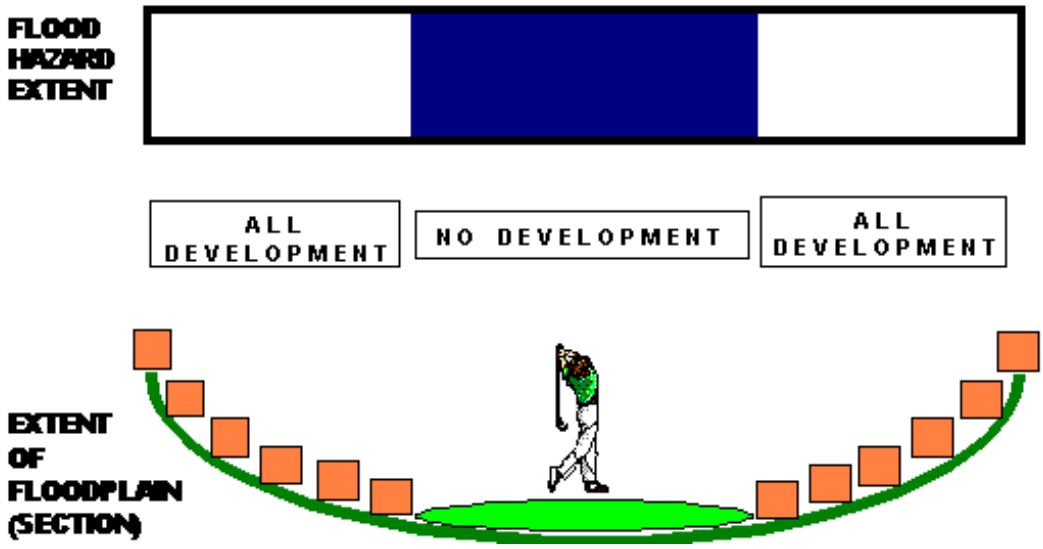

Illustration 4: Current Floodplain Planning
(Derived from an inappropriate view of flood hazard and the use of a singular flood planning level)

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 **Illustration 5** below.

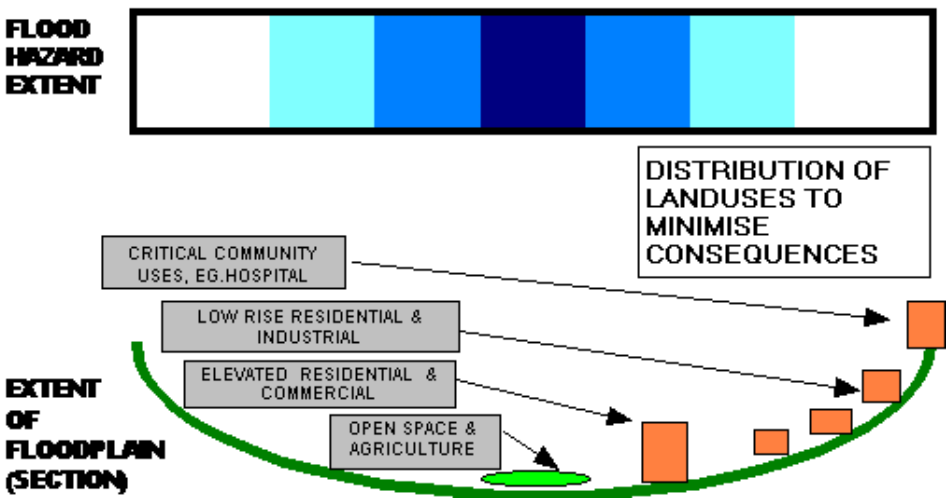

Illustration 5: Distributing Land Uses under the Planning Matrix Approach

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) 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 **Illustration 6**. It is fully consistent with the Floodplain Management Manual.

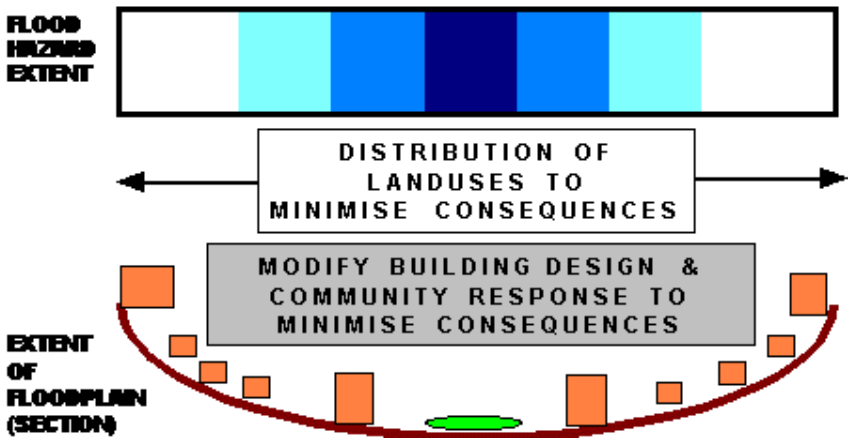

Illustration 6: The Planning Matrix Approach to Floodplain Planning

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 Georges River Floodplain. Notwithstanding, it is our approach that each Council 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 advocated in this report is based on the principles outlined in the NSW Floodplain Management Manual and could be adequate for use in other floodplains (including stormwater floodplains). However, other approaches towards floodplain management may also be appropriate provided they are generally in accordance with the NSW Floodplain Management Manual.

The approach intended to be adopted to satisfy the above objective, is to prepare singular DCP which has 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. In regard to the subject study, the following three FRPs are proposed:

- **High Flood Risk** — This has been defined as the area of land below the 100 year flood that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties. 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 that is not subject to a high hydraulic hazard and where there are no significant evacuation difficulties. 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 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 Georges River Floodplain. While the above criteria may be transferable to other floodplains, the particular characteristics of each floodplain need to be considered when preparing a Floodplain Risk Management Plan.

For the Georges River Floodplain, the Low Flood Risk precinct 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 **Illustration 7.**

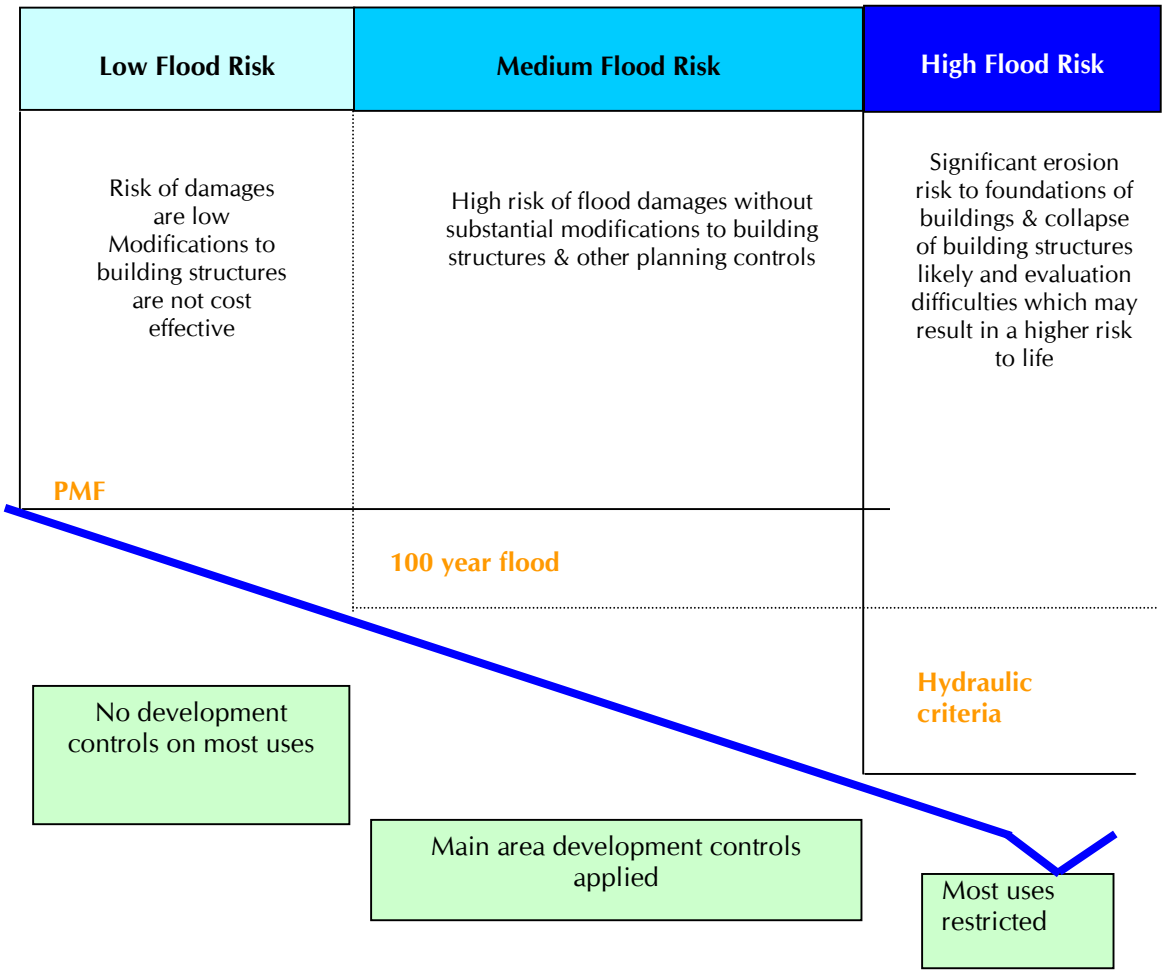

Illustration 7: Definition of Planning Precincts

An individual property may be subject to more than one Flood Risk Precinct. In such situations, more than one set of controls apply depending upon the Flood Risk Precinct of that part of the site subject to a development proposal. This is consistent with the manner in which zoning controls are applied, but more importantly provides a mechanism to encourage appropriate forms of development across sites which may be affected by a range of flood risks. For example, on a site affected by

multiple Flood Risk Precincts, a development can be encouraged to concentrate on that part subject to lower risk.

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:

- Critical uses and facilities
- Sensitive uses and facilities
- Subdivisions
- Residential
- Commercial and industrial
- Tourist related development
- Recreation and non-urban
- Concessional development.

Defined land uses, as specified by the relevant LEPs, are included within each of the above categories (and further described where necessary). 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 and methods
- Structural soundness
- Flood effect on others
- Car parking
- Evacuation
- Flood 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 the subject Councils as a DCP.

In the case of Bankstown City Council, their existing array of flooding DCPs have been amalgamated with the recommended DCP, as outlined later. This provides the opportunity to continue the application of locality specific flood related controls developed and adopted by Council in the past, in consultation with the relevant communities.

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. Changes would also be relevant for the Georges River REP. These changes are outlined and discussed further in a later section of this report.

4.0 REVIEW OF PLANNING OPTIONS

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 for the majority of the subject floodplain study area). Town planning can also assist in regard to flood awareness initiatives through notations on Section 149 Certificates (zoning information certificates).

It is noted that the Plan (such as LEPs and DCPS) making processes under the EPA Act operate independently to the preparation of FRMPs under the FMM. While these 2 processes could be overlapped, it has been the preference of the Floodplain Management Committee to undertake the processes separately. This will provided

for extended opportunities for public participation. Accordingly, once the FRMP has been adopted by the Council's, each will subsequently implement the recommendations of the FRMP as they relate to that Council, which will include the preparation of LEPs and DCPs under the EPA Act. During this later plan making process further refinement and adjustment to the recommended LEPs and DCPs can be undertaken.

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 the George River REP, should appropriately be amended to provide a consistent framework for flood planning for each of the Councils' LEPs. The recommended changes to this REP are included as **Appendix A**.

4.4 Local Environmental Plans (LEPs)

There are various aspects of each Councils' 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 which 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 LEPs which could be considered to ensure consistency with the potential outcomes of all FRMPs prepared under the ambit of the current FMM, including that for the Georges River. These inclusions are generally outlined as follows:

- An additional objective (if one does not exist) to be inserted within the initial clauses of the plan which identifies flood risk management as an objective of the plan. This 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 by all of the Councils, 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 within each of the Council's LEPs which outline 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 and complying development provisions to generally retain the status quo in regard to such minor development. That is, it is recommended that the exempt and complying 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 and, in the case of Bankstown, to not exclude "exempt" developments on the basis of being located on flood liable land. Exempt development generally includes minor development such as pergolas, barbeques, 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. One approach considered, (which has been applied within LGAs outside of the study area) is to identify the High Risk Flood Precinct and to insert a special clause within the LEP to exclude the majority of forms of development within that area. The unfettered application of such an approach to the subject floodplain is unlikely to be appropriate on economic and social grounds, due to the potential sterilisation of substantial existing urban land, particularly in the Bankstown LGA.

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 some cases, the High Flood Risk Precinct represents a narrow band along the river and creek foreshores, which in the majority of cases is an area within which Council would not endorse the construction of new buildings. 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 for the Sutherland LGA where the High FRP is in a narrow band and Sutherland currently applies FSBL provisions which would marry comfortably with this approach.

For the remaining LGAs (other than Sutherland) individualised resolution of this issue would be appropriate. Generally, some reliance could be placed on the proposed DCP to indicate where certain types of development would be undesirable in the High FRP. Although the DCP would not provide a statutory prohibition, it would identify the issue for resolution and provide a degree of flexibility for Council. As a separate exercise, it would also be appropriate for Councils to review the land uses permissible in High FRPs having regard to all relevant planning issues (not just flooding) and undertake a broader strategic review of the zoning controls applying to these areas.

At present no Council within the study area has any particular provision within their LEP to prohibit a particular land use within a dangerous part of the floodplain (eg. such as the High FRP). Flooding will always remain just one issue to be dealt with in the assessment of a development application, and each Council will have different existing land use patterns and topographic conditions, necessitating different approaches in regard to achieving a balance between stringency and flexibility. Having regard to the particular existing planning context for each of the Councils, other than Sutherland Shire Council as discussed above, the following outcomes are proposed:

- **Bankstown City Council -** No special clause or use of the foreshore building line provisions, as may be implemented through an LEP, are recommended to exclude uses within the High FRP. There are no cases envisaged where this additional stringency would be required and Council can rely on the DCP to discourage inappropriate uses (albeit not an unchallengeable statutory provision).

- **Fairfield City Council -** Discussions with Fairfield City Council officers indicate their preference to embody additional statutory force through a special clause within the LEP, to exclude the majority of land uses within the High FRP. The use of a FSBL will not be practical due to the wide expanse of the High FRP. The approach to be adopted by Bankstown City Council would also be acceptable in the case of Fairfield, but should Council wish to have a more statutorily enforceable provision in an LEP, then this would be a desirable addition in regard to floodplain risk management objectives.

- **Liverpool City Council -** While no specific preference has been expressed by the planning officers of Liverpool City Council, the study area within their LGA is effectively the subject of similar considerations as for the Fairfield LGA. In this regard, it is our conclusion that the use of a FSBL provision in their case would not be appropriate. The use of a special clause or not to prohibit the majority of uses within the High FRP, would be a matter for Council's further consideration having regard to other matters inclusive of their experience and practice in dealing with applications in the area and their perceived necessity for flexibility verses stringency.

The final outcome would remain the same, and the options chosen and implemented by Council to achieve this purpose can be a matter for individual consideration. The primary question to consider, is whether each of the Councils would, in the majority of cases, advise development applicants that the majority of uses are not acceptable in a High FRP and would subsequently refuse development applications, regardless of whether there was a special clause pre-notifying the applicant. This is unlikely to be the case within the study area, in our view, as there are often many competing factors to be considered. Further, the more stringent approach would prevent an applicant being able to mitigate the risk through, for example, filling which would have the consequence of altering the applicable FRP, if an absolute prohibition was applied through the provisions of an LEP. Accordingly, it would be our view that where an FSBL provision could not be applied practically, then Council rely solely upon the provisions of the DCP, but undertake a more strategic review of its zoning plans to determine whether flood risk sensitive uses should be excluded from high FRPs, having regard to the broad ambit of planning issues, and not just flooding.

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 for the individual LEPs for each Council is provided below.

4.4.1 Bankstown LGA

A review of Bankstown LEP 2001 has indicated the following amendments for consideration:

- **Clause 2 – Aims and Objectives**

This clause provides only broad aims and objectives for the plan and it would be desirable if an objective was inserted which related to an intent to minimise risks associated with natural hazards, inclusive of flooding. It is therefore recommended that the objective contained within **Appendix B** be inserted. This is not critical to the recommendations of the FRMP, but may be considered by Council in any future review of the plan.

- **Clauses 9 & 10 – Exempt and Complying Development**

These clauses excludes flood liable land from being considered as exempt and complying development. This exclusion should be refined in accordance with the recommended inclusions outlined at **Appendix B,** with additional provisions to specifically address the current Bankstown situation.

- **Clause 26 – Flood Liable Land**

This clause provides a cursory outline of matters for consideration in the assessment of development applications on flood liable land. It is recommended this clause be updated with the recommended clause at **Appendix B**, providing an outline of matters for consideration in the assessment of development on flood liable land.

- **Schedule 1 – Dictionary**

Provides a definition for *flood liable land*. This definition needs to be reviewed in accordance with the recommendations discussed previously and contained in **Appendix B**, to include a revised definition for *flood liable land* and a definition for the *probable maximum flood*.

4.4.2 Fairfield LGA

A review of Fairfield LEP 1994 has indicated the following amendments for consideration:

- Consistent with the recommendations for the Bankstown LEP, it is considered desirable that Clause 2 of the Fairfield LEP be expanded to include a general

objective regarding a desire to ensure new development minimises exposure to natural hazards, inclusive of flooding. A recommended objective is provided at **Appendix B**.

- Clause 11 of LEP 1994 provides a relatively comprehensive outline of matters to be considered in the assessment of development on flood liable land. The recommended updated clause provided at **Appendix B** will provide the opportunity to revise terminology and references to documents such as Council's "*Flood Management Policy*" and introduce the consideration of accumulative impacts. While not critical in the situation of the Fairfield LEP, it is recommended that the updated clause provided at **Appendix B** be considered for inclusion within LEP 1994.

- While other clauses refer to flooding, such as Clause 13, their amendment do not appear to be an imperative. Notwithstanding, Council may wish to review such clauses to ensure that the original intent is not altered by other associated recommended changes.

- It is recommended that the definitions of *flood liable land* and *floodway* contained within the dictionary of LEP 1994, be deleted and replaced with definitions of *flood liable land* and the *probable maximum flood*, as outlined at **Appendix B**. This would provide consistency in the application of the proposed DCP and in the approach taken by the other Councils within the catchment.

4.4.3 Liverpool LGA

During the conduct of the FRMS, an interim recommendation was provided to Liverpool City Council in regard to amendments to its LEP, to coincide with its review of the LEP at that time. Those recommendations are consistent with the recommendations contained within **Appendix B** and are summarised as follows:

- Replace the existing definition of *flood liable land* provided at Clause 6 with that contained within **Appendix B**.

- Add the definition of *probable maximum flood* contained within **Appendix B** to those contained within Clause 6.

- Consider replacing the objective provided at Clause 2(g) within LEP 1997 with that contained at **Appendix B** to provide clearer intent in regard to the management of risk associated with natural hazards. It was indicated that the inclusion of this objective was not critical, but nonetheless desirable.

- Replace Clause 21 with the updated clause providing general considerations in the assessment of development applications on flood liable land, outlined at **Appendix B**. It was noted that Clause 21 as presently exists within LEP 1997 is reasonably comprehensive and, therefore, it is not essential that it be changed. Notwithstanding, it is recommended that the clause at **Appendix B** is simpler and clear and will be consistent with that recommended for many other Councils and comprehensively covers all relevant matters.

- In regard to Council's exempt and complying development provisions, it is recommended that Clauses 6A(3)(f) and 6B(3)(a) of the LEP be review consistent with the recommendations outlined at **Appendix B**.

4.4.4 Sutherland LGA

A review of Sutherland LEP 2000 has indicated the following amendments for consideration:

- Consistent with the above recommendations, the general objective provided at Clause 2 of this LEP should be expanded to include an objective regarding the management of natural hazards and related risks outlined within **Appendix B**.

- The LEP should be expanded to include a clause providing general considerations for development on flood liable land, as specified at **Appendix B**.

- The dictionary of the LEP should be expanded to include definitions of *flood liable land* and the *probable maximum flood* as outlined at **Appendix B**.

- While Clause 20 provides some reference to flooding in the determination of a foreshore building line (with respect to Sandy Point only), this clause has the potential to be utilised more widely to provide setback criteria aligning at a minimum with the High FRP, as discussed previously. In this regard, it is recommended Clause 20 be reviewed to include flood risk management as an objective of the clause (Clause 20(1) of the LEP) and the determination of the line generally should be a reference to the High FRP extent, where not otherwise indicated on the LEP maps.

- Clause 18(3) of the LEP excludes land subject to "flooding" from being complying development. This should be amended to accord with the recommendations outlined at **Appendix B**.

4.5 Development Control Plans (DCP's)

4.5.1 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. The DCP should be accompanied by a map which identifies all FRPs, which are provided as an outcome of the FRMP.

4.5.2 Proposed DCP for Each LGA

The outcomes of the FRMP, which relate to recommendations for development controls, are to be embodied within a DCP for each of the Council's in the study area. The format of the DCPs will vary to meet the specific requirements of each

Council, with regard the manner which they present their current DCPs or other preferences.

Each of the documents proposed will be generally similar, involving a preamble of provisions which establishes a framework to allow for the outcomes of multiple FRMPs to be incorporated into the document, of which the Georges River FRMP will be one. Where possible, existing controls from other sources from each Council are integrated into the proposed documents, to increase the convenience for Council to accelerate the adoption of the plan. The particular intricacies and format relevant to each of the Council's are outlined and discussed further in the following section.

4.5.2.1 Bankstown LGA

Bankstown Council has a number of DCPs with flood-related issues, as discussed previously. It is recommended that those components of these DCPs which remain relevant should be incorporated within a comprehensive DCP which relates to floodplain risk management for the LGA as a whole. This exercise has been undertaken as part of this study, and a recommended DCP is provided as **Appendix C**.

In addition to the above, it is recommended that Council review DCP 35 regarding exempt and complying development provisions. The object of this review would be to ensure that additional development is not excluded from being exempt and complying development, due to the redefinition of floodprone land to be inclusive of all areas affected up to the PMF. A qualification of the definition of flood liable land as recommended for the LEP, as outlined at **Appendix B**, would be desirable.

4.5.2.2 Fairfield LGA

Fairfield Council presently have a comprehensive flood policy, which effectively provides provisions for consideration of development applications, in a manner similar to that expected of a DCP. It is recommended that this policy be superseded with a specific floodplain risk management DCP which addresses the issues identified previously within this study, providing a framework for floodplain risk management across the LGA as a whole, with specific recommendations for the Georges River. A copy of the recommended floodplain risk management DCP for the Fairfield LGA is provided at **Appendix D**.

4.5.2.3 Liverpool LGA

Liverpool City Council does not have any specific Development Control Plan or comprehensive policy in regard to development controls to manage flood risk issues. Accordingly, it is recommended that the model DCP provided at **Appendix E** be adopted for consideration by Council.

4.5.2.4 Sutherland LGA

The Sutherland LGA does not have specific Development Control Plan or policy in regard to development controls to manage flood risk issues. Accordingly, it is recommended that the model DCP provided at **Appendix F** be adopted for consideration by Council.

4.5.3 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.

4.5.3.1 Floor Area

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.

Similarly, the floor levels of industrial and commercial development should be at the 100 year ARI flood level plus freeboard, where possible. An alternative floor level control is provided for commercial uses in order to allow for floor and street levels to relate in a manner consistent with existing development in a centre, subject to elevated storage space being provided. This control will increase existing standards in some cases, such as from the industrial floor level control of the 50 year flood plus 0.1 metre freeboard, applied in the Fairfield LGA, to a consistent standard across the floodplain.

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 20 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 out). Sensitive uses and facilities (such as communication facilities and schools) should have floor levels above the PMF as these will be essential to ensuring minimal disruption to the community during major floods. Critical uses and facilities (such as hospitals and nursing homes) should be located outside of the floodplain to provide for potential refuge during major floods and minimal impact to the community.

4.5.4 Flood Compatible 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 Department of Infrastructure, Planning and Natural Resources has commissioned a

detailed study 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). it is understood that this study is yet to be completed. It is recommended that the DCP be reviewed upon completion and availability of this study.

4.5.5 Structural Soundness

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

The issue of structural soundness should also be considered elsewhere within the floodplain, but it is not considered that an engineering report would be necessary in each case. The applicant would still need to demonstrate that the issue has nonetheless been addressed, by either explaining how such an issue is not relevant in any particular case, or that the design has minimised any impacts to the maximum practical extent. Council engineers may require an engineer's report once the matter is assessed or the applicant could elect to provide such a report in recognition of the issue.

4.5.6 External Flood Effects

An appropriate principle in floodplain management is to ensure that development within the floodplain does not increase the flood affectation or hazard upon other properties or persons. Hence, it is recommended that an engineer's report is provided for any development within the High Flood Risk FRP or for any subdivision works and filling in the Medium Flood Risk FRP to prove that the development will not increase flood affectation 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. As above, the applicant would be required to demonstrate that the issue has been addressed and Council engineers will assess the matter and determine whether an engineering report is nonetheless required in any particular case.

4.5.7 Car Parking

Damage to vehicles during floods can often be a major component of total damage costs. Enclosed car parking areas (eg. basements) are potentially dangerous during floods due to their ability to inundate quickly and unexpectedly when entrance points are over topped. Inappropriately designed driveways can also often constrain evacuation from individual properties. Accordingly, controls are proposed to address these issues in a practical way.

4.5.8 Evacuation/Access

These controls are aimed at ensuring that human life is protected by maximising opportunities to safely evacuate people outside of or above the floodplain. The

direction of evacuation will be dependent on warning times, duration of floods and available evacuation routes. For example, if warning times and flood duration are short, and roads out of the floodplain are blocked early in a flood, it can be more appropriate to require a refuge on-site above the PMF. The refuge must always be above the PMF when considering issues of human life, to avoid situations where persons evacuate to locations early during a flood which are eventually inundated as the flood becomes more extreme.

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.

4.5.9 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 waterway and floodplain potentially occurring during floods.

4.6 Section 149 Certificates

Section 149 (S149) certificates should not be used as broad community education tools 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. On the other hand, S149 certificates should not confuse or mislead those people who have access to them, with regard to understanding whether there are any risks of floods affecting a particular property.

It is desirable that all properties in the floodplain (i.e. up to the probable maximum flood) be notified. Notification may include the Flood Risk Precinct if known and the existence of the relevant DCP. If the property is 'potentially flood affected' this could 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 may not have been identified (eg. in local catchments). While it is considered that along the Georges River 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 determining what flood risk precinct applies to the site and 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 local catchment "major drainage" stormwater and overland flow. (Generally inundation from local catchment "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 can 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 suggested that the inundation status can 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 may be inundated but the flood behaviour has not been quantified to the extent noted in Category A above or a flood study is needed to determine if the property is flood affected. 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 for consideration for S149 (2) certificates for the Georges River Councils is presented in **Appendix G**. For any property generally within the LGA, one of the three categories A, B or C may apply in respect of flooding from creeks/rivers and another of the categories for stormwater/overland flow from local catchments. A matrix of possible outcomes is possible as indicated in **Appendix G**. Only a portion of these outcomes will normally apply within the study area, however all possible outcomes have been included for completeness.

For S149 (5) certificates, it is recommended that consideration be given to providing a flood certificate 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 from local catchments) the certificate could provide additional details of the potential flood affectation and/or suggest that the Applicant contact Council's Stormwater/Flooding Engineer for further details.

5.0 CONCLUSION AND SUMMARY OF RECOMMENDED PLANNING MEASURES

Having regard to the above discussion, the following planning measures are recommended for consideration by Council. Each Council will need to review each recommendation having regard to a broad range of issues, inclusive of comments received during public exhibition, prior to adopting the final Floodplain Risk Management Plan:

(a) That the Floodplain Management Committee (FMC) endorse the planning approach outlined within this report. This approach basically requires 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 the FMC formally endorses the recommended changes to the Georges River REP provided at **Appendix A**, for referral to Department of Infrastructure, Planning & Natural Resources.

(c) That each 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 Sutherland Council give force to discouraging building in the High Flood Risk Precinct by utilising foreshore building line provisions embodied within LEPs and the other Councils utilise alternate suitable mechanisms as outlined above primarily being a review of zonings within the High FRP having regard to the ambit of planning considerations inclusive of flooding.

(e) That each Council adopt or amend their current DCPs and/or Policies in the manner outlined above and so to generally accord with the Model DCPs appended to this report for each of the four study area Councils (refer to **Appendices C** to **F**).

(f) That each Council consider the need to include flooding advice on S149 Certificates that includes the flood risk of a property and the existence of any policies affecting development. Any such notation should have retard to the level of information (having regard to both local overland flooding and creek/riverine flooding and should preferably provide for notification up to the PMF. A suggested wording for S149 notations is included in **Appendix G**. Other wordings could also be developed by the Councils to suit their own particular circumstances.

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 Consulting Pty Ltd and Don Fox Planning Pty Ltd , October 1997, *'Land Use Planning and Development Control Measures'*, Hawkesbury-Nepean Flood Management Strategy, prepared for the Hawkesbury-Nepean Flood Management Advisory Committee.

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APPENDIX A

GENERAL PROVISIONS REGARDING RECOMMENDED AMENDMENTS TO GMREP NO. 2 – GEORGES RIVER CATCHMENT

OBJECTIVES

Insert as Objective 1(g) the following:

> *To minimise the risk to human life and damage to property caused by flooding.*

GENERAL AND SPECIFIC PLANNING PRINCIPLES

Add the following general principle to clause 8:

> *(f1) Any floodplain risk management plan prepared and adopted by Council in accordance with the State Government's Floodplain Management Manual dated 2001.*

Replace sub-clause 8(3) with the following:

> *(3) All development on flood liable land should avoid the following:*
>
> - *A diminution of the benefits of periodic flooding to wetland and other riverine ecosystems.*
> - *Pollution hazards resulting in the event of a flood.*
> - *Any detrimental increase in the potential flood affectation of other development or property.*
> - *An unacceptable increased risk to human life.*
> - *The potential for additional economic and social cost to arise as a result of flooding, which could not reasonably be managed by potentially affected persons and the general community.*
> - *An adverse affect on the environment of the floodplain resulting from avoidable erosion, siltation, unnecessary destruction of riverbank vegetation or reduction in the stability of the river bank.*
> - *The development having an unacceptable impact when considered in combination with the cumulative impact of development which is likely to occur in the future, within the same floodplain.*

PLANNING CONTROL AND CONSULTATION TABLE

Where the planning controls specify that a development is prohibited where proposed on flood liable land, the following words to be placed thereafter such a reference within a provision:

(unless otherwise consistent with a floodplain risk management plan,. adopted by Council, and prepared in accordance with the Floodplain Management Manual dated 2001 as published by the State Government.

DEFINITIONS

Review the definition of terms provided within the Dictionary at the conclusion of the REP, by:

- Deleting the definitions of ***floodplain***, ***flood liable land*** and ***flood prone land*** and replace with the following:

  Flood liable land *(being synonymous with* ***flood prone land*** *and* ***floodplain****) means land identified in an environmental planning instrument as flood liable land*

Amend the definition of ***floodway*** so to insert the following after the word *"floods"* in the first sentence:

, or identified as subject to a high flood risk (using this term or cognate words) in a floodplain risk management plan adopted by Council and prepared in accordance with the Floodplain Management Manual dated 2001 (published by the State Government).

APPENDIX B

STANDARD RECOMMENDED LEP INCLUSIONS

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 a probable maximum flood (PMF).

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

OBJECTIVES

(...) To minimise the risk to human life and damage to property caused by natural hazards such as bushfire, land instability and flooding and to allow for more detailed controls for development on flood prone land to be implemented within a Development Control Plan.

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 effect on other development or property;

(c) result, to a substantial degree, in 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 Infrastructure, Planning and Natural

Resources, any relevant constituted Catchment Management Authority, 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.

EXEMPT & COMPLYING DEVELOPMENT

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

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

In regard to the Bankstown LEP, the following additional changes are recommended:

- Delete the words 'flood liable' from clause 9(d)

- In addition to the above words add the following to clause 10(1)(c)

"…(unless a site specific assessment prepared by Council concludes that development of the land would not give rise to flooding issues) …".

FORESHORE BUILDING LINES (FSBL)

Adopt a FSBL along the Georges River which is a distance from the River equal to the extent of the High Flood Risk Precinct but need not be less than any existing FSBL. Other criteria, such as protection of riparian corridors, could also be considered when establishing the FSBL. Consultation with DIPNR in regard to Part 3A Rivers and Foreshore Improvement Act requirements is also recommended.

ALTERNATE APPROACH TO USE OF FORESHORE BUILDING LINE TO EXCLUDE DEVELOPMENT FROM HIGH FLOOD RISK PRECINCTS

Insert following definition in dictionary of LEP:

> ***High Flood Risk Precinct*** means:
>
> Those parts of flood liable land where the depth and velocity of flood waters and evacuation difficulties would pose an unacceptable risk to types of development and activity, as indicated by hatching on the map.

Insert following clause in LEP:

> **Development in a High Flood Risk Precinct**
>
> ….. Notwithstanding any other provision of this plan, all development in a high flood risk precinct is prohibited, other than rebuilding, and alterations and additions to existing buildings, agriculture, forestry, recreation areas,

roads, utility installations (other than gas holders or generating works), extractive industries and mines.

Bankstown City Council

"..... all about managing our flood risks emanating from rivers, creeks, major drains and overland flow."

FLOOD RISK MANAGEMENT

Draft Development Control Plan (DCP) No. 9

Environmental Planning and Assessment Act, 1979

FLOOD RISK MANAGEMENT

Draft Development Control Plan (DCP) No. 9

Environmental Planning and Assessment Act, 1979

Prepared by Don Fox Planning
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Project No: P4925
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Date: May 2004

TABLE OF CONTENTS

LIST OF ATTACHED SCHEDULES

1.0 GENERAL

1.1 What is the Plan?

This document is to be known as the "Bankstown Flood Risk Management Development Control Plan" (DCP) No. 9. This Plan has been adopted by Council at its meeting of ..... in accordance with Section 72 of the Environmental Planning and Assessment Act, 1979 (Development Control Plans).

1.2 Why is This Plan Required?

In 1984, the State Government introduced its flood prone land policy applicable to New South Wales. 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. 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."*

To achieve this objective 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 is the least preferred option, being costly 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 merit based approach to be followed by local government when dealing with planning, development and building matters on flood prone land. 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).

This Plan 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, as identified for some floodplains, through the preparation of FRMS's and FRMP's.

1.3 To Which Applications Does the Plan Apply?

Council will take into consideration this Plan when determining development applications received in accordance with the Environmental Planning and Assessment Act, 1979.

This Plan does not propose to exempt any applications from the necessity to obtain a particular approval of the Council or other government agencies, where such a requirement would otherwise exist.

1.4 Where Does the Plan Apply?

The Plan applies to whole of the Local Government area, as depicted upon the DCP Map.

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

1.5 How Does the Plan Relate to Other Legislation and Regulations?

This Plan repeals Bankstown Flood Prone Land DCP No. 9A, Kelso Park, East Hills Levee Area Flood Prone Land DCP No. 9B, East Hills Flood Prone Land DCP No. 9C, and Carinya Road Area Picnic Point DCP No. 9D.

This Plan 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 (in particular Bankstown Local Environmental Plan (LEP) 2001, and Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment and other relevant Development Control Plans and policies adopted by Council.

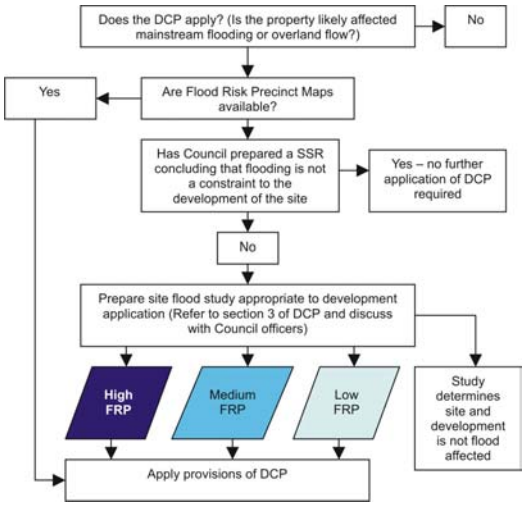
1.6 How to Use this Plan

Please read this document carefully and seek assistance from Council officers as required. The following is a summary of the major steps you should address:

(a) Check the proposal is permissible in the zoning of the land by reference to any applicable Environmental Planning Instrument (eg. Bankstown Local Environment Plan 2001).

(b) Consider any other relevant planning controls of Council (eg. controls in any other applicable DCP which governs the size and setback of development).

(c) Determine the applicable floodplain or component thereof (eg. Georges River, Kelso Park Levee Area, etc.) and flood risk precinct (low, medium or high) within which your site is situated. Enquire with Council regarding existing flood risk mapping or whether a site specific assessment may be warranted in your case (for example, if local overland flooding is a potential problem). A property may be located in more than one precinct and the assessment must consider the controls for each Precinct where relative to where located on the site. The flow diagram below summarises this consideration process.



(d) Determine the land use category relevant to your development proposal, by firstly confirming how it is defined by the relevant environmental planning

instrument and secondly by ascertaining the land use category from Schedule 2 of this Plan.

(e) Assess and document how the proposal will achieve the performance criteria for development and associated fencing provided by Clauses 2.4.2 and 2.5.2 of this Plan.

(f) Check if the proposal will satisfy the prescriptive controls for different land use categories in different flood risk precincts, as specified in Schedule 3 to 6 of this Plan depending on which floodplain the site is located.

If the proposal does not comply with the prescriptive controls, determine whether the performance criteria are nonetheless achieved.

Illustrations provided in this plan to demonstrate the intent of development controls are diagrammatic only. Proposals must satisfy all relevant controls contained in this plan and associated legislation.

The assistance of Council staff or an experienced floodplain consultant may be required at various steps in the process to ensure that the requirements of this Plan are fully and satisfactorily addressed.

Note: Compliance with all the requirements in this plan does not guarantee that an application will be approved.

1.7 What are the Aims of the Plan?

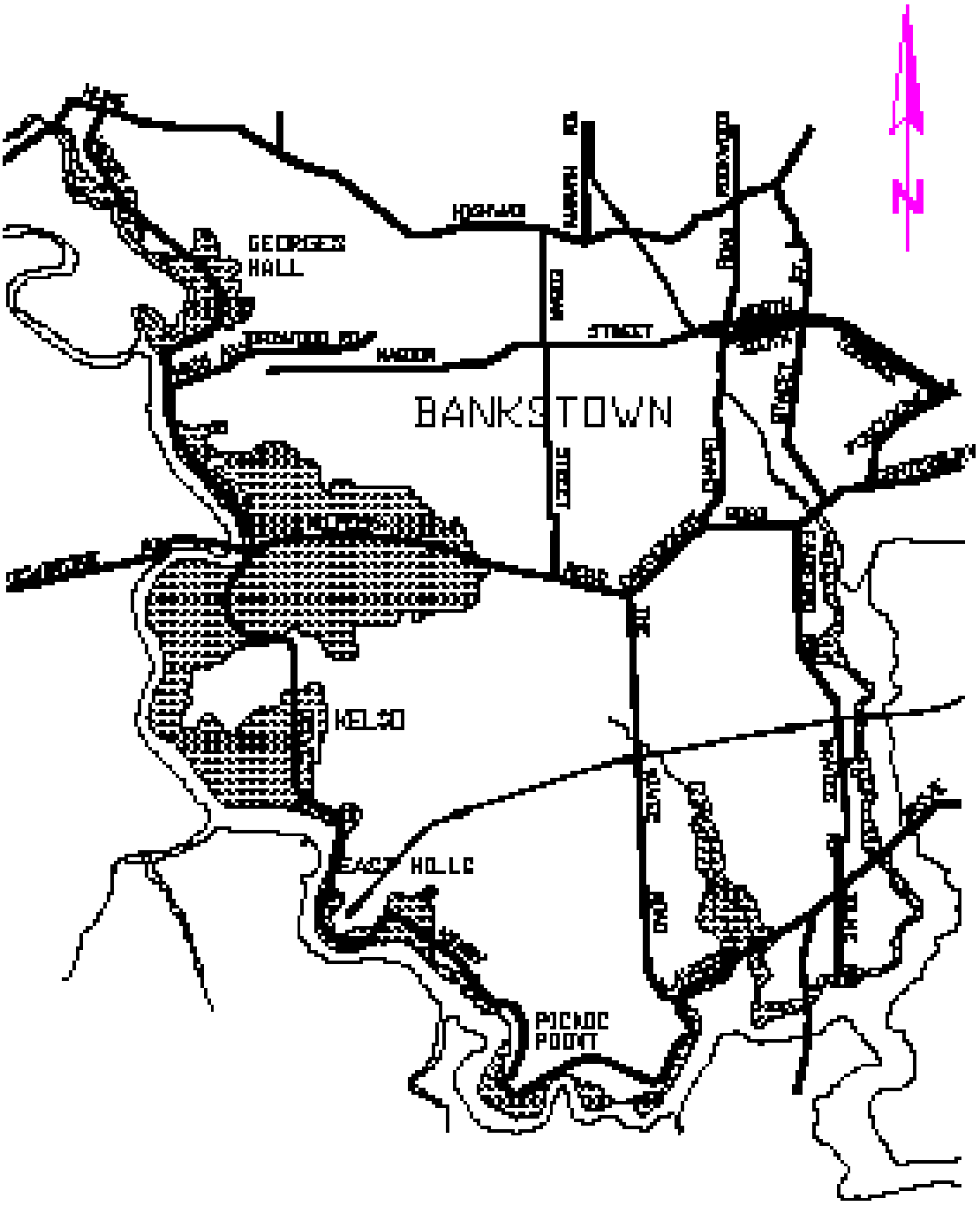
This Plan aims to:-

(a) Reduce the risk to human life and damage to property caused by flooding through controlling development on land affected by potential floods.

(b) Apply a "merit-based approach" to all development decisions which takes account of social, economic and environmental as well as flooding considerations in accordance with the principles contained in the FMM.

(c) 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 FRMS's and FRMP's.

DCP MAP



COUNCIL TO REPLACE WITH BETTER LGA BOUNDARY MAP
SHOWING AREAS WHERE EACH MATRIX APPLIES

2.0 WHAT ARE THE CRITERIA FOR DETERMINING APPLICATIONS?

2.1 General

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 (from Schedule 2);
- secondly, determine which floodplain and which part of that floodplain the land is located within (refer to Clause 2.3 and relevant flood risk mapping); and
- then apply the controls outlined under Clause 2.4.

Clause 2.5 provides specific requirements for fencing in the floodplain, while Clause 2.6 identifies special considerations which will apply only to some development in specific circumstances.

Clauses 2.4 and 2.5 which 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.

2.2 Land Use Categories

Eight 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 **Schedule 2.**

2.3 Flood Risk Precincts

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

- **High Flood Risk Precinct**

This is the area of land below the 100 year flood that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties.

> **Note:** The high flood risk precinct is where high flood damages, potential risk to life, evacuation problems would be anticipated or development would significantly and adversely effect flood behaviour. Most development should be restricted in this precinct. In this precinct, there would be a significant risk of flood damages without compliance with flood related building and planning controls.

- **Medium Flood Risk Precinct**

This is land below the 100 year flood that is not subject to a high hydraulic hazard and where there are no significant evacuation difficulties.

> **Note:** In this precinct there would still be a significant risk of flood damage, but these damages can be minimised by the application of appropriate development controls.

- **Low Flood Risk Precinct**

This is defined as all other land within the floodplain (ie. within the extent of the probable maximum flood) but not identified within either the High Flood Risk or the Medium Flood Risk Precinct.

> **Note:** The Low Flood Risk Precinct is 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.

2.4 Which Controls Apply to Proposed Developments?

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 exists, council's interim considerations. The categories applicable to each floodplain are depicted on the planning matrices contained in the following schedules:

- **Schedule 3** –Georges River Floodplain (excluding components of this floodplain referred to separately)
- **Schedule 4A** – Carinya Road Area, Picnic Point – refer to Map 2 (Schedule 4B provides a compilation of controls for residential development for this floodplain component)
- **Schedule 5** – Kelso Park, East Hills Levee Area – refer to Map 3.
- **Schedule 6** – All other floodplains (including land affected by major overland flow from local catchments). ***[To be prepared by Council as part of DCP preparation process under the EPA Act and/or as an outcome of other catchment specific Flood Risk Management Plans as required by the Floodplain Management Manual].***

2.4.1 Objectives

(a) Require developments with high sensitivity to flood risk to be designed so that they are subject to minimal risk.

(b) Allow development with a lower sensitivity to the flood hazard to be located within the floodplain, provided the risk of harm and damage to property is minimised.

(c) To minimise the intensification of the High Flood Risk Precinct or floodways, and if possible, allow for their conversion to natural waterway corridors.

(d) Ensure design and siting controls required to address the flood hazard do not result in unreasonable social, economic or environmental impacts upon the amenity or ecology of an area.

(e) Minimise the risk to life by ensuring the provision of reliable access from areas affected by flooding.

(f) To minimise the damage to property, including motor vehicles arising from flooding.

(g) To ensure the proposed development does not expose existing development to increased risks associated with flooding.

2.4.2 Performance Criteria

(a) The proposed development should not result in any significant increased in risk to human life, or in a significant increase in economic or social costs as a result of flooding..

(b) The proposal should only be permitted where effective warning time and reliable access is available to an area free of risk from flooding, consistent with any relevant or flood evacuation strategy.

(c) Development should not significantly increase the potential for damage or risk on other properties either individually or in combination with the cumulative impact of development that is likely to occur in the same floodplain.

(d) Motor vehicles are able to be relocated, undamaged, to an area with substantially less risk from flooding, within effective warning time.

(e) Procedures would be in place, if necessary, (such as warning systems, signage or evacuation drills) so that people are aware of the need to evacuate and relocate motor vehicles during a flood and are capable of identifying the appropriate evacuation route.

(f) To minimise the damage to property, including motor vehicles arising from flooding.

(g) 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.

2.4.3 Prescriptive Controls

Schedules 3 to 6 outline the controls relevant to each of the floodplains to which this Plan applies.

2.5 Are There Special Requirements for Fencing?

2.5.1 Objectives

(a) Ensure that fencing does not result in the undesirable obstruction of the free flow of floodwaters.

(b) Ensure that fencing does not become unsafe during floods so as to threaten the integrity of structures or the safety of people.

2.5.2 Performance Criteria

(a) Fencing is to be constructed in a manner which does not significantly increase flood damage or risk on surrounding land.

(b) Fencing shall be certified by a suitably qualified engineer, that the proposed fencing is adequately constructed so as to withstand the forces of floodwaters, or collapse in a controlled manner to prevent the undesirable impediment of flood waters.

2.5.3 Prescriptive Controls

2.5.3.1 All fencing within a High FRP will require a development application.

2.5.3.2 An applicant will need to demonstrate that the fence (new or replacement 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;

(b) Other than a brick or other masonry type fence (which will generally not be permitted); or

(c) A fence type and siting criteria as prescribed by Council.

2.6 Special Considerations

2.6.1 General

2.6.1.1 This section applies to all areas where this Policy applies.

2.6.1.2 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 direct or cumulative 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) Proposals for house raising must demonstrate the raised structure will not be at risk of failure from the forces of floodwaters and will not result in significant adverse impacts upon the amenity and character of an area.

(c) Notwithstanding any other provision where a property is identified within a Voluntary Acquisition Scheme area, Council will only consent to:

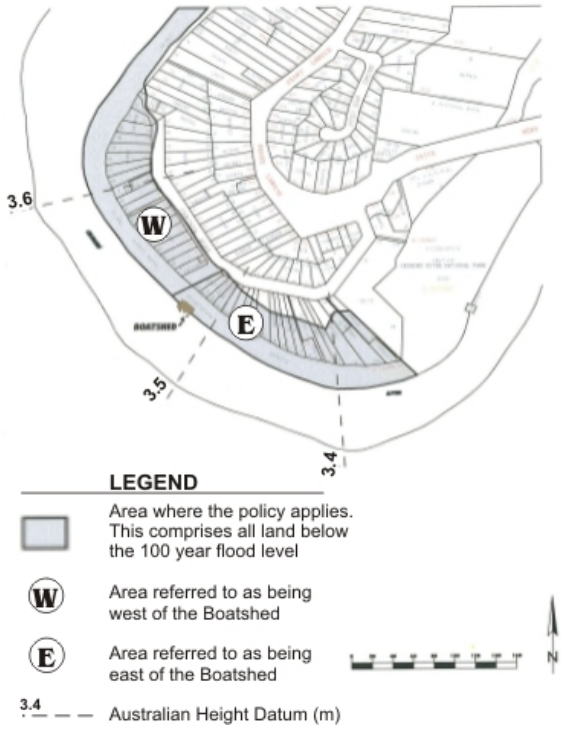
(i) development for minor works such as small awnings over existing floor balconies or in-ground swimming pools; and

(ii) the capital investment intended for the property is not greater than the minimum required to provide an acceptable proposal.

Note: Council will not permit any type of development which would be inconsistent with the objective of discouraging further development in areas of high risk and with Council's commitment to the Voluntary Acquisition Scheme.

2.6.2 Carinya Road Area, Picnic Point

2.6.2.1 This section applies to only the Carinya Area, Picnic Point floodplain. (Refer to Map 2)



Map 2 Carinya Road Area, Picnic Point

2.6.2.2 Subdivision and Density Standards

Proposed development must comply with the following residential density standards:

Area	**Maximum Residential Dwelling Density**
East of the boatshed	1 dwelling/650m^2 of site area
West of the boatshed	1 dwelling/500m^2 of site area

For subdivision, refer to Bankstown LEP 2001.

2.6.2.3 Scenic Quality and Amenity Considerations

(i) The maximum height of buildings shall not exceed 9m to the topmost point of the structure from the existing ground level below.

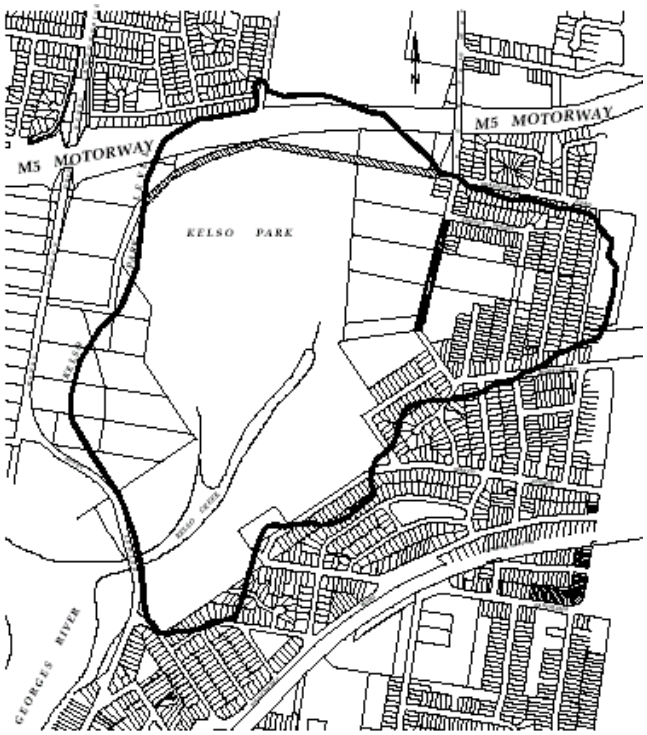
(ii) The relevant flood risk management related development controls are provided in Schedule 4.

(iii) Where the proposed buildings are required to be elevated, the building needs to be designed to conform with the scale and character of existing development in the area;

(iv) The design of elevated walkways will need to address: privacy, overshadowing and impact on the scenic quality of the area. The length of the walkways should be minimised by locating dwellings as close as possible to Carinya Road.

2.6.3 Kelso Park, East Hills Levee Floodplain

2.6.3.1 This section applies only to land protected by the Kelso Park Levee in East Hills. (Refer to Map 3)



Map 3 Kelso Park, East Hills Levee Area

The Kelso Park Levee was constructed for the purpose of protecting the properties behind the Levee from flooding from the Georges River. The levee provides protection for floods at least as high as the 100 year flood.

However, some of the properties protected by the Levee may still be inundated by local stormwater flooding, though to a lesser degree. This would result from the escape of local stormwater being prevented by the Levee and the closure of floodgates in the Levee during flooding of the Georges River, or by levee failure and/or overtopping in rare events.

2.6.3.2 Any approval for the erection or extension of a dwelling or other building on land to which this DCP applies shall be accompanied by the following advice:

"A Levee known as the Kelso Park Levee has been constructed for the purpose of protecting this property and a large number of other

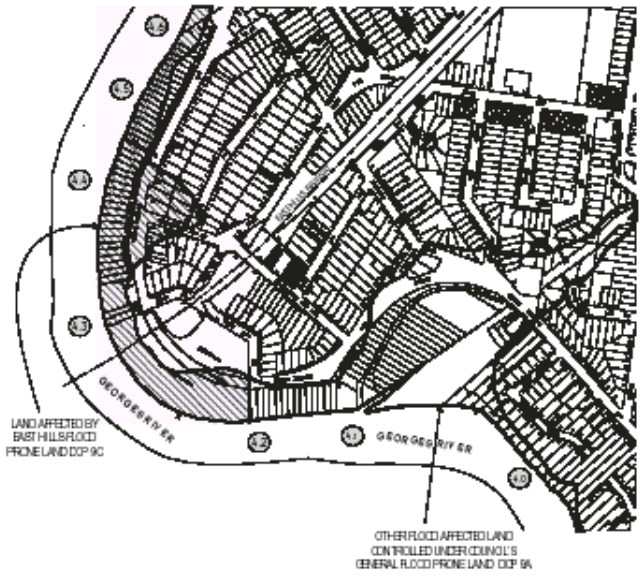
properties behind the Levee from flooding from the Georges River. The Levee could be overtopped in floods greater than the 100 year event"

2.6.3.3 In the case of properties shown edged in heavy black and also shown shaded on Map 3 attached to this DCP, approvals for the erection or extension of a dwelling or other building shall be accompanied by the advice in 2.6.3.2 and also the following advice:

"Council's adopted 1 in 100 year level in respect of localised and stormwater flooding in the 1 in 100 year flood event for properties that are behind the Kelso Levee is 3.75m AHD."

2.6.4 East Hills Floodplain

2.6.4.1 This section of the plan applies to only that land at East Hills. (refer to Map 4).



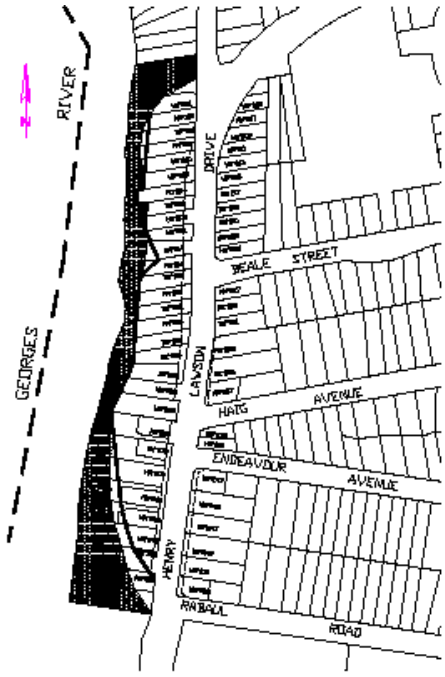
Map 4 East Hills Floodplain

2.6.4.2 All new dwellings, raised dwellings, relocated houses, major additions and dual occupancies shall have direct fail-safe pedestrian access to land above the PMF flood level.

2.6.4.3 Notwithstanding 2.6.4.2 above, the construction of an external staircase to the street boundary will be accepted as satisfactory access for numbers 528 to 558 Henry Lawson Drive for new dwellings, dual occupancies, raised dwellings, relocated houses and major additions provided the dwelling stands on the 5.5m building line. However, dual occupancies will only be permitted where the proposed flood mitigation works have been completed and after considering the effectiveness of proposed flood evacuation measures.

2.6.5 Rabaul Road Floodplain

2.6.5.1 This section applies only to the Rabaul Road Floodplain. (Refer Map 5).



Map 5 Rabaul Road Floodplain

2.6.5.2 Notwithstanding any other provisions of this Plan, Council may consider applications, which involve minor encroachment onto the High Flood Risk Precinct of the Rabaul Road Floodplain, but only where no other opportunity exists for redevelopment elsewhere on the site and provided all the relevant requirements of this DCP are met.

2.6.5.3 Notwithstanding the provisions of 2.6.5.2 above and

provided any new building work complies with the relevant requirements of this Plan.

(a) Council would be prepared to consider applications for minor additions to the existing building at H.No. 56 Rabaul Road, subject to the inclusion of safe emergency access for the occupants of the first floor residence. No additional residential development will be permitted at ground floor level, nor will any occupation of the existing unauthorised lower ground floor unit be permitted for residential purposes.

Note: Council considers the access arrangements which currently exist for the occupants of the first floor residence at H.No. 56 Rabaul Road to be potentially hazardous.

(b) A dwelling may be permitted on H.No. 248A Henry Lawson Drive and provided a safe evacuation route from the eastern wall of the dwelling to a medium FRP.

SCHEDULE 1
FLOOD COMPATIBLE MATERIALS

BUILDING COMPONENT	FLOOD COMPATIBLE MATERIAL	BUILDING COMPONENT	FLOOD COMPATIBLE MATERIAL
Flooring and Sub-floor Structure	" concrete slab-on-ground monolith construction " suspension reinforced concrete slab.	**Doors**	" solid panel with water proof adhesives " flush door with marine ply filled with closed cell foam " painted metal construction " aluminium or galvanised steel frame
Floor Covering	" 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	**Wall and Ceiling Linings**	" 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
Wall Structure	" solid brickwork, blockwork, reinforced, concrete or mass concrete	**Insulation** **Windows**	" 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	**Nails, Bolts, Hinges and Fittings**	" brass, nylon or stainless steel " removable pin hinges " hot dipped galvanised steer wire nails or similar

Electrical and Mechanical Equipment For dwellings constructed on land to which this Policy applies, the electrical and mechanical materials, equipment and installation should conform to the following requirements.	**Heating and Air Conditioning Systems** 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.
Main power supply - 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.	**Fuel -** 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.
Wiring - 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.	**Installation -** 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.
Equipment - All equipment installed below or partially below the relevant flood level should be capable of disconnection by a single plug and socket assembly.	**Ducting -** 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.
Reconnection - 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.	

SCHEDULE 2
LAND USE CATEGORIES

Critical Uses and Facilities	Sensitive Uses and Facilities	Subdivision	Residential
Community facility which may provide an important contribution to the notification or evacuation of the community during flood events; Hospitals; and Nursing Homes.	Communication facilities; Hazardous or offensive industry or storage establishment; Housing for older persons or persons with a disability; institutions; Liquid fuel depot; Public utility undertakings (including generating works) which are essential to evacuation during periods of flood or if affected would unreasonably affect the ability of the community to return to normal activities after flood events; and Waste disposal.	Subdivision of land which involves the creation of new allotments, with potential for further development.	Bed and breakfast establishments; Boarding houses; Camp or caravan park site – long-term sites only (1); Community facility (other than sensitive uses and facilities); Dual occupancy; Dwelling; Dwelling house; Educational establishments; Family day care centre; Family housing; Health consulting rooms; Home based child care centre; Home business; Home office; Group homes; Residential flat building; Row houses; Serviced apartments; Utility installations (other than critical utilities); and Villas.

(1) As defined by the Local Government (Caravan Park and Camping Grounds) Transitional Regulation 1993.

Commercial or Industrial	Tourist Related Development	Recreation or Non-urban Uses	Concessional Development
Amusement centres; Brothels; Bulky goods salesroom or showroom; Business premises; Car parks; Centre based child care centres; Convenience stores; Depot; Entertainment establishment; Entertainment facility; Heliports; Highway service centre; Hotel Industry; Junkyard; Light industry; Materials recycling yard; Medical centre; Motel; Motor showroom; Offensive industry; Offensive or hazardous storage establishment; Office premises; Passenger transport terminal; Place of public worship; Public building; Recreation facility which includes a bowling alley, pinball and video parlour, pool hall or like development; Registered club; Research establishment; Research facility; Restaurant; Restricted premises; Roadside stall; Road transport terminal; Service station; Shop; Transport depot; Vehicle body repair workshop; Vehicle repair station; Veterinary hospital; and Warehouse or distribution centre.	Camp or caravan site – short term sites (1) only	Agriculture; Animal boarding or training establishments; Boat sheds; Dam; Extractive industry; Helicopter landing site; Jetties; Marina; Mine; Recreation areas and minor ancillary structures (eg. toilet blocks or kiosks/cafes); Recreation facilities other than those categorised under "commercial or industrial"; Retail plant nurseries; Sanctuary; Swimming pools; and Turf farming.	(a) In the case of residential development: (i) An addition or alteration to an existing dwelling of not more than 50m^2 of the habitable floor area which existed at the date of commencement of this Plan; (ii) The construction of an outbuilding with a maximum floor area of 30m^2; or (iii) Rebuilt dwellings which substantially reduce flood risk having regard to property damage and personal safety; or (iv) A change of use which does not increase flood risk having regard to property damage and personal safety. (b) In the case of other development: (i) An addition to existing premises of not more than 10% of the floor area which existed at the date of commencement of this DCP; (ii) Rebuilding of a development which substantially reduces the extent of flood effects to the existing development; (iii) A change of use which does not increase flood risk having regard to property damage and personal safety; or (iv) Subdivision which does not involve the creation of new allotments with potential for further development.

(1) As defined by the Local Government (Caravan Park and Camping Grounds) Transitional Regulation 1993.

Schedule 3

Georges River Floodplain

Planning & Development Controls

Planning Consideration	Flood Risk Precincts (FRP's)																			
	Low Flood Risk								**Medium Flood Risk**								**High Flood Risk**							
	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development
Floor Level		3		2,6,7	5,6,7	2,6,7	1,6	4,7				2,6,7	5,6,7	2,6,7	1,6	4,7							1,6	4,7
Building Components		2		1	1	1	1	1				1	1	1	1	1							1	1
Structural Soundness		3		2	2	2	2	2				1	1	1	1	1							1	1
Flood Effects		2	2	2	2	2	2	2			1	2	2	2	2	2							1	1
Car Parking & Driveway Access		1,3,5, 6,7		1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,4,6, 7	6,7,8				1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,4,6, 7	6,7,8							2,4,6, 7	6,7,8
Evacuation		2,3,4	6	2,3	1 or 2, 3	2,3	4,3	2,3			6	2,3	1,3	2,3	4,3	2,3							4,3	2,3
Management & Design		4,5	1		2,3,5	2,3,5	2,3,5	2,3,5			1		2,3,5	2,3,5	2,3,5	2,3,5							2,3,5	2,3,5

COLOUR LEGEND : Not Relevant Potentially Unsuitable Land Use

General Notes

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. This matrix identifies where flood risks are likely to determine where certain development types will be considered "potentially 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	Refer to Section 2.5 of the DCP for planning considerations for proposals involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effects and Structural Soundness planning considerations of the applicable landuse category.
5	Refer to section 2.7 of the DCP for special considerations such as for house raising proposals and development of properties identified for voluntary acquisition.
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 LGA.
7	From time to time, Council may adopt mapping showing the *Boundary of Significant Flow* and/or *Flood Storage Areas* for this floodplain. Refer to Council to find out if these areas have been defined and mapped for this floodplain.

Floor Level

1	All floor levels to be no lower than the 20 year flood unless justified by site specific assessment.
2	*Habitable floor* levels to be no lower than the 100 year flood level plus freeboard.
3	*Habitable floor* levels to be no lower than the *PMF* level. Non-*habitable floor* levels to be no lower than the *PMF* level unless justified by a site specific assessment.
4	Floor levels to be no lower than the *design floor level*. 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	The level of *habitable floor areas* to be equal to or greater than the 100 year *flood* level plus *freeboard*. If this level is impractical for a development in a Business zone, the floor level should be as high as possible.
6	Non-habitable floor levels to be no lower than the 20 year flood unless justified by site specific assessment.
7	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 more than 1.5m above finished ground level, confirming that the undercroft area is not to be enclosed.

Building Components & Method

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

Structural Soundness

1	Engineer's report to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus *freeboard*.
2	Applicant to demonstrate that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus *freeboard*. An engineer's report may be required.
3	Applicant to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a *PMF* An engineers report may be required.

Flood Effects

1	Engineer's report required to certify that the development will not increase flood effects elsewhere, having regard to: (I) loss of flood storage; (ii) changes in flood levels and velocities caused by alterations to the flood *conveyance*; and (iii) the cumulative impact of multiple potential developments in the floodplain.
2	The flood impact of the development to be considered to ensure that the development will not increase flood effects elsewhere, having regard to: (I) loss of flood storage; (ii) changes in flood levels and velocities caused by alterations to the flood *conveyance*; and (iii) the cumulative impact of multiple potential developments in the floodplain. An engineer's report may be required.

Note: (1) If a *Boundary of Significant Flow* has been defined for this floodplain, any development inside this area will normally be unacceptable as it will reduce flood conveyance and increase flood effects elsewhere. (2) If a *Flood Storage Area* has been defined for this floodplain, any filling of the floodplain inside this area (except where this occurs by compensatory excavation), will normally be unacceptable as it will reduce the volume of flood storage available on the floodplain and increase flood effects elsewhere. (3) Even where a *Boundary of Significant Flow* and/or a *Flood Storage Area* have been defined, development outside these areas may still increase flood effects elsewhere and therefore be unacceptable.

Car Parking and Driveway Access

1	The minimum surface level of open car parking spaces or carports shall be as high as practical, but no lower than the 20 year flood or the level of the crest of the road at the location where the site has access. In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 20 year flood.
2	The minimum surface level of open car parking spaces, carports or garages, shall be as high as practical.
3	Garages capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, or *enclosed car parking,* must be protected from inundation by floods equal to or greater than the 100 year flood.
4	The driveway providing access between the road and parking space 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 space shall be no lower than 0.3m below the 100 year flood or such that the depth of inundation during a 100 year flood is not greater than either the depth at the road or the depth at the car parking space. A lesser standard may be accepted for single detached dwelling houses where it can be demonstrated that risk to human life would not be compromised.
6	*Enclosed car parking and car parking areas accommodating more than 3 vehicles (other than on Rural zoned land), with a floor level below the 20 year flood or more than 0.8m below the 100 year flood level, shall have adequate warning systems, signage and exits.*
7	Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year flood
8	Driveway and parking space levels to be no lower than the *design ground/floor levels*. Where this is not practical , a lower level may be considered. In these circumstances, the level is to be as high as practical, and, when undertaking alterations or additions, no lower than the existing level.

Note: (1) A flood depth of 0.3m is sufficient to cause a typical vehicle to float. (2) *Enclosed car parking* is defined in the glossary and typically refers to carparks in basements.

Evacuation

1	Reliable access for pedestrians or vehicles required during a 100 year flood.
2	Adequate flood warning is available to allow safe and orderly evacuation without increased reliance upon the SES or other authorised emergency services personnel.
3	The development is to be consistent with any relevant *flood evacuation strategy, Flood Plan adopted by Council* or similar plan.
4	The evacuation requirements of the development are to be considered. An engineers report will be required if circumstances are possible where the evacuation of persons might not be achieved within the *effective warning time*.
5	Reliable access for pedestrians or vehicles required to a publicly accessible location above the *PMF*.
6	Applicant to demonstrate that evacuation in accordance with the requirements of this DCP is available for the potential development flowing from the subdivision proposal.

Management and Design

1	Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this DCP.
2	*Site Emergency Response Flood Plan* required where floor levels are below the *design floor level,* (except for single dwelling-houses).
3	Applicant to demonstrate that area is available to store goods above the 100 year flood level plus *freeboard.*
4	Applicant to demonstrate that area is available to store goods above the *PMF* level.
5	No storage of materials below the *design floor level* which may cause pollution or be potentially hazardous during any flood.

Schedule 4A

Carinya Road, Picnic Point Floodplain

Planning & Development Controls

Planning Consideration	Flood Risk Precincts (FRP's)																	
	Low Flood Risk									Medium & High Flood Risk								
	Sensitive Uses & Facilities	Critical Utilities & Uses	Subdivision	Residential (General including new & rebuilt dwellings)	Residential (alterations & additions other than concessional development)	Residential (house raising)	Residential (outbuildings eg. Garages, carports, garden sheds, swimming pools)	Recreation & Non-Urban	Concessional Development	Sensitive Uses & Facilities	Critical Utilities & Uses	Subdivision	Residential (General including new & rebuilt dwellings)	Residential (alterations & additions other than concessional development)	Residential (house raising)	Residential (outbuildings eg. Garages, carports, garden sheds, swimming pools)	Recreation & Non-Urban	Concessional Development
Floor Level		3	6	2,5	2				2,4			6	2,5	2	2	5	1	2 or 4
Building Components		2		1	1				1				1	1	1	1	1	1
Structural Soundness		3		2									1	1	1	1#,2	2	1#,2
Flood Affectation		2	2	2,3	2							1	2,3	1,3	1,3	1,3	2	1,3
Evacuation		3,5	[1,2] *	1,2,4	1,4							[1,2] *	1,2,4	1#,4	1,4		3,4	
Management & Design		4,5	1,7									1,7	2,3,5,6,7,8	2,5,6,7,8	2,5,6,8	5,6	2,3,5	3,5,8

Not Relevant

Potentially Unsuitable Land Use

Freeboard equals an additional height of 500mm

* Refer to *'Management & Design'* planning consideration for subdivision

\# Desirable but not mandatory. Will be considered by Council on the merits of each application

Note: 1. Filling of the site, where acceptable to Council, may change the FRP considered to determine the controls applied in the circumstances of individual applications.

2. 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.

3. Alterations & additions (except concessional development) are not permitted for existing dwellings which have *habitable floor areas* below the 100 year *flood* level plus 0.5m *freeboard*.

4. 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. This matrix identifies where flood risks are likely to determine where certain development types will be considered "potentially unsuitable" due to flood related risks.

Floor Level

1. All Floor Levels to be equal to or greater than the 20 year *flood* level plus *freeboard* unless justified by site specific assessment
2. *Habitable floor* levels to be equal to or greater than the 100 year *flood* level plus *freeboard*
3. All Floor Levels to be equal to or greater than the *PMF flood* level plus *freeboard*
4. Floor levels to be as close to the *design floor level* as practical & no lower than the existing floor level when undertaking alterations or additions
5. On allotments west of the boat shed with vehicle access to Carinya Road, which have new or additional dwellings constructed after the date of commencement of this Plan, garages/carports/carspaces/driveways to have ground/floor levels equal to or greater than the 100 year *flood* level. Front of garage (if practical) to be located between the building line & Carinya Road, to
6. Restrictions to be placed on title advising of minimum floor levels required relative to flood level.

Building Components & Method

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

Structural Soundness

1. Engineers report to certify that any structure can withstand the forces of floodwater, debris & buoyancy up to & including a 100 year *flood* plus *freeboard*
2. Applicant to demonstrate that any structure can withstand the forces of floodwater, debris & buoyancy up to & including a 100 year *flood* plus *freeboard*
3. Applicant to demonstrate that any structure can withstand the forces of floodwater, debris & buoyancy up to & including a *PMF flood* plus *freeboard*

Flood Effects

1. Engineers report required to certify that the development will not increase *flood* effects elsewhere, if proposed filling covers more than 200sq.m and extends more than 25m from the Carinya Road frontage.
2. The impact of the development on flooding elsewhere to be considered
3. Limited filling will be considered for new dwellings in the area between new dwellings/garages and Carinya Road

Note: When assessing *flood* effects the following must be considered:
1. Loss of storage area in the *floodplain*
2. Changes in *flood* levels & velocities caused by alteration of conveyance of *flood* waters

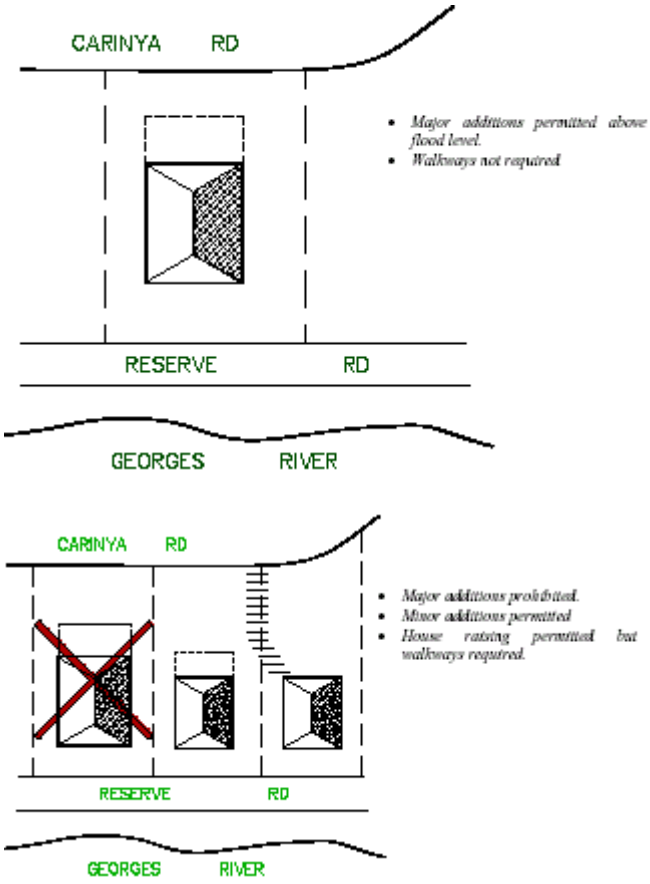
Evacuation

1. *Reliable and failsafe access* for pedestrians required at or above the 100 year *flood* level, and not more than 0.5m below the highest floor level. This access is to be adjacent the side boundary. Granting a R.O.W. to the adjoining owner is encouraged. In the case of subdivision this may be satisfied by the placement of a restriction as-to-user on the title of the land to be acted upon when a dwelling is developed
2. *Reliable and failsafe access* for vehicles (eg. garage, carport, driveway or carsoace) required at or above the 100 year *flood* level for allotments with frontage to Carinya Road and west of the boat shed, which have new or additional dwellings constructed after the date of commencement of this Plan.
3. *Reliable access* for pedestrians and vehicles required during a *PMF flood*
4. The development is to be consistent with any relevant *flood evacuation strategy* or similar plan

Management and Design

1. Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this Plan
2. *Site Emergency Response Flood plan* required.
3. Applicant to demonstrate that area is available to store goods above the 100 year *flood* level plus *freeboard*
4. Applicant to demonstrate that area is available to store goods above the *PMF* level plus *freeboard*
5. No external storage of materials below the 100 year *flood* level plus *freeboard,* which may cause pollution or be potentially hazardous during a *flood*

SCHEDULE 4B – CARINYA ROAD, PICNIC POINT FLOODPLAIN: COMPILATION OF DEVELOPMENT CONTROLS FOR RESIDENTIAL DEVELOPMENT

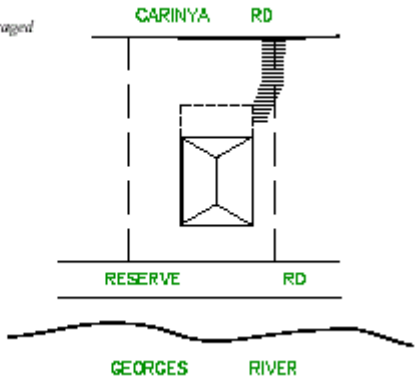
Type of Development	Requirements
1. Additions to an existing dwelling whose floor level is already raised at least 0.5m above the 100 year flood level 	• Habitable floor area extensions permitted at or above 100 year flood level plus 0.5m • Non-habitable floor area extensions permitted below 100 year flood level plus 0.5m • Outbuildings (garages, carports, sheds) permitted below the 100 year flood level, except for garages, driveways, carports, etc on allotments west of the boat shed, with frontage to Carinya Road. Refer to Section below. • Failsafe pedestrian access (walkways and stairs) encouraged but not mandatory. • Failsafe vehicular access (driveways and car space) generally encouraged but not mandatory. However, new or improved garages, carports, driveways, car spaces, etc on allotments west of the boat shed and with frontage to Carinya Road, must have ground/floor levels at or above the 100-year flood level. • Construction methods for non-habitable areas used below the 100-year flood level plus 0.5m must preclude the area from being converted into a habitable room. Acceptable methods include single brick walls with roller shutter doors at opposite sides, lattice walling and the like. These construction methods will also assist in reducing damage during floods and will facilitate cleaning after a flood event. • Construction materials used below the 100-year flood level plus 0.5m must comply with Schedule 3.

SCHEDULE 4B – CARINYA ROAD, PICNIC POINT FLOODPLAIN: COMPILATION OF DEVELOPMENT CONTROLS FOR RESIDENTIAL DEVELOPMENT

Type of Development	Requirements
	• Applications must include a certificate from a practising Structural Engineer verifying that the structure can withstand the force of flood waters (from debris and buoyancy) from a flood up to 1m above the 100 year level. • S.149 Certificates to notify affectation by the 100-year flood. • No external storage of materials (which may be hazardous during floods) below the 100 year flood level plus 0.5m. • Allotment stormwater drainage to be designed to avoid adverse impact on adjoining properties.

Note: In the event of inconsistencies between Schedule 4A and Schedule 4B, Schedule 4A applies.

SCHEDULE 4B – CARINYA ROAD, PICNIC POINT FLOODPLAIN: COMPILATION OF DEVELOPMENT CONTROLS FOR RESIDENTIAL DEVELOPMENT

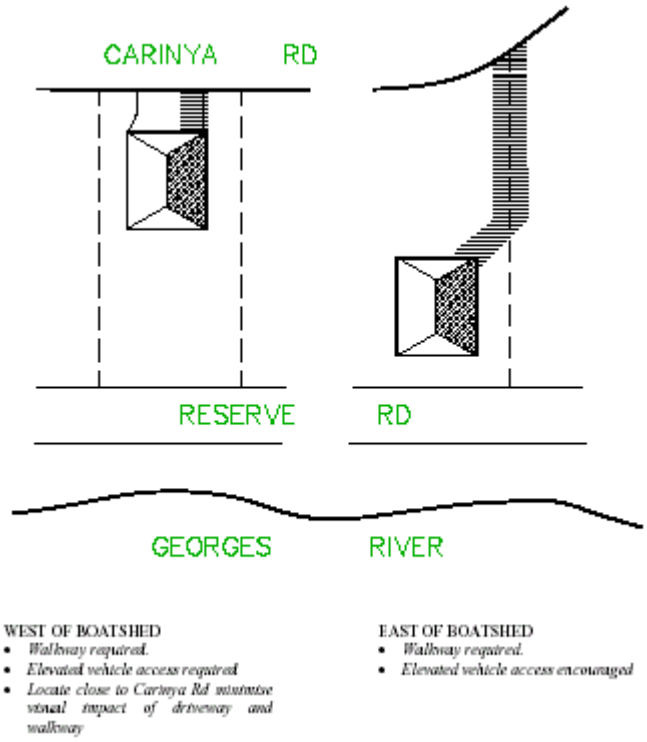
Type of Development	Requirements
2. Additions to an existing dwelling NOT already raised at least 0.5m above the 100-year flood level, including house raising . *HOUSE RAISING:* • *Walkway required.* • *Elevated vehicle access encouraged*  	**ADDITIONS ARE NOT PERMITTED, EXCEPT FOR MINOR ADDITIONS AND HOUSE RAISING** • Desirably, habitable floor levels to be equal to or above the 100 year flood level plus 0.5m. The floor level of minor additions are permitted below this level (but not below the existing floor level). • Non habitable floor area extensions are permitted below the 100-year flood level plus 0.5m. • Outbuildings (garages, carports, sheds) permitted below the 100 year flood level, except for garages, driveways, carports, etc on allotments west of the boat shed, with frontage to Carinya Road. Refer Section below. • Failsafe pedestrian access (walkways and stairs) is required for house raising. For minor additions, such access is encouraged but is not mandatory. • Failsafe vehicular access (driveways and car space) generally encouraged but not mandatory. • Construction methods for non-habitable areas used below the 100-year flood level plus 0.5m must preclude the area from being converted into a habitable room. Acceptable methods include single brick walls with roller shutter doors at opposite sides, lattice walling and the like. These construction methods will also assist in reducing damage during floods and will facilitate

SCHEDULE 4B – CARINYA ROAD, PICNIC POINT FLOODPLAIN: COMPILATION OF DEVELOPMENT CONTROLS FOR RESIDENTIAL DEVELOPMENT

Type of Development	Requirements
	cleaning after a flood event. • Construction materials used below the 100-year flood level must comply with Schedule 3. • Applications must include a certificate from a practising Structural Engineer verifying that the structure can withstand the force of flood waters (from debris and buoyancy) from a flood up to 1m above the 100 year level. • S.149 Certificates to notify affectation by 100-year flood. • No external storage of materials (which may be hazardous during floods) below 100 year flood level plus 0.5m. • Allotment stormwater drainage to be designed to avoid adverse impact on adjoining properties.

Note: In the event of inconsistencies between Schedule 4A above and Schedule 4B, Schedule 4A applies.

SCHEDULE 4B – CARINYA ROAD, PICNIC POINT FLOODPLAIN: COMPILATION OF DEVELOPMENT CONTROLS FOR RESIDENTIAL DEVELOPMENT

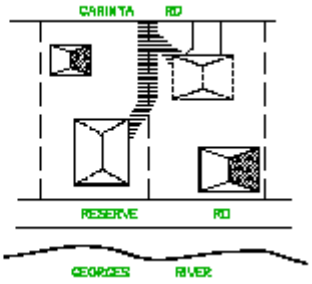
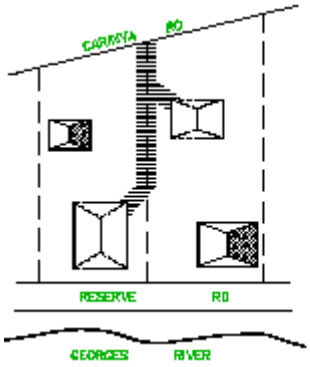
Type of Development	Requirements
3. Rebuilt dwellings  	• Habitable floor levels to be equal to or above the 100 year flood level plus 0.5m. • Non habitable floor area extensions are permitted below the 100-year flood level plus 0.5m. • Outbuildings (garages, carports, sheds) permitted below the 100 year flood level, except for garages, driveways, carports, etc on allotments west of the boat shed, with frontage to Carinya Road refer section below • Failsafe pedestrian access (walkways and stairs) is required. • Failsafe vehicular access (garages, carports, driveways, car spaces, etc) is required for allotments west of the boat shed and with frontage to Carinya Road, and must have ground/floor levels at or above the 100 year flood level. On other allotments, such access is encouraged but is not mandatory. • Construction methods for non-habitable areas used below the 100-year flood level plus 0.5m must preclude the area from being converted into a habitable room. Acceptable methods include single brick walls with roller shutter doors at opposite sides, lattice walling and the like. These construction methods will also assist in reducing damage during floods and will facilitate cleaning after a flood event. • Construction materials used below the 100-year flood level plus 0.5m must comply with Schedule 3.

SCHEDULE 4B – CARINYA ROAD, PICNIC POINT FLOODPLAIN: COMPILATION OF DEVELOPMENT CONTROLS FOR RESIDENTIAL DEVELOPMENT

Type of Development	Requirements
	• Applications must include a certificate from a practising Structural Engineer verifying that the structure can withstand the force of flood waters (from debris and buoyancy) from a flood up to 1m above the 100 year level. • S.149 Certificates to notify affectation by 100-year flood. • No external storage of materials (which may be hazardous during floods) below 100 year flood level plus 0.5m. • Allotment stormwater drainage to be designed to avoid adverse impact on adjoining properties. • Consideration should be given to locating new dwellings close to Carinya Road to minimise the impact of walkways and filling.

Note: In the event of inconsistencies between Schedule 4A and Schedule 4B, Schedule 4A applies.

SCHEDULE 4B – CARINYA ROAD, PICNIC POINT FLOODPLAIN: COMPILATION OF DEVELOPMENT CONTROLS FOR RESIDENTIAL DEVELOPMENT

Type of Development	Requirements
4. Additional dwellings WEST OF BOATSHED • *Walkway required for additional dwelling.* • *Elevated vehicle access required for additional dwellings where it fronts Carinya Rd* • *Sharing of walkways encouraged* • *Maximum density 1 dwelling / 500m squared*   EAST OF BOATSHED • *Walkway required for additional dwelling.* • *Elevated vehicle access encouraged where practical.* • *Walkway to existing dwelling not required unless it is rebuilt or raised.* • *Sharing of walkways encouraged* • *Maximum density 1 dwelling / 650m squared*	• Habitable floor levels to be equal or above the 100 year flood level plus 0.5m. • Non habitable floor areas are permitted below the 100 year flood level plus 0.5m. • Outbuildings (garages, carports, sheds) permitted below the 100 year flood level, except for garages, driveways, carports, etc on allotments west of the boat shed, with frontage to Carinya Road. See Section below. • Failsafe pedestrian access (walkways and stairs) is required. • Failsafe vehicular access (garages, carports, driveways, car spaces, etc) is required for allotments west of the boat shed and with frontage to Carinya Road, and must have ground/floor levels at or above the 100 year flood level. On other allotments, such access is encouraged but is not mandatory. • Construction methods for non-habitable areas used below the 100-year flood level plus 0.5m must preclude the area from being converted into a habitable room. Acceptable methods include single brick walls with roller shutter doors at opposite sides, lattice walling and the like. These construction methods will also assist in reducing damage during floods and will facilitate cleaning after a flood event. • Construction materials used below the 100 year flood level plus 0.5m must comply with Schedule 3. • Applications must include a certificate from a practising Structural Engineer verifying that

SCHEDULE 4B – CARINYA ROAD, PICNIC POINT FLOODPLAIN: COMPILATION OF DEVELOPMENT CONTROLS FOR RESIDENTIAL DEVELOPMENT

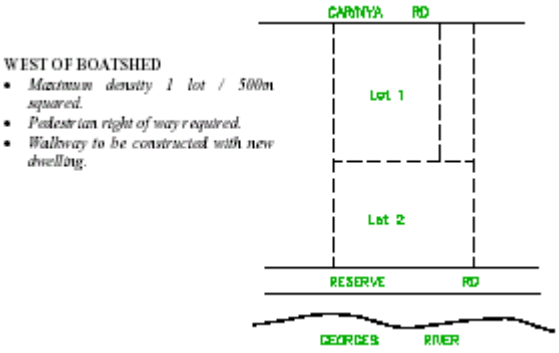
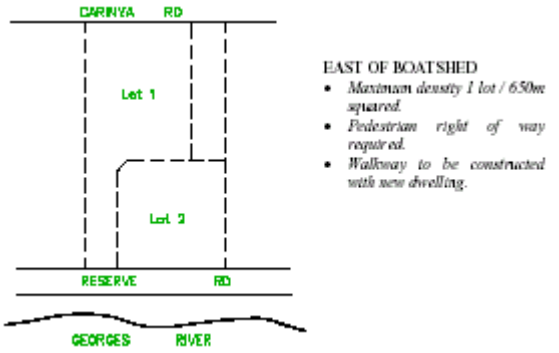
Type of Development	Requirements

	the structure can withstand the force of flood waters (from debris and buoyancy) from a flood up to 1m above the 100 year level.
	• S.149 Certificates to notify affectation by 100-year flood.
	• No external storage of materials (which may be hazardous during floods) below 100 year flood level plus 0.5m.
	• Allotment stormwater drainage to be designed to avoid adverse impact on adjoining properties.
	• Limited filling will be considered in the area between new dwellings/garages and Carinya Road subject to -
	  • It providing failsafe pedestrian and/or vehicular access.
	  • A maximum filled area of 200m2.
	  • Filling not to extend more than 25m from the Carinya Road frontage.
	  • Any additional filling will only be considered if a flood effects statement is submitted demonstrating minimal impact.
	• Provide a site flood plan.
	• Provide an area 0.5m above 100-year flood level for storage of goods.
	• Proposals should involve minimal impact on streetscape and adjoining properties. Plans and elevations showing visual impact on the streetscape and the impact on the amenity of adjoining properties will be required.
	• Consideration should be given to locating new dwellings close to Carinya Road to minimise the impact of walkways and filling.

Note: In the event of inconsistencies between Schedule 4A and Schedule 4B, Schedule 4A applies.

SCHEDULE 4B – DEVELOPMENT CONTROLS FOR RESIDENTIAL DEVELOPMENT (CONTINUED)

Type of Development	Requirements

5. Subdivision
 
 
	• Limited filling will be considered in the area between new dwellings/garages and Carinya Road subject to:
	  • it providing failsafe pedestrian and/or vehicular access;
	  • maximum filled area of 200m2;
	  • filling not to extend more than 25m from the Carinya Road frontage.
	  • Any additional filling will only be considered if a flood effects statement is submitted demonstrating minimal impact.
	• Failsafe pedestrian access (walkways and stairs) is required. Construction may be deferred until dwelling construction but a restriction as-to-user will be required identifying the access way on title.
	• Failsafe vehicular access (driveways and car space) is required on lots with frontage to Carinya Road, west of the boat shed. On other lots, such access is encouraged but is not mandatory.
	• Notation on property title advising floor level to be at or above the 100-year flood level plus 0.5m.
	• S149 Certificates to notify affectation by 100 year flood.
	• The minimum size of an allotment required in the area east of boatshed is 650m2, and in the area west of the boatshed is generally 550m2 or 500m2 for a two lot subdivision (see Bankstown Planning Scheme Ordinance for more detail).

Note: In the event of inconsistencies between Schedule 4A and 4B, Schedule 4A applies.

Schedule 5

Kelso Park, East Hills Levee Floodplain

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	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Sensitive Uses & Facilities	Critical Utilities & Uses	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Sensitive Uses & Facilities	Critical Utilities & Uses	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development
Floor Level		3		2	2or5	2	1	2,4				2	2or5	2	1	2or4							1	2or4
Building Components		2										1	1	1	1	1							1	1
Structural Soundness		3										2	2	2	2	2							1	1
Flood Affectation		3	3		3	3					1	2	2	2	2	2							1	1
Evacuation		2,4	*	3,4	4	3,4					*	3,4	1,4	3,4	1	1or3							1	1or3
Management & Design		4,5	1								1		2,3,5	2,3,5	2,3,5	2,3,5							2,3,5	2,3,5

Not Relevant

Potential Unsuitable Land Use

* Refer to *'Management & Design'* planning consideration for subdivision

Freeboard equals an additional height of 500mm

Note: 1. Filling of the site, where acceptable to Council, may change the FRP considered to determine the controls applied in the circumstances of individual applications**.**

2. 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.

3. 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. This matrix identifies where flood risks are likely to determine where certain development types will be considered "potentially unsuitable" due to flood related risks.

Floor Level

1. All Floor Levels to be equal to or greater than the 20 year *flood* level plus *freeboard* unless justified by site specific assessment
2. *Habitable floor* levels to be equal to or greater than 4.25m above AHD
3. All Floor Levels to be equal to or greater than the *PMF flood* level plus *freeboard*
4. Floor levels to be as close to the *design floor level* as practical & no lower than the existing floor level when undertaking alterations or additions
5. Floor levels of shops to be as close to the *design floor level* as practical. Where the below the *design floor level*, more than 30% of the floor area to be above the *design floor level* or premises to be flood proofed below the *design floor level*

Building Components & Method

1. All structures to have *flood compatible building components* below 4.25m AHD
2. All structures to have *flood compatible building components* below or at the *PMF* level plus *freeboard*

Structural Soundness

1. Engineers report to certify that any structure can withstand the forces of floodwater, debris & buoyancy up to & including a 100 year *flood* plus *freeboard, within the area protected by the levee.*
2. Applicant to demonstrate that any structure can withstand the forces of floodwater, debris & buoyancy up to & including a 100 year *flood* plus *freeboard, within the area protected by the levee.*
3. Applicant to demonstrate that any structure can withstand the forces of floodwater, debris & buoyancy up to & including a *PMF flood* plus *freeboard*

Flood Effect

1. Engineers report required to certify that the development will not increase *flood* effects elsewhere
2. The impact of the development on flooding elsewhere to be considered to ensure that the development will not increase flood effects elsewhere. An engineers report may be required if Council considers a significant affectation is likely.
3. The impact of the development on flooding elsewhere to be considered.

Note: When assessing *flood* effects the following must be considered:
1. Loss of storage area in the *floodplain*
2. Changes in *flood* levels & velocities caused by alteration of conveyance of *flood* waters

Evacuation

1. *Reliable access* for pedestrians required during a 100 year *flood, within the area protected by the levee.*
2. *Reliable access* for pedestrians and vehicles required during a *PMF flood*
3. *Reliable access* for pedestrians or vehicles is required from the building, commencing at a minimum level equal to the lowest *habitable floor* level to an area of refuge above the *PMF level*, or to a floor of the dwelling above the *PMF* level.
4. The development is to be consistent with any relevant *flood evacuation strategy* or similar plan

Management and Design

1. Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this Plan
2. *Site Emergency Response Flood plan* required (except for single dwelling-houses) where floor levels are below the *design floor level*
3. Applicant to demonstrate that area is available to store goods above 4.25m AHD.
4. Applicant to demonstrate that area is available to store goods above the *PMF* level plus *freeboard*
5. No external storage of materials below the *design floor level* which may cause pollution or be potentially hazardous during any *flood*

SCHEDULE 6

To be prepared by Council as part of DCP preparation process under the EPA Act and/or as an outcome of other FRMPs.

SCHEDULE 7
GLOSSARY

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

Adequate Warning Systems, Signage and Exits is where the following is provided:

(a) an audible and visual alarm system which alerts occupants to the need to evacuate, sufficiently prior to likely inundation to allow for the safe evacuation of pedestrians and vehicles;
(b) signage to identify the appropriate procedure and route to evacuate; and
(c) exits which are located such that pedestrians evacuating any location during any flood do not have to travel through deeper water to reach a place of refuge above the 100 year flood away from the enclosed car parking.

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.

Basement car parking means car parking areas generally below ground level, or above natural ground level and enclosed by bunding, where inundation of the surrounding areas may raise water levels above the entry level to the basement, resulting in rapid inundation of the basement to depths greater than 0.8 metres. Basement car parks are areas where the means of drainage of accumulated water in the car park has an outflow discharge capacity significantly less than the potential inflow capacity.

Design floor level **or** ***ground level*** means the minimum floor level that applies to the development. If the development is concessional development, this level is determined based on what land use category would apply if it was not categorised as Concessional Development. The floor level standards specified for the relevant land use category (excluding Concessional Development) in the low flood risk precinct are to be applied.

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.

Enclosed car parking means car parking which is potentially subject to rapid inundation, which consequently increases risk to human life and property (such as basement of bunded car parking areas). The following criteria apply for the purposes of determining what is enclosed car parking:

(a) Flooding of surrounding areas may raise water levels above the perimeter which encloses the car park (normally the entrance), resulting in rapid inundation of the car park to depths greater than 0.8m, and
(b) Drainage of accumulated water in the car park has an outflow discharge capacity significantly

less than the potential inflow capacity.

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

Fail safe access for pedestrians means a reliable and permanent system which will allow safe evacuation for pedestrians up to and including the 100 year flood and may include a walkway and stairs designed in accordance with the Building Code of Australia (BCA), or where necessitated by topography, fixed ladders designed in accordance with Australian Standard AS 1657 (AS, 1992), located at or above the 100 year flood level.

Fail safe access for motor vehicles means a reliable and permanent system which will allow the safe movement of vehicles during all floods up to and including the 100 year flood.

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.

> **Note:** Consistent with the FMM, this DCP does not apply in the circumstances of local drainage inundation as defined in the FMM and determined by Council. Local drainage problems can generally be minimised by the adoption of urban building controls requiring a minimum difference between finished floor and ground levels.

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 any policy of Council, the FRMP, the relevant SES Flood Plan, by advices received from the State Emergency Services (SES) or as determined in the assessment of individual proposals.

Flood Plan is a management plan prepared in consultation with the State Emergency Services (SES) which demonstrates the means to minimise the likelihood of flood damage, including demonstrated ability to move goods above the flood level within the likely available flood warning time and a strategy to safely evacuate persons on the site.

Flood prone land (being synonymous with ***flood liable*** and ***floodplain***) is the area of land which is subject to inundation by the 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 of which this DCP forms part.

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 design flood level. Freeboard provides a factor of safety to compensate for uncertainties in the estimation of flood levels across the floodplain, such and 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 plan, the hazard is flooding which has the potential to cause harm or loss to the community.

Hydraulic hazard is the hazard as determined by the provisional criteria outlined in the FMM in a 100 year flood event.

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).

Rebuilt dwelling refers to the construction of a new dwelling on an allotment where an existing dwelling is demolished.

Reliable access during a flood means the ability for people to safely evacuate an area subject to flooding, having regard to the depth and velocity of flood waters, the suitability of the evacuation route, 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 (not being an SES Flood Plan) is a management plan that demonstrates the ability to safely evacuate persons and include a strategy to move goods above the flood level within the available warning time. This Plan must

be consistent with any flood evacuation strategy, flood plan or similar plan adopted by Council.

Stormwater Systems Report (SSR) is a report prepared by Council on request of an applicant to review the flooding constraints on a particular site.

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.

SCHEDULE 8
WHAT INFORMATION IS REQUIRED WITH AN APPLICATION TO ADDRESS THIS PLAN?

1. Applications must include information which addresses all relevant controls listed above, and the following matters as applicable.

2. Applications for Concessional Development (see Schedule 2) to an existing dwelling on Flood Prone Land shall be accompanied by documentation from a registered surveyor confirming existing floor levels.

3. Development applications affected by this plan shall be accompanied by a survey plan showing:-

(a) The position of the existing building/s or proposed building/s;

(b) The existing ground levels to Australian Height Datum around the perimeter of the building and contours of the site; and

(c) The existing or proposed floor levels to Australian Height Datum.

4. Applications for earthworks, filling of land and subdivision shall be accompanied by a survey plan (with a contour interval of 0.25m) showing relative levels to Australian Height Datum.

5. For large scale developments, or developments in critical situations, particularly where an existing catchment based flood study is not available, a flood study using a fully dynamic one or two dimensional computer model may be required. For smaller developments the existing flood study may be used if available and suitable (eg it contains sufficient local detail), or otherwise a flood study prepared in a manner consistent with the "Australian Rainfall and Runoff" publication, Council's Drainage Design Code and the Floodplain Management Manual, will be required. From this study, the following information shall be submitted in plan form:

(a) water surface contours;

(b) velocity vectors;

(c) velocity and depth product contours;

(d) delineation of flood risk precincts relevant to individual floodplains; and

(e) show both existing and proposed flood profiles for the full range of events for total development including all structures and works (such as revegetation/ enhancements).

This information is required for the pre-developed and post-developed scenarios.

6. Where the controls for a particular development proposal require an assessment of structural soundness during potential floods, the following impacts must be addressed:

(a) hydrostatic pressure;

(b) hydrodynamic pressure;

(c) impact of debris; and

(d) buoyancy forces.

Foundations need to be included in the structural analysis.

APPENDIX D

"..... all about managing our flood risks emanating from rivers, creeks, major drains and overland flow."

FLOOD RISK MANAGEMENT

Draft Development Control Plan (DCP) No…

Environmental Planning and Assessment Act, 1979

FLOOD RISK MANAGEMENT

Draft Development Control Plan (DCP) No. ...

Environmental Planning and Assessment Act, 1979

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Date: May 2004

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LIST OF ATTACHED SCHEDULES

1 Flood Compatible Materials
2 Land Use Categories
3 Prescriptive Controls – Georges River Floodplain (including Lower Prospect and Lower Cabramatta Creeks)
4 Prescriptive Controls – Upper Prospect Creek Floodplain [to be inserted by Council at a later date]
5 Prescriptive Controls – Upper Cabramatta Creek Floodplain [to be inserted by Council at a later date]
6 Prescriptive Controls – South Creek Catchment Floodplain [to be inserted by Council at a later date]
7 Prescriptive Controls – All Other Floodplains Including Areas Affected by Local Overland Flooding

1.0 GENERAL

1.1 What is the Plan?

This document is to be known as the "Fairfield Flood Risk Management Development Control Plan" (DCP) No. ….. This Plan has been adopted by Council at its meeting of ..... in accordance with Section 72 of the Environmental Planning and Assessment Act, 1979 (Development Control Plans).

1.2 Why has this Plan been prepared?

In 1984, the State Government introduced its current flood prone land policy applicable to New South Wales. 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. 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."*

To achieve this objective 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 is the least preferred option, being costly 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 merit based approach to be followed by local government when dealing with planning, development and building matters on flood prone land. 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**.

This Plan 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, as identified for some floodplains, through the preparation of FRMS's and FRMP's.

1.3 What are the Aims of the Plan?

This Plan aims to:-

(a) To minimise the potential impact of development and other activity upon the aesthetic, recreational 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) Reduce the risk to human life and damage to property caused by flooding through controlling development on land affected by potential floods.

(e) 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.

(f) 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.

(g) Apply a “merit-based approach” to all development decisions which takes account of social, economic and ecological as well as flooding considerations.

(h) 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 FRMS’s and FRMP’s prepared in accordance with the FMM and its predecessor, the FDM.

(i) 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.

1.4 To Which Applications Does the Plan Apply?

Council will take into consideration this Plan when determining development applications received in accordance with the Environmental Planning and Assessment Act, 1979.

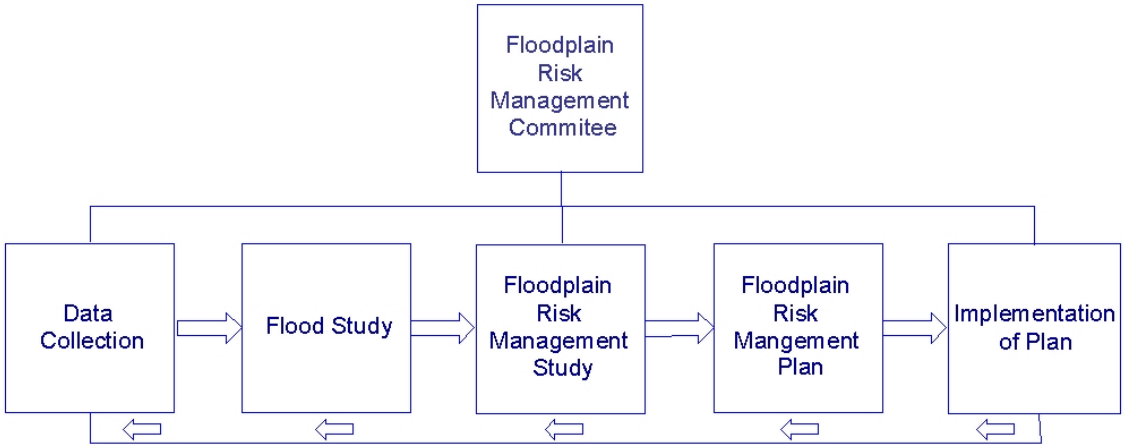


Figure 1: Floodplain Risk Management Process (FMM, 2001)

This Plan does not propose to exempt any applications from the necessity to obtain a particular approval of the Council or other government agencies, where such a requirement would otherwise exist.

1.5 Where Does the Plan Apply?

The Plan applies to whole of the Local Government area, as depicted upon the DCP Map.

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

1.6 How Does the Plan Relate to Other Legislation and Regulations?

This Plan 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 (in particular Fairfield Local Environmental Plan (LEP) 1994 and Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment and other relevant Development Control Plans and policies adopted by Council.

1.7 How to Use this Plan

Please read this document carefully and seek assistance from Council officers as required. The following is a summary of the major steps you should address:

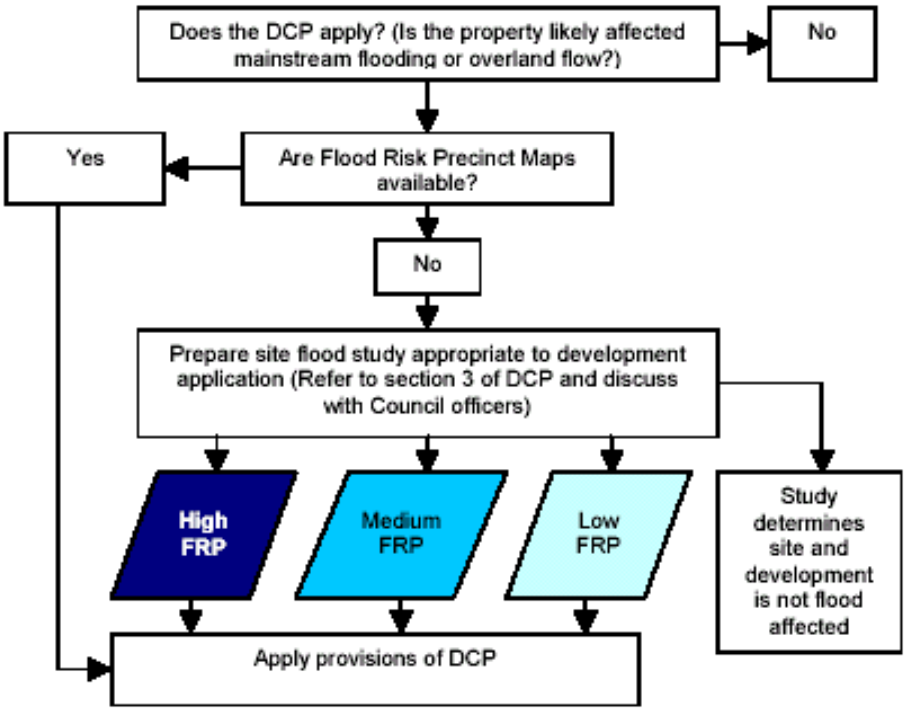
(a) Check the proposal is permissible in the zoning of the land by reference to any applicable Environmental Planning Instrument (eg. Fairfield Local Environment Plan 1994).

(b) Consider any other relevant planning controls of Council (eg. controls in any other applicable DCP which governs the size and setback of development).

(c) Determine the floodplain (eg. Georges River, Upper Prospect Creek, etc.) and flood risk precinct (low, medium or high) within which your site is situated. Enquire with Council regarding existing flood risk mapping or whether a site specific assessment may be warranted in your case (for example, if local overland flooding is a potential problem). A property may be located in more than one precinct and the assessment must consider the controls

for each Precinct where relative to where located on the site.

The flow diagram below summarises this consideration process.



(d) Determine the land use category relevant to your development proposal, by firstly confirming how it is defined by the relevant environmental planning instrument and secondly by ascertaining the land use category from Schedule 2 of this Plan.

(e) Assess and document how the proposal will achieve the performance criteria for development and associated fencing provided by Clauses 2.4.2 and 2.5.2 of this Plan.

(f) Check if the proposal will satisfy the prescriptive controls for different land use categories in different flood risk precincts, as specified in Schedule 4 to 10 of this Plan depending on which floodplain the site is located.

If the proposal does not comply with the prescriptive controls, determine whether the performance criteria are nonetheless achieved.

The assistance of Council staff or an experienced floodplain consultant may be required at various steps in the process to ensure that the requirements of this Plan are fully and satisfactorily addressed.

DCP MAP

COUNCIL TO INSERT LGA MAP SHOWING AREAS WHERE EACH MATRIX APPLIES

1.8 What do the Terms in this Plan mean?

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

Adequate Warning Systems, Signage and Exits is where the following is provided:

(a) an audible and visual alarm system which alerts occupants to the need to evacuate, sufficiently prior to likely inundation to allow for the safe evacuation of pedestrians and vehicles;
(b) signage to identify the appropriate procedure and route to evacuate; and
(c) exits which are located such that pedestrians evacuating any location during any flood do not have to travel through deeper water to reach a place of refuge above the 100 year flood away from the enclosed car parking.

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 minimum floor level that applies to the development. If the development is concessional development, this level is determined based on what land use category would apply if it was not categorised as Concessional Development. The floor level standards specified for the relevant land use category (excluding Concessional Development) in the low flood risk precinct are to be applied.

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.

Enclosed car parking means car parking which is potentially subject to rapid inundation, which consequently increases risk to human life and property (such as basement of bunded car parking areas). The following criteria apply for the purposes of determining what is enclosed car parking:

(a) Flooding of surrounding areas may raise water levels above the perimeter which encloses the car park (normally the entrance), resulting in rapid inundation of the car park to depths greater than 0.8m, and

(b) drainage of accumulated water in the car park has an outflow discharge capacity significantly less than the potential inflow capacity.

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.

> **Note:** Consistent with the FMM, this DCP does not apply in the circumstances of local drainage inundation as defined in the FMM and determined by Council. Local drainage problems can generally be minimised by the adoption of urban building controls requiring a minimum difference between finished floor and ground levels.

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 any policy of Council, the FRMP, the relevant SES Flood Plan, 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 the 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 design flood level. Freeboard provides a factor of safety to compensate for uncertainties in the estimation of flood levels across the floodplain, such and 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 plan, the hazard is flooding which has the potential to cause harm or loss to the community.

Hydraulic hazard is the hazard as determined by the provisional criteria outlined in the FMM in a 100 year flood event.

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).

Rebuilt dwelling refers to the construction of a new dwelling on an allotment where an existing dwelling is demolished.

Reliable access during a flood means the ability for people to safely evacuate an area subject to flooding, having regard to the depth and velocity of flood waters, the suitability of the evacuation route, 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 (not being an SES Flood Plan) is a management plan that demonstrates the ability to safely evacuate persons and include a strategy to move goods above the flood level within the available warning time. This Plan must be consistent with any flood evacuation strategy, flood plan or similar plan adopted by Council.

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.

2.0 WHAT ARE THE CRITERIA FOR DETERMINING APPLICATIONS?

2.1 General

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 (from Schedule 2);
- secondly, determine which floodplain and which part of that floodplain the land is located within (refer to Clause 2.3 and relevant flood risk mapping); and
- then apply the controls outlined under Clause 2.4.

Clause 2.5 provides specific requirements for fencing in the floodplain, while Clause 2.6 identifies special considerations which will apply only to some development in specific circumstances.

Clauses 2.4 and 2.5 which 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.

2.2 Land Use Categories

Eight 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 **Schedule 2.**

2.3 Flood Risk Precincts

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

▪ High Flood Risk Precinct

This has been defined as the area of land below the 100 year flood that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties.

Note: The high flood risk precinct is where high flood damages, potential risk to life, evacuation problems would be anticipated or development would significantly and adversely effect flood behaviour. Most development should be restricted in this precinct. In this precinct, there would be a significant risk of flood damages without compliance with flood related building and planning controls.

▪ Medium Flood Risk Precinct

This has been defined as land below the 100 year flood that is not subject to a high hydraulic hazard and where there are no significant evacuation difficulties

Note: In this precinct there would still be a significant risk of flood damage, but these damages can be minimised by the application of appropriate development controls.

▪ Low Flood Risk Precinct

This has been defined as all other land within the floodplain (ie. within the extent of the probable maximum flood) but not identified within either the High Flood Risk or the Medium Flood Risk Precinct.

Note: The Low Flood Risk Precinct is 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.

2.4 Which Controls Apply to Proposed Developments?

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 exists, council's interim considerations. The categories applicable to each floodplain are depicted on the planning matrices contained in the following schedules:

- **Schedule 3** –Georges River (including Lower Prospect and Lower Cabramatta Creeks) Floodplain
- **Schedule 4** – Prospect Creek Floodplain
- **Schedule 5** – Upper Cabramatta Creek Floodplain
- **Schedule 6** – South Creek Catchment Floodplain (to be completed)
- **Schedule 7** – All Other Floodplains affected by local overland. (Note these controls are interim only until catchment specific Flood Risk Management Plans are prepared as required by the Floodplain Management Manual)

[Council to insert controls for other floodplains as FRMP's are prepared]

2.4.1 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 with 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 and have reliable access.

(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 in general

(d) To prevent any intensification of the use of High Flood Risk Precinct or floodways, and wherever appropriate and possible, allow for their conversion to natural waterway corridors.

(e) 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.

(f) To minimise the risk to life by ensuring the provision of appropriate access from areas affected by flooding up to extreme events.

(g) To minimise the damage to property, including motor vehicles, arising from flooding.

(h) To ensure that proposed development does not expose existing development to increased risks associated with flooding.

2.4.2 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 and general community.

(c) The proposal should only be permitted where effective warning time and reliable access is available for evacuation from an area potentially affected by floods to an area free of risk from flooding. Evacuation should

be consistent with any relevant or flood evacuation strategy where in existence.

(d) Development should not detrimentally increase the potential flood effects on other development or properties either individually or in combination with the cumulative impact of development that is likely to occur in the same floodplain.

(e) Motor vehicles are able to be relocated, undamaged, to an area with substantially less risk from flooding, within effective warning time.

(f) Procedures would be in place, if necessary, (such as warning systems, signage or evacuation drills) so that people are aware of the need to evacuate and relocated motor vehicles during a flood and are capable of identifying the appropriate evacuation route.

(g) 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.

(h) Proposed development must be consistent with ESD principles.

(i) Development should not prejudice the economic viability of any Voluntary Acquisition Scheme.

2.4.3 Prescriptive Controls

Schedules 3 to 7 outline the controls relevant to each of the floodplains to which this Plan applies.

2.5 Are There Special Requirements for Fencing?

2.5.1 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.

2.5.2 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 in a controlled manner to prevent the undesirable impediment of flood waters.

2.5.3 Prescriptive Controls

2.5.3.1 Fencing within a floodway or High FRP will not be permissible except for security/ permeable/ open type/safety fences of a type approved by Council. Council may require such fencing to be able to be opened at the bottom with the force of flood waters. (This may be secured by a Section 88B instrument).

2.5.3.2 Council will require a Development Application

for all new solid (non-porous) and continuous fences in the High and Medium FRP's unless otherwise stated by exempt and complying development provisions which may be incorporated into Council's Environmental Planning Instruments from time to time.

2.5.3.3 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;

(b) Other than a brick or other masonry type fence (which will generally not be permitted); or

(c) A fence type and siting criteria as prescribed by Council.

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

2.6 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 direct or cumulative 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 design of car parking (covered or uncovered) and associated driveways should not result in unacceptable environmental or amenity impacts. These unacceptable impacts would include elevated driveways and parking structures which are visually intrusive and overshadowing of adjoining residential properties which exceeds Council's normal standards.

(d) The proposal must not constrain the orderly and efficient utilisation of the waterways for multiple purposes.

(e) 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.

(f) 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.

(g) Notwithstanding any other provision where a property is identified within a Voluntary Acquisition Scheme area, Council will only consent to further development for 'concessional' development and 'recreation or non-urban'; provided:

(i) the development is for only minor works such as small awnings over existing floor balconies or in-ground swimming pools; and

(ii) the capital investment intended for the property is not greater than the minimum required to provide an acceptable proposal.

Note: Council will not permit any type of development which would be inconsistent with the objective of discouraging further development in areas of high risk and with Council's commitment to the Voluntary Acquisition Scheme.

3.0 WHAT INFORMATION IS REQUIRED WITH AN APPLICATION TO ADDRESS THIS PLAN?

3.1 Applications must include information which addresses all relevant controls listed above, and the following matters as applicable.

3.2 Applications for Concessional Development (see Schedule 2) to an existing dwelling on Flood Prone Land shall be accompanied by documentation from a registered surveyor confirming existing floor levels.

3.3 Development applications affected by this plan shall be accompanied by a survey plan showing:-

(a) The position of the existing building/s or proposed building/s;

(b) The existing ground levels to Australian Height Datum around the perimeter of the building and contours of the site; and

(c) The existing or proposed floor levels to Australian Height Datum.

3.4 Applications for earthworks, filling of land and subdivision shall be accompanied by a survey plan (with a contour interval of 0.25m) showing relative levels to Australian Height Datum.

3.5 For large scale developments, or developments in critical situations, particularly where an existing catchment based flood study is not available, a flood study using a fully dynamic one or two dimensional computer model may be required. For smaller developments the existing flood study may be used if available and suitable (eg it contains sufficient local detail), or otherwise a flood study prepared in a manner consistent with the "Australian Rainfall and Runoff" publication, any relevant Council Drainage Design Code and the Floodplain Management Manual, will be required. From this study, the following information shall be submitted in plan form:

(a) water surface contours (including the 100 year flood and PMF extents)

(b) velocity vectors;

(c) velocity and depth product contours;(d) delineation of flood risk precincts relevant to individual floodplains; and

(e) show both existing and proposed flood profiles for the full range of events for total development including all structures and works (such as revegetation/ enhancements).

This information is required for the pre-developed and post-developed scenarios.

3.6 Where the controls for a particular development proposal require an assessment of structural soundness during potential floods, the following impacts must be addressed:

(a) hydrostatic pressure;

(b) hydrodynamic pressure;

(c) impact of debris; and

(d) buoyancy forces.

Foundations need to be included in the structural analysis.

SCHEDULE 1
FLOOD COMPATIBLE MATERIALS

BUILDING COMPONENT	FLOOD COMPATIBLE MATERIAL	BUILDING COMPONENT	FLOOD COMPATIBLE MATERIAL
Flooring and Sub-floor Structure	" concrete slab-on-ground monolith construction " suspension reinforced concrete slab.	**Doors**	" solid panel with water proof adhesives " flush door with marine ply filled with closed cell foam " painted metal construction " aluminium or galvanised steel frame
Floor Covering	" 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	**Wall and Ceiling Linings**	" 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
Wall Structure	" solid brickwork, blockwork, reinforced, concrete or mass concrete	**Insulation** **Windows**	" 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	**Nails, Bolts, Hinges and Fittings**	" brass, nylon or stainless steel " removable pin hinges " hot dipped galvanised steer wire nails or similar

Electrical and Mechanical Equipment For dwellings constructed on land to which this Policy applies, the electrical and mechanical materials, equipment and installation should conform to the following requirements.	**Heating and Air Conditioning Systems** 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.
Main power supply - 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.	**Fuel -** 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.
Wiring - 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.	**Installation -** 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.
Equipment - All equipment installed below or partially below the relevant flood level should be capable of disconnection by a single plug and socket assembly.	**Ducting -** 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.
Reconnection - 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.	

SCHEDULE 2
LAND USE CATEGORIES

Critical Uses and Facilities	Sensitive Uses and Facilities	Subdivision	Residential
Community facility which may provide an important contribution to the notification or evacuation of the community during flood events (eg. SES Headquarters and Police Stations); Hospitals; and Nursing Homes.	Communication facility; Hazardous or offensive industry or storage establishment; Housing for older persons or persons with a disability (or Aged and disabled persons' housing); Institutions; Educational establishments; Liquid fuel depot; and Public utility (including generating works) undertakings which are essential to evacuation during periods of flood or if affected would unreasonably affect the ability of the community to return to normal activities after flood events.	Subdivision of land which involves the creation of new allotments, with potential for further development.	Camping ground/caravan park site – long-term sites only (1); Dwelling; Dwelling house; Family day care home, or home based care home; Group homes; Health consulting rooms; Home business; Hostel; Multi-unit housing; Permanent group home; Residential flat building; Serviced apartments; Transitional group home; and Utility installations (other than critical utilities)

(1) As defined by the Local Government (Caravan Park and Camping Grounds) Transitional Regulation 1993.

Commercial or Industrial	Tourist Related Development	Recreation or Non-urban Uses	Concessional Development
Abattoir; Amusement centre; Amusement park; Brothels; Bulky goods salesroom or showroom; Business premises; Heliports; Hotel; Industry; Junk yard; Light Industry; Medical Centre; Motel; Motor showroom; Offensive storage establishment; Place of public entertainment; Place of worship; Plant hire; Recreation facility; Refreshment room; Registered club; Restaurant; Roadside stall; Rural industry; Sawmill; Service station; Shop; Transport terminal; Transport depot; Vehicle body repair workshop; Vehicle repair station; Veterinary hospital; and Warehouse	Camping ground/caravan park site – short term sites (1) only	Agriculture; Animal establishment; Extractive industry; Forestry; Helicopter landing site; Intensive agriculture; Mine; Plant nursery; Recreation areas and minor ancillary structures (eg. toilet blocks or kiosks); Stock and sales yard; and Turf farming.	(a) In the case of residential development: (i) An addition or alteration to an existing dwelling of not more than 10% or 30m^2 (whichever is the lesser) of the habitable floor area which existed at the date of commencement of this Plan; (ii) The construction of an outbuilding with a maximum floor area of 20m^2; or (iii) Rebuilt dwellings which substantially reduce the extent of flood affectation to the existing building; (b) In the case of other development: (j) An addition to existing premises of not more than 10% of the floor area which existed at the date of commencement of this DCP; (ii) Rebuilding of a development which substantially reduces the extent of flood effects to the existing development; (iii) A change of use which does not increase flood risk having regard to property damage and personal safety; or (iv) Subdivision which does not involve the creation of new allotments with potential for further development.

(1) As defined by the Local Government (Caravan Park and Camping Grounds) Transitional Regulation 1993.

Schedule 3

Georges River (including Lower Prospect and Lower Cabramatta Creeks) Floodplain

Planning & Development Controls

Planning Consideration	Flood Risk Precincts (FRP's)																							
	Low Flood Risk								**Medium Flood Risk**								**High Flood Risk**							
	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development
Floor Level		3		2,6,7	5,6,7	2,6,7	1,6	4,7				2,6,7	5,6,7	2,6,7	1,6	4,7							1,6	4,7
Building Components		2		1	1	1	1	1				1	1	1	1	1							1	1
Structural Soundness		3		2	2	2	2	2				1	1	1	1	1							1	1
Flood Effects		2	2	2	2	2	2	2			1	2	2	2	2	2							1	1
Car Parking & Driveway Access		1,3,5, 6,7		1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,4,6, 7	6,7,8				1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,4,6, 7	6,7,8							2,4,6, 7	6,7,8
Evacuation		2,3,4	6	2,3	1 or 2, 3	2,3	4,3	2,3			6	2,3	1,3	2,3	4,3	2,3							4,3	2,3
Management & Design		4,5	1		2,3,5	2,3,5	2,3,5	2,3,5			1		2,3,5	2,3,5	2,3,5	2,3,5							2,3,5	2,3,5

COLOUR LEGEND: Not Relevant; Potentially Unsuitable Land Use

General Notes

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. This matrix identifies where flood risks are likely to determine where certain development types will be considered "potentially 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	Refer to Section 2.5 of the DCP for planning considerations for proposals involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effects and Structural Soundness planning considerations of the applicable landuse category.
5	Refer to section 2.7 of the DCP for special considerations such as for house raising proposals and development of properties identified for voluntary acquisition.
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 LGA.
7	From time to time, Council may adopt mapping showing the *Boundary of Significant Flow* and/or *Flood Storage Areas* for this floodplain. Refer to Council to find out if these areas have been defined and mapped for this floodplain.

Floor Level

1	All floor levels to be no lower than the 20 year flood unless justified by site specific assessment.
2	*Habitable floor* levels to be no lower than the 100 year flood level plus freeboard.
3	*Habitable floor* levels to be no lower than the *PMF* level. Non-*habitable floor* levels to be no lower than the *PMF* level unless justified by a site specific assessment.
4	Floor levels to be no lower than the *design floor level*. 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	The level of *habitable floor areas* to be equal to or greater than the 100 year *flood* level plus *freeboard*. If this level is impractical for a development in a Business zone, the floor level should be as high as possible.
6	Non-habitable floor levels to be no lower than the 20 year flood unless justified by site specific assessment.
7	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 more than 1.5m above finished ground level, confirming that the undercroft area is not to be enclosed.

Building Components & Method

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

Structural Soundness

1	Engineer's report to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus *freeboard*.
2	Applicant to demonstrate that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus *freeboard*. An engineer's report may be required.
3	Applicant to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a *PMF* An engineers report may be required.

Flood Effects

1	Engineer's report required to certify that the development will not increase flood effects elsewhere, having regard to: (I) loss of flood storage; (ii) changes in flood levels and velocities caused by alterations to the flood *conveyance*; and (iii) the cumulative impact of multiple potential developments in the floodplain.
2	The flood impact of the development to be considered to ensure that the development will not increase flood effects elsewhere, having regard to: (I) loss of flood storage; (ii) changes in flood levels and velocities caused by alterations to the flood *conveyance*; and (iii) the cumulative impact of multiple potential developments in the floodplain. An engineer's report may be required.

Note: (1) If a *Boundary of Significant Flow* has been defined for this floodplain, any development inside this area will normally be unacceptable as it will reduce flood conveyance and increase flood effects elsewhere. (2) If a *Flood Storage Area* has been defined for this floodplain, any filling of the floodplain inside this area (except where this occurs by compensatory excavation), will normally be unacceptable as it will reduce the volume of flood storage available on the floodplain and increase flood effects elsewhere. (3) Even where a *Boundary of Significant Flow* and/or a *Flood Storage Area* have been defined, development outside these areas may still increase flood effects elsewhere and therefore be unacceptable.

Car Parking and Driveway Access

1	The minimum surface level of open car parking spaces or carports shall be as high as practical, but no lower than the 20 year flood or the level of the crest of the road at the location where the site has access. In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 20 year flood.
2	The minimum surface level of open car parking spaces, carports or garages, shall be as high as practical.
3	Garages capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, or *enclosed car parking,* must be protected from inundation by floods equal to or greater than the 100 year flood.
4	The driveway providing access between the road and parking space 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 space shall be no lower than 0.3m below the 100 year flood or such that the depth of inundation during a 100 year flood is not greater than either the depth at the road or the depth at the car parking space. A lesser standard may be accepted for single detached dwelling houses where it can be demonstrated that risk to human life would not be compromised.
6	*Enclosed car parking and car parking areas accommodating more than 3 vehicles (other than on Rural zoned land), with a floor level below the 20 year flood or more than 0.8m below the 100 year flood level, shall have adequate warning systems, signage and exits.*
7	Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year flood
8	Driveway and parking space levels to be no lower than the *design ground/floor levels*. Where this is not practical , a lower level may be considered. In these circumstances, the level is to be as high as practical, and, when undertaking alterations or additions, no lower than the existing level.

Note: (1) A flood depth of 0.3m is sufficient to cause a typical vehicle to float. (2) *Enclosed car parking* is defined in the glossary and typically refers to carparks in basements.

Evacuation

1	Reliable access for pedestrians or vehicles required during a 100 year flood.
2	Adequate flood warning is available to allow safe and orderly evacuation without increased reliance upon the SES or other authorised emergency services personnel.
3	The development is to be consistent with any relevant *flood evacuation strategy, Flood Plan adopted by Council* or similar plan.
4	The evacuation requirements of the development are to be considered. An engineers report will be required if circumstances are possible where the evacuation of persons might not be achieved within the *effective warning time*.
5	Reliable access for pedestrians or vehicles required to a publicly accessible location above the *PMF.*
6	Applicant to demonstrate that evacuation in accordance with the requirements of this DCP is available for the potential development flowing from the subdivision proposal.

Management and Design

1	Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this DCP.
2	*Site Emergency Response Flood Plan* required where floor levels are below the *design floor level,* (except for single dwelling-houses).
3	Applicant to demonstrate that area is available to store goods above the 100 year flood level plus *freeboard.*
4	Applicant to demonstrate that area is available to store goods above the *PMF* level.
5	No storage of materials below the *design floor level* which may cause pollution or be potentially hazardous during any flood.

Schedule 7

All Other Floodplains Including Areas Affected by Local Overland Flooding

Planning & Development Controls (Note these controls are interim until catchment specfic FRMPs are prepared)

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

Not Relevant

Potentially Unsuitable Land Use

Notes

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. Notwithsatnding, 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 "potentially 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. Refer to section 2.7 of the DCP for special considerations such as for house raising proposals and development of properties identified for voluntary acquisition.

5. Refer to Section 2.5 of the DCP for planning considerations for proposals involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effects and Structural Soundness planning considerations of the applicable landuse category.

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 *flood* level unless justified by site specific assessment.
2	Habitable floor levels to be equal to or greater than the 100 year *flood* level plus freeboard.
3	All floor levels to be equal to or greater than the *PMF* level.
4	Floor levels to be equal to or greater than the *design floor level*. 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	The level of *habitable floor areas* to be equal to or greater than the 100 year *flood* level plus *freeboard*. If this level is impractical for a development in a Business zone, the floor level should be as high as possible.
6	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 more than 1.5m above finished ground level, confirming that the undercroft area is not to be enclosed.

Building Components & Method

1	All structures to have *flood compatible building components* below the 100 year *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 *flood* plus *freeboard*.
2	Applicant to demonstrate that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year *flood* plus *freeboard*. An engineers report may be required.
3	Applicant to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a *PMF*. An engineers report may be required.

Flood Effects

1	Engineers report required to certify that the development will not increase *flood* effects 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 vicinity.
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 a car parking space, which is not enclosed (eg. open parking space or carport) shall be as high as practical, but no lower than the 20 year *flood* level or the level of the crest of the road at the location where the site has access.
2	The minimum surface level of a car parking space, which is not enclosed, shall be as high as practical.
3	*Enclosed car parking* capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, must be protected from inundation by *floods* equal to or greater than the 100 year *flood*.
4	The driveway providing access between the road and parking space 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 space shall be a minimum of 0.3m above the 100 year *flood* or such that depth of inundation during a 100 year *flood* is not greater than either the depth at the road or the depth at the car parkng space. A lesser standard may be accepted for single detached dwelling houses where it can be demonstrated that risk to human life would not be compromised.
6	*Enclosed car parking* and car parking areas accommodating more than 3 vehicles (other than on Rural zoned land), with a floor level below the 20 year *flood* level or more than 0.8m below the 100 year *flood* level, shall have *adequate warning systems, signage and exits*.
7	Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year *flood*

Note: A flood depth of 0.3m is sufficient to cause a typical vehicle to float

Evacuation

1	Reliable access for pedestrians required during a 100 year *flood.*
2	Reliable access for pedestrians or vehicles is required from the building, commencing at a minimum level equal to the lowest *habitable floor* level to an area of refuge above the *PMF level*, or a minimum of 40% of the gross floor area of the dwelling to be above the *PMF* level.
3	The development is to be consistent with any relevant *flood evacuation strategy, Flood Plan adopted by Council* or similar plan.
4	The evacuation requirements of the development are to be considered. An engineers report will be required if the evacuation of persons might not be achieved within the *effective warning time*.
5	Reliable access for pedestrians or vehicles required to a publicly accessible location above the *PMF.*

Management and Design

1	Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this Plan.
2	Site Emergency Response Flood plan required where floor levels are below the *design floor level,* (except for single dwelling-houses).
3	Applicant to demonstrate that area is available to store goods above the 100 year *flood* level plus *freeboard.*
4	Applicant to demonstrate that area is available to store goods above the *PMF* level.
5	No storage of materials below the *design floor level* which may cause pollution or be potentially hazardous during any *flood.*

Liverpool City Council

"..... all about managing our flood risks emanating from rivers, creeks, major drains and overland flow."

FLOOD RISK MANAGEMENT

Draft Development Control Plan (DCP) No. 52

Environmental Planning and Assessment Act, 1979

FLOOD RISK MANAGEMENT

Draft Development Control Plan (DCP) No. 52

Environmental Planning and Assessment Act, 1979

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Project No: P4925
File RefE:\PROJECTS\4925 Georges River Catchment\Reports\4925 Appendix E_ Liverpool DCP.doc
Date: May 2004

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LIST OF ATTACHED SCHEDULES

1.0 GENERAL

1.1 What is the Plan?

This document is to be known as the "Liverpool Flood Risk Management Development Control Plan" (DCP) No..... This Plan has been adopted by Council at its meeting of ..... in accordance with Section 72 of the Environmental Planning and Assessment Act, 1979 (Development Control Plans).

1.2 Why is This Plan Required?

In 1984, the State Government introduced its current flood prone land policy applicable to New South Wales. 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. 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."*

To achieve this objective 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 is the least preferred option, being costly 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 merit based approach to be followed by local government when dealing with planning, development and building matters on flood prone land. 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**.

This Plan 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, as identified for some floodplains, through the preparation of FRMS's and FRMP's.

1.3 To Which Applications Does the Plan Apply?

Council will take into consideration this Plan when determining development applications received in accordance with the Environmental Planning and Assessment Act, 1979.

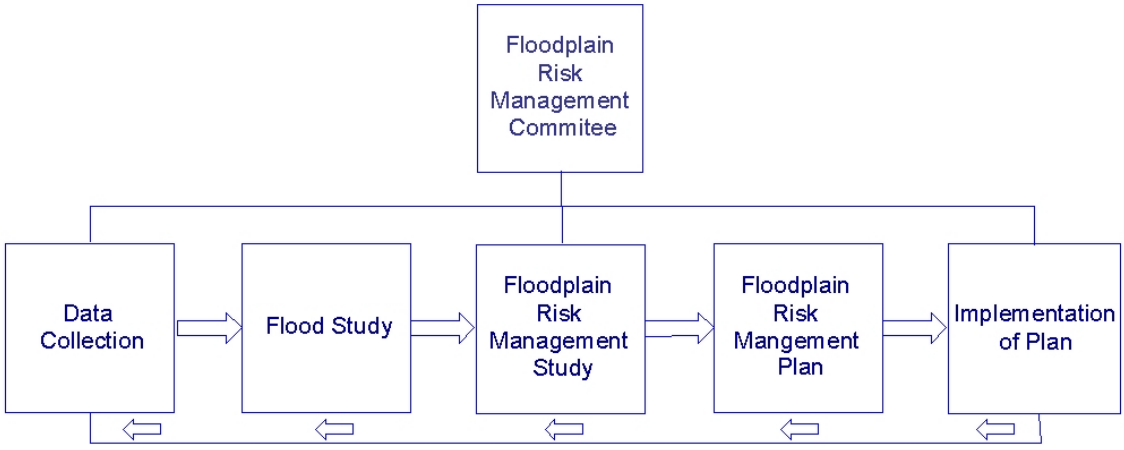


Figure 1: Floodplain Risk Management Process (FMM, 2001)

This Plan does not propose to exempt any applications from the necessity to obtain a particular approval of the Council or other government agencies, where such a requirement would otherwise exist.

1.4 Where Does the Plan Apply?

The Plan applies to whole of the Local Government area, as depicted upon the DCP Map.

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

1.5 How Does the Plan Relate to Other Legislation and Regulations?

This Plan 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 (in particular Liverpool Local Environmental Plan (LEP) 1997, the Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment and other relevant Development Control Plans and policies adopted by Council.

1.6 How to Use this Plan

Please read this document carefully and seek assistance from Council officers as required. The following is a summary of the major steps you should address:

(a) Check the proposal is permissible in the zoning of the land by reference to any applicable Environmental Planning Instrument (eg. Liverpool Local Environment Plan 1997).

(b) Consider any other relevant planning controls of Council (eg. controls in any other applicable DCP which governs the size and setback of development).

(c) Determine the floodplain (eg. Georges River, Cabramatta Creek, etc.) and flood risk precinct (low, medium or high) within which your site is situated. Enquire with Council regarding existing flood risk mapping or whether a site specific assessment may be warranted in your case (for example, if local overland flooding is a potential problem). A property may be located in more than one Precinct and the assessment must consider the controls for each Precinct where relative to where located on the site. The flow diagram illustrated at **Figure 1.1** below summarises this consideration process.

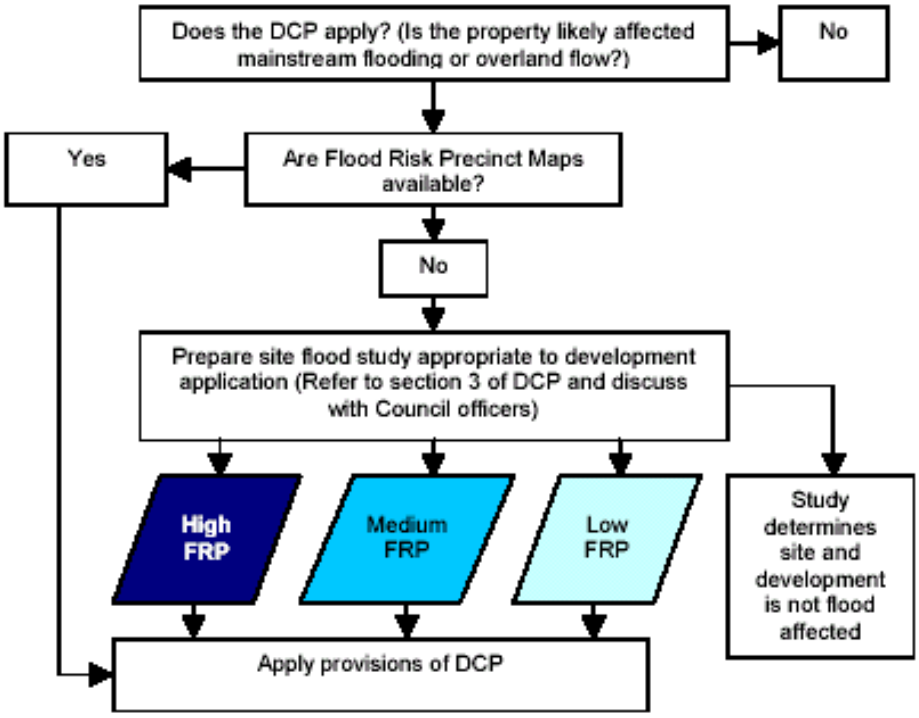


Figure 1.1: Flowchart for the determination of floodplain and flood risk

(d) Determine the land use category relevant to your development proposal, by firstly confirming how it is defined by the relevant environmental planning instrument and secondly by ascertaining the land use category from Schedule 2 of this Plan.

(e) Assess and document how the proposal will achieve the performance criteria for development and associated fencing provided by Clauses 2.4.2 and 2.5.2 of this Plan.

(f) Check if the proposal will satisfy the prescriptive controls for different land use categories in different flood risk precincts, as specified in Schedule 3 to 7 of this Plan depending on which floodplain the site is located.

If the proposal does not comply with the prescriptive controls, determine whether the performance criteria are nonetheless achieved.

The assistance of Council staff or an experienced floodplain consultant may be required at various steps in the process to ensure that the requirements of this Plan are fully and satisfactorily addressed.

1.7 What are the Aims of the Plan?

This Plan aims to:-

(a) Minimise the potential impact of development and other activity upon the aesthetic, recreational 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).

(c) Ensure essential services and land uses are planned in recognition of all potential floods.

(d) Inform the community of Council's policy for the use and development of flood prone land.

(e) Reduce the risk of loss to human life and damage to property

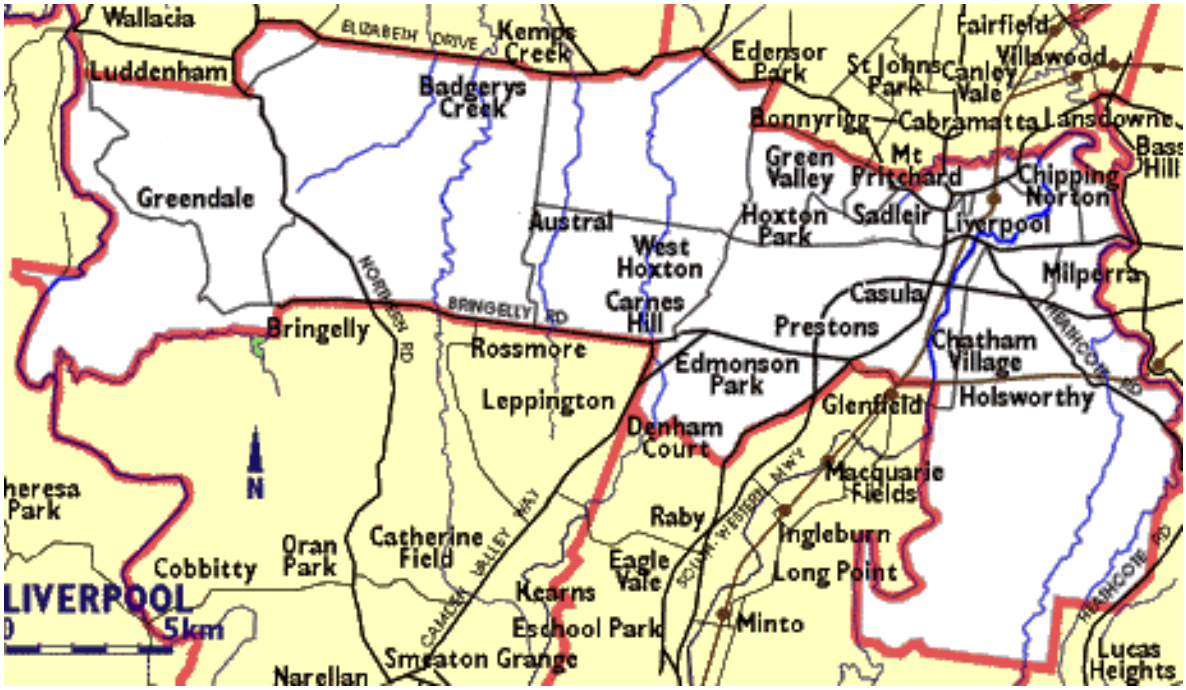
caused by flooding through controlling development on land affected by potential floods.

(f) Apply a "merit-based approach" to all development decisions which takes account of social, economic, ecological and flooding considerations.

(g) 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 FRMS's and FRMP's prepared in accordance with the FMM and its predecessor, the FDM.

(h) Deal equitably and consistently with development applications on land affected by potential floods, in accordance with the principles contained in the FMM.

DCP MAP



[COUNCIL TO INSERT BETTER MAP SHOWING CATCHMENTS WHERE EACH MATRIX APPLIES]

1.8 Glossary

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

Adequate Warning Systems, Signage and Exits is where the following is provided:

(a) an audible and visual alarm system which alerts occupants to the need to evacuate, sufficiently prior to likely inundation to allow for the safe evacuation of pedestrians and vehicles;

(b) signage to identify the appropriate procedure and route to evacuate; and

(c) exits which are located such that pedestrians evacuating any location during any flood do not have to travel through deeper water to reach a place of refuge above the 100 year flood away from the enclosed car parking.

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.

Basement car parking means car parking areas generally below ground level, or above natural ground level and enclosed by bunding, where inundation of the surrounding areas may raise water levels above the entry level to the basement, resulting in rapid inundation of the basement to depths greater than 0.8 metres. Basement car parks are areas where the means of drainage of accumulated water in the car park has an outflow discharge capacity significantly less than the potential inflow capacity.

Design floor level* or *ground level means the minimum floor level that applies to the development. If the development is concessional development, this level is determined based on what land use category would apply if it was not categorised as Concessional Development. The floor level standards specified for the relevant land use category (excluding Concessional Development) in the low flood risk precinct are to be applied.

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.

Enclosed Car Parking means car parking which is potentially subject to rapid inundation, which consequently increases risk to human life and property (such as basement of bunded car parking areas). The following criteria apply for the purposes of determining what is enclosed car parking:

(a) Flooding of surrounding areas may raise water levels above the perimeter which encloses the car park (normally the entrance) resulting in rapid inundation of the car park to depths greater than 0.8m, and

(b) Drainage of accumulated water in the car park has an outflow discharge capacity significantly less than the potential inflow capacity.

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.

> **Note:** Consistent with the FMM, this DCP does not apply in the circumstances of local drainage inundation as defined in the FMM and determined by Council. Local drainage problems can generally be minimised by the adoption of urban building controls requiring a minimum difference between finished floor and ground levels.

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 any policy of Council, the FRMP, the relevant SES Flood Plan, 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 the 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 design flood level. Freeboard provides a factor of safety to compensate for uncertainties in the estimation of flood levels across the floodplain, such and 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 plan, the hazard is flooding which has the potential to cause harm or loss to the community.

Hazard is a source of potential harm or a situation with a potential to cause loss. In relation to this plan, the hazard is flooding which has the potential to cause harm or loss 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 and ecological impacts of land use options for different flood prone areas together with flood damage, hazard and behaviour implications, 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).

Rebuilt dwelling refers to the construction of a new dwelling on an allotment where an existing dwelling is demolished.

Reliable access during a flood means the ability for people to safely evacuate an area subject to flooding, having regard to the depth and velocity of flood waters, the suitability of the evacuation route, 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 (not being an SES Flood Plan) is a management plan that demonstrates the ability to safely evacuate persons and include a strategy to move goods above the flood level within the available warning time. This Plan must be consistent with any flood evacuation strategy, flood plan or similar plan adopted by Council.

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.

2.0 WHAT ARE THE CRITERIA FOR DETERMINING APPLICATIONS?

2.1 General

The criteria for determining applications for development 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 (from Schedule 2);
- secondly, determine which floodplain and which part of that floodplain the land is located within (refer to Clause 2.3 and relevant flood risk mapping); and
- then apply the controls outlined under Clause 2.4.

Clause 2.5 provides specific requirements for fencing in the floodplain, while Clause 2.6 identifies special considerations which will apply only to some development in specific circumstances.

Clauses 2.4 and 2.5 which 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.

2.2 Land Use Categories

Eight 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 Schedule 2.

2.3 Flood Risk Precincts

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

▪ High Flood Risk Precinct

This has been defined as the area of land below the 100 year flood that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties.

Note: The high flood risk precinct is where high flood damages, potential risk to life, evacuation problems would be anticipated or development would significantly and adversely effect flood behaviour. Most development should be restricted in this precinct. In this precinct, there would be a significant risk of flood damages without compliance with flood related building and planning controls.

▪ Medium Flood Risk Precinct

This has been defined as land below the 100 year flood that is not subject to a high hydraulic hazard and where there are no significant evacuation difficulties.

Note: In this precinct there would still be a significant risk of flood damage, but these damages can be minimised by the application of appropriate development controls.

▪ Low Flood Risk Precinct

This has been defined as all other land within the floodplain (ie. within the extent of the probable maximum flood) but not identified within either the High Flood Risk or the Medium Flood Risk Precinct.

Note: The Low Flood Risk Precinct is 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.

2.4 Which Controls Apply to Proposed Developments?

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 exists, Council's interim considerations. The categories applicable to each floodplain are depicted on the planning matrices contained in the following schedules:

- **Schedule 3** –Georges River Floodplain (including Lower Cabramatta Creek)
- **Schedule 4** – Kemps/Bonds Creeks Floodplain

- **Schedule 5** – South Creek Floodplain
- **Schedule 6** – Upper Nepean River Floodplain
- **Schedule 7** – Upper Cabramatta Creek Floodplain
- **Schedule 8** – All other floodplains including areas affected by local overland flooding. (Note these controls are interim only until catchment specific Flood Risks Management Plan are prepared as required by the Floodplain Management Manual).

[Council to insert controls for other floodplains as FRMP's are prepared]

2.4.1 Objectives

(a) To minimise the risk to life by ensuring the provision of appropriate access from areas affected by flooding up to extreme events.

(b) 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.

(c) To require developments with 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 and have reliable access.

(d) 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 in general

(e) To prevent any intensification of the use of High Flood Risk Precinct or floodways, and wherever appropriate and possible, allow for their conversion to natural waterway corridors.

(f) 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.

(g) To minimise the damage to property, including motor vehicles arising from flooding.

(h) To ensure that proposed development does not expose existing development to increased risks associated with flooding.

2.4.2 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 and general community.

(c) The proposal should only be permitted where effective warning time and reliable access is available for evacuation from an area potentially affected by floods to an area free of risk from flooding. Evacuation should be consistent with any relevant or flood evacuation strategy where in existence.

(d) Development should not detrimentally increase the potential flood effects on other development or properties either individually or in combination with the cumulative impact of development that is likely to occur in the same floodplain.

(e) Motor vehicles are able to be relocated undamaged, to an area with substantially less

risk from flooding, within effective warning time.

(f) Procedures would be in place, if necessary, (such as warning systems, signage or evacuation drills) so that people are aware of the need to evacuate and relocate motor vehicles during a flood and are capable of identifying the appropriate evacuation route.

(g) 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.

(h) Proposed development must be consistent with ecologically sustainable development principles.

(i) Development should not prejudice the economic viability of any Voluntary Acquisition Scheme.

2.4.3 Prescriptive Controls

Schedules 3 to 8 outline the controls relevant to each of the floodplains to which this Plan applies.

2.5 Are There Special Requirements for Fencing?

2.5.1 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.

2.5.2 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 in a controlled manner to prevent the undesirable impediment of flood waters.

2.5.3 Prescriptive Controls

2.5.3.1 Fencing within a floodway or High FRP will not be permissible except for security/ permeable/ open type/safety fences of a type approved by Council.

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

2.5.3.3 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;

(b) Other than a brick or other masonry type fence (which will generally not be permitted); or

(c) A fence type and siting criteria as prescribed by Council.

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

2.6 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 direct or cumulative 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 design of car parking (covered or uncovered) and associated driveways should not result in unacceptable environmental or amenity impacts. These unacceptable impacts would include elevated driveways and parking structures which are visually intrusive and overshadowing of adjoining residential properties which exceeds Council's normal standards.

(d) The proposal must not constrain the orderly and efficient utilisation of the waterways for multiple purposes.

(e) 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 ecologically sustainable development principles.

(f) 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.

(g) Notwithstanding any other provision where a property is identified within a Voluntary Acquisition Scheme area, Council will only consent to further development for 'concessional' development and 'recreation or non-urban'; provided:

(i) the development is for only minor works such as small awnings over existing floor balconies; and

(ii) the capital investment intended for the property is not greater than the minimum required to provide an acceptable proposal.

Note: Council will not permit any type of development which would be inconsistent with the objective of discouraging further development in areas of high risk and with Council's commitment to the Voluntary Acquisition Scheme.

3.0 WHAT INFORMATION IS REQUIRED WITH AN APPLICATION TO ADDRESS THIS PLAN?

3.1 Applications must include information which addresses <u>all</u> relevant matters listed

above, and the following matters as applicable.

3.2 Applications for Concessional Development (see Schedule 2) to an existing dwelling on Flood Prone Land shall be accompanied by documentation from a registered surveyor confirming existing floor levels.

3.3 Development applications affected by this plan shall be accompanied by a survey plan showing:-

(a) The position of the existing building/s or proposed building/s;

(b) The existing ground levels to Australian Height Datum around the perimeter of the building and contours of the site; and

(c) The existing or proposed floor levels to Australian Height Datum.

3.4 Applications for earthworks, filling of land and subdivision shall be accompanied by a survey plan (with a contour interval of 0.25m) showing relative levels to Australian Height Datum.

3.5 For large scale developments, or developments in critical situations, particularly where an existing catchment based flood study is not available, a flood study using a fully dynamic one or two dimensional computer model may be required. For smaller developments the existing flood study may be used if available and suitable (eg it contains sufficient local detail), or otherwise a flood study prepared in a manner consistent with the "Australian Rainfall and Runoff" publication, Council's Drainage Design Code and the Floodplain Management Manual, will be required. From this study, the following information shall be submitted in plan form:

(a) water surface contours;

(b) velocity vectors;

(c) velocity and depth product contours;

(d) delineation of flood risk precincts relevant to individual floodplains; and

(e) show both existing and proposed flood profiles for the full range of storm events including all proposed structures and works (such as revegetation/ enhancements).

This information is required for the pre-developed and post-developed scenarios.

3.6 Where the controls for a particular development proposal require an assessment of structural soundness during potential floods, the following impacts must be addressed:

(a) hydrostatic pressure;

(b) hydrodynamic pressure;

(c) impact of debris; and

(d) buoyancy forces.

Foundations need to be included in the structural analysis.

SCHEDULE 1
FLOOD COMPATIBLE MATERIALS

BUILDING COMPONENT	FLOOD COMPATIBLE MATERIAL	BUILDING COMPONENT	FLOOD COMPATIBLE MATERIAL
Flooring and Sub-floor Structure	" concrete slab-on-ground monolith construction " suspension reinforced concrete slab.	**Doors**	" solid panel with water proof adhesives " flush door with marine ply filled with closed cell foam " painted metal construction " aluminium or galvanised steel frame
Floor Covering	" 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	**Wall and Ceiling Linings**	" 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
Wall Structure	" solid brickwork, blockwork, reinforced, concrete or mass concrete	**Insulation** **Windows**	" 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	**Nails, Bolts, Hinges and Fittings**	" brass, nylon or stainless steel " removable pin hinges " hot dipped galvanised steer wire nails or similar

Electrical and Mechanical Equipment For dwellings constructed on land to which this Policy applies, the electrical and mechanical materials, equipment and installation should conform to the following requirements.	**Heating and Air Conditioning Systems** 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.
Main power supply - 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.	**Fuel -** 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.
Wiring - 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.	**Installation -** 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.
Equipment - All equipment installed below or partially below the relevant flood level should be capable of disconnection by a single plug and socket assembly.	**Ducting -** 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.
Reconnection - 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.	

SCHEDULE 2
LAND USE CATEGORIES

Critical Uses and Facilities	Sensitive Uses and Facilities	Subdivision	Residential
Community facility which may provide an important contribution to the notification or evacuation of the community during flood events; Hospitals; Nuclear activities; Nuclear facility; and Nursing Homes.	Assisted accommodation; Communications facility; Hazardous or offensive industry or storage establishment; Housing for older persons or persons with a disability (or aged or disabled persons); Institutions; Educational establishments; Liquid fuel depot; Utility installations or undertakings (including generating works) undertakings which are essential to evacuation during periods of flood or if affected would unreasonably affect the ability of the community to return to normal activities after flood events; Telecommunication facilities; and Waste disposal.	Subdivision of land which involves the creation of new allotments, with potential for further development.	Bed and breakfast premises; Boarding houses; Camp or caravan park– long-term sites only (1); Cottage industry; Dual occupancy housing; Dwelling; Dwelling house; Exhibition home; Exhibition village; Family day care centre; Group homes; Health consulting rooms; Home-based child care service; Home business; Home occupation; Integrated housing; Multiple dwellings; Permanent group home; Residential flat building; Serviced apartments; Transitional group home; and Utility installations or undertakings (other than critical utilities)

(1) As defined by the Local Government (Caravan Park and Camping Grounds) Transitional Regulation 1993.

Commercial or Industrial	Tourist Related Development	Recreation or Non-urban Uses	Concessional Development
Abattoir; Animal boarding or training establishment; Brothels; Bulky goods salesroom or showroom; Business premises; Child care centre; Commercial facilities; Heliports; Heavy Industry; Highway service centre; Hotel; Industry; Light Industry; Materials recycling yard; Medical centre; Motel; Motor showroom; Office premises; Passenger transport terminal; Place of public worship; Plant hire; Public building; Recreation facility; Registered club; Research establishment; Research facility; Restaurant; Road transport terminal; Roadside stall; Rural industry; Sawmill; Service station; Shop; Transport depot; Vehicle body repair workshop; Vehicle repair station; Veterinary hospital; and Warehouse or distribution centre.	Caravan park - short term sites (1) only	Agriculture; Aquaculture; Dam; Extractive industry; Forestry; Helicopter landing site; Intensive livestock agriculture; Intensive plant agriculture; Leisure area; Mine; Marina; Recreation areas and minor ancillary structures (eg. toilet blocks or kiosks); Retail plant nursery; stock and sale yard; and Turf farming.	(a) In the case of residential development: (i) An addition or alteration to an existing dwelling of not more than 10% or 30m^2 (whichever is the lesser) of the habitable floor area which existed at the date of commencement of this Plan; (ii) The construction of an outbuilding with a maximum floor area of 20m^2; or (iii)Rebuilt dwellings which substantially reducing the extent of flood affectation to the existing building; or (b) In the case of other development: (i) an addition to existing premises of not more than 10% of the floor area which existed at the date of commencement of the DCP; (ii) Rebuilding of a development which substantially reduces the extent of flood effects to the existing development; or (iii) A change of use which does not increase flood risk having regard to property damage and personal safety; or (iv) Subdivision which does not involve the creation of new allotments with potential for further development.

(1) As defined by the Local Government (Caravan Park and Camping Grounds) Transitional Regulation 1993.

Schedule 3

Georges River (including Lower Cabramatta Creek) Floodplain

Planning & Development Controls

Planning Consideration	Flood Risk Precincts (FRP's)																							
	Low Flood Risk								**Medium Flood Risk**								**High Flood Risk**							
	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development
Floor Level		3		2,6,7	5,6,7	2,6,7	1,6	4,7				2,6,7	5,6,7	2,6,7	1,6	4,7							1,6	4,7
Building Components		2		1	1	1	1	1				1	1	1	1	1							1	1
Structural Soundness		3		2	2	2	2	2				1	1	1	1	1							1	1
Flood Effects		2	2	2	2	2	2	2			1	2	2	2	2	2							1	1
Car Parking & Driveway Access		1,3,5, 6,7		1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,4,6, 7	6,7,8				1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,4,6, 7	6,7,8							2,4,6, 7	6,7,8
Evacuation		2,3,4	6	2,3	1 or 2, 3	2,3	4,3	2,3			6	2,3	1,3	2,3	4,3	2,3							4,3	2,3
Management & Design		4,5	1		2,3,5	2,3,5	2,3,5	2,3,5			1		2,3,5	2,3,5	2,3,5	2,3,5							2,3,5	2,3,5

COLOUR LEGEND : Not Relevant Potentially Unsuitable Land Use

General Notes

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. This matrix identifies where flood risks are likely to determine where certain development types will be considered "potentially 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	Refer to Section 2.5 of the DCP for planning considerations for proposals involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effects and Structural Soundness planning considerations of the applicable landuse category.
5	Refer to section 2.7 of the DCP for special considerations such as for house raising proposals and development of properties identified for voluntary acquisition.
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 LGA.
7	From time to time, Council may adopt mapping showing the *Boundary of Significant Flow* and/or *Flood Storage Areas* for this floodplain. Refer to Council to find out if these areas have been defined and mapped for this floodplain.

Floor Level

1	All floor levels to be no lower than the 20 year flood unless justified by site specific assessment.
2	*Habitable floor* levels to be no lower than the 100 year flood level plus freeboard.
3	*Habitable floor* levels to be no lower than the *PMF* level. Non-*habitable floor* levels to be no lower than the *PMF* level unless justified by a site specific assessment.
4	Floor levels to be no lower than the *design floor level*. 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	The level of *habitable floor areas* to be equal to or greater than the 100 year *flood* level plus *freeboard*. If this level is impractical for a development in a Business zone, the floor level should be as high as possible.
6	Non-habitable floor levels to be no lower than the 20 year flood unless justified by site specific assessment.
7	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 more than 1.5m above finished ground level, confirming that the undercroft area is not to be enclosed.

Building Components & Method

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

Structural Soundness

1	Engineer's report to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus *freeboard*.
2	Applicant to demonstrate that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus *freeboard*. An engineer's report may be required.
3	Applicant to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a *PMF* An engineers report may be required.

Flood Effects

1	Engineer's report required to certify that the development will not increase flood effects elsewhere, having regard to: (I) loss of flood storage; (ii) changes in flood levels and velocities caused by alterations to the flood *conveyance*; and (iii) the cumulative impact of multiple potential developments in the floodplain.
2	The flood impact of the development to be considered to ensure that the development will not increase flood effects elsewhere, having regard to: (I) loss of flood storage; (ii) changes in flood levels and velocities caused by alterations to the flood *conveyance*; and (iii) the cumulative impact of multiple potential developments in the floodplain. An engineer's report may be required.

Note: (1) If a *Boundary of Significant Flow* has been defined for this floodplain, any development inside this area will normally be unacceptable as it will reduce flood conveyance and increase flood effects elsewhere. (2) If a *Flood Storage Area* has been defined for this floodplain, any filling of the floodplain inside this area (except where this occurs by compensatory excavation), will normally be unacceptable as it will reduce the volume of flood storage available on the floodplain and increase flood effects elsewhere. (3) Even where a *Boundary of Significant Flow* and/or a *Flood Storage Area* have been defined, development outside these areas may still increase flood effects elsewhere and therefore be unacceptable.

Car Parking and Driveway Access

1	The minimum surface level of open car parking spaces or carports shall be as high as practical, but no lower than the 20 year flood or the level of the crest of the road at the location where the site has access. In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 20 year flood.
2	The minimum surface level of open car parking spaces, carports or garages, shall be as high as practical.
3	Garages capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, or *enclosed car parking,* must be protected from inundation by floods equal to or greater than the 100 year flood.
4	The driveway providing access between the road and parking space 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 space shall be no lower than 0.3m below the 100 year flood or such that the depth of inundation during a 100 year flood is not greater than either the depth at the road or the depth at the car parking space. A lesser standard may be accepted for single detached dwelling houses where it can be demonstrated that risk to human life would not be compromised.
6	*Enclosed car parking and car parking areas accommodating more than 3 vehicles (other than on Rural zoned land), with a floor level below the 20 year flood or more than 0.8m below the 100 year flood level, shall have adequate warning systems, signage and exits.*
7	Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year flood
8	Driveway and parking space levels to be no lower than the *design ground/floor levels*. Where this is not practical , a lower level may be considered. In these circumstances, the level is to be as high as practical, and, when undertaking alterations or additions, no lower than the existing level.

Note: (1) A flood depth of 0.3m is sufficient to cause a typical vehicle to float. (2) *Enclosed car parking* is defined in the glossary and typically refers to carparks in basements.

Evacuation

1	Reliable access for pedestrians or vehicles required during a 100 year flood.
2	Adequate flood warning is available to allow safe and orderly evacuation without increased reliance upon the SES or other authorised emergency services personnel.
3	The development is to be consistent with any relevant *flood evacuation strategy, Flood Plan adopted by Council* or similar plan.
4	The evacuation requirements of the development are to be considered. An engineers report will be required if circumstances are possible where the evacuation of persons might not be achieved within the *effective warning time*.
5	Reliable access for pedestrians or vehicles required to a publicly accessible location above the *PMF*.
6	Applicant to demonstrate that evacuation in accordance with the requirements of this DCP is available for the potential development flowing from the subdivision proposal.

Management and Design

1	Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this DCP.
2	*Site Emergency Response Flood Plan* required where floor levels are below the *design floor level,* (except for single dwelling-houses).
3	Applicant to demonstrate that area is available to store goods above the 100 year flood level plus *freeboard*.
4	Applicant to demonstrate that area is available to store goods above the *PMF* level.
5	No storage of materials below the *design floor level* which may cause pollution or be potentially hazardous during any flood.

Schedule 8

All Other Floodplains Including Areas Affected by Local Overland Flooding

Planning & Development Controls (Note these controls are interim until catchment specfic FRMPs are prepared)

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

Not Relevant

Potentially Unsuitable Land Use

Notes

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. Notwithsatnding, 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 "potentially 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. Refer to section 2.7 of the DCP for special considerations such as for house raising proposals and development of properties identified for voluntary acquisition.

5. Refer to Section 2.5 of the DCP for planning considerations for proposals involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effects and Structural Soundness planning considerations of the applicable landuse category.

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 *flood* level unless justified by site specific assessment.
2	Habitable floor levels to be equal to or greater than the 100 year *flood* level plus freeboard.
3	All floor levels to be equal to or greater than the *PMF* level.
4	Floor levels to be equal to or greater than the *design floor level.* 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	The level of *habitable floor areas* to be equal to or greater than the 100 year *flood* level plus *freeboard*. If this level is impractical for a development in a Business zone, the floor level should be as high as possible.
6	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 more than 1.5m above finished ground level, confirming that the undercroft area is not to be enclosed.

Building Components & Method

1	All structures to have *flood compatible building components* below the 100 year *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 *flood* plus *freeboard.*
2	Applicant to demonstrate that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year *flood* plus *freeboard.* An engineers report may be required.
3	Applicant to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a *PMF*. An engineers report may be required.

Flood Effects

1	Engineers report required to certify that the development will not increase *flood* effects 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 vicinity.
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 a car parking space, which is not enclosed (eg. open parking space or carport) shall be as high as practical, but no lower than the 20 year *flood* level or the level of the crest of the road at the location where the site has access.
2	The minimum surface level of a car parking space, which is not enclosed, shall be as high as practical.
3	*Enclosed car parking* capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, must be protected from inundation by *floods* equal to or greater than the 100 year *flood*.
4	The driveway providing access between the road and parking space 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 space shall be a minimum of 0.3m above the 100 year *flood* or such that depth of inundation during a 100 year *flood* is not greater than either the depth at the road or the depth at the car parkng space. A lesser standard may be accepted for single detached dwelling houses where it can be demonstrated that risk to human life would not be compromised.
6	*Enclosed car parking* and car parking areas accommodating more than 3 vehicles (other than on Rural zoned land), with a floor level below the 20 year *flood* level or more than 0.8m below the 100 year *flood* level, shall have *adequate warning systems, signage and exits*.
7	Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year *flood*

Note: A flood depth of 0.3m is sufficient to cause a typical vehicle to float

Evacuation

1	Reliable access for pedestrians required during a 100 year *flood.*
2	Reliable access for pedestrians or vehicles is required from the building, commencing at a minimum level equal to the lowest *habitable floor* level to an area of refuge above the *PMF level*, or a minimum of 40% of the gross floor area of the dwelling to be above the *PMF* level.
3	The development is to be consistent with any relevant *flood evacuation strategy, Flood Plan adopted by Council* or similar plan.
4	The evacuation requirements of the development are to be considered. An engineers report will be required if the evacuation of persons might not be achieved within the *effective warning time*.
5	Reliable access for pedestrians or vehicles required to a publicly accessible location above the *PMF.*

Management and Design

1	Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this Plan.
2	Site Emergency Response Flood plan required where floor levels are below the *design floor level,* (except for single dwelling-houses).
3	Applicant to demonstrate that area is available to store goods above the 100 year *flood* level plus *freeboard.*
4	Applicant to demonstrate that area is available to store goods above the *PMF* level.
5	No storage of materials below the *design floor level* which may cause pollution or be potentially hazardous during any *flood.*

"..... all about managing our flood risks emanating from rivers, creeks, major drains and overland flow."

FLOOD RISK MANAGEMENT

Draft Development Control Plan (DCP) No. ...

Environmental Planning and Assessment Act, 1979

FLOOD RISK MANAGEMENT

Draft Development Control Plan (DCP) No. ...

Environmental Planning and Assessment Act, 1979

Prepared by Don Fox Planning
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Date: May 2004

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LIST OF ATTACHED SCHEDULES

1 Flood Compatible Materials

2 Land Use Categories

3 Prescriptive Controls –Georges River Floodplain

4 Prescriptive Controls – Woronora River Floodplain [To be inserted by Council at a later date]

5 Prescriptive Controls – All Other Floodplains Including Areas Affected by Local Overland Flooding

1.0 GENERAL

1.1 What is the Plan?

This document is to be known as the "Sutherland Flood Risk Management Development Control Plan" (DCP) No. ….. This Plan has been adopted by Council at its meeting of ..... in accordance with Section 72 of the Environmental Planning and Assessment Act, 1979 (Development Control Plans).

1.2 Why is This Plan Required?

In 1984, the State Government introduced its current flood prone land policy applicable to New South Wales. 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. 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."*

To achieve this objective 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 is the least preferred option, being costly 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 merit based approach to be followed by local government when dealing with planning, development and building matters on flood prone land. 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**.

This Plan 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, as identified for some floodplains, through the preparation of FRMS's and FRMP's.

1.3 To Which Applications Does the Plan Apply?

Council will take into consideration this Plan when determining development applications received in accordance with the Environmental Planning and Assessment Act, 1979.

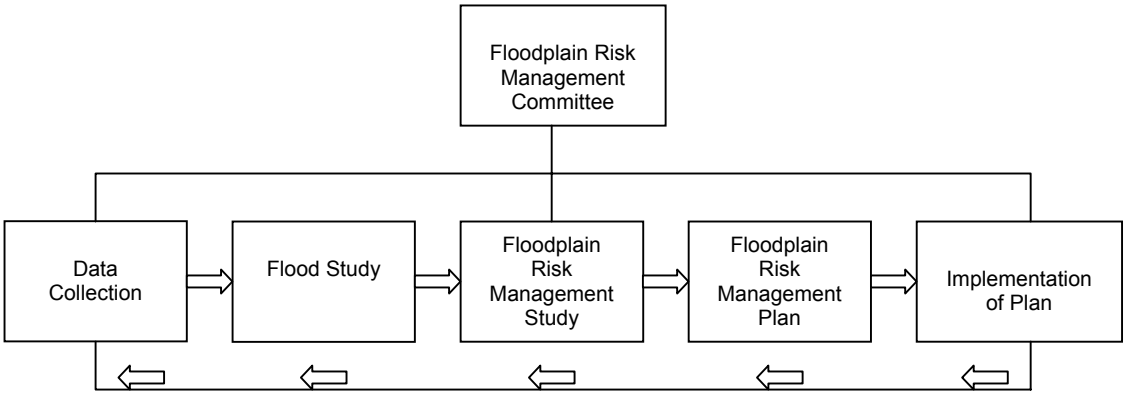


Figure 1: Floodplain Risk Management Process (FMM, 2001)

This Plan does not propose to exempt any applications from the necessity to obtain a particular approval of the Council or other government agencies, where such a requirement would otherwise exist.

1.4 Where Does the Plan Apply?

The Plan applies to whole of the Local Government area, as depicted upon the DCP Map.

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

1.5 How Does the Plan Relate to Other Legislation and Regulations?

This Plan 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 (in particular Sutherland Local Environmental Plan (LEP) 2000, and Greater Metropolitan Regional Environmental Plan No. 2 – Georges River Catchment) and other relevant Development Control Plans and policies adopted by Council.

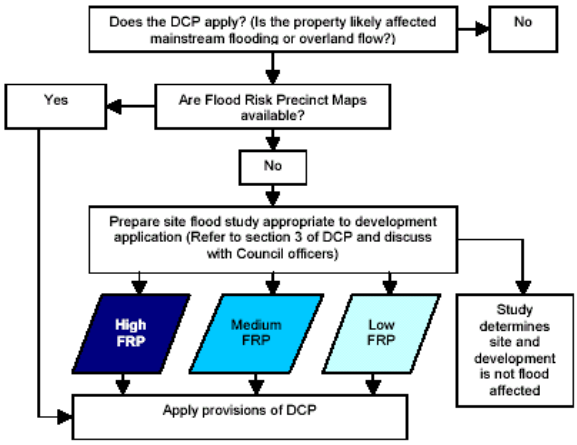
1.6 How to Use this Plan

Please read this document carefully and seek assistance from Council officers as required. The following is a summary of the major steps you should address:

(a) Check the proposal is permissible in the zoning of the land by reference to any applicable Environmental Planning Instrument (eg. Sutherland Local Environment Plan 1997).

(b) Consider any other relevant planning controls of Council (eg. controls in any other applicable DCP which governs the size and setback of development).

(c) Determine the floodplain (eg. Georges River, etc.) and flood risk precinct (low, medium or high) within which your site is situated. Enquire with Council regarding existing flood risk mapping or whether a site specific assessment may be warranted in your case (for example, if local overland flooding is a potential problem). A property may be located in more than one Precinct and the assessment must consider the controls for each Precinct where relative to where located on the site. The flow diagram below summarises this consideration process.



(d) Determine the land use category relevant to your development proposal, by firstly confirming how it is defined by the relevant environmental planning instrument and secondly by ascertaining the land use category from Schedule 2 of this Plan.

(e) Assess and document how the proposal will achieve the performance criteria for development and associated fencing provided by Clauses 2.4.2 and 2.5.2 of this Plan.

(f) Check if the proposal will satisfy the prescriptive controls for different land use categories in different flood risk precincts, as specified in Schedule 3 to 4 of this Plan depending on which floodplain the site is located.

If the proposal does not comply with the prescriptive controls, determine whether the performance criteria are nonetheless achieved.

The assistance of Council staff or an experienced floodplain consultant may be required at various steps in the process to ensure that the requirements of this Plan are fully and satisfactorily addressed.

1.7 What are the Aims of the Plan?

This Plan aims to:-

(a) To minimise the potential impact of development and other activity upon the aesthetic, recreational 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) Reduce the risk to human life and damage to property caused by flooding through controlling development on land affected by potential floods.

(e) 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.

(f) 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.

(g) Apply a “merit-based approach” to all development decisions which takes account of social, economic and ecological as well as flooding considerations.

(h) 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 FRMS's and FRMP's prepared in accordance with the FMM and its predecessor, the FDM.

(i) 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.

DCP MAP

COUNCIL TO INSERT MAP OF LGA SHOWING AREAS WHERE EACH MATRIX APPLIES

1.8 Glossary

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

Adequate Warning Systems, Signage and Exits is where the following is provided:

(a) an audible and visual alarm system which alerts occupants to the need to evacuate, sufficiently prior to likely inundation to allow for the safe evacuation of pedestrians and vehicles;
(b) signage to identify the appropriate procedure and route to evacuate; and
(c) exits which are located such that pedestrians evacuating any location during any flood do not have to travel through deeper water to reach a place of refuge above the 100 year flood away from the enclosed car parking.

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.

Basement car parking means car parking areas generally below ground level, or above natural ground level, and enclosed by bunding, where inundation of the surrounding areas may raise water levels above the entry level to the basement, resulting in rapid inundation of the basement to depths greater than 0.8 metres. Basement car parks are areas where the means of drainage of accumulated water in the car park has an outflow discharge capacity significantly less than the potential inflow capacity.

Design floor level **or** ***ground level*** means the minimum floor level that applies to the development. If the development is concessional development, this level is determined based on what land use category would apply if it was not categorised as Concessional Development. The floor level standards specified for the relevant land use category (excluding Concessional Development) in the low flood risk precinct are to be applied.

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.

Enclosed car parking means car parking which is potentially subject to rapid inundation which consequently increases risk to human life and property (such as basement of bunded car parking areas). The following criteria apply for the purposes of determining what is enclosed car parking:

(a) Flooding of surrounding areas may raise water levels above the perimeter which encloses the car park (normally the entrance), resulting in rapid inundation of the car park to depths greater than 0.8m, and

(b) Drainage of accumulated water in the car park has an outflow discharge capacity significantly less than the potential inflow capacity.

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, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunami.

> **Note:** Consistent with the FMM, this DCP does not apply in the circumstances of local drainage inundation as defined in the FMM and determined by Council. Local drainage problems can generally be minimised by the adoption of urban building controls requiring a minimum difference between finished floor and ground levels.

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 any policy of Council, the FRMP, the relevant SES Flood Plan, 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 the 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 design flood 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 plan, the hazard is flooding which has the potential to cause harm or loss to the community.

Hydraulic hazard is the hazard as determined by the provisional criteria outlined in the FMM in a 100 year flood event.

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).

Rebuilt dwelling refers to the construction of a new dwelling on an allotment where an existing dwelling is demolished.

Reliable access during a flood means the ability for people to safely evacuate an area subject to flooding, having regard to the depth and velocity of flood waters, the suitability of the evacuation route, 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 (not being an SES Flood Plan) is a management plan that demonstrates the ability to safely evacuate persons and include a strategy to move goods above the flood level within the available warning time. This Plan must be consistent with any flood evacuation strategy, flood plan or similar plan adopted by Council.

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.

2.0 WHAT ARE THE CRITERIA FOR DETERMINING APPLICATIONS?

2.1 General

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 (from Schedule 2);
- secondly, determine which floodplain and which part of that floodplain the land is located within (refer to Clause 2.3 and relevant flood risk mapping); and
- then apply the controls outlined under Clause 2.4.

Clause 2.5 provides specific requirements for fencing in the floodplain, while Clause 2.6 identifies special considerations which will apply only to some development in specific circumstances.

Clauses 2.4 and 2.5 which 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.

2.2 Land Use Categories

Eight 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 **Schedule 2.**

2.3 Flood Risk Precincts

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

▪ High Flood Risk Precinct

This has been defined as the area of land below the 100 year flood that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties.

> **Note:** The high flood risk precinct is where high flood damages, potential risk to life, evacuation problems would be anticipated or development would significantly and adversely effect flood behaviour. Most development should be restricted in this precinct. In this precinct, there would be a significant risk of flood damages without compliance with flood related building and planning controls.

▪ Medium Flood Risk Precinct

This has been defined as land below the 100 year flood that is not subject to a high hydraulic hazard and where there are no significant evacuation difficulties.

> **Note:** In this precinct there would still be a significant risk of flood damage, but these damages can be minimised by the application of appropriate development controls.

▪ Low Flood Risk Precinct

This has been defined as all other land within the floodplain (ie. within the extent of the probable maximum flood) but not identified within either the High Flood Risk or the Medium Flood Risk Precinct.

Note: The Low Flood Risk Precinct is 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.

2.4 Which Controls Apply to Proposed Developments?

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 exists, council's interim considerations. The categories applicable to each floodplain are depicted on the planning matrices contained in the following schedules:

- **Schedule 3** – Georges River Floodplain
- **Schedule 4** – All other floodplains including areas affected by local overland flooding. (Note these controls are interim only until catchment specific Flood Risk Management Plans are prepared as required by the Floodplain Management Manual)

[Council to insert controls for other floodplains as FRMP's are prepared]

2.4.1 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 with 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 and have reliable access.

(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 in general

(d) To prevent any intensification of the use of High Flood Risk Precinct or floodways, and wherever appropriate and possible, allow for their conversion to natural waterway corridors.

(e) 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.

(f) To minimise the risk to life by ensuring the provision of appropriate access from areas affected by flooding up to extreme events.

(g) To minimise the damage to property, including motor vehicles, arising from flooding.

(h) To ensure that proposed development does not expose existing development to increased risks associated with flooding.

2.4.2 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 and general community.

(c) The proposal should only be permitted where effective warning time and reliable access is available for evacuation from an area potentially affected by floods to an area free of risk from flooding. Evacuation should be consistent with any relevant or flood evacuation strategy where in existence.

(d) Development should not detrimentally increase the potential flood effects on other development or properties either individually or in combination with the cumulative impact of development that is likely to occur in the same floodplain.

(e) Motor vehicles are able to be relocated, undamaged, to an area with substantially less risk from flooding, within effective warning time.

(f) Procedures would be in place, if necessary, (such as warning systems, signage or evacuation drills) so that people are aware of the need to evacuate and relocated motor vehicles during a flood and are capable of identifying the appropriate evacuation route.

(g) 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.

(h) Proposed development must be consistent with ESD principles.

(i) Development should not prejudice the economic viability of any Voluntary Acquisition Scheme.

2.4.3 Prescriptive Controls

Schedules 3 to 4 outline the controls relevant to each of the floodplains to which this Plan applies.

2.5 Are There Special Requirements for Fencing?

2.5.1 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.

2.5.2 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 affect 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 in a controlled manner to prevent the undesirable impediment of flood waters.

2.5.3 Prescriptive Controls

2.5.3.1 Fencing within a floodway or High FRP will not be permissible except for security/ permeable/ open type/safety fences of a type approved by Council.

2.5.3.2 Council will require a Development Application for all new solid (non-porous) and continuous fences in the High and Medium FRP's unless otherwise stated by exempt and complying development provisions which may be incorporated into Council's Environmental Planning Instruments from time to time.

2.5.3.3 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;

(b) Other than a brick or other masonry type fence (which will generally not be permitted); or

(c) A fence type and siting criteria as prescribed by Council.

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

2.6 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 direct or cumulative 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 design of car parking (covered or uncovered) and associated driveways should not result in unacceptable environmental or amenity impacts. These unacceptable impacts would include elevated driveways and parking structures which are visually intrusive and overshadowing of adjoining residential properties which exceeds Council's normal standards.

(d) The proposal must not constrain the orderly and efficient utilisation of the waterways for multiple purposes.

(e) 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.

(f) 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.

(g) Notwithstanding any other provision where a property is identified within a Voluntary Acquisition Scheme area, Council will only consent to further development for 'concessional' development and 'recreation or non-urban'; provided:

(i) the development is for only minor works such as small awnings over existing floor balconies or in-ground swimming pools; and

(ii) the development will be permitted provided that the capital investment intended for the property is not greater than the minimum required to provide an acceptable proposal.

Note: Council will not permit any type of development which would be inconsistent with the objective of discouraging further development in areas of high risk and with Council's commitment to the Voluntary Acquisition Scheme.

3.0 WHAT INFORMATION IS REQUIRED WITH AN APPLICATION TO ADDRESS THIS PLAN?

3.1 Applications must include information which addresses all relevant controls listed above, and the following matters as applicable.

3.2 Applications for Concessional Development (see Schedule 2) to an existing dwelling on Flood Prone Land shall be accompanied by documentation from a registered surveyor confirming existing floor levels.

3.3 Development applications affected by this plan shall be accompanied by a survey plan showing:-

(a) The position of the existing building/s or proposed building/s;

(b) The existing ground levels to Australian Height Datum around the perimeter of the building and contours of the site; and

(c) The existing or proposed floor levels to Australian Height Datum.

3.4 Applications for earthworks, filling of land and subdivision shall be accompanied by a survey plan (with a contour interval of 0.25m) showing relative levels to Australian Height Datum.

3.5 For large scale developments, or developments in critical situations, particularly where an existing catchment based flood study is not available, a flood study using a fully dynamic one or two dimensional computer model may be required. For smaller developments the existing flood study may be used if available and suitable (eg it contains sufficient local detail), or otherwise a flood study prepared in a manner consistent with the "Australian Rainfall and Runoff" publication, Council's Drainage Design Code and the Floodplain Management Manual, will be required. From this study, the following information shall be submitted in plan form:

(a) water surface contours;

(b) velocity vectors;

(c) velocity and depth product contours;

(d) delineation of flood risk precincts relevant to individual floodplains; and

(e) show both existing and proposed flood profiles for the full range of events for total development including all

structures and works (such as revegetation/enhancements).

This information is required for the pre-developed and post-developed scenarios.

3.6 Where the controls for a particular development proposal require an assessment of structural soundness during potential floods, the following impacts must be addressed:

(a) hydrostatic pressure;

(b) hydrodynamic pressure;

(c) impact of debris; and

(d) buoyancy forces.

Foundations need to be included in the structural analysis.

SCHEDULE 1
FLOOD COMPATIBLE MATERIALS

BUILDING COMPONENT	FLOOD COMPATIBLE MATERIAL	BUILDING COMPONENT	FLOOD COMPATIBLE MATERIAL
Flooring and Sub-floor Structure	" concrete slab-on-ground monolith construction " suspension reinforced concrete slab.	**Doors**	" solid panel with water proof adhesives " flush door with marine ply filled with closed cell foam " painted metal construction " aluminium or galvanised steel frame
Floor Covering	" 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	**Wall and Ceiling Linings**	" 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
Wall Structure	" solid brickwork, blockwork, reinforced, concrete or mass concrete	**Insulation** **Windows**	" 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	**Nails, Bolts, Hinges and Fittings**	" brass, nylon or stainless steel " removable pin hinges " hot dipped galvanised steer wire nails or similar

Electrical and Mechanical Equipment For dwellings constructed on land to which this Policy applies, the electrical and mechanical materials, equipment and installation should conform to the following requirements.	**Heating and Air Conditioning Systems** 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.
Main power supply - 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.	**Fuel -** 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.
Wiring - 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.	**Installation -** 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.
Equipment - All equipment installed below or partially below the relevant flood level should be capable of disconnection by a single plug and socket assembly.	**Ducting -** 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.
Reconnection - 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.	

SCHEDULE 2
LAND USE CATEGORIES

Critical Uses and Facilities	Sensitive Uses and Facilities	Subdivision	Residential
Community facility which may provide an important contribution to the notification or evacuation of the community during flood events; Hospitals; Nuclear activities; Nuclear facility; and Nursing Homes.	Assisted accommodation; Communications facility; Hazardous or offensive industry or storage establishment; Housing for older persons or persons with a disability; Institutions; Educational establishments; Liquid fuel depot; Public utility undertakings or utility installations (including generating works) which are essential to evacuation during periods of flood or if affected would unreasonably affect the ability of the community to return to normal activities after flood events; Telecommunication facilities; and Waste disposal.	Subdivision of land which involves the creation of new allotments, with potential for further development.	Backpackers accommodation; Boarding houses; Camp or caravan park– long-term sites only (1); Cluster housing; Dual occupancy housing; Dwelling; Dwelling house; Group homes; Home activity; Residential flats; Residential medical practice; Townhouses; Public utility undertakings or utility installations (other than critical utilities); and villa houses.

(1) As defined by the Local Government (Caravan Park and Camping Grounds) Transitional Regulation 1993.

Commercial or Industrial	Tourist Related Development	Recreation or Non-urban Uses	Concessional Development
Arts and craft centre; Brothels; Bulky goods retailing; Bus depot; Business premises; Car parking; Child care centre; Convenience store; Food shop; Hotel; Industry; Junk yard; Liquid fuel depot; Medical facility; Motel; Motor showroom; Nightclub; Offensive industry; Passenger transport terminal; Place of assembly; Place of public worship; Plant hire; Recreation facility; Registered club; Repair centre; Restaurant; Road transport terminal; Service station; Sex shop; Shop; Tourist information centre; Vehicle and mechanical repair premises; Veterinary hospital; Warehouse; Waste recycling and management centre.	Caravan park - short term sites (1) only	Agriculture; Animal establishment; Aquaculture; Extractive industry; Marina; Recreation areas and minor ancillary structures (eg. toilet blocks or kiosks); Swimming enclosure; Tennis court (private); and Watercraft facility.	(a) In the case of residential development: (i) An addition or alteration to an existing dwelling of not more than 10% or 30m^2 (whichever is the lesser) of the habitable floor area which existed at the date of commencement of this Plan; (ii) The construction of an outbuilding with a maximum floor area of 20m^2; or (iii) Rebuilt dwellings which substantially reducing the extent of flood affectation to the existing building; (b) In the case of other development: (i) an addition to existing premises of not more than 10% of the floor area which existed at the date of commencement of this DCP; (ii) Rebuilding of development which substantially reduces the extent of flood effects to the existing development; (iii) A change of use which does not increase flood risk having regard to property damage and personal safety; or (iv) Subdivision which does not involve the creation of new allotments with potential for further development.

(1) As defined by the Local Government (Caravan Park and Camping Grounds) Transitional Regulation 1993.

Schedule 3

Georges River Floodplain

Planning & Development Controls

Planning Consideration	Flood Risk Precincts (FRP's)																							
	Low Flood Risk								Medium Flood Risk								High Flood Risk							
	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development	Critical Uses & Facilities	Sensitive Uses & Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation & Non-Urban	Concessional Development
Floor Level		3		2,6,7	5,6,7	2,6,7	1,6	4,7				2,6,7	5,6,7	2,6,7	1,6	4,7							1,6	4,7
Building Components		2		1	1	1	1	1				1	1	1	1	1							1	1
Structural Soundness		3		2	2	2	2	2				1	1	1	1	1							1	1
Flood Effects		2	2	2	2	2	2	2			1	2	2	2	2	2							1	1
Car Parking & Driveway Access		1,3,5, 6,7		1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,4,6, 7	6,7,8				1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,4,6, 7	6,7,8							2,4,6, 7	6,7,8
Evacuation		2,3,4	6	2,3	1 or 2, 3	2,3	4,3	2,3			6	2,3	1,3	2,3	4,3	2,3							4,3	2,3
Management & Design		4,5	1		2,3,5	2,3,5	2,3,5	2,3,5			1		2,3,5	2,3,5	2,3,5	2,3,5							2,3,5	2,3,5

COLOUR LEGEND: Not Relevant Potentially Unsuitable Land Use

General Notes

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. This matrix identifies where flood risks are likely to determine where certain development types will be considered "potentially 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	Refer to Section 2.5 of the DCP for planning considerations for proposals involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effects and Structural Soundness planning considerations of the applicable landuse category.
5	Refer to section 2.7 of the DCP for special considerations such as for house raising proposals and development of properties identified for voluntary acquisition.
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 LGA.
7	From time to time, Council may adopt mapping showing the *Boundary of Significant Flow* and/or *Flood Storage Areas* for this floodplain. Refer to Council to find out if these areas have been defined and mapped for this floodplain.

Floor Level

1	All floor levels to be no lower than the 20 year flood unless justified by site specific assessment.
2	*Habitable floor* levels to be no lower than the 100 year flood level plus freeboard.
3	*Habitable floor* levels to be no lower than the *PMF* level. Non-*habitable floor* levels to be no lower than the *PMF* level unless justified by a site specific assessment.
4	Floor levels to be no lower than the *design floor level*. 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	The level of *habitable floor areas* to be equal to or greater than the 100 year *flood* level plus *freeboard*. If this level is impractical for a development in a Business zone, the floor level should be as high as possible.
6	Non-habitable floor levels to be no lower than the 20 year flood unless justified by site specific assessment.
7	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 more than 1.5m above finished ground level, confirming that the undercroft area is not to be enclosed.

Building Components & Method

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

Structural Soundness

1	Engineer's report to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus *freeboard*.
2	Applicant to demonstrate that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus *freeboard*. An engineer's report may be required.
3	Applicant to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a *PMF* An engineers report may be required.

Flood Effects

1	Engineer's report required to certify that the development will not increase flood effects elsewhere, having regard to: (I) loss of flood storage; (ii) changes in flood levels and velocities caused by alterations to the flood *conveyance*; and (iii) the cumulative impact of multiple potential developments in the floodplain.
2	The flood impact of the development to be considered to ensure that the development will not increase flood effects elsewhere, having regard to: (I) loss of flood storage; (ii) changes in flood levels and velocities caused by alterations to the flood *conveyance*; and (iii) the cumulative impact of multiple potential developments in the floodplain. An engineer's report may be required.

Note: (1) If a *Boundary of Significant Flow* has been defined for this floodplain, any development inside this area will normally be unacceptable as it will reduce flood conveyance and increase flood effects elsewhere. (2) If a *Flood Storage Area* has been defined for this floodplain, any filling of the floodplain inside this area (except where this occurs by compensatory excavation), will normally be unacceptable as it will reduce the volume of flood storage available on the floodplain and increase flood effects elsewhere. (3) Even where a *Boundary of Significant Flow* and/or a *Flood Storage Area* have been defined, development outside these areas may still increase flood effects elsewhere and therefore be unacceptable.

Car Parking and Driveway Access

1	The minimum surface level of open car parking spaces or carports shall be as high as practical, but no lower than the 20 year flood or the level of the crest of the road at the location where the site has access. In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 20 year flood.
2	The minimum surface level of open car parking spaces, carports or garages, shall be as high as practical.
3	Garages capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, or *enclosed car parking,* must be protected from inundation by floods equal to or greater than the 100 year flood.
4	The driveway providing access between the road and parking space 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 space shall be no lower than 0.3m below the 100 year flood or such that the depth of inundation during a 100 year flood is not greater than either the depth at the road or the depth at the car parking space. A lesser standard may be accepted for single detached dwelling houses where it can be demonstrated that risk to human life would not be compromised.
6	*Enclosed car parking and car parking areas accommodating more than 3 vehicles (other than on Rural zoned land), with a floor level below the 20 year flood or more than 0.8m below the 100 year flood level, shall have adequate warning systems, signage and exits.*
7	Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year flood
8	Driveway and parking space levels to be no lower than the *design ground/floor levels*. Where this is not practical , a lower level may be considered. In these circumstances, the level is to be as high as practical, and, when undertaking alterations or additions, no lower than the existing level.

Note: (1) A flood depth of 0.3m is sufficient to cause a typical vehicle to float. (2) *Enclosed car parking* is defined in the glossary and typically refers to carparks in basements.

Evacuation

1	Reliable access for pedestrians or vehicles required during a 100 year flood.
2	Adequate flood warning is available to allow safe and orderly evacuation without increased reliance upon the SES or other authorised emergency services personnel.
3	The development is to be consistent with any relevant *flood evacuation strategy, Flood Plan adopted by Council* or similar plan.
4	The evacuation requirements of the development are to be considered. An engineers report will be required if circumstances are possible where the evacuation of persons might not be achieved within the *effective warning time*.
5	Reliable access for pedestrians or vehicles required to a publicly accessible location above the *PMF.*
6	Applicant to demonstrate that evacuation in accordance with the requirements of this DCP is available for the potential development flowing from the subdivision proposal.

Management and Design

1	Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this DCP.
2	*Site Emergency Response Flood Plan* required where floor levels are below the *design floor level,* (except for single dwelling-houses).
3	Applicant to demonstrate that area is available to store goods above the 100 year flood level plus *freeboard.*
4	Applicant to demonstrate that area is available to store goods above the *PMF* level.
5	No storage of materials below the *design floor level* which may cause pollution or be potentially hazardous during any flood.

Schedule 5

All Other Floodplains Including Areas Affected by Local Overland Flooding

Planning & Development Controls (Note these controls are interim until catchment specfic FRMPs are prepared)

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

Notes — Not Relevant — Potentially Unsuitable Land Use

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. Notwithsatnding, 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 "potentially 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. Refer to section 2.7 of the DCP for special considerations such as for house raising proposals and development of properties identified for voluntary acquisition.

5. Refer to Section 2.5 of the DCP for planning considerations for proposals involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effects and Structural Soundness planning considerations of the applicable landuse category.

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 *flood* level unless justified by site specific assessment.
2	Habitable floor levels to be equal to or greater than the 100 year *flood* level plus freeboard.
3	All floor levels to be equal to or greater than the *PMF* level.
4	Floor levels to be equal to or greater than the *design floor level.* 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	The level of *habitable floor areas* to be equal to or greater than the 100 year *flood* level plus *freeboard*. If this level is impractical for a development in a Business zone, the floor level should be as high as possible.
6	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 more than 1.5m above finished ground level, confirming that the undercroft area is not to be enclosed.

Building Components & Method

1	All structures to have *flood compatible building components* below the 100 year *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 *flood* plus *freeboard.*
2	Applicant to demonstrate that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year *flood* plus *freeboard.* An engineers report may be required.
3	Applicant to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a *PMF*. An engineers report may be required.

Flood Effects

1	Engineers report required to certify that the development will not increase *flood* effects 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 vicinity.
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 a car parking space, which is not enclosed (eg. open parking space or carport) shall be as high as practical, but no lower than the 20 year *flood* level or the level of the crest of the road at the location where the site has access.
2	The minimum surface level of a car parking space, which is not enclosed, shall be as high as practical.
3	*Enclosed car parking* capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, must be protected from inundation by *floods* equal to or greater than the 100 year *flood*.
4	The driveway providing access between the road and parking space 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 space shall be a minimum of 0.3m above the 100 year *flood* or such that depth of inundation during a 100 year *flood* is not greater than either the depth at the road or the depth at the car parkng space. A lesser standard may be accepted for single detached dwelling houses where it can be demonstrated that risk to human life would not be compromised.
6	*Enclosed car parking* and car parking areas accommodating more than 3 vehicles (other than on Rural zoned land), with a floor level below the 20 year *flood* level or more than 0.8m below the 100 year *flood* level, shall have *adequate warning systems, signage and exits*.
7	Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year *flood*

Note: A flood depth of 0.3m is sufficient to cause a typical vehicle to float

Evacuation

1	Reliable access for pedestrians required during a 100 year *flood.*
2	Reliable access for pedestrians or vehicles is required from the building, commencing at a minimum level equal to the lowest *habitable floor* level to an area of refuge above the *PMF level*, or a minimum of 40% of the gross floor area of the dwelling to be above the *PMF* level.
3	The development is to be consistent with any relevant *flood evacuation strategy, Flood Plan adopted by Council* or similar plan.
4	The evacuation requirements of the development are to be considered. An engineers report will be required if the evacuation of persons might not be achieved within the *effective warning time*.
5	Reliable access for pedestrians or vehicles required to a publicly accessible location above the *PMF.*

Management and Design

1	Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this Plan.
2	Site Emergency Response Flood plan required where floor levels are below the *design floor level,* (except for single dwelling-houses).
3	Applicant to demonstrate that area is available to store goods above the 100 year *flood* level plus *freeboard.*
4	Applicant to demonstrate that area is available to store goods above the *PMF* level.
5	No storage of materials below the *design floor level* which may cause pollution or be potentially hazardous during any *flood.*

APPENDIX G

SECTION 149
NOTIFICATIONS AND FLOOD CERTIFICATES

PROPOSED WORDING FOR FLOOD NOTATIONS ON SECTION 149(2) 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)**
STATUS OF INUNDATION FROM STORMWATER AND OVERLAND FLOW	**Category 'A' And 'Low' Flood Risk**	Part or all of the property is located within a Low Flood Risk area. [Plus Note 2]	Part or all of the property is located within a Medium Flood Risk area. [Plus Note 2]	Part or all of the property is located within a High Flood Risk area. [Plus Note 2]	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 2]	Part or all of the property is located within a Low Flood Risk area due to overland flow. [Plus Note 2]
	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 2]	Part or all of the property is located within a Medium Flood Risk area. [Plus Note 2]	Part or all of the property is located within a High Flood Risk area. [Plus Note 2]	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 2]	Part or all of the property is located within a Medium Flood Risk area due to overland flow. [Plus Note 2]
	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 2]	Part or all of the property is located within a High Flood Risk area due to overland flow. [Plus Note 2]	Part or all of the property is located within a High Flood Risk area. [Plus Note 2]	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 2]	Part or all of the property is located within a High Flood Risk area due to overland flow. [Plus Note 2]
	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 2]	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 2]	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 2]	Part or all of the property is potentially affected by creek/river flooding and overland flow. [Plus Note 2]	Part or all of the property is potentially affected by overland flow. [Plus Note 2]
	Category 'C' (ie. not thought to be inundated)	Part or all of the property is located within a Low Flood Risk area. [Plus Note 2]	Part or all of the property is located within a Medium Flood Risk area. [Plus Note 2]	Part or all of the property is located within a High Flood Risk area. [Plus Note 2]	Part or all of the property is potentially affected by creek/river flooding. [Plus Note 2]	Based on the information available to Council, the property is not affected by creek/river flooding or overland flow from major drainage.

Note

1. This table provides specific wording for S149(2) notations based on the status of inundation from creeks/rivers and from stormwater/overland flow.
2. The following additional wording is be added to each notation where indicated in the table:
   - *The term "Flood Risk" relates to the potential danger to personal safety and property. Further details are provided in the NSW Government's Floodplain Management Manual, 2001, or are available from Council..*
   - *Council's Development Control Plan No… "Managing Our Flood Risks" applies to this property. This DCP specifies controls on development to manage potential flood risks within the property and adjacent areas*
3. The rows shown shaded in the table will not generally apply as mapping of Flood Risk Precincts may not be available for stormwater/overland flow.
4. All S149(2) Certificates shall also include within the list of applicable Development Control Plans — *"Development Control Plan No. … Managing our Flood Risks."*