

Applying the Flood Provisions in Planning Schemes

A guide for councils

Planning Practice Note | 12

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This practice note provides guidance about applying the flood provisions in planning schemes including the preparation of policy, identifying land affected by flooding, preparing a local floodplain development plan and the application and operation of the flood provisions, including the preparation of schedules.

The practice note was prepared in conjunction with Melbourne Water.

This is one of two practice notes on planning for flooding. The other is Practice note 11: *Applying for a planning permit under the flood provisions – A guide for councils, referral authorities and applicants*, which explains the requirements of the flood provisions and provides guidance about making an application for a planning permit where flooding is a consideration and about how an application will be assessed.

Flooding is a natural hazard but, unlike most other natural hazards, floods are to a great degree predictable in terms of their location, depth and extent. This means that appropriate measures can be developed to reduce flood damage. Land use planning is recognised as being the best means of avoiding future flooding problems. Through careful planning, flood risks to life, property and community infrastructure can be minimised and the environmental significance of our floodplains protected.

Section 62(e) of the *Planning and Environment Act 1987* enables planning schemes to 'regulate or prohibit any use or development in hazardous areas, or areas likely to become hazardous'. As a result, planning schemes contain State planning policy for floodplain management requiring, among other things, that flood risk be considered in the preparation of planning schemes and in land use decisions.

The statutory authorities responsible for the collection of flood information and for land use planning in flood-affected areas are councils and floodplain management authorities (CMAs and Melbourne Water). The specific roles and responsibilities of each organisation and a map showing the distribution of floodplain management areas in Victoria are attached.

Abbreviations

ARI	Average Recurrence Interval
CMA	Catchment Management Authority
DFE	Design Flood Event
DELWP	Department of Environment, Land, Water and Planning
EPA	Environment Protection Authority
FMA	Floodplain Management Authority
FO	Floodway Overlay
LPPF	Local Planning Policy Framework
LSIO	Land Subject to Inundation Overlay

MSS	Municipal Strategic Statement
NPL	Nominal Protection Level
PMF	Probable Maximum Flood
SBO	Special Building Overlay
UFZ	Urban Floodway Zone

A council can use flood information to articulate local planning objectives and strategies for flooding in its Local Planning Policy Framework (LPPF) and apply the most appropriate flood provision to control land use and development in flood affected areas.

The planning authority has a range of tools to choose from to identify flood affected land in its planning scheme. There are four types of flood provisions available; the Urban Floodway Zone (UFZ), Floodway Overlay (FO), Land Subject to Inundation Overlay (LSIO) and Special Building Overlay (SBO). These have been derived based on the type of flooding and the potential level of risk to life and property.

The level of planning control in each provision is commensurate with the potential flood risk. For example, the UFZ is a restrictive provision that prohibits most uses and development. It is designed to be applied to urban environments where there is a high potential flood risk and only low intensity uses and development (such as recreation) are suitable. In contrast, the LSIO is used for both urban and rural environments to identify land with a lower potential flood risk or as an interim measure, areas where accurate flood mapping to identify the floodway is yet to be carried out. The LSIO only requires a permit for buildings and works and does not prohibit either use or development.

The flood provisions do not address the cause of flooding, but the way future land use and development will impact on the flooding problem or be impacted themselves by flooding. The cause needs to be dealt with by separate means. This may include other actions of council and/or the floodplain management authority, such as flood mitigation measures, that may be linked to a corporate plan or a floodplain management strategy.

For more information on floodplain management, see the references at the end of this practice note. A glossary of commonly used terms in floodplain management (some used in this practice note) is also included.

Identifying land affected by flooding

Before flood provisions can be introduced to a planning scheme, information on the type and extent of flooding is required to accurately map land affected by flooding and apply the most appropriate flood provision.

Types of flooding

Floods in Victoria are usually caused by heavy or prolonged rainfall, which can result in either ‘mainstream flooding’ or ‘stormwater flooding’. These two types of flooding are the basis of the flood zone and overlays in planning schemes.

Other types of flooding such as flooding associated with the failure of dams or water-supply systems are not specifically addressed in planning schemes.

Mainstream flooding

Heavy rainfall produces surface run-off which flows into streams and rivers. When there is a large amount of run-off, water overflows the river banks on to adjacent low-lying land causing flooding. This is called mainstream flooding and can occur in both rural and urban areas. The UFZ, FO and LSIO identify areas affected by mainstream flooding in planning schemes.

Stormwater flooding

During severe storms in urban areas, land can be affected by overland flows. These occur when the rainfall run-off exceeds the capacity of the piped drainage system and no provision has been made for overland flows. This is called stormwater flooding and often occurs in areas where there is a high density of existing development and a high flood damage potential. The SBO identifies areas affected by stormwater flooding in planning schemes.

Defining the extent of flooding

The ‘probable maximum flood’ (PMF) determines the maximum possible extent and height of flooding. This is the largest flood that could conceivably occur at a particular location. The area defined by the PMF is referred to as ‘flood prone’ and the area outside the PMF is referred to as ‘flood-free’ (see Figure 1).

In general, it is not practical or economical to provide land use planning or flood protection up to the PMF. A lesser flood standard, known as the ‘design flood event’ (DFE), is adopted for land use planning purposes and is the area applicable for planning schemes. The area defined by the DFE will

be referred to as 'land subject to inundation' and can be divided into its relevant UFZ, FO, LSIO and SBO components as the case requires.

In Victoria, the DFE for land use planning and building purposes is the 100-year ARI (average recurrence interval) flood, which occurs on average once every 100 years. This is the basis for declaring flood levels and flood areas under the *Water Act 1989* and for setting minimum building floor levels under the *Building Act 1993*.

Floodways

Floodways are areas that are important for the discharge or storage of water during major floods. They are usually aligned with naturally defined channels and depressions and often carry relatively deep and high velocity flows. Filling or even partial blockage of floodways can redistribute flood flows causing increased flood levels and flow velocities and increased flood risk for nearby properties. A blockage of a floodway can also have adverse environmental impacts, such as isolating wetlands, destroying natural habitats, eroding stream channels and increasing siltation.

The identification of floodway areas requires an assessment of the level of flood risk. One or more flood risk factors may apply to a given area and not all factors are given the same weight. The higher the potential flood risk, the more likely that the area will be defined as a floodway. For information on delineating floodways, contact your CMA (for Regional Victoria) or Melbourne Water (for the Greater Melbourne Area) for guidance.

Flood risk factors include:

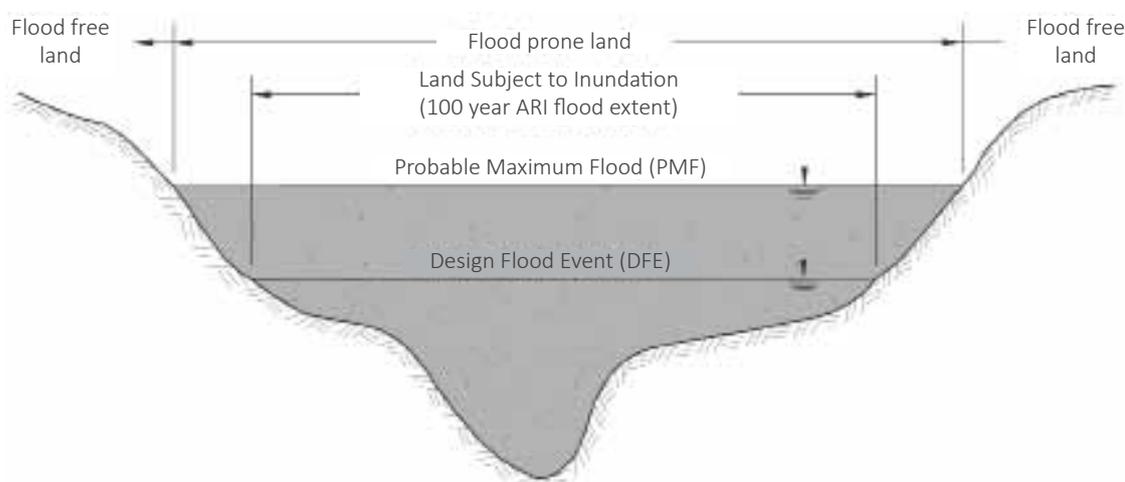
- land use
- duration of flooding
- available flood warning time
- size and frequency of flood
- rate of rise of floodwater
- access and evacuation
- depth and velocity of floodwater
- available flood storage capacity
- environmental values.

Flood information

Where possible, the DFE that defines the extent of land subject to inundation should be based on the 100-year ARI flood. Remember that this is not the maximum extent of flooding, which is defined by the PMF, a much larger event. If the magnitude of the 100-year ARI flood has not been determined, the DFE should be based on the known extent of the largest recorded historic flood or on other available information.

The floodplain management authority or council usually collects flood information for an area for use in planning schemes. This information should be included in a flood information report prepared by the relevant floodplain management authority and held for reference by the authority and the council.

Figure 1. Defining flood-prone land



The area designated as 'Land Subject to Inundation' is the area used for planning scheme purposes.

The report should link the flood boundaries shown in the planning scheme to a set of statements which reference the source of their delineation and include any necessary qualifications. An example for a council might state:

- The flood areas shown represent the best estimate of flood extent based on currently available information.
- Delineation of the LSIO is based on aerial photography of the October 1993 flood, which is currently the best estimate of the 100-year ARI flood.
- The flood areas shown do not necessarily represent the maximum possible extent of flooding and can be exceeded by a larger flood event.
- Other areas in the municipality may be liable to flooding, but are not shown on the planning scheme maps due to lack of information at the present time.
- The flood areas are subject to change and new flood areas may be introduced as additional information becomes available and further investigations are carried out.

Sources of flood information

Flood information is available from various sources, including detailed flood studies, flood mapping projects, aerial photographs, historic flood levels, ground levels, soil and geology maps, river surveys, and local knowledge.

In many parts of Victoria, investigations have been undertaken to assess flood risk and identify land subject to inundation and its various components, including floodways and overland flow paths. At present, flood maps are not available for all areas of the state. Councils and floodplain management authorities should continually extend and update their current flood mapping database, giving priority to the higher flood-risk areas. Where adequate flood maps have not been prepared for a particular area, all available local knowledge should be documented and a flood mapping investigation should be initiated.

If detailed information on flooding is not available, in the interim the floodplain management authority should identify land known to be subject to inundation as best it can and the LSIO should be applied, even if the LSIO boundary is based

on limited information. The boundary should be adjusted, and floodway provisions included if necessary, after detailed flood mapping has been completed.

The department has undertaken a comprehensive flood mapping program for regional Victoria, which involves the presentation of available information on flood maps for use by catchment management authorities and councils. These maps apply only to mainstream flooding and show the extent of flooding, floodways and flood levels. Melbourne Water has carried out detailed studies to identify overland flow paths of stormwater in urban areas of Melbourne, as well as mainstream flooding in some urban and rural areas.

What are the flood provisions?

State Planning Policy Framework (SPPF)

The State planning policy for floodplains (Clause 13.02) provides the broad framework for the integration of flood policy and provisions into planning schemes. It brings together various strands of policy and strategic planning from all areas of government that have a bearing on floodplain management. It also aims to provide consistency in planning controls for flood affected areas of the state.

The objective of the State Planning Policy for floodplain management is to assist in the protection of:

- life, property and community infrastructure from flood hazard
- the natural flood-carrying capacity of rivers, streams and floodways
- the flood storage function of floodplains and waterways
- floodplain areas of environmental significance or of importance to river health.

The policy states that flood risk must be considered in the preparation of planning schemes and in land use decisions, so as to avoid intensifying the impact of flooding through inappropriately located uses and developments. It also states that land affected by flooding should be shown on planning scheme maps and recognises that land affected by flooding is land inundated by the 1-in-100-year flood event or as determined by the floodplain management authority.

Planning authorities should have regard to the following documents when preparing planning schemes for areas affected by flooding:

- regional catchment strategies and special area plans (under the *Catchment and Land Protection Act 1994*)
- state environmental protection policies
- any floodplain management manual of policy and practice, or catchment management or floodplain management strategy adopted by the relevant floodplain management authority
- any best practice environmental management guidelines for stormwater adopted by the EPA.

Local Planning Policy Framework

The LPPF sets out the local policy context for a municipality and includes the following key elements:

Municipal Strategic Statement

If flooding is a planning issue in a municipality, this should be identified in the Municipal Strategic Statement (MSS). The MSS should describe the characteristics of flooding (including the location of affected areas, flooding impacts and specific issues), the objectives of floodplain management and strategies, and implementation measures for achieving the objectives. It should also identify the data source for flooding information.

An example of an MSS extract on the issue of flooding is attached.

Local Planning Policies

Where additional guidance is needed for decision-making on planning permit applications in flood affected areas, a local planning policy on flooding may be warranted. This can be for general application or for specific areas. The local policy may include locality plans that are linked to policies for future development of flood-affected areas. An example of a typical local policy for flooding is attached. Alternatively, a local floodplain development plan can be prepared.

Flood zone and overlays

The flood zone and overlays are specifically designed to identify land with particular flood characteristics.

Which flood zone or overlay should apply?

The nature of the flood risk and the type of flood information available will determine how and to what extent the flood provisions are applied in the planning scheme.

The flood zone and overlay provisions ensure that the use and development of land subject to inundation is made compatible with the level of flood risk through the planning permit process.

The UFZ applies to urban areas where the potential flood risk is high and strict controls over land use are required. The three overlays (FO, LSIO and SBO) cover a range of situations in both urban and rural areas where the potential flood risk is less than in the UFZ, and where control over development (buildings, works and subdivision) and not land use, is sufficient.

One or more of these tools can be applied to cover a particular flooding situation. The ways the flood zone and overlays can be applied in a rural and urban context are shown in Table 1 and Figure 2.

Urban Floodway Zone

The UFZ applies to mainstream flooding in urban areas where the primary function of the land is to convey active flood flows. It applies to urban floodway areas where the potential flood risk is high due to the presence of existing development or to pressures for new or more intensive development.

The UFZ restricts the use of such land, as the risk associated with flooding renders it unsuitable for any further intensification of use or development. The land use is therefore restricted to activities such as apiculture, animal husbandry and recreational activities. Most other uses are prohibited (see Case 1 in Table 1 and Figure 2.3).

Sometimes the UFZ can cover the full extent of land subject to inundation, including situations where the floodplain is relatively narrow and deep.

The UFZ is not widely used due to its restrictive nature. As an alternative, a flood overlay can be used in conjunction with an appropriate zone (such as the Floodway Overlay and the Public Park and Recreation Zone) to enable the primary use of the land to be recognised at the same time as acknowledging its flooding characteristics.

Floodway Overlay

The FO applies to mainstream flooding in both rural and urban areas. These areas convey active flood flows or store floodwater in a similar way to the UFZ, but with a lesser flood risk. The FO is suitable for areas where there is less need for control over land use, and the focus is more on control of development.

As with the UFZ, in some cases the FO can cover the full extent of land subject to inundation, for example, in situations where the floodplain is relatively narrow and deep.

The FO can be applied in three situations (see Cases 2 to 4 in Table 1 and Figures 2.2 and 2.3).

Land Subject to Inundation Overlay

The LSIO applies to mainstream flooding in both rural and urban areas. In general, areas covered by the LSIO have a lower flood risk than UFZ or FO areas.

The LSIO can be applied in three situations (see Cases 5 to 7 in Table 1 and Figures 2.1, 2.2 and 2.3).

Special Building Overlay

The SBO applies to stormwater flooding in urban areas only (see Case 8 in Table 1 and Figure 2.4).

Before 1975, drainage systems were designed to a lower standard than those used today. Often they were designed for a five-year ARI storm capacity, and sometimes for a lesser standard. Usually no provision was made for overland flows, so land is often flooded when the capacity of the underground drainage system is exceeded.

With the redevelopment of existing urban areas and the proposed development of new areas, there will be pressure to develop within overland flow-path areas. The purpose of the SBO is to manage development in these areas.

While the SBO is primarily intended for overland flow path areas in the Melbourne metropolitan area, it can also be applied to urban areas affected by stormwater flooding in regional towns.

Earthworks

Earthworks include land forming, laser grading, levee banks, lanes, tracks, aqueducts, surface and subsurface drains and any associated structures.

Inappropriate earthworks have the potential to obstruct or divert flood flows, reduce natural flood

storage areas, impact on environmental values and increase flood flows, flow velocities and flood damage.

Significant earthworks, including levees and raised roads, are inappropriate for floodway land. In rural areas, private levees may be constructed without regard for the potential effects of these works beyond the farm boundaries. In urban areas, earthworks can interfere with local drainage and divert floodwater onto other properties. Councils should consider introducing earthworks provisions into their planning schemes where necessary as an additional measure in protecting floodplains.

Any change to the planning scheme to introduce earthworks provisions should be linked to strategies in the MSS and preferably supported by some guidelines for the application of the earthworks provisions in a local floodplain development plan or local planning policy.

Preparing schedules to overlays

Apart from the standard exemptions for buildings and works in the overlays, the schedules to the overlays can be used to exempt certain buildings and works from the need for a permit. Care should be taken when specifying types of development to be exempted, and this should be done in consultation with the floodplain management authority.

Exemptions in schedules should respond to local conditions, taking into account specific types of development and local needs. For example, in rural areas, typical exempt buildings and works that would not have a significant effect on flood risk might include minor earthworks, farm sheds and hay sheds. In view of the need to monitor development more carefully in floodway areas, exempt buildings and works in the FO should be more limited than in the LSIO.

The SBO includes standard exemptions for common urban developments such as minor extensions to dwellings, replacement fencing, carports, pergolas and in-ground swimming pools.

The principal benefit of 'scheduling out' specific buildings and works is that the planning permit application process will be more streamlined. The effective use of schedules should reduce the number of planning permit applications the council and the flood plain management authority need to process.

Attached is an example of a schedule that could apply to an LSIO in a rural area.

Preparing a local floodplain development plan

A local floodplain development plan enables the council and local floodplain management authority to include specific local requirements in the planning scheme. It has two purposes:

- to provide a set of requirements and guidelines for development in a particular area. It should address local circumstances and record local flooding information.
- to simplify and streamline the consideration of planning permit applications and avoid the need to prepare a flood risk report.

A council usually prepares a local floodplain development plan in consultation with the floodplain management authority.

Once the plan has been adopted, the planning scheme should be amended to include it as an incorporated document.

In preparing a local floodplain development plan, the council and floodplain management authority should consider what objectives they are trying to achieve in managing the floodplain area and how the plan can best achieve those objectives.

The plan should be carefully drafted as the planning scheme requires that any planning permit application must be consistent with it. If the plan is too prescriptive it may restrict development unnecessarily. A planning permit application that is inconsistent with the local floodplain development plan should be refused.

For subdivision in the UFZ and FO, if the subdivision provisions in the local floodplain development plan differ from the subdivision provisions in the UFZ or FO, the local floodplain development plan prevails. Once the plan has been adopted, an applicant need not prepare a flood risk report in these areas.

A local floodplain development plan should include:

- flood history
- flood information sources
- flood impacts (description of the types of flood behaviour in the UFZ, FO, LSIO and SBO areas and their importance)
- flora, fauna and other environmental values and constraints

- development guidelines for permissible subdivisions, buildings and works, including earthworks (these may vary for different zone and overlay areas)
- guidelines to assist the council prepare its local policies, schedules and referral agreements.

Flood conditions vary for different areas, so a local floodplain development plan may need to include a number of subplans to reflect differences in flooding behaviour.

Councils and floodplain management authorities should give a high priority to the preparation of local floodplain development plans, particularly in areas of significant flood risk and where a large number of applications are anticipated. For the local floodplain development plan to have effect, it must be adopted by the council in consultation with the floodplain management authority.

A suggested basis for a local floodplain development plan is attached. This is not the only form such a plan can take. Performance-based plans provide more flexibility to respond to particular local flooding issues.

More information

Flood information and advice

For information on flood risks and other flooding matters in an area, contact the relevant floodplain management authority.

Regional Victoria

Ten FMAs operate across Victoria comprising nine CMAs within rural provincial areas of Victoria and Melbourne Water within the Port Phillip and Western Port Catchment Management Region. They are Corangamite CMA, East Gippsland CMA, Glenelg Hopkins CMA, Goulburn Broken CMA, Mallee CMA, North Central CMA, North East CMA, West Gippsland CMA, Wimmera CMA and Melbourne Water.

Greater Melbourne area

Contact the relevant local retail water company (City West Water, South East Water, or Yarra Valley Water) first as they issue property information statements, including flood risk information, on behalf of Melbourne Water.

For further flood information and advice, contact the Land Development Team of Melbourne Water on (03) 9679 7517.

References

Advisory Notes for Delineating Floodways, Department of Natural Resources and Environment (1998)

Victoria Flood Management Strategy, Department of Justice and Department of Natural Resources and Environment (1998)

Guidelines for Development in Overland Flow Paths, Melbourne Water Corporation, Waterways and Drainage (2000)

Floodplain Management in Australia: Best practice principles and guidelines, Agriculture and Resource Management Council of Australia and New Zealand (2000).

Glossary

This glossary is based on that used in the *Victoria Flood Management Strategy* (Department of Justice and Department of Natural Resources and Environment 1998). Other terms used in this practice note may be defined in the *Planning and Environment Act 1987*.

Average Recurrence Interval (ARI): The likelihood of occurrence of flooding expressed in terms of the long-term average number of years between the occurrence of a flood as large or larger than the DFE. For example, floods with a discharge as large as or larger than the 100-year ARI flood event will occur on average once every 100 years.

Catchment: The area draining to a particular site. It always relates to a specific location and includes the catchments of tributary streams as well as the main stream.

Design Flood Event (DFE): A flood event of known magnitude or average recurrence interval, or a historic event which is selected for land use planning, emergency planning and engineering design purposes. The DFE for land use planning purposes should be the 100-year ARI flood where information is available. Note that the design flood does not define the maximum extent of land liable to flooding, which is defined by the PMF.

Discharge (or flow): The rate of flow of water measured in terms of volume over time (for example, cubic metres per second). It is to be distinguished from the speed or velocity, which is a measure of how fast the water is moving rather than how much is moving.

Flood: Relatively high flows which overtop the natural or artificial banks in any part of a creek, river, estuary, lake, dam or artificial channel.

Flood awareness: An appreciation of the likely effects of flooding and a knowledge of the relevant flood warning, response and evacuation procedures.

Flood damage: The tangible and intangible costs of flooding.

Flood fringe: Those areas that include already developed land, future infill development areas or protected areas. They are areas of land which are not effective for the free passage and temporary storage of floodwater and which are associated with a relatively low flood risk.

Flood mitigation works: Structural works (including levees, excavated floodways, water storages, retarding basins, stream channel modification, flood-proofing and house-raising) built to protect existing development and assets from flood risk and damage up to the DFE.

Flood-prone land: Land affected by the PMF, which defines the maximum possible extent of flooding.

Flood-proofing: A combination of measures incorporated in the design, construction and alteration of buildings or structures subject to flooding to reduce or eliminate flood damage.

Flood risk: Potential for loss or damage to property, including environmental assets, or harm to people due to flooding.

Flood storage areas: Those parts of the floodplain which would temporarily store floodwater to be later discharged as the flood recedes. These parts of the floodplain are important for the attenuation of a flood and for the reduction of its severity during its passage.

Floodplain: The area of land adjacent to a creek, river, estuary, lake, dam or artificial channel which is affected by the PMF, that is, flood-prone land.

Floodplain management: The range of measures (including land-use planning, development and building controls, flood mitigation works, flood warning and flood awareness) available to prevent or reduce flood risk.

Floodplain management authority: Any authority with 'direct' or 'delegated' functions for Floodplain Management under Part 10, Division 4 of the *Water Act 1989*. The main floodplain management

authorities are Melbourne Water and the regional catchment management authorities for their respective areas. In areas not covered by the 'delegated' authority, the Minister for Water is the authority.

Floodway: The channel, stream and that portion of land subject to inundation necessary to convey the main flow of floodwater, and usually comprising the high-hazard portion of the floodplain where most development is to be avoided. Floodways are often, but not necessarily, the areas of deeper flow or the areas where higher velocities occur.

Freeboard: A factor of safety above design flood levels typically used in relation to the setting of floor levels. It is usually expressed as a height above the level of the DFE.

Hydraulics: The determination of parameters such as flood levels, flood depth and flow velocity in a river, stream, adjacent floodplain or overland flow path.

Hydrology: The study of the rainfall and run-off process as it relates to the determination of flows or discharges for given floods.

Land subject to inundation: The estimated area that would be inundated by the DFE. This will vary for different purposes, but should be based on the 100-year ARI flood for land use planning. Its extent will be less than the extent of flood-prone land, which is based on the PMF.

Local floodplain development plan: The principle means of managing development on land subject to inundation. It includes both written and diagrammatic information and guidelines which describe how the land is to be developed, particularly in relation to subdivisions, buildings and works.

Mainstream flooding: Inundation of normally dry land occurring when water overflows the natural or artificial banks of a watercourse in a catchment. Mainstream flooding generally excludes water carriers constructed with pipes or artificial channels, which are considered as stormwater channels.

Nominal Protection Level (NPL): The 100-year ARI flood level plus a freeboard margin of 300 mm.

Planning authority: Any government minister or agency that has the power to prepare a planning scheme amendment, and which may include a council or public authority.

Probable Maximum Flood (PMF): The largest flood that could conceivably occur at a particular location. The extent, nature and potential consequences of flooding associated with the PMF event should be assessed in a flood study. The PMF event may form the basis of evacuation planning and the identification of refuge areas. Considerations should be given to adopting the PMF event as the DFE for emergency services planning and for determining the location and floor levels of facilities such as telephone exchanges, police stations, hospitals and schools.

Responsible authority: The body or agency which administers and enforces a planning scheme, usually the municipal council.

Risk management: The systematic application of management policies, procedures and practices to the tasks of identifying, analysing, assessing, treating and monitoring risk.

Run-off: The portion of rainfall that drains into the surface drainage network, also known as rainfall excess.

Stormwater flooding: Stormwater flooding can be caused by local run-off exceeding the capacity of an urban stormwater drainage system or by the backwater effects of mainstream flooding causing the urban stormwater drainage system to overflow.

Velocity: A measure of how fast water is moving in terms of distance over time (for example, in metres per second). It is to be distinguished from the discharge or flow, which is a measure of how much volume of water is moving rather than its speed.

Roles and responsibilities of statutory authorities

Statutory authorities	Legislation	Roles and responsibilities
<p>Floodplain management authorities</p> <ul style="list-style-type: none"> Catchment Management Authorities (see attached map of Floodplain Management Areas in Victoria) Melbourne Water 	<p>Floodplain management functions under the <i>Water Act 1989</i> and <i>Catchment and Land Protection Act 1994</i>.</p>	<p>Catchment management authorities</p> <ul style="list-style-type: none"> manage and control waterways, drainage and floodplains promote community awareness of management of land and water resources develop regional catchment management strategies prepare and implement floodplain management plans maintain and enhance flood information, including the extent and height of floodwater provide advice about flooding and controls on development of land to local councils, DELWP and the community. <p>Melbourne Water</p> <ul style="list-style-type: none"> manages and controls waterways, drainage and floodplains promotes community awareness of water resource management issues prepares comprehensive drainage and flood mitigation schemes for new development areas and corridors, and for existing areas undergoing redevelopment prepares detailed information on overland flow paths and floodplains to guide orderly planning for future land development activities updates individual property information and encumbrance databases so that interested parties can gain easy access to flood information regulates development in the Melbourne metropolitan area as a formal referral authority under local planning schemes. <p>DELWP</p> <ul style="list-style-type: none"> develops national and statewide flood policy promotes best practice in floodplain management coordinates the statewide flood database.
<p>Responsible authorities</p> <ul style="list-style-type: none"> All municipal councils 	<p>Administer and enforce planning schemes under the <i>Planning and Environment Act 1987</i>.</p> <p>Municipal councils also have responsibilities for building approvals under the <i>Local Government Act 1989</i> and the <i>Building Act 1993</i>.</p>	<p>Municipal councils</p> <ul style="list-style-type: none"> provide for the fair, orderly, economic and sustainable use and development of land provide for the protection of natural resources and man-made resources and the maintenance of ecological processes and genetic diversity establish a system of planning schemes to be the principal way of setting out objectives, policies and controls for the use, development and protection of land ensure that environmental, social and economic effects are considered when decisions are made about the use and development of land provide for effective enforcement procedures to achieve compliance with planning schemes, permits and agreements regulate or prohibit any use or development in hazardous areas or in areas which are likely to become hazardous facilitate accountability at all levels by maintaining information and reporting systems. prepare ‘designated special area’ maps for areas liable to flooding set minimum floor levels for buildings in areas liable to flooding consider the likely danger to life, health and safety of the occupants of a proposed building due to flooding.

Table 1. Application of the flood zone and overlays

	Urban Floodway Zone	Floodway Overlay	Land Subject to Inundation Overlay	Special Building Overlay
Urban or rural areas?	Urban areas only	Both urban and rural areas	Both urban and rural areas	Urban areas only
Mainstream or stormwater flooding?	Mainstream flooding from a river or stream	Mainstream flooding from a river or stream	Mainstream flooding from a river or stream	Stormwater flooding along overland flow paths
Application	<p>Case 1 (see Fig. 2.3)</p> <ul style="list-style-type: none"> Urban land which is mainly undeveloped The stream channel or primary flow path area Important for conveying and/or storing floodwater Higher flood depths and/or flow velocities Higher potential flood risk Unsuitable for intensive urban development. 	<p>All cases</p> <ul style="list-style-type: none"> The stream channel or primary flow path area Important for conveying and/or storing floodwater Higher flood depths and/or flow velocities Higher potential flood risk, but usually not as severe as in the UFZ. <p>Case 2</p> <ul style="list-style-type: none"> Rural land which is mainly undeveloped. <p>Case 3</p> <ul style="list-style-type: none"> Urban land which is mainly undeveloped Unsuitable for intensive urban development but may be suitable for development compatible with the flood risk (for example, public purpose uses, such as school grounds, golf courses, sports grounds and recreation areas). <p>Case 4</p> <ul style="list-style-type: none"> Urban land that is fully or substantially developed (for example, currently zoned residential, commercial or industrial areas). 	<p>Case 5 (see Fig. 2.1)</p> <ul style="list-style-type: none"> Rural or urban areas where the extent of the floodway has not been identified and only the extent of land subject to inundation is known Areas that cover the total extent of land subject to inundation, including the higher risk floodway component LSIO can be applied as an interim measure until further mapping of the floodway is carried out. <p>Case 6 (see Fig. 2.2)</p> <ul style="list-style-type: none"> Rural land that is mainly undeveloped Areas where the extent of the floodway has been identified and LSIO covers the balance of land subject to inundation, excluding the floodway component Lower flood depths and/or flow velocities Lower potential flood risk. <p>Case 7 (see Fig.2.3)</p> <ul style="list-style-type: none"> Urban land that is fully or substantially developed ('flood fringe') Areas where the extent of the floodway has been identified and the LSIO covers the balance of land subject to inundation, except the floodway component Lower flood depths, lower flow velocities Lower potential flood risk. 	<p>Case 8 (see Fig. 2.4)</p> <ul style="list-style-type: none"> Urban land that is inundated if the capacity of the drainage system is exceeded during heavy rainfall Currently used by Melbourne Water in the Melbourne metropolitan area Can be applied by councils for regional towns provided overland flow path areas are delineated.

Figure 2: Application of flood zone and overlays

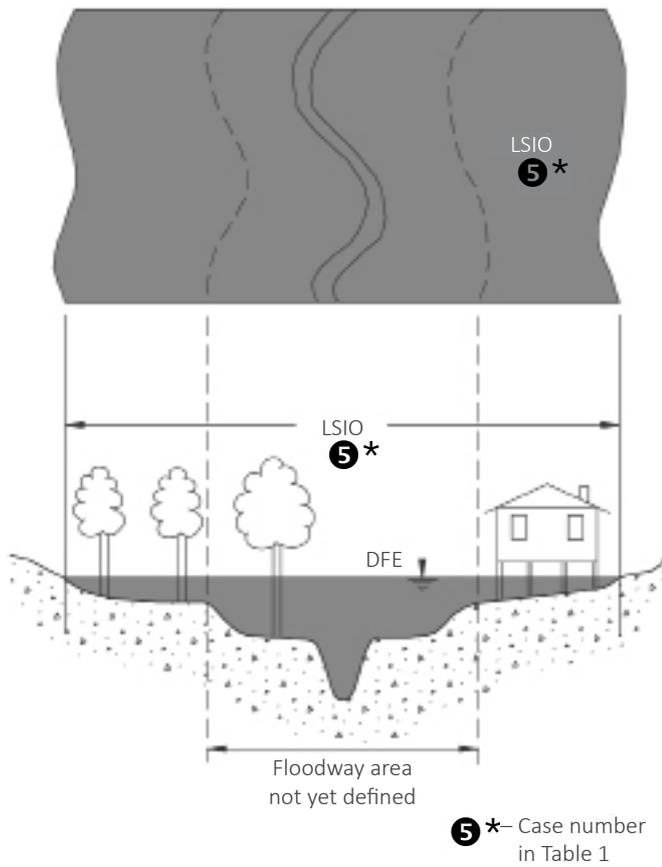


Figure 2.1
Rural and urban areas
Mainstream flooding
Case 5

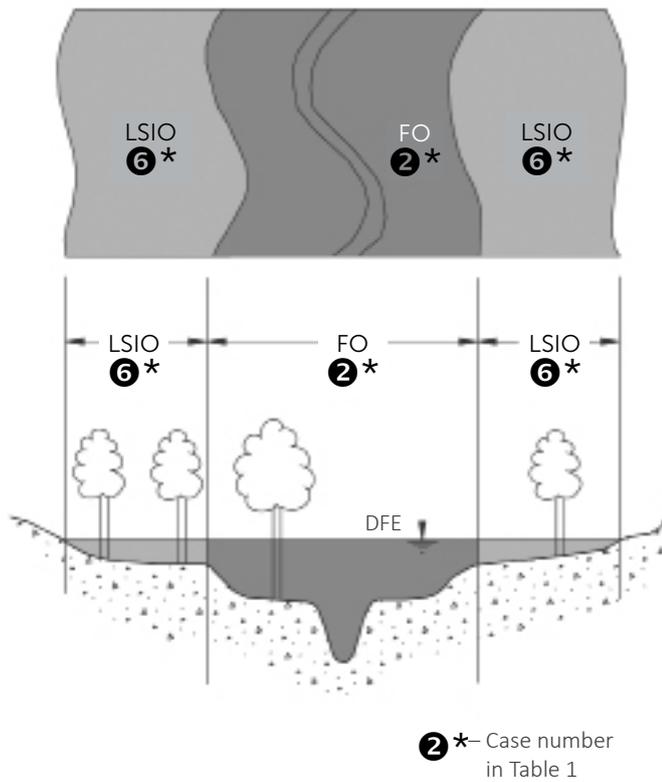
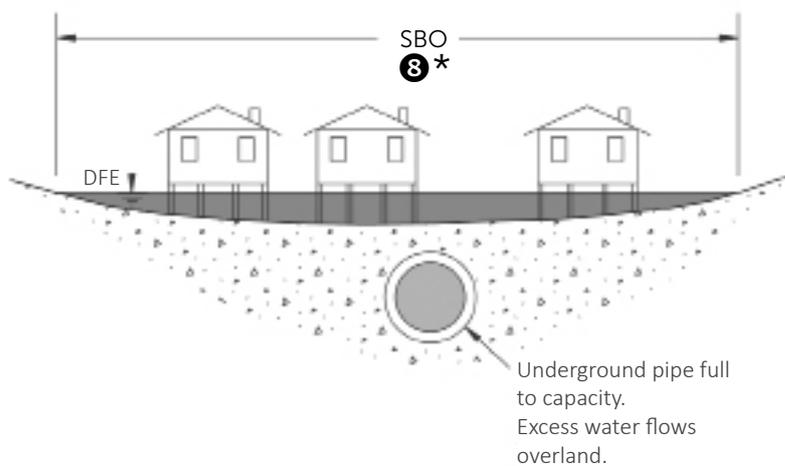
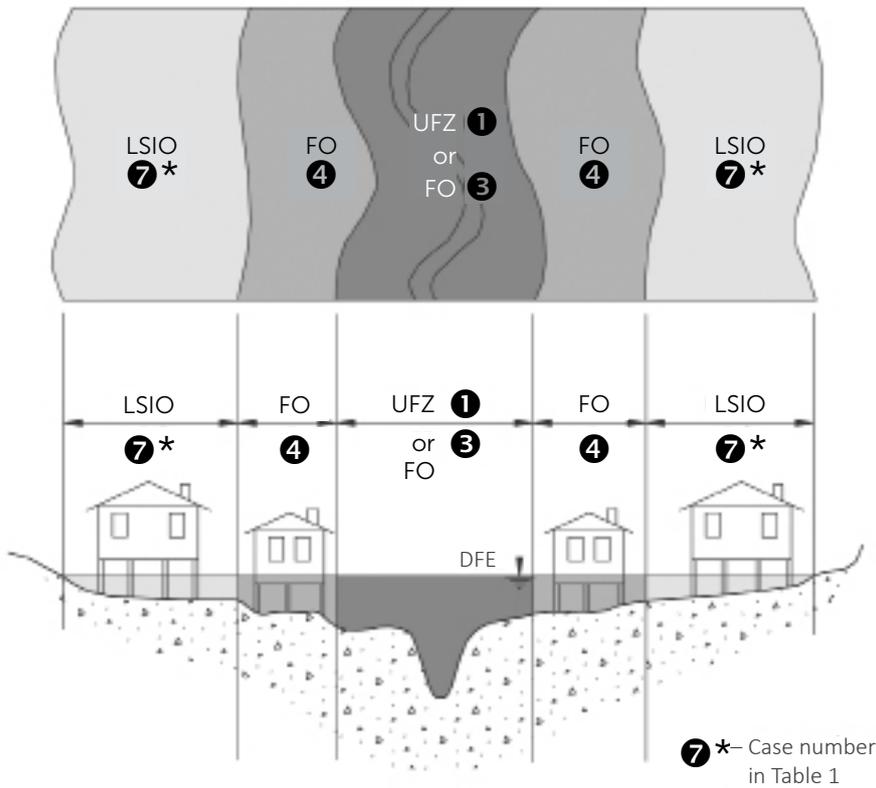


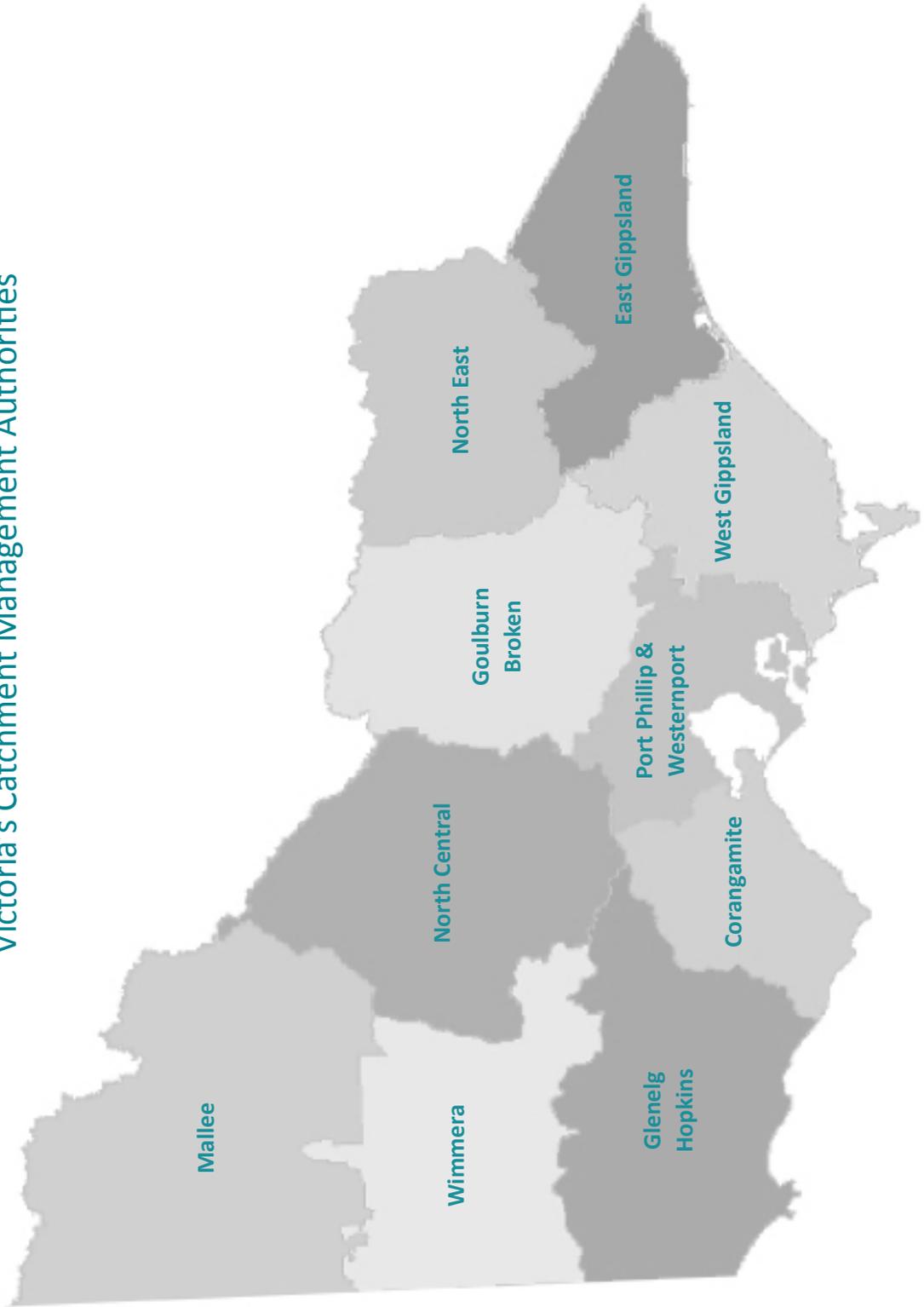
Figure 2.2
Rural and urban areas
Mainstream flooding
Cases 2 and 6

Figure 2: Application of flood zone and overlays continued



8* – Case number in Table 1

Victoria's Catchment Management Authorities



Examples

This appendix provides examples to illustrate a typical approach to addressing flood issues in a planning scheme. It is hoped that they will be of assistance to councils and floodplain management authorities.

The examples are intended as a guide only, and their content is not necessarily recommended for any particular situation. Councils and floodplain management authorities should agree on the format and content of documentation that will suit the requirements of a given area.

The examples are:

- Clause 21.05- an MSS extract
- Clause 22.03-3 – a local planning policy
- A schedule to the LSIO
- A local floodplain development plan.

21.05-2 FLOODING

27/11/2012
C197

Overview

Much of the Gumnut shire is subject to regular flooding due to the number of rivers flowing through the area, the topography and the use of irrigation channels for drainage throughout the Shire. Figure 1 shows the extent of flooding in the Shire.

Flood mapping for the Shire provided by the Catchment Management Authority in 2012 identifies 600 square kilometres of land within the municipality as flood prone. Significant floods occurred in 1890, 1916, 1934, 1952, 1974, 1990 and 1993.

Flooding is costly to the community. In June 1993, Yellow River experienced a 70-year ARI flood that caused some \$25m in damages in Johnsville.

Flooding is the most critical physical planning issue within the Shire and drives many Council policies for economic and land use development. Council is aware that inappropriate development within designated floodways and floodplains can significantly exacerbate flood impacts, not only at the development site, but elsewhere in the floodplain. The floodways and floodplains of the municipality also provide an important agricultural resource and need to be maintained for active farming.

Dealing with flood issues requires an integrated approach to floodplain management, therefore, there needs to be improved coordination between Council and the Catchment Management Authority.

21.05-2.1 Objectives and strategies

27/11/2012
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Objective 1

To recognise that a large proportion of Gumnut Shire is flood prone and to implement appropriate floodplain management strategies.

Strategies

- Promote the effective management, maintenance and upgrade of levee construction along the Green River and Yellow River floodplains.
- Limit the maximum bank height to the 10-year ARI flood level.
- Promote effective laser grading, land forming, irrigation and drainage works in the Sunrise Horticultural Estate that ensure the capacity of floodplains to carry and store floodwaters is not diminished.
- Encourage an integrated approach to flood management, fostering close coordination between Council, the Catchment Management Authority and affected landowners.
- Develop local floodplain development plans that allow buildings and works and forms of subdivision that do not increase the level of flood risk.

Objective 2

To minimise the risk to life, health and safety from the effects of flood waters.

Strategies

Ensure that new buildings and works minimise the potential for flood risk and damage resulting from floodwater.

Objective 3

To preserve the natural function of floodplains, including their inherent wetland values.

Strategies

- Promote community awareness and education of the value of floodplains and wetlands through the development of recreational and tourism opportunities.
- Promote land use practices that preserve or enhance existing natural water storage and wetland areas.

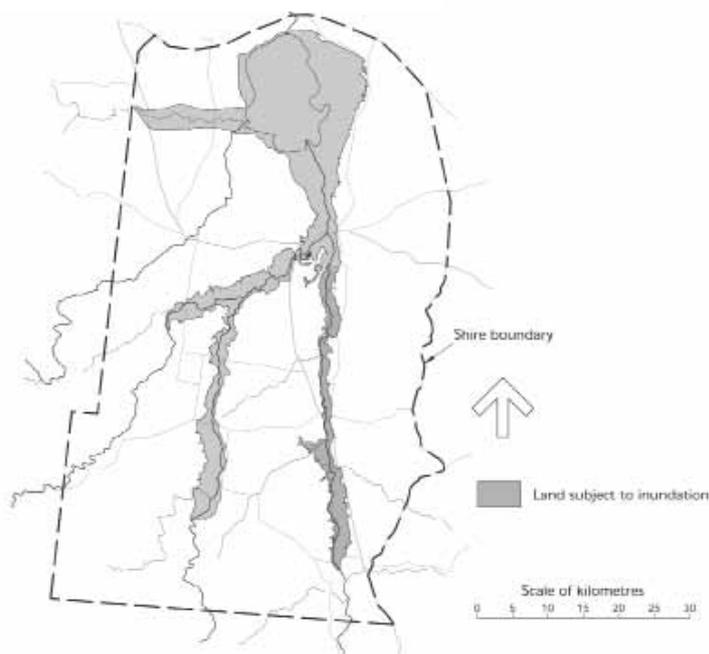
21.05-2.2 Implementation

27/11/2012
C197

Further strategic work

- In conjunction with the Catchment Management Authority, undertake a detailed review of the existing flood mapping and floodplain management plans by December 2014 and incorporate any alterations through an amendment to the Gumnut Planning Scheme.
- Establish a monitoring and review program for the implementation of the Gumnut Shire Local Floodplain Development Plan – Yellow River Precinct (2012).

Figure 1. Extent of flooding



22.02-3

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FLOODPLAIN MANAGEMENT

This policy applies to all areas within the Urban Floodway Zone, the Land Subject to Inundation Overlay and the Floodway Overlay.

Policy basis

Flooding is the most critical physical planning issue within the Shire and drives much of the Council's policies for economic and land use development.

Much of the Shire is subject to regular flooding. Natural flooding cannot be prevented, but minimisation of flood risk and damage is possible through floodplain management plans and emergency management procedures.

Objectives

- To coordinate the management of floodplains throughout the catchment.
- To ensure that the location and design of all new development recognises the identified flood hazard and local drainage characteristics.
- To minimise the construction of inappropriate works in floodplains.
- To protect important wetlands.

Policy

It is policy that, when considering applications, the responsible authority will have regard to the requirements in the Gumnut Shire Local Floodplain Development Plan – Yellow River Precinct (2012).

References

Yellow River Flood Study/Strategy Plan, Gumnut Shire Council, 2012

Green River Flood Study/Strategy Plan, Gumnut Shire Council, 2012

GUMNUT PLANNING SCHEME

27/11/2012
C197

SCHEDULE TO THE LAND SUBJECT TO INUNDATION OVERLAY

Shown on the planning scheme map as **LSIO**.

1.0
27/11/2012
C197

Permit requirement

A permit is not required to construct or carry out the following:

Buildings

- A non-habitable building with a floor area less than 100 square metres.
- An extension to a non-habitable building provided that the total area of the building is less than 100 square metres.
- An extension to an existing dwelling provided that the floor area of the extension is less than 40 square metres and is less than 50% of the existing floor area.
- Pergolas, carports, in-ground swimming pools and hay sheds with open sides.

Works

- Earthworks that do not raise ground level topography by more than 200 millimetres.
- A protective wall or levee bank around the immediate surrounds of a dwelling provided that the buildings or works are in accordance with the Gumnut Shire Local Floodplain Development Plan – Yellow River Precinct (2012).
- Repairs and routine maintenance which do not affect the height, length or location of a levee, embankment or road.
- Open type fencing (excluding paling fencing, brick and concrete walls) and a replacement fence of the same type and materials as the existing fence.
- Works associated with apiaries and vine or horticultural trellises.
- Sports grounds with no grandstands or raised view areas.
- Golf courses, playgrounds, picnic shelters and barbeques.

Gumnut Shire Local Floodplain Development Plan – Yellow River Precinct (2012)

Before deciding on an application, the responsible authority must consider the Gumnut Shire Local Floodplain Development Plan, Yellow River Precinct (2012).

2.0
27/11/2012
C197

Referral of applications

An application for a permit is not required to be referred to the floodplain management authority if the application is in accordance with an adopted local floodplain development plan.

Local Floodplain Development Plan

YELLOW RIVER PRECINCT, SHIRE OF GUMNUT (2012)

Application

This local floodplain development plan has been prepared under the Gumnut Planning Scheme.

The plan provides requirements for buildings and works and subdivision in the Yellow River Precinct in Gumnut Shire shown on Figure 5. An application for a planning permit under the Floodway Overlay (FO), Land Subject to Inundation Overlay (LSIO) and Urban Floodway Zone (UFZ) must be consistent with this local floodplain development plan.

Flood history

Rural flooding in the Shire is frequent, with relatively high flood depths and velocities in the active floodway areas. The Yellow River has a long history of flooding, with major floods in this century occurring in 1916, 1934, 1952, 1974 and 1993. During the 1993 flood there were substantial losses to stock, fencing and crops in rural floodplain areas, and 600 urban properties were inundated in Johnsville.

Floodwater breaks out from the Yellow River during events greater than the 10-year ARI flood. In a 100-year ARI flood, floodwater up to 2 km in width may spread across the floodplain.

Urban development in Johnsville began in the 1920s and, in the absence of sound land use planning strategies, has progressively obstructed floodplain land, diminishing its ability to convey, store and drain floodwater. Inappropriate development has caused increases in flood levels and flood risk. In the 1993 flood, flooding depths of up to 2 m were experienced in the town.

Flood information

Figure 5 completed by the Catchment Management Authority in 2012 shows the extent of flooding of the Yellow River. The project made use of historic flood levels documented in past floods, aerial photography, and ground level information. UFZ, FO and LSIO areas are based on the relative flood risk assessed for different parts of the floodplain, considering factors such as flood depth, velocity, natural storage and warning time.

Flood impacts

Flood impacts in the FO areas of Gumnut Shire are significant, resulting in road closures, loss of access for rural communities, stranding of livestock and soil erosion.

Flood impacts in the UFZ of Johnsville are also significant, resulting in road closures, loss of access for urban residents, risks to emergency personnel during sand-bagging and evacuation operations, and damage to buildings constructed below flood level.

Flood impacts in both the rural and urban LSIO areas are less than in the floodway areas. However, urban flood damage costs in the urban LSIO area of Johnsville can still be considerable because of the high density of development.

Development requirements for the Floodway Overlay in rural areas

Dwellings

- No more than one dwelling is permitted per lot, provided the average dwelling density is not less than one dwelling per X hectares.
- A new dwelling should not be permitted on a lot if the 100-year ARI flood depth at the proposed house site, or along the accessway to the house site from a main road, is more than 0.5 m above the natural surface level.
- The minimum floor level of all new dwellings, or of extensions greater than 20 m² to existing dwellings, is 300 mm above the 100-year ARI flood level.

Commercial and industrial buildings

- New commercial and industrial buildings should not be permitted.

All buildings

- Buildings should be aligned with their longitudinal axis parallel to the direction of flood.
- The design of a building should minimise the damage caused by flooding to the structure and its contents, such as by raising floor levels, using water-resistant materials and raising electrical fittings above flood level.
- Building pads should be restricted as near as practicable to the building envelope.

Figure 5. Local floodplain development plan – Yellow River Precinct



Earthworks

- A permit is not required for earthworks which would raise the natural surface levels by less than 100 mm.
- Significant earthworks, including levees and raised roads, are inappropriate for floodway land.
- If requested by the floodplain management authority, an hydraulic impact assessment by an appropriate specialist consultant must be undertaken for proposed earthworks which would raise natural surface levels by more than 100 mm (other than building pads and works to protect the immediate surrounds of existing dwellings).

Development requirements for the Land Subject to Inundation Overlay in rural areas

Subdivision

- Any new lot must be at least X hectares.

Dwellings

- No more than one dwelling should be permitted per lot, provided the average dwelling density is not less than one dwelling per X hectares.
- A new dwelling should not be permitted on a lot if the 100-year ARI flood depth at the proposed house site is more than 0.5 m above the natural surface level, or if the flood depth along the accessway to the house site from a main road is more than 0.8 m above the natural surface level.
- The minimum floor level of all new dwellings is 300 mm above the 100-year ARI flood level.
- The minimum floor level of extensions to existing dwellings is 300 mm above the 100-year ARI flood level, unless the extension is less than 40 m² and is less than 50 per cent of the existing floor area.

All buildings

- Buildings should be aligned with their longitudinal axis parallel to the direction of flood flow.
- The design of buildings should minimise the damage caused by flooding to the structure and its contents, such as by raising floor levels, using water-resistant materials and raising electrical fittings above flood level.
- Building pads should be restricted, as near as practicable, to the building envelope.

Earthworks

- A permit is not required for earthworks which would raise natural surface levels by less than 200 mm.
- If requested by the floodplain management authority, an hydraulic impact assessment by an appropriate specialist consultant must be undertaken for proposed earthworks which would raise natural surface levels by more than 200 mm (other than building pads or works to protect the immediate surrounds of existing dwellings).

Development requirements for the Floodway Overlay in Johnsville

Dwellings

- There should be no increase in the number of dwellings in the township.
- A new dwelling should not be permitted on a lot if the 100-year ARI flood depth at the proposed house site, or along the accessway to the house site from a main road, is more than 0.5 m above the natural surface level.
- The minimum floor level of all new dwellings, or of extensions greater than 20 m² to existing dwellings, is 300 mm above the 100-year ARI flood level.
- In the case of a replacement dwelling or extension to an existing dwelling, the maximum increase in the building envelope area is 40m².

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