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Structure Plan Report

COASTAL / HOPKINS RIVER ENVIRONMENT

[MAY 2008]

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This report provides analysis and information necessary to prepare a Structure Plan for the Coastal / Hopkins River Environment area in accordance with the Project Brief. Additional analysis beyond the scope of this report will be required prior to the future development of the area.

1. Introduction

1.1 Project Brief

The Warrnambool City Council has entered into a Memorandum of Understanding with landowners within the Coastal / Hopkins River Environment area who have instigated the preparation of a Structure Plan for the area.

Planisphere was engaged to prepare the Structure Plan for the area which includes 115 hectares (approx) of land. The Structure Plan is a first critical step for the future development of this important future residential area of Warrnambool.

The aim of the Structure Plan is to guide the integrated development of the land in terms of changes in land use, built form and public spaces that together will achieve economic, social and environmental objectives for the area. The Council is keen to create whole suburbs rather than ad hoc subdivisions, in order to achieve:

- Structural integration
- Sense of place and coordinated streetscape design
- True networks of open space
- Proper provision of community facilities

The project involved the following key tasks:

- Prepare a Structure Plan with vision and objectives.
- Develop an Implementation Plan containing an action plan with timelines and responsibilities, potential funding sources, infrastructure costs and statutory and non-statutory implementation recommendations.
- Recommend appropriate planning scheme implementation mechanisms.
- Prepare outline costs for major infrastructure.

- Prepare a model for monitoring and review of the plan.

The Structure Plan addresses:

- Vehicle and pedestrian access points and links with road cross sections
- Building siting / envelopes
- Landscaping contribution
- Interface issues
- Drainage and service provision
- Open space links

Particular matters examined are:

- Identification of existing features to be retained
- Road network capacity issues, including Hopkins River Bridge
- Requirements for water and sewerage pumping infrastructure
- Specific guidelines aimed at achieving high quality design outcomes that exploit the unique natural attributes of the site and safeguard its landscape significance

As work has progressed, it has been agreed that some tasks, including those relating to apportionment of infrastructure costs, will be addressed at planning scheme amendment stage.

1.2 Method

The Structure Plan process involved three stages which are detailed below. The project has proceeded through the Draft Plan stage where the Draft report was exhibited to the public. The feedback which has been received has enabled the finalisation of the Structure Plan.

Stage 1: Inception, Background & Analysis

The main tasks in this stage were:

- Agree detailed work program, scope the tasks and agree on the method, brainstorm issues and arrange access to base data.
- Provide an analysis of existing policies, studies and plans.
- Undertake site inspection.
- Provide an analysis of landscape, urban and built form, building condition, key sites, interface issues, public space, landscape, ped access etc
- Identify infrastructure capacity opportunities and constraints
- Existing transport, traffic and parking data sources
- Discussions with Council personnel to identify difficulties, constraints and "hot-spots" based on their experience
- SWOT analysis

Outputs

Project timetable with agreed meeting dates for the project

Analysis Report, Maps and Photographs

Consultation

Consultation involved face-to-face discussions with the owner and Council, and discussions with relevant infrastructure agencies.

Stage 2: Draft Plan

The main tasks in this stage were:

- Ongoing discussions with relevant Council officers and infrastructure agencies
- Establish a plan framework that explicitly responds to the results of the analysis work
- Develop a preliminary vision statement and objectives / development principles

- Differentiate between issues / opportunities for which choices exist, and those for which either there is no choice or one practical course of action
- Test these and agree on their implications for the evolution of a preferred plan with the owner, Council officers and the Reference Group
- Produce a Draft Structure Plan

Outputs

Draft Structure Plan and supporting documentation

Consultation

The Draft Structure Plan was circulated for comment to a Reference Group. The Plan was revised and then was placed on public exhibition. 5 submissions from public bodies and servicing authorities and 17 submissions from the general public were received. All submissions have been reviewed and the Final Structure Plan has been amended accordingly.

The review of the submissions has resulted in increased emphasis on the importance of the environmental values of the land and of views to and from the site and adjoining properties.

A summary of the submissions and responses is included in Appendix 3.

Stage 3: Final Plan

The main tasks in this stage have been:

- Amend the plan to take account of comments received on the Draft Structure Plan
- Revisit the vision statement and objectives / development principles
- Confirm the agreed approach / directions canvassed in the Draft Plan
- Prepare final maps and report

- Develop an implementation plan containing an action plan with timelines and responsibilities, potential funding sources, infrastructure costs and statutory and non-statutory implementation recommendations.
- Recommend appropriate planning scheme implementation mechanisms.
- Prepare outline costs for major infrastructure.
- Prepare a model for monitoring and review of the plan.

Outputs

Final Structure Plan and supporting documentation

1.3 The Study Area

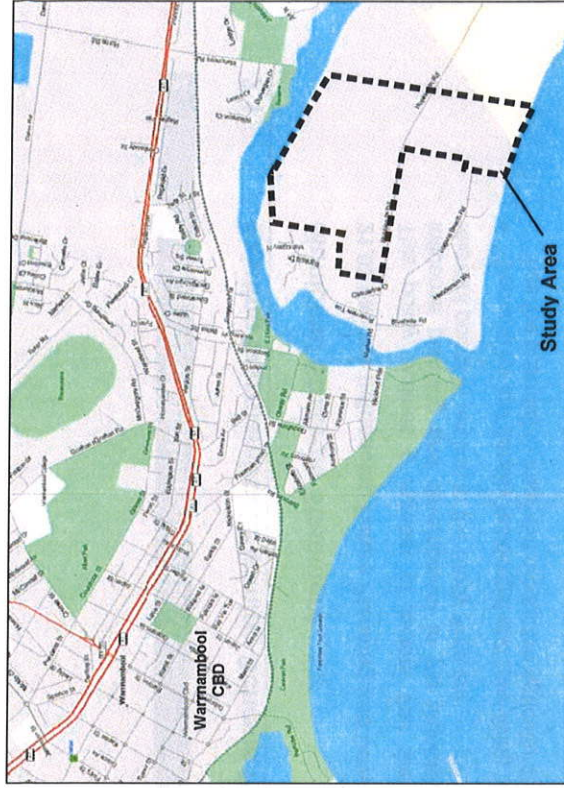
The study area includes 115 hectares of rural land located approximately 3km east of the Warrambool CBD. Properties are located north and south of Hopkins Point Road.

The parcels of land north of Hopkins Point Road (Study Area North) are bounded by the Hopkins River in the north, rural land to the east, and an existing low density residential area to the west. Allotments south of Hopkins Point Road (Study Area South) are bounded by Logans Beach in the South, and low density residential development to the east and west.

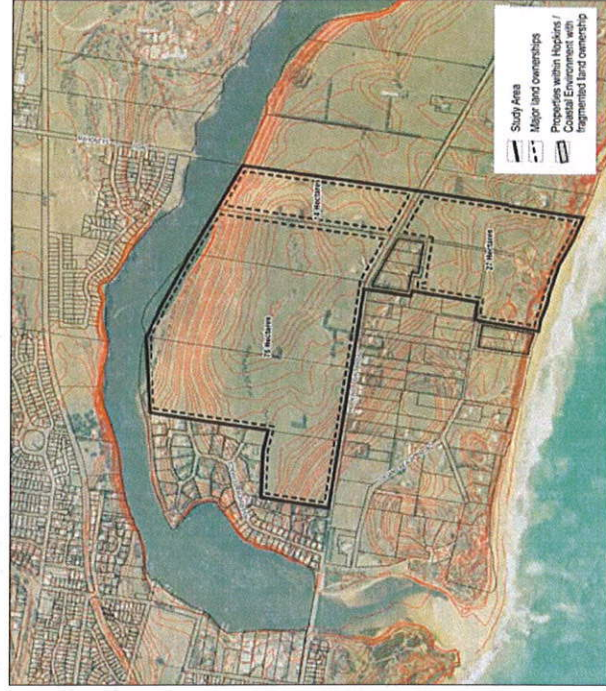
Primary access to the study area is provided along Hopkins Point Road, which continues through to Allansford in the east. There are also access points to the study area from adjoining residential areas, which haven't been formalised. The road reserve of Banksia Drive meets the western boundary of Study Area North, and the road reserve of Logans Beach Road meets the western boundary of Study Area South.

The study area is in three major ownerships. The largest land holding is located in Study Area North with an area of 75 hectares. Immediately to the east is a smaller land holding of 14 hectares. Study Area South includes one land holding of 27 hectares.

Each of the landowners is involved in the preparation of this Structure Plan.



Location Map



Study Area / Land Ownership Map

2. Policy and Strategic Context

2.1 Existing Warrnambool Planning Scheme Policies

Municipal Strategic Statement

21.03 Factors Influencing Future Planning and Development

This policy outlines a number of factors that are seen to influence planning and development in the municipality. The relevant points in relation to the Study Area are:

- Demand for low density residential and rural living lifestyles has the potential to fragment productive agricultural land.
- Stream side qualities in the municipality are severely degraded, and the majority of indigenous vegetation cleared. The environmental and recreational qualities will benefit from restoration and revegetation works.

21.03-2 Warrnambool Land Use Strategy, September 2004

Successive Councils established and continued a comprehensive strategic planning program known as 'City Plan'. The process commenced in 1991, and following extensive consultation and research, *City Plan* was released in 1992. Following local government restructure in 1995, *City Plan* was revised to include all areas of the new municipality. That document, produced in 1996, was subsumed into Warrnambool first MSS in 1999.

As a result of the three year review of that MSS in 2003, Council commissioned a comprehensive range of further strategic analysis and review, culminating in the preparation of the *Warrnambool Land Use Strategy*, (2004). The *Land Use Strategy* is the successor to *City Plan* and is focused on the residential, industrial and commercial development needs of the city over the next 20 years. The key outcomes of the *Land Use Strategy* are shown on the following plan.

21.05-1 Housing Overview

The study area is identified as a Greenfield Development Area in the Hopkins Point River and Coastal Environment. The housing overview reads as follows:

Urban expansion east of the Hopkins River will involve utilisation of greenfield sites including approximately 450 lots. A creative solution is required for the development of this area which may result in higher densities within some parts of the site offset by environmental benefits including large areas of open space, revegetation and transfer of the primary dune to public ownership. While an overall density of 4 or 5 dwellings/hectare may be achieved this will be contingent on structure planning based on achieving environmental outcomes. This location is a unique residential area within Warrnambool, with coastal and river views and would be suited to a more selective residential market segment. Preservation of landscape qualities and managing environmental sensitivities, particularly the dune area, Hopkins River frontages and ridgelines, will be of primary importance. Further investigation is required to determine the extent of development together with comprehensive design and siting required prior to approval.

To ensure that the coastal environment south of Hopkins Point Road and east of Logan's Beach is protected, no further residential development should extend east beyond the ridge line or Deakin University. Development at a range of densities is to occur based upon a design analysis which in turn is based upon consideration of environmental values and constraints with high quality design features encouraged. These features include the preservation of views from the river to land and a substantial river edge reserve, and the creation of coastal public land frontages, the protection of coastal views and landscape qualities for the area south of Hopkins Point Road.

The Logans Beach area is identified as an Outlying Settlement Area. The housing overview reads as follows:

The Logans Beach area is of national importance for the viewing of the Southern Right Whale. In addition, the area is a locality of high environmental and landscape amenity, and an important entrance to the city. It has some capacity for further development, provided various constraints affecting the area are properly managed and respected. There is ongoing development pressure in Logans Beach for residential infill. Previous building activity in the area has resulted in some intrusive developments that do not fit in with the environment and lifestyle. Likewise there are good local examples of built elements which can be used as guides to achieving better building design. In order to address these issues, council will

continue to implement the Logans Beach Urban Design Guidelines including the retention of existing densities of 6000m².

21.05-3 Housing Strategies

The policy includes the following relevant general strategies for Greenfield development in the municipality:

- Apply an urban growth boundary to identify the limits of urban growth.
- Encourage a range of uses to locate around community nodes to cater for relevant sectors of the community.
- Encourage urban design that enhances the streetscape and promotes activity in the public realm.
- Incorporate solar oriented allotments and other sustainable design features.
- Incorporate indigenous plant species and Water Sensitive Urban Design as part of subdivision, site layout, design and landscaping schemes for new developments.

The following strategies apply to the Hopkins Point River and Coastal Environment in which the study area is located:

- Encourage development that is clustered together to provide for large areas of public open space, environmental linkages and the protection of ridgelines and significant flora and fauna species that demonstrate key environmental benefits.
- Promote land use and development south east of Hopkins Point Road which results in net environmental benefit to the coast. Encourage environmental housing with a substantial river edge reserve, north of Hopkins Point Road.
- Establish a clear eastern boundary at the ridgeline on the south side of Hopkins Point Road and in line with Deakin University at the northern side of Hopkins Point Road as shown by the urban growth boundary.
- Preserve the environmental values and landscape qualities of the area.
- Require the preparation of detailed siting and design schemes such as stormwater reuse, drought resistant

gardens, habitat creation and enhancement which includes revegetation and solar orientation of buildings that demonstrate net environmental benefits resulting from any form of proposed residential development.

- Require the identification of building envelopes which respond to the visual and environmental context of the site.
- Protect the ridgeline, coastal and river systems when considering any form of development.
- Encourage development densities that are not necessarily uniform, but respond to a visual and environmental assessment of potential development impacts.
- Require subdivision with buffer areas that afford effective protection of the environmental values of the coast and river environments from impacts such as stormwater, septic discharge, domestic animals, and climate change.
- Require building and site design to blend into the landscape.
- Ensure that the staging of development provides for the most effective roll-out of infrastructure.
- Ensure that future development does not encroach upon significant flora, fauna and cultural heritage assets.
- Develop the area in accordance with a structure plan that implements the Coastal/Hopkins River Area Outline Plan included in this clause.

The following strategies apply to the Logans beach area in which a small part of the study area is located:

- Retain the low density residential nature of the Logans Beach area.
- Implement the Logans Beach Urban Design Guidelines.
- Implement the Logans Beach Local Plan.

21.05-4 Housing Implementation

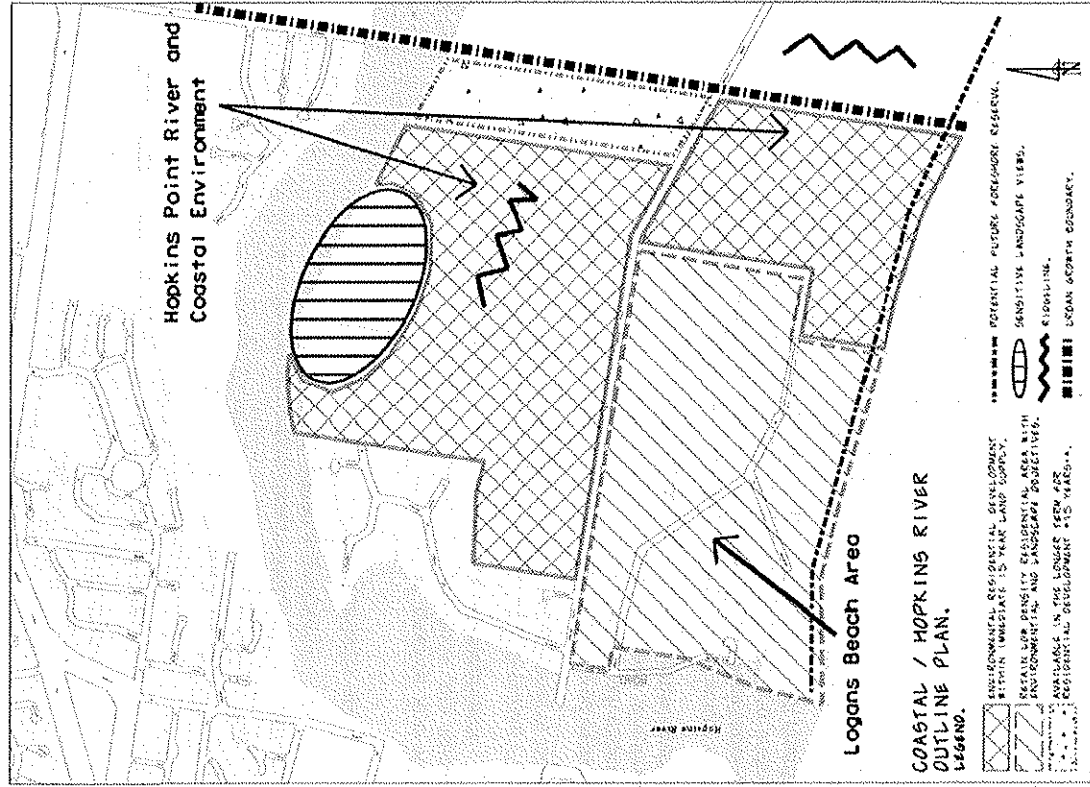
The following relevant strategic work is required to implement the housing strategies that apply to the Hopkins Point River and Coastal Environment:

- Obtain appropriate public open space as nodes at selected locations along the Hopkins and Merri Rivers, as part of the subdivision approvals process.
- Undertake an annual audit of land development rates to monitor the rate of land take up and hence the need for additional land to be made available.
- In accordance with the recommendations of the Warrnambool Land Use Strategy, prepare Structure Plans, Development Contribution Plans and introduce appropriate planning scheme amendments...
- Evaluate sites within the Hopkins Point River and Coastal Environment... to more accurately identify existing environmental features including flora and fauna, and cultural heritage.

Other implementation actions include:

- Retain the valuable dune and cliff areas through designation as a public reserve in association with proposed rezoning.
- Investigate the practicality of establishing public open space areas along areas of the Hopkins River that are constrained by steep cliff faces. Consider alternative methods of maintaining these areas.

Coastal / Hopkins River Outline Plan



21.06-3 Environment Strategies

The following strategies are relevant to the future development of the study area:

Sustainability

- Apply water sensitive urban design principles to urban development, including the option of managing stormwater through the use of constructed wetlands.

Biodiversity and Native Vegetation

- Protect remnant vegetation especially in habitat corridors associated with drainage lines stream frontages, and protect those Ecological Vegetation Classes (EVCs) rated as having either high or very high conservation significance, are habitat corridors or areas identified as habitat for rare and threatened flora and fauna species.
- Protect sites of significant flora and fauna
- Protect remnant vegetation on roadsides.
- Require revegetation along river frontages and floodplains using original Ecological Vegetation Classes (EVC) species, with the inclusion of understorey species.
- Contain the spread of noxious and pest weeds and progressively reduce the areas affected.

Waterways

- Control urban run-off to protect and enhance waterways.
- Exclude inappropriate development from degraded river banks and adjacent land areas.
- Discourage ribbon development along waterways.
- Minimise native vegetation removal along waterways.
- Ensure a net gain of native vegetation along waterways.
- Establish a substantial public reserve on either side of the Hopkins and Merri Rivers, Russells Creek and the South Warrambool Wetlands.

- Establish a 40 metre wide reserve along both sides of the Hopkins River.
- Provide public land frontages along waterways.
- Development on the coast and adjoining estuarine areas should be setback sufficiently to take into account the cumulative effects of the 1:100 year storm event, sea level rise associated with climate change.

Flooding

- Utilise open spaces to act as floodways.
- Prevent development in floodway areas.
- Discourage the filling of land which is liable to flooding.
- Ensure that when drainage and flood protection works are constructed, that existing habitable buildings are protected from flooding in major storms.
- Ensure that new developments shall not have an adverse impact on downstream properties and environments in terms of flooding and water quality.
- Implement the North Warrambool Flood Study

Fire

- Ensure that new developments in the small settlements and the urban/rural interface are adequately designed and serviced to take into account the risk of uncontrolled fire.
- Develop and implement sensible fire management solutions.

Steep land

- Ensure that use and development of land with a slope greater than 20% takes into account environmental constraints such as erosion and fire hazard.
- Discourage development on slopes in excess of 20 degrees (approximately 36%).
- Minimise vegetation removal on land with slopes in excess of 20 degrees (approximately 36%).

Heritage

- Have regard to the current Aboriginal heritage study document or Aboriginal cultural resource management grid map and guidelines.
- Liaise with the local aboriginal community where cultural heritage sites are threatened.

Coastal Landscape

- Protect vantage points and viewlines from inappropriate development
- Use simple building details.
- Utilise colours and finishes that complement those occurring naturally in the local area.
- New buildings should be designed to respond to the characteristics of the site and locality, demonstrating a high standard of contemporary expression and finish.
- Ensure townships have a definite visual edge, delineating the boundary between urban development and the natural landscape beyond.
- Discourage ribbon development.
- Maintain existing tree planting, and carry out appropriate landscaping on all major approach routes and local streets.
- Identify and protect significant exotic and indigenous trees which contribute to the overall character of the city, including avoidance of removal and lopping of such trees to facilitate the construction of buildings and works and installation of utility services.
- Protect all mature Norfolk Island Pines from removal and lopping
- Ensure new development is sited so that existing vistas throughout Warrambool are not impeded.
- Prevent the degradation of scenic landscapes along the coast, river valleys and inland ridge lines

21.08-3 Infrastructure Strategies

The following strategies are relevant to the future planning of the study area:

General

- Ensure that future urban development is planned on the basis of providing full infrastructure development and a range of social and community facilities sufficient to support the future population of the municipality.
- Incorporate buffer zones and reserves into new developments to enhance and preserve natural and heritage assets.
- Develop an open space network that links areas of environmental significance and connects local destinations.
- Require that residential subdivisions incorporate a road hierarchy that includes capability for public transport and access to nearby commercial centres.
- Maintain the Princes Highway as the major boulevard entrance to Warrambool and develop and maintain the Hopkins Highway as a secondary major boulevard entrance to Warrambool.
- Support and enhance public transport to and within Warrambool.
- Provide a network of open space and recreation facilities, which reflects the needs of local communities within the city. Establish over the medium to longer term, shared pathways for pedestrian and bicycle users between major activity areas including along the foreshore, between Proudfoots Boathouse and the University, and between the city and Allansford along the Princes Highway reservation.

Water, sewerage and drainage

- Ensure that stormwater drainage constraints are considered in an assessment of any redevelopment.
- Prevent urban run-off which leads to erosion, salinisation or degradation of waterways

- Implement the Warrambool Drainage Strategy.
- Implement the Warrambool Stormwater Management Plan.
- Encourage the integration of drainage systems into the urban landscape to maximise the visual and recreational amenity of developments.
- Ensure that a high standard of effluent disposal is achieved and that all waste water is retained on site where reticulated sewer is not available. Encourage the re-use of treated wastewater on site to more effectively seek to reduce water demand particularly for gardens, while ensuring that wastewater pollution beyond the boundary of development sites are prevented.
- Ensure that piped drains have sufficient capacity to ensure that flooding is not a regular nuisance in minor storms.
- Ensure that in new subdivisions no overland flow is directed onto the building envelope of any new allotment from roadways or upstream properties during major flood events.

Community Services

- Provide facilities and services which satisfy the range of community needs for children, youth and the aged.
- Provide a network of open space and recreation facilities, which reflects the needs of communities within the city.
- Maintain an efficient and comprehensive range of community facilities.
- Encourage development in locations where a range of infrastructure and appropriate community services are available.

Local Planning Policies (LPP)

Local Planning Policies provide additional guidance in the planning process and come into play when discretion is able to be exercised in the decision making process. A number of the current LPP's in the Warrambool City Planning Scheme have relevance for the study area.

22.01-1 Building Construction in Low Density Residential and Rural Living Zones

This policy applies to any residential construction in the Low Density and Rural Living Zones. Around 40% of the study area is currently zoned Rural Living and there is a possibility that future residential development could be zoned Low Density Residential. This policy ensures that development is able to harmonise with the surrounding environment and preserve and/or enhance the aesthetic amenity of the area. Relevant policies include:

- The external cladding of all new buildings within the Low Density Residential Zone and Rural Living Zone be of a subdued tone, except where the buildings are not readily visible from roads, public land or adjoining properties due to the topography or existing vegetation.
- The colour of building materials should minimise the visual intrusion of structures in any area by use of a green or earthy tone.
- Subdued toning will be used which is a non-reflective surface unless an effective visual buffer is provided to adjoining landowners and/or roadways or any other public space.
- The buildings will be required to be painted, screen planted or otherwise treated within 6 months of completion.

22.01-2 Logan's Beach

This policy applies to the entire study area and land south of Hopkins Point Road down to Logan's Beach. It identifies Logan's Beach area of being of national importance for the viewing of the Southern Right Whale and recognises the area as a locality of high environmental and landscape amenity and an entrance to the city. Relevant objectives include:

- To protect the whales from potential offshore impacts of development in the Logans Beach area by limiting the extent and density of development.
- To encourage sustainable management of privately owned tracts of foreshore and river frontage.

- To ensure the proper protection and management of the primary dune and river environs.
- To protect the distinct hill top and ridge lines and other notable vantage points and view corridors from inappropriate development.
- To develop appropriate building guidelines for the area to ensure that buildings harmonise with the environment and landscape.
- To ensure that development does not contaminate ground water and other natural resources.
- To protect the capacity and enhance the safe operation of Hopkins Point Road.
- To develop Hopkins Point Road as a major tourist gateway to the City, and potential consideration as the Great Ocean Road tourist drive.
- To define the eastern extent of the Warrnambool urban area by the principal north/west - south ridge line and flat hilltop to ensure the development of the area does not adversely affect panoramic views from the City, Princes Highway and from Hopkins Point Road east of the study area.

Relevant implementation policies include:

- Conventional sized residential development in the Logan's Beach area is not supported.
- Development and subdivision should take place generally in accordance with the requirements of the Logan's Beach Local Plan (1998).
- A proposed subdivision should have a minimum lot size of 6,000 square metres and an average for a multiple lot subdivision of 10,000 square metres. A boundary realignment must not create any capacity for additional lots and each lot must be a minimum of 6000 square metres.
- New uses requiring the construction of new buildings and/or effluent disposal systems will not be supported in the area identified as the Coastal Protection Area in Map 2 to this clause.

- The design and built form of new development shall be sensitive to the environment and landscape qualities of the area and shall be in accordance with the requirements of the Design and Development Overlay, Schedule 2.
- Proper protection and management of the primary dune and river environs occur through the use of Environmental Significance Overlays.
- Particular care will be taken in the assessment of development applications on the south side of Hopkins Point Road to protect the visual landscape amenity, through the designation of a Significant Landscape Overlay.
- Revegetation be actively encouraged.
- Hill tops, ridge lines and other notable vantage points be protected from inappropriate use and development.
- Development should not contaminate ground water and other natural resources.

22.02-4 Steep Land

Applies to land with slope greater than 20%. This Policy will affect the land sloping north to the river. The policy ensures that steep land takes into account constraints such as erosion and fire hazards. Relevant policies include:

- The design and location of buildings and works should ensure that there is no increase in the potential for erosion or land slip
- The need for earthworks to be minimised and any necessary earthworks are undertaken in accordance with advice from the Department of Sustainability and Environment.
- Removal of natural vegetation is minimised.
- The location and design of access roads or drives shall cause minimum visual impact and shall be generally in accordance with advice from the Department of Sustainability and Environment.

22.02-5 Hilltop and Ridgeline Protection

Policy to protect significant hilltops and ridgelines. Objectives include:

- To protect areas of environmental and visual significance from inappropriate development.
- To limit development on prominent ridges and hilltops.
- To encourage the protection and revegetation of landscape features.
- To contribute to the protection of the environmental qualities of hill tops and ridgelines.

Implementation policies include:

- It is policy that the environmental, landscape and visual significance of hilltops and ridgelines be considered in assessing applications for new uses and development.

Zones and Overlays

Zones

Farming Zone (FZ)

This zone applies to the eastern side of the study area and the area south Hopkins Point Road. This zone provides for the sustainable use of land for agriculture and for non-agricultural uses that do not adversely affect the highly productive and versatile agricultural land.

Rural Living Zone (RLZ)

This zone predominantly applies to the western side of the study area and abuts already developed areas to which the Rural Living Zone also applies. This zone provides for residential use in a rural environment and for rural uses which do not adversely affect the amenity of surrounding land uses.

Overlays

Environmental Significance Overlay 1 (Coastal Environments)

This overlay applies to the southern part of the study area which abuts Logans Beach. The policy is designed to protect the

environmental significance of the Warrnambool coastline as a valuable conservation, scientific and tourism resource. Relevant policies include:

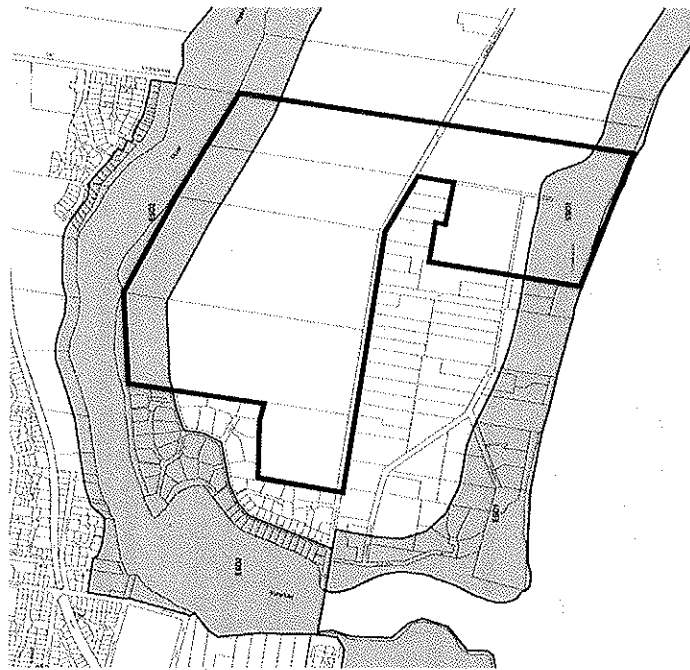
- To protect the natural and cultural values of the coast, and appreciate the complex nature of biological and physical coastal processes.
- To promote the integrated management and protection of the coastal areas by the community, private sector and various levels of government.
- To recognise the economic value of coastal tourism, and balance the desire for public access to the coast and proposals for coastal tourism facilities with the need to sustainably manage natural and cultural coastal values, which includes placing limitations upon the extent of coastal areas available for development.
- To ensure freehold land along the coast is used and developed in a sustainable manner.
- To prevent and arrest coastal erosion, including discouraging the grazing by stock of sensitive coastal environs and cliff tops.
- To maintain and enhance stands of remnant vegetation and encourage planting of locally indigenous species.
- To arrest the spread and encourage the removal of invasive environmental weeds.

Environmental Significance Overlay 2 (Hopkins and Merri River Environments)

This overlay applies to the northern part of the study area which abuts the Hopkins River. The policy is designed to protect the river's long term function as a drainage corridor, stream habitat and landscape area. Relevant policies include:

- To protect the natural, cultural and visual values of the Hopkins River, their tributaries, adjacent land and associated habitat corridors
- To promote the integrated management and protection of the rivers and adjacent land

- To ensure freehold land along the rivers is used and developed in a sustainable manner
- To maintain and enhance stands of remnant vegetation and encourage planting of locally indigenous species
- To prevent and arrest erosion of the riverbanks, which includes discouraging the grazing of stock close to riverbanks
- To place high priority on protecting the rivers and adjacent land in locations which are visible from main roads, residential areas or other key activity locations
- To provide the opportunity for the provision of public open space adjacent to the river in appropriate location to provide for passive and active recreational activities.

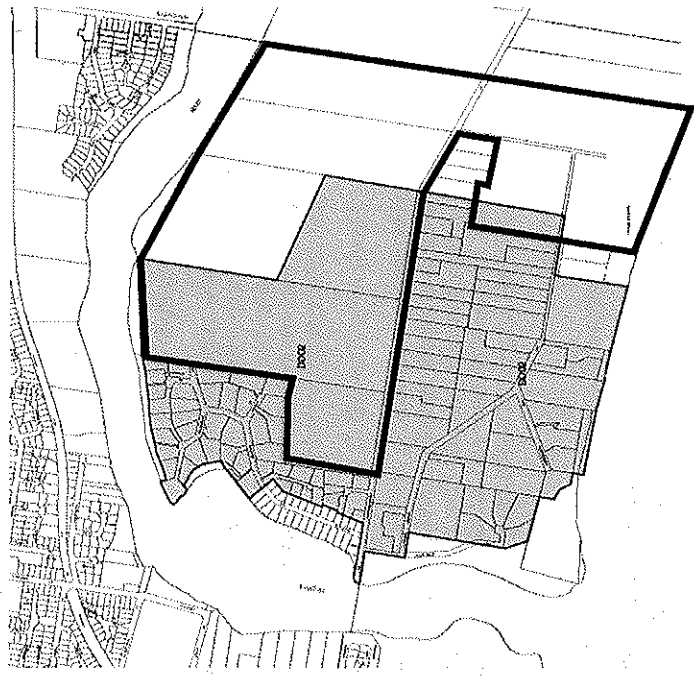


Design and Development Overlay 2 (Logan's Beach)

This overlay applies to the part of the study area which is zoned Rural Living. The objective of the policy is to set design, subdivision and development parameters. Relevant policies include:

- To ensure the proper protection and management of the whale viewing area and its environs
- To protect the local environment and significant views
- To provide generous separation between dwellings to enable revegetation of the landscape
- To limit intrusion on the skyline and ridgeline.

The policy includes guidelines for buildings and works, and subdivision.



Significant Landscape Overlay 1 (Costal Hinterland Landscape Area)

This overlay applies the study area south of Hopkins Point Road. The objective of the policy is to protect significant coastal and coastal hinterland views. Relevant policies include:

- To protect and enhance the scenic qualities of coastal hinterland areas.
- To recognise the value of the scenic qualities of views towards the coast to residents, visitors and the tourist industry.
- To maintain and enhance views from major roads and residential areas towards the coast.
- To prevent the interruption of views towards the coast by inappropriate or poorly designed development or that which is sited in prominent locations.
- To encourage development which does not intrude upon views of the coast.
- To recognise hedgerows and established exotic vegetation as an important element of the coastal landscape.



3. Site Analysis, Issues and Opportunities



3.1 Topography

The study area includes a prominent hill that falls to Logan's Beach in the South and to the Hopkins River in the north and west. The highest point on the site is approximately RL 62 which is one of the highest points in Warrnambool.

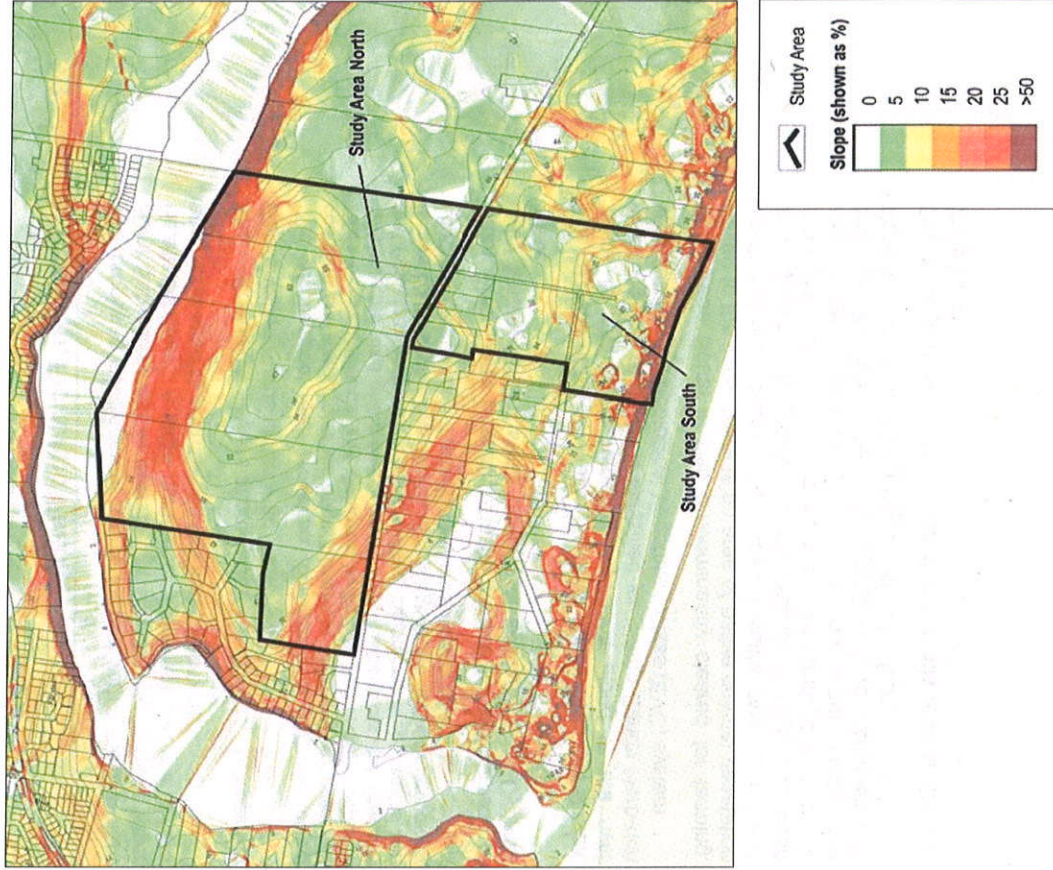
Study Area North includes a ridgeline that runs east west through the centre of the property. From this point, the topography falls to the north, south and west, with a slope of between 5% and 10%. There is a dramatic increase in slope (between 20% and 35%) down to the river edge with some extremely steep areas close to the river in the east.

There is also a steep sloping area in the south west corner of the site which falls to flood prone land adjacent to Hopkins Road. Some parts of this area have a slope greater than 20%.

Study Area South includes undulating land which falls gradually to Logans Beach. There is a steep dune at the Logans Beach boundary.

Structure Plan Implications

- Vehicle and pedestrian access will be constrained in the northern section and possibly the south west corner of Study Area North.
- The undulating topography of Study Area South could be used to reduce the visual intrusion of future development on existing residential areas.
- Roads will need to follow topography to minimise excavation.
- Future development will need to incorporate erosion protection measures.
- Development on the ridge top may need to be restricted to minimise the visual impact of development.



3.2 Vegetation, Flora and Fauna

The proposed development site is located within the H9-Merri River Sub-catchment as described in the Glenelg Hopkins River Health Strategy¹. A large number of significant EVCs and flora and fauna species occur within this sub-catchment.

The Ecological Vegetation Class (EVC) Bioregional Conservation Status states that:

'The Warrambool Plain providence consists of a distinctive cliffed coastline and low calcareous dune formations, dissected by rivers and inlets and swamplands. The Cainozoic sediments and volcanic deposits dominate the area giving rise to sandy soils (Calcarosols and Tenosols and Podosols) on the dunes and cliffline, supporting Brown earths and texture contrast soils (Dermosols, Sodosols) on the flat plain supporting Lowland Forest and Herb-rich Foothill Forest ecosystems.'

Study Area North is predominantly cleared for the purpose of dairy farming with a small number of shelterbelts of Cypress Trees.

The ridgeline has been planted out with native trees and shrubs. There is also some remnant vegetation along to the river corridor some of which is classified as 'Damp Sands Herb-rich Woodland' in the Ecological Vegetation Class (EVC) system.

Study Area South is also predominantly cleared for farming. Closer to the water there is an area of native coastal vegetation which includes coastal ti-tree, coastal wattle, marram grasses and pigface. Revegetation of the coastal frontage has been undertaken and with the removal of cattle and pests from the area some natural revegetation of indigenous plants has occurred. Patches of remnant vegetation have increased with along with some increase in observed native fauna.

The Ecological Vegetation Class found in this area is 'Coastal Dune Scrub'.

Structure Plan Implications

- Potential to further revegetate strategic parts of the study area through planting of indigenous and native vegetation in public open spaces and private land.
- Enhancement of the riparian area through intensive plantings of indigenous species of the appropriate EVC offers an opportunity to improve the environmental value of the riparian corridor. No non-indigenous species should be permitted within the riparian area.
- Opportunity to retain existing vegetation along the ridgeline in Study Area North and incorporate into future public open space.
- Native coastal vegetation in Study Area South should be retained as much as possible in future development.
- Opportunity for revegetation along the river corridor and Logans Beach in accordance with the existing Ecological Vegetation Classes.
- Consideration needs to be given to soil types through using appropriate soil stability practices and techniques.
- Consider the restriction of domestic animals onto the site.
- The creation of wildlife corridors through revegetation should be encouraged.

¹ Glenelg Hopkins CMA, 2008



Native Vegetation planted along the ridge



Existing shelterbelt planting in Study Area North



Remnant vegetation along the River Corridor



Native coastal vegetation in Study Area South

3.3 Views from the Study Area

Because of the high elevation and varying aspect of the land a variety of panoramic views are available from within the entire study area.

Areas north of the ridgeline provide panoramic views to the river, the escarpment, and across the rural hinterland. South of the ridgeline, panoramic views are available to the Warrnambool urban area, the river mouth, the breakwater and ocean. Port Fairy is also visible on a clear day.

Towards the east of Study Area North, the aspect of the hill faces shifts to the south and east provides views across Logan's Beach.

Study Area South provides panoramic views across Logans Beach to rural hinterland in the east and the river mouth and breakwater in the west.

The panoramic views available from within the study area are shown below and on the following page.

Structure Plan Implications

- The study area offers spectacular panoramic views some of which should be made available from future Public open space and private allotments.
- Siting of buildings and vegetation should be carefully considered in order to balance sustainable development options and the optimisation of views.





Views south of the ridgeline to Logans Beach and the river mouth



Views south of the ridgeline to the River mouth, Warrnambool and the Breakwater



Views south of Hopkins Point Road and south of the ridgeline to Logans Beach and Warrnambool

3.4 Views to the Study Area

The study area is visible from a number of key public viewing locations in Warrnambool. On the north side of Hopkins Point Road, it is predominantly the ridgeline and upper slopes that are visible in long distance views, and the lower slopes that are more visible within close proximity of the site. On the south side of Hopkins Point Road, it is the north west corner of the study area that is most visible from surrounding areas.

The photos on the following pages show the study area from key viewing locations around Warrnambool.

Viewshed Analysis Mapping

Viewshed Analysis software has been used to accurately determine the extent of visibility of the site from a number of key public viewing locations. This software uses topographic information - 2m contour intervals but does not take into account existing vegetation or built form, as such, it provides a 'worst case scenario' for the extent of viewing.

Viewshed Analysis maps have been prepared for each of the viewpoints below and are included in the following pages.

The Views to the Study Area

The following viewpoints were selected for the Viewshed Analysis mapping and photographic analysis because they were considered to have the highest public visitation:

- Whale watching platform
- Point Richie
- Deakin University
- The Breakwater Car park

Whale Watching Platform

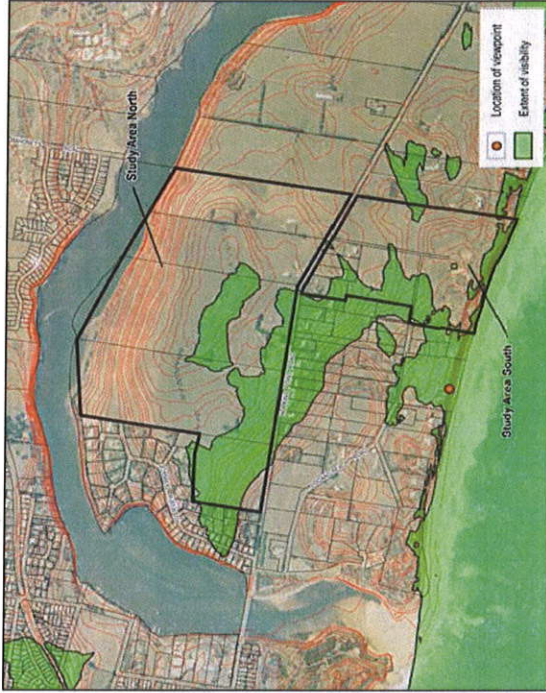
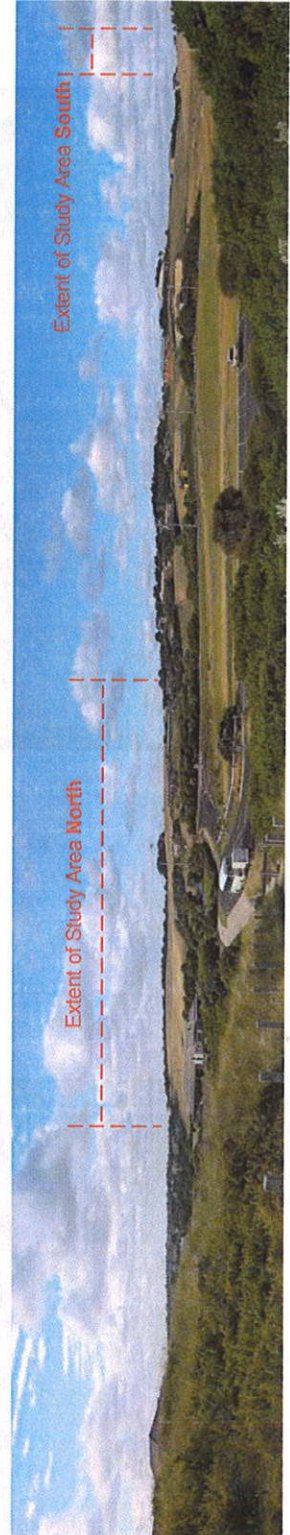
Study Area North is not visible from this location because it is screened by vegetation and topography. The Viewshed Analysis Map indicates that the site would be visible however this map is based on 2 metre contour intervals and does not account for small variations in topography or vegetation which is seen to screen Study Area North in the photo.

The western sections of Study Area South are visible in the photo. Parts of the coastal edge are also visible.

Whale Watching Platform – Path to car park

A large proportion of the south west slopes of Study Area North are visible from this location as well as the vegetated ridgeline. The eastern slopes disappear behind the low density residential areas on the south side of Hopkins Point Road.

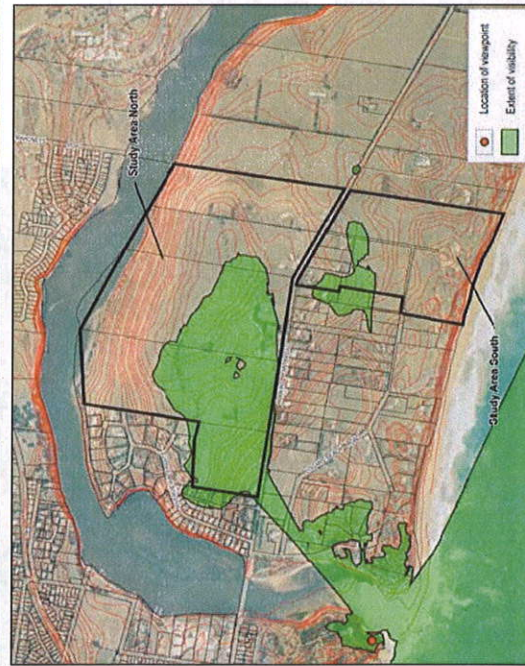
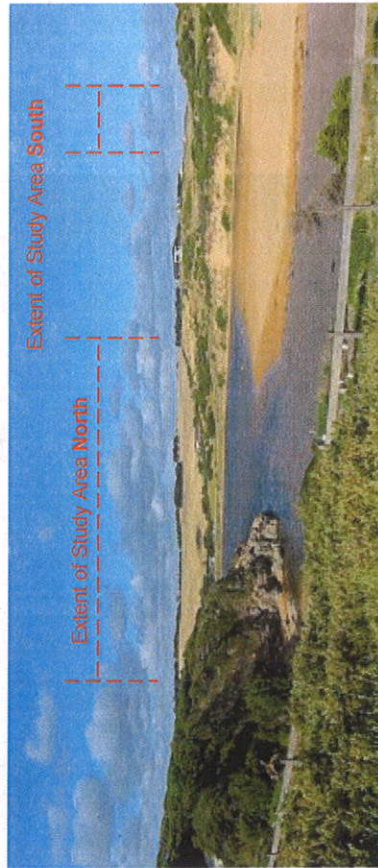
A small proportion of the north western slopes of Study Area South are visible from this location however vegetation at the right hand side of the photo screens the majority of this area.



Whale Watching Platform Viewshed Map

Point Richie – Car park

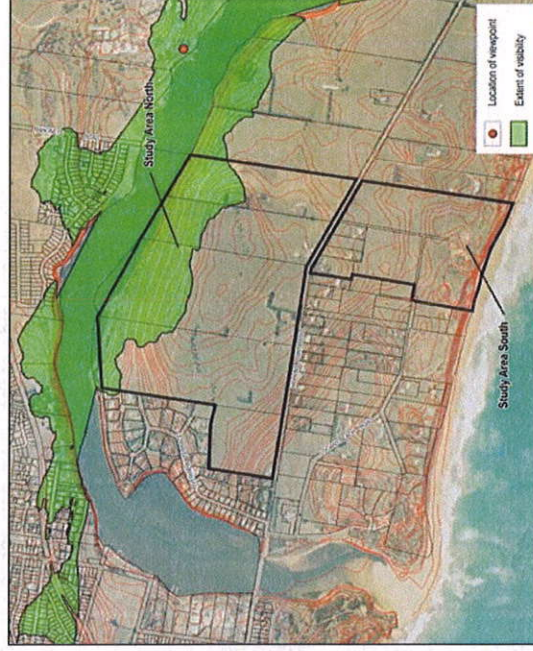
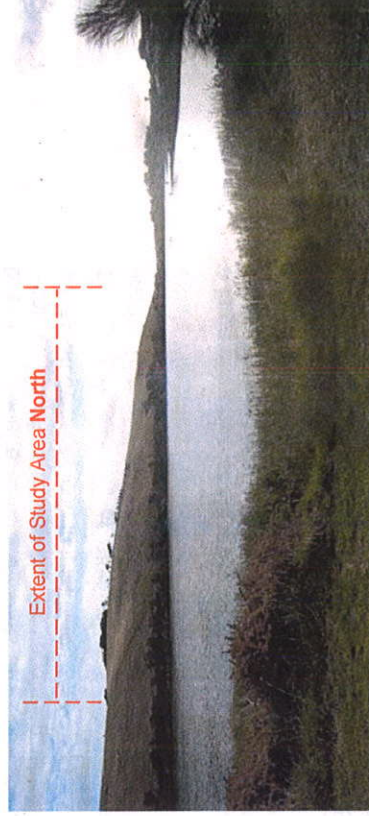
The lower and upper south and south western slopes of Study Area North are visible from this location and provide a scenic backdrop to the river mouth. The north west corner of Study Area South is also visible.



Point Richie Car Park Viewshed Map

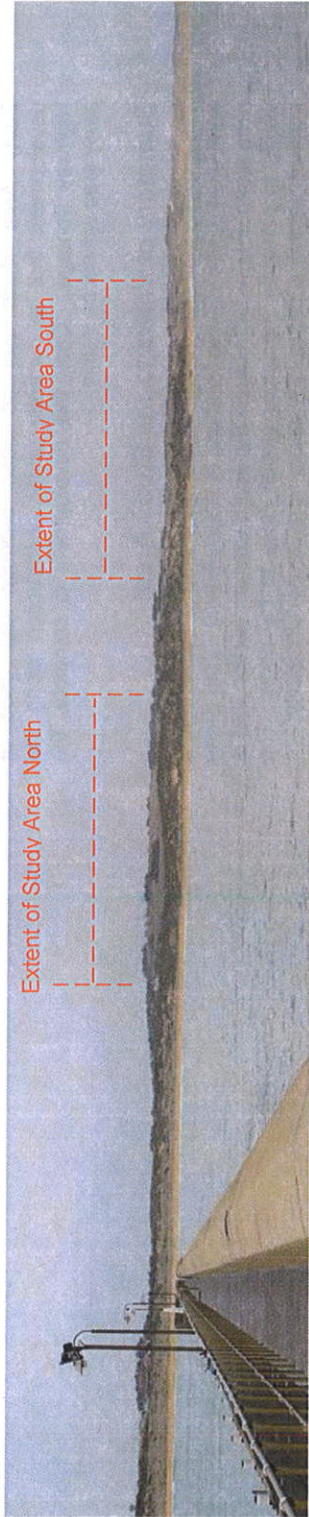
Deakin University

The northern slopes of Study Area North are highly visible from this area. The rural land currently provides a scenic backdrop to the river corridor. Study Area South is not visible.



Deakin University Viewshed Map

Breakwater - Car park



The upper part of the south western slopes of Study Area North, are visible from this location. The lower sections of the slope are hidden from view because of the coastal dunes.

The north western slopes of Study Area South are visible as well as the coastal dune area.

The breakwater is approximately 3 kilometres from the site and it occupies only a small proportion of the vertical and horizontal field of view, therefore the visual impact of development would be less than the other views.



Breakwater Viewshed Map

Princes Highway

Study Area North can be seen between the gaps of development that is currently under construction along the Highway frontage. Once this development is complete, the study area will not be visible.

Summary of Views to the Study Area

The analysis indicates that the entire study area is visible from a number of public viewing locations in Warrnambool. With Study Area North, it is predominantly the south western section that is visible in particular the upper slopes close to the ridge. The northern section is particularly visible from Deakin University.

Study Area South is generally less visible. The north western section of this area is particularly visible from the key viewing locations. Small sections closer to the coast and to the east are less visible from the key viewing locations.

Structure Plan Implications

- The photos from the key viewpoints show that the study area highly visible from a number of the key viewing locations. The visual impact of future development should be minimised and revegetation should occur on the hillside to screen development and maintain a dominance of the landscape.
- The photos also demonstrate the profile of the ridge line is visible in every view. Buildings in this area may need to be limited to maintain a natural ridge line. It would also be necessary to revegetate the ridge at early stage so that vegetation will be a dominant feature.

3.5 Cultural Heritage

The Aboriginal Heritage Act 2006 commenced operation on 28 May 2007. The Act requires a Cultural Heritage Management Plan when all or part of a proposed activity is:

- defined as a high impact activity; and
- on an area of cultural heritage sensitivity.

An activity is considered to be high impact if it results in significant ground disturbance. Subdivision of land into three or more lots for dwellings is classified as a high impact activity.

Cultural heritage sensitivity areas have been mapped by Aboriginal Affairs Victoria. The types of areas with relevance to the study area include; registered Cultural Heritage Places (and within 50 metres), waterways (and within 200m), coastal land within 200m of high water mark, and dunes.

The Study Area is bounded by Hopkins River in the north and Logans Beach in the south, which indicates that a substantial proportion would be identified as an area of cultural heritage sensitivity. In addition, discussions with a member of the Framlingham Aboriginal Trust suggested that there was a possibility that sites of Aboriginal significance would be located within the Study Area.

The requirement for a Cultural Heritage Management Plan is triggered at the time of applying for a planning permit for the high impact activity. The onus is on the proponents to identify the need for the preparation of a Plan.

A Plan can also be prepared voluntarily. It is likely that Council and AAV would encourage the preparation of the Cultural Heritage Management Plan at the time of rezoning, which is prior to applying for a planning permit for subdivision.

A Plan would consist of a written report detailing the findings of an assessment and any management recommendations that are made in the assessment. The assessment of the project area may include background research, consultation, and field survey and excavation.

Structure Plan Implications

- The preparation of a Cultural Heritage Management Plan will be required at the time of applying for a planning permit for subdivision. However it is recommended that the Plan is prepared during the rezoning process.

3.6

Acid Sulfate Soils

'Acid Sulfate Soils have accumulations of iron sulfides. As long as these materials remain waterlogged or de-oxygenated, they remain innocuous and do not cause problems. Drainage or other disturbance which causes oxidation creates a chain of events resulting in the release of highly acidic leachates from the soil, which can affect plants, aquatic life and infrastructure.²

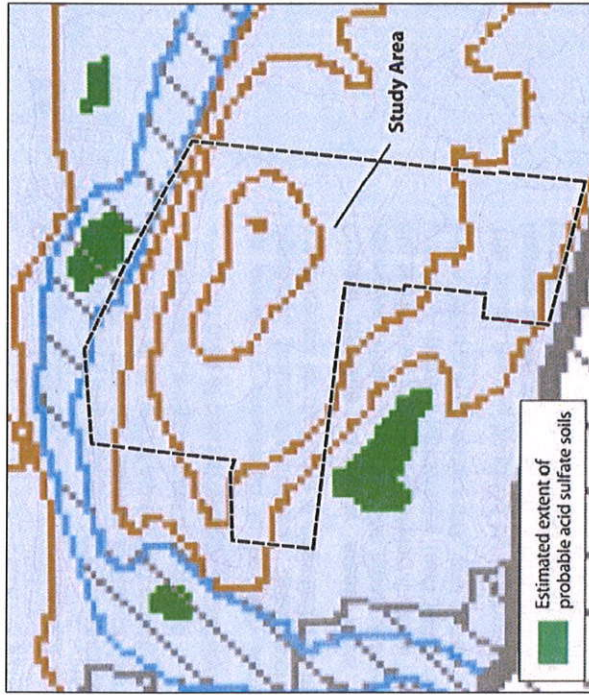
The Department of Primary Industries has prepared Acid Sulfate Soil Hazard Maps for Victoria. The Hazard Map has been combined with property boundaries to determine whether Acid Sulfate Soils are likely to be found in the study area.

The mapping has limitations because it was undertaken at a scale of 1:100,000. The Acid Sulfate Hazard Maps, Guidelines for Coastal Victoria, 2003, recommends that areas adjacent to those assessed as having a 'probable hazard' should also be investigated.

The map on the following page shows that a low lying area on the southern side of Hopkins Point Road would probably have Acid Sulfate Soils. A small section of the Hopkins River to the north would also probably have Acid Sulfate Soils. Parts of the Study Area are adjacent to these 'probable hazard' areas.

Structure Plan Implications

- It is recommended that further work is undertaken to investigate the presence of Acid Sulfate Soils in the Study Area in accordance with the Department of Primary Industry Guidelines. The extent and timing of this investigation will need to be determined through consultation with relevant agencies.



Source: Department of Primary Industries and Warrnambool City Council

Acid Sulfate Soil Hazard Map (with property boundaries overlaid)

² Department of Primary Industries Victoria, at <http://www.dpi.vic.gov.au>

3.7

Stormwater management

The study area is included within the Hopkins Basin – Sub-Catchment H1: Hopkins River/ Brucknell, which is managed by the Glenelg Hopkins Catchment Management Authority (GHCMA).

GHCMA have prepared the 'Hopkins Estuary Management Plan' which applies to the study area. The Plan makes the following relevant comments about the threats from urban development.

Urban development and subdivision near the estuary is a threat to the environmental and social values of the system. Development and subdivision along the estuary may also impact on the landscape values of the estuary. Stormwater has the potential to lower the water quality of the estuary and therefore represents a significant threat to the health of the system and the associated social and economic values.

Subdivision and development also has the potential to restrict access to the estuary, which can also impact on the estuary's social and economic values...

New development anywhere in the urban area is automatically sewered. Planning conditions within the planning scheme control stormwater and its management in new subdivisions. Warrambool City Council has applied water sensitive urban design on an area at Merrivale Drive, which demonstrates the application of such design principles. Application of these principles needs to be considered in any new developments that have the potential to discharge stormwater to the estuary.

The Hopkins Estuary Management Plan also provides management objectives, targets and actions for the Hopkins Estuary. The following actions are considered relevant to the preparation of the Structure Plan:

- *Produce a revegetation and enhancement planting guide, which includes the importance of using plants that are of local provenance.*
- *Revegetate in partnership with GHCMA.*
- *Establish water quality standards for stormwater runoff from new developments. Comply with State Environment Protection Policy - Waters of Victoria to minimise the impacts of point sources of pollution.*
- *Restrict major development (e.g. residential, commercial and tourist) through planning schemes on land subject to inundation.*

- *Negotiate, as part of planning approvals, to obtain public access to, or acquire foreshore land for public access.*
- *Apply the VCC Siting and Design Guidelines for structures on the Victorian Coast.*
- *Require that an environmental impact statement be prepared for major planning applications for any area within or adjoining the estuary.*

Discussions with Department of Sustainability of Development in Warrambool provided the following guidance for stormwater management:

- Stormwater will need to be managed to minimise environmental impacts on the river and estuary. There could be potential impacts on in-stream flora and fauna and water quality.
- It would be ideal to introduce stormwater filtration systems through wetlands or swale drains within the street network or open space. Alternative filtration methods may be required for steeply sloping land.
- There is a stormwater retention pond on the south side of Hopkins Point Road that sometimes overflows.

Structure Plan Implications

- Water Sensitive Urban Design solutions should be employed to improve the water quality of the catchment and maintain appropriate flows.
- The riverside should be designated as open space and revegetated in partnership with the GHCMA.
- There is a challenge for WSUD solutions because of the sloping topography.
- The Stormwater and Drainage Plan should be designed as a whole area plan rather than staged development plans. By considering the area as a whole the river health outcomes may greatly be improved as the potential for more effective treatment works are possible at this scale.
- Consider the use of existing wetlands within the water sensitive urban design function of the stormwater management system.

3.8 Issues and Opportunities

The following Issues and Opportunities have emerged through the site analysis process. Refer to the Site Analysis / Issues and Opportunities Map on Page 15 for locations.

1. Lands slopes significantly down to the river and in the south west corner of the site. This will provide constraints on development because of access difficulties and provide a constraint on development of housing in these areas. Roads will need to follow the topography as closely as possible to minimise excavation and steepness, and housing lots in these areas may need to be large to be feasible for development.
2. Opportunity to orientate housing and roads with the topography where possible to take advantage of views, limit the need for excavation, and minimise the visual impact of development.
3. The upper slopes of the site are highly visible from key viewing locations around Warrambool. There is an opportunity to maintain a landscape dominance of the site particularly when viewed from the highly visited locations. This could be achieved by providing public open space in the more visible areas or larger allotments to allow tree planting around buildings. Retaining and strengthening the vegetation along the ridgeline would also contribute the landscape setting.
4. Opportunity for housing of higher densities in the flatter, more useable land within the study area.
5. Opportunity to provide public access to the Hopkins River corridor with a new public open space. The steepness of the land could limit the useability of the future public open space however the north west corner of the corridor is flatter and may be more useable. A trail could follow the contours to minimise its steepness.
6. Opportunity to provide public open space along the Logans Beach edge to provide for the continuation of the walking

trail. Adequate control measures would need to be put into place in order to ensure minimum degradation and loss of biodiversity.

7. Opportunity to create open space links between Hopkins River and Logans Beach which connects to the existing network of open spaces and trails. Revegetation could occur to create wildlife corridors. The use of Indigenous species should be encouraged.
8. Opportunity for public open space along the ridgeline. This new space could provide the public with a variety of views available on one of the flattest parts of the site. It would also assist in minimising the visibility of development.
9. Vehicle access in this area to the site is constrained because visibility is limited by the road cutting.
10. Prevailing south westerly winds would affect the amenity of future allotments south of the ridgeline particularly the upper south west facing slopes. Vegetation may be required for protection which could also restrict viewing opportunities.
11. Future allotment layouts and housing need to be carefully designed to minimise impacts on adjoining residential areas. Given the low slope of the land in some areas, it is important that vegetation is low-lying and carefully placed in order to maintain ocean views where possible.
12. Development within areas of existing native/ indigenous vegetation will need to be carefully designed to have minimal impact on the existing vegetation.
13. Potential for pedestrian/ cycle connections to existing residential areas. Further consultation with existing residents will be required.
14. The Hopkins Point Trig Survey Station was first established by the Survey Corp circa 1941 and is locally important. It is essential that the existing trig is surrounded with a 25x25m area of public open space in order to allow the trig to continue to receive satellite signals. Revegetation in this

area should be limited to low-lying vegetation of no more than 1.5m high so as not to interfere with satellite reception.

15. Opportunity to reinforce and strengthen the gateway and the visual amenity of the outlook from the ridgeline along Hopkins Point Road in the longer term. It is important that the qualities of the existing views to the ocean are considered in future development and that the ridgeline remains free of visual clutter as far as reasonably possible.

4. Infrastructure Analysis

The notes from Planisphere's discussions with service providers and Council are summarised below.

4.1 Water Supply

Wannon Water has recently undertaken the Hopkins Point Sewer and Water Project which provides detailed plans of future water supply and sewer layouts for the entire growth area.

Wannon Water has indicated that a water storage tower is likely to be required on the highest point of Study Area North.

Discussions were held with Wannon Water regarding water supply to the site, prior to the commencement of their Sewer and Water Project. These discussions revealed the following:

- A tower located to the north of the site supplies water underneath the river.
- Water can currently be provided to development up the 40 metre contour line.
- A booster pump can be installed to service development up to the 52-55 metre contour line. The service authority has in its 2006/07 program installing a booster pump of limited capacity. While it would be possible to use or augment this capacity at the developers cost it is not an ideal long term option because of the poor level of security of supply.
- A hilltop storage facility is a longer term solution and would need to be located on the study area at least 20 metres above the highest dwelling. The installation of a tower in this location has been accounted for in the authority's 2008-09 budget.
- To bring the installation of the tower forward, a 'brought forward' cost would most likely be incurred which is calculated according to a formula provided by the Essential Services Commission.

Structure Plan Implications

- A water and sewerage plan for the Coastal / Hopkins River Environment area is currently being prepared by Wannon Water. No recommendations have been made for the provision of water and reticulated sewerage to the area.

4.2 Sewerage

Wannon Water has recently undertaken the Hopkins Point Sewer and Water Project.

Discussions with Wannon Water regarding sewerage reticulation prior to commencement of the Water and Sewerage Project revealed the following:

- There is a sewerage pump station to the west of the study area which was installed for the low density development. Augmentation of this sewerage pump station would be required and that would be funded by the supplier. The pipes to the west would also need to be widened to service the development. This would only service allotments to the south of the ridge.
- North of the ridge, a new pumping station would be required which would require a detailed design.

Structure Plan Implications

- A water and sewerage plan for the Coastal / Hopkins River Environment area is currently being prepared by Wannon Water. No recommendations have been made for the provision of water and reticulated sewerage to the area.

4.3 Circulation

Roads

A discussion with Council's Traffic Engineer provided the following information:

- Council has indicated that there could be potential traffic management issues west of the bridge at the intersection of Hopkins Point Road and Hopkins Road, and Otway Road and Hopkins Road.
- Council has indicated that there may be a possible requirement to widen the reservation of Hopkins Point Road if development occurs out to the proposed future growth boundary. They also indicated that the bridge may need to be widened.
- Localised widening around the access points to the development may be required for left and right turning lanes into the site.

In response to the discussion with Council's Traffic Engineer, traffic modelling was undertaken by Maunsell to assess the impact of future development on the existing road network, and to test the appropriateness of the proposed entry and exit points to the future residential area. The detailed traffic assessment report is attached as Appendix A.

This report provided an assessment based on 700 new residential allotments within the growth area.

Four entry and exit points to the subdivisions (3 for development north of Hopkins Point Road and 1 for development south) were tested in the assessment.

A summary of the findings of this report is as follows:

- The impact of the proposed development along Hopkins Point Road will generate traffic volumes which will be adequately catered by Hopkins Point Road, Flaxman Street and the surrounding road network.

- The four proposed access points along Hopkins Point Road provide absorption capacities beyond what is required of the development.

- The addition of development traffic on the immediate intersections of Hopkins Rd/ Marfell Rd and Hopkins Rd/ Otway Rd will not result in capacity issues at these intersections.

- The location of the proposed access points provides sufficient distance for sightlines provided speeds are reduced to 60 km/hr.

While the Maunsell Report found that there would not be capacity issues at the Hopkins Road/ Marfell Street, Hopkins Road/ Otway Road and Flaxman/Nicholson/ Bostock Streets intersections, it has been agreed that contributions to the upgrade of these intersections as part of the rezoning process. These contributions will be made by way of section 173 agreements prior to rezoning.

Structure Plan Implications

- Road upgrades would be assessed at planning permit stage.
- A reduced speed limit along Hopkins Point Road will need to be implemented to ensure there is sufficient sight distance for the entry and exit points to the future residential area.

Public Transport

Buses provide the main form of public transport in Warrnambool and are operated by Warrnambool Bus Lines.

The closest bus route is approximately one kilometre from the subject site and travels from the City centre and along Otway Road and Simpson Street (Route 7 – East).

Structure Plan Implications

- It is important that pedestrian access to the bus routes is maximised.
- Consultation with the bus operator has occurred. Upgrade as per agreement with Warrnambool Bus Lines.

4.4 Electricity

Powercor is the electricity distributor for the study area and were contacted to provide an assessment on the impacts of future residential development on the current electricity supply. A development scenario of 400-450 allotments for the study area provided the basis for the assessment. Powercor's response is summarised below:

- Powercor presently have sufficient capacity in its high voltage network (in Hopkins Point Road) to supply a residential development of 400-450 allotments.
- Banksia Drive is a private roadway therefore Powercor may not be able to provide supply into the Structure Plan area via Banksia Drive.

Structure Plan Implications

- Electricity will not provide a constraint for future development in the study area.
- Underground powerlines will need to be provided to reduce the visual impact of infrastructure.

4.5 Gas

SP Ausnet is the gas distributor for the Warrnambool Area. Discussions revealed that:

- A gas distribution system exists on the west side of the Hopkins River.
- A main would need to be extended from the distribution point across the river to the study area. The approximate distance of the extension would be 1.5km.

Structure Plan Implications

- Negotiate with SP Ausnet to negotiate the provision of mains gas to the study area.

Pedestrian / Bicycle Links and Open Space

A site visit and GIS analysis provided the following assessment of pedestrian / bicycle links and open space:

- Pedestrian links in the immediate area are limited. There are no footpaths along Hopkins Point Road which provides the only link to the Warrnambool centre.
- There is a pedestrian trail along Logan's Beach which forms part of the Promenade Beach Stroll. This trail ceases at west of the Structure Plan area.
- The steeply sloping land in the study area may provide a constraint for pedestrian access.
- The road to Logan's Beach is part of the Flagstaff Hill to River Mouth Bicycle Ride.
- There is an extensive Coastal Reserve to the south and a reserve and boat house on the west side of Hopkins River.

Structure Plan Implications

- Recommend upgrades to Hopkins Point Road for improved pedestrian and bicycle access.
- Provide a permeable pedestrian and bicycle network within the study area that connects the various public open spaces.
- Limit pedestrian access in steeply sloping areas.
- Potential to link future public open spaces to the existing networks of open space.
- Due to the fragile environment of the coastal reserve to the South, access to Logan's beach across the primary dune area should not be encouraged. However, a single access point may be considered in the longer term in order to protect and reduce the human impact on this fragile environment.
- Any proposed walking tracks along the primary dune area require an environmental impact study before being considered to ensure minimum degradation and loss of biodiversity. Adequate control measures should be put into place.

4.6 Telecommunications

Telstra is the telecommunications provider for the area and it is connected to the Warrnambool Exchange.

- The current telecommunications infrastructure would require upgrading to accommodate additional residential development in the area. A 30 pair copper wire feed currently exists which is close to capacity.
- One upgrade option is to run fibre optic cable from the exchange to a cabinet from which copper wires will be run to the subdivision and future dwellings. Telstra would cover costs to the cabinet however further costs would need to be discussed with Telstra.
- Another upgrade option is to provide a 'Velocity' connection which will supply fibre optic cable directly to the home. This has the advantage of providing access to super high speed broadband, digital TV, pay TV as well as the land line service. This would need to be discussed with Telstra.

Structure Plan Implications

- Negotiate with Telstra to provide telephone and broadband services to the study area. The development can be registered with Telstra's Smart Communities program.

5. The Structure Plan

5.1 Vision

The Coastal / Hopkins River Environment, provides a superior quality residential environment, that responds to local characteristics and context. The area functions as a neighbourhood of Warrambool and provides a range of living opportunities through a diversity of residential densities situated in a variety of landscape settings.

A strong sense of community is created by the network of walking and bicycle paths that provide links between the open spaces and residential areas. Convenient access to shops and services is available to many, with a concentration of housing opportunities close to Hopkins Point Road, and more spacious living opportunities located in environmentally and visually sensitive areas.

The residential area sits in harmony with the existing landscape with roads and buildings located to minimise alterations to the natural topography. Looking back from the surrounding areas, the Coastal / Hopkins River Environment appears as heavily vegetated with dwellings just visible between the trees and open spaces, and a low-lying vegetated ridge forming the skyline.

Coastal, estuary and river views are available for everyone to enjoy with the public open spaces located at the primary vantage points in the area. The careful siting and design of buildings ensures that views are available between buildings within streets and from residential allotments.

There is a focus on protecting and enhancing the local environment throughout the area. Hopkins River and its environs is revegetated and incorporated into public open space, as is Logans Beach, the coastal fringe and the ridge area. Improvements to water quality are achieved through appropriate stormwater management filtration systems in streets and open spaces, and through best practice environmentally sustainable development within private allotments.

5.2 Development Objectives

The following objectives will guide future development in the Coastal / Hopkins River Environment area:

Strengthening communities

- Provide for a range of lifestyle opportunities and a diversity of residential densities.
- Ensure higher residential densities are located to take advantage of access to shops and services.
- Enhance links to the surrounding residential areas and community nodes.
- Provide highly accessible and high amenity public open spaces that are interconnected into the broader open space network.

Providing safe and convenient access

- Provide for a permeable street network which allows for safe and convenient pedestrian, bicycle and vehicle movement.
- Enhance pedestrian and bicycle links between public open spaces within and beyond the study area and between existing and future residential development in the Coastal / Hopkins River Environment area.
- Ensure that development is designed to be integrated with existing public transport systems.
- Manage the impacts of residential development on the existing road network.

Enhancing landscape qualities and environmental benefits

- Provide accessible and high amenity public open spaces to incorporate existing landscape and environmental features and take advantage of key views.
- Provide the opportunity for views of the surrounding landscape from private allotments, and public domain.

- Minimise the visual intrusion of residential development when viewed from key locations in the surrounding areas.
- Ensure future development is responsive to the topographical challenges of the study area.
- Protect and enhance the vegetated character of the ridge line.
- Improve the ecological integrity of the Hopkins River, ridge line and Logans Beach dunes, whilst serving as an important part of the public open space network.
- Minimise the environmental impact on the primary dune area through providing only minimal access to Logans Beach.
- Embrace best practice environmentally sustainable development principles in the design of the subdivision layout, streetscapes, open spaces, private dwellings and landscaping.
- Ensure new residential development incorporates Water Sensitive Urban Design principles.
- Ensure high quality urban design in streetscapes, open spaces and residential development.

Balancing Service Provision

- Provide for the co-ordinated and cost effective provision of infrastructure to service the Coastal / Hopkins River Environment area.
- Ensure the provision of infrastructure results in social and environmental benefits.



Housing Areas

- Riverside Bush Lots (2,000-4,000sqm)** Land is partly constrained because of the steeply sloping land
- Low Density Bush Lots (1,500-2,500sqm)** Strong emphasis on revegetation to protect highly visible ridge and hill faces

- Spacious Residential Lots (1,000-2,000sqm)** Includes areas of lower visibility with emphasis on revegetation and generous space between buildings

- Conventional Density Residential Lots (600-800sqm)** Properties front onto public open space and located on flatter, more useable land

- Open Space Cluster Lots (400+ sqm)** Lots surrounded by common land and public open spaces with a heavy emphasis on low-lying revegetation. Clusters will be arranged to protect views from existing dwellings

- Environmental Cluster Lots (400+ sqm)** Clusters of low impact dwellings surrounded by low-lying heavily vegetated open spaces

- Existing public open space areas
- Future public open space areas / corridors
- Major pedestrian and/or cycle network
- Minor pedestrian and/or cycle network
- Proposed major road network
- Proposed service road
- Existing bus route
- Existing Trig survey station
- Vehicle entrance points
- Preferred location for shop / community facility
- Potential location for jetty
- High point
- Entrance Gateway and Boulevard
- Study Area

The Structure Plan has been developed by responding to the issues identified during the analysis stage of the project which involved background research, site analysis and a site visits, and consultation with Council and relevant agencies.

The Structure Plan provides a framework for the development of the study area at a range of residential densities. The layout responds to the distinctive landscape setting and environmental sensitivities through the location of open spaces, layout of roads and distribution of residential densities.

A network of open spaces incorporates the key landscape and environmental features and is linked by pedestrian and bicycle paths, which ultimately providing connection to surrounding residential areas, shops and services.

Environmental benefit is achieved with new public open spaces and revegetation in sensitive areas and water quality will be improved with WSUD techniques incorporated into road design and residential development.

5.3 Development Density

The plan accommodates approximately 650-700 allotments at various development densities. The densities been carefully considered to minimise the visual impact of development, respond to the topographic constraints and provide for a diversity of lifestyle opportunities.

The total number of lots to be provided is higher than the yield included in Clause 21.05 of the Planning Scheme, which is 450 allotments. It is considered the Structure Plan area is able to provide additional allotments and still satisfy the objectives and strategies of Clause 21.05.

Structure Plans prepared for the other growth areas included in Clause 21.05 have also produced higher development yields than those included in the Planning Scheme. This could suggest that the Planning Scheme yields are slightly conservative and require further detailed work to establish more realistic yields.

Housing Areas

The Views to the Site and Viewshed Analysis has indicated that the higher slopes and ridgeline of Study Area North are generally most visible from the key public viewing locations. For this reason the larger lots and open space have generally been located on the higher slopes and smaller allotments on the lower slopes. Building siting requirements will ensure that the ridge remains undeveloped and forms a low-lying vegetated skyline for the area.

South of Hopkins Point Road, a different approach to development has been recommended. In this area, clusters of smaller residential allotments or residential allotments aligned with land contours will be surrounded by common land and public open spaces giving the appearance of a heavily vegetated environment. Building siting requirements and careful placement of vegetation will ensure appropriate view sharing is achieved and that new and existing residential properties have coastal / ocean views.

The following housing areas are shown on the Structure Plan on the previous page:

Area 1 - Riverside Bush Lots: Lots range between 2,000sqm and 4,000sqm and are located on land that slopes to the Hopkins River. Development on these sites will be limited by topographic and access constraints.

Area 2 - Low Density Bush Lots: Lots range between 1,500sqm and 2,500sqm and are located on the upper, more visible slopes of the hilltop. This lot size would provide space for substantial tree planting around buildings to create the appearance of a treed hilltop.

Area 3 - Spacious Residential Lots: Lots range between 1,000sqm and 2,000sqm, and are located on the lower slopes south of the ridge. This lot size would provide substantial space for planting of trees and shrubs to enhance the vegetated appearance of the hill.

Area 4 - Conventional Density Residential Lots: Lots range between 600sqm and 800sqm and are located on flatter, more useable land which is less visible from surrounding key viewing locations. These allotments are also designated around an area

of public open space to the east of the development area to assist with passive surveillance. There are opportunities for tree planting within this lot size range.

Area 5 – Open Space Cluster Lots: Larger allotments of 400sqm and over are located across the majority of the development area south of Hopkins Point Road. These allotments will surround large areas of common property open space and/or private revegetated land and provide a heavy emphasis on low-lying revegetation with native and indigenous species.

Area 6 – Environmental Cluster Lots: Larger allotments of 400sqm and over are located in the southern section of study area south. Development in this area will be carefully designed to have minimal impact on the existing native vegetation. There will be a heavy emphasis on low-lying revegetation with native and indigenous species.

passive recreational facilities could be located such as tables and chairs or a fishing platform on the river.

A smaller area of public open space is located to the east of the development area (approximately 7,750sqm). This will serve the role of a local park and be fronted on each side by housing. It is located on fairly flat land that would be ideal for recreational activities.

Another smaller area of public open space (approximately 3,700sqm) is located in the south west corner of the site. This area would offer good views to the estuary and ocean.

South of Hopkins Point Road

South of Hopkins Point Road, two major public open space areas are provided, which are connected by an open space corridor and areas of common property open space.

The most significant area of public open space is located along the Logans Beach frontage with a depth of 100-160 metres and a total area of 57323m². This area includes undulating land with dense coastal vegetation and the steep dunes which form a backdrop to Logans Beach. Pedestrian access through this area will be reduced to a singular access point and carefully designed to minimise impacts on vegetation and wildlife habitats. A smaller area of public open space will be provided in the northern section of the property.

Common property open space that is surrounded by clusters of residential allotments will be a unique feature of development south of Hopkins Point Road. It is intended that the large areas of common property will serve as private open space for the residents and connect into the public open space network. The common property will be managed privately and generally accessed privately. Ongoing care and maintenance of vegetation will ensure that the quality, style and character of the area will be retained and key views will not be impeded upon.

A wildlife corridor has been established to provide a link between habitats in the Logans Beach area and habitats along Hopkins River. This corridor will be heavily vegetated with species suited to the existing wildlife. It will be incorporated into the narrow open space corridor south of Hopkins Point Road, and within the road reserve north of Hopkins Point Road.

5.5 Circulation



Pedestrian and Bicycle access

A network of pedestrian and bicycle paths has been provided in the Structure Plan to provide residents with access to the various areas of open spaces, and to Hopkins Point Road for access to nearby shops and services. The main features of the pedestrian / bicycle network include:

- A shared pedestrian / bicycle trail in the centre of the study area which commences at the Hopkins Point Road and extends down to the riverside open space corridor.
- A shared trail near the eastern boundary of the study area which provides a connection between Hopkins River and Logans Beach
- A shared trail along the riverside open space corridor which follows the contours to minimise steepness and has potential for connection to future open space to the east.
- A shared trail that provides a scenic journey along the ridgeline incorporating existing vegetation and connecting to the riverside open space and the on-street pedestrian / bicycle network.
- A trail along Logans Beach which will be carefully designed to minimise environmental and visual impact.
- An on-street pedestrian / bicycle network connecting to the shared trails and open spaces to future residential areas. All roads will incorporate pedestrian footpaths.

Road Layout and Traffic Management

The road layout has been designed to respond to the challenging topography and also provide a permeable layout for convenient vehicle and pedestrian access.

North of Hopkins Point Road, major vehicle access to the residential areas will be provided along a heavily landscaped avenue located roughly in the centre of the Structure Plan area. This road will incorporate substantial landscaping and a shared pedestrian / bicycle trail. A secondary access point will be located in the south west corner of the site which is intended to service properties in that immediate area. A third access point

will be located at the eastern edge of the Structure Plan area. No Vehicle connection will be provided through the existing residential streets west of the study area (via Riverview Terrace), in order to minimise disruption to this area.

A series of loop roads will branch off the major access avenue to provide access to the majority of residential areas. A service road is located along the Hopkins Road frontage, which will provide access to properties along Hopkins Point Road and provide for a residential frontage to the development area.

South of Hopkins Point Road, one major access road will service properties from which smaller access roads will be provided. No vehicle connection to Logans Beach Road will be provided to minimise disruption to adjoining residential areas.

Connectivity points between the new residential areas and the main road have been carefully selected to optimise sight distance in both directions. The new intersections are widely spaced to avoid adverse interactions between traffic movements entering and exiting each. It is recommended that speed limits are reduced to 60km/hr within the Structure Plan area to ensure sufficient sight lines can be provided.

Internal roads have been largely laid out to follow natural contours and thus avoid excessively steep sections and reduce the visual impact of roads. This will also result in a scenic outlook when travelling along the roads. Some steep grades remain but have been mainly kept within dead-end courts.

Detailed road designs will need to take into account Council's Design Guidelines for Subdivisional Developments Urban/Rural Road and Drainage Projects and Traffic Management.

It has been agreed that contributions to the upgrade of the Hopkins Road/ Marfell Street, Hopkins Road/ Ohway Road and Flaxman/ Nicholson/ Bostock Streets intersections as part of the rezoning process. These contributions will be made by way of section 173 agreements prior to rezoning.

Public Transport

The road network has been designed to accommodate bus services when available.

Initial feedback from Warrnambool Bus Lines has indicated that both Transit and School Bus routes could service the Structure Plan area. They have provided preliminary routes which are shown on the Circulation Map. These routes are only preliminary and will require further refinement.

5.6

Shops and Services

The addition of 650-700 allotments may provide the impetus for a small scale retail or community facility to be located within the study area. The preferred location for such a use has been shown on the Structure Plan in a position which is central to the entire residential area east of Hopkins River, and in close proximity of the higher density residential areas. Such a development would need to be carefully designed to integrate with surrounding residential areas.

5.7

Infrastructure

Water and Sewerage

Wannon Water are preparing a water and sewerage plan for the area. Details of the required infrastructure will be included in those plans.

Electricity

Powercor has indicated that there is capacity in its high voltage network to supply electricity to future development in the Structure Plan area.

All electrical infrastructure works internal to the new development would need to be separately costed and an agreement entered into with Powercor.

Powercor's current Supply Policy allows for a Powercor Network Contribution (funds from Powercor) per residential allotment. Generally, this Contribution may offset the total infrastructure costs of the electrical assets (with the exception of the required civil works).

Gas

SP Ausnet has advised that the development area can be reticulated with gas.

The costs of reticulation can be calculated by SP Ausnet when a subdivision layout is prepared. The developer would be expected to contribute to costs.

Telecommunications

Telstra has indicated that the current telecommunications infrastructure would require upgrading to accommodate additional residential development in the area.

There are a number of upgrade options including providing fibre optic cabling to the development area to deliver high speed broadband, digital TV, pay TV and the landline service.

Telstra would cover costs of telecommunications infrastructure to the cabinet however further costs would need to be negotiated.

5.8 Integrated Water Management

The following recommendations for Integrated Water Management have been summarised from a more detailed report included as Appendix B.

Clause 56.07 of the Warrambool Planning Scheme sets out the integrated water management requirements that must be met for residential subdivision proposals in an urban area.

The aims of Clause 56 are to:

- Integrate use of all water resources including rainwater, reused water, recycled water and stormwater
- Conserve the supply and reduce the use of potable water
- Use alternative water supplies where potable water quality is not required, and

- To use best practise water sensitive design (WSUD) techniques to conserve, reuse and recycle water and manage the quality of stormwater run-off.

The following provides recommendations on how each element of Clause 56.07 can be addressed in the Structure Plan:

Drinking Water Supply

The aim of this objective is to reduce the use of drinking water. Reduced use of drinking water will be achieved in the Coastal / Hopkins River Environment Area via:

- Water saving appliances, especially washing machines
- Potable water mains designed to limit flow
- No supply of potable water to outside the house
- Supply of alternative water supplies
- Compulsory connection of rainwater tanks to both the garden taps and the hot water service

Reused and Recycled Water

Alternative water sources should be supplied for those activities within the house where potable water quality is not required. Alternative water sources include rainwater, stormwater, and recycled water.

The following recommendations can be implemented to provide for the re-use of and recycling of water

- Provide rainwater tanks on all houses which are connected to the hot water service and all outdoor water uses. Rainwater tanks should be sized such that there is at least a 90% probability that the rainwater tank can supply the intended uses for the entire year.
- Give consideration to requiring household reuse systems, particularly those houses with occupancy rates of four or more people (i.e. households with families). The type of reuse system installed will dictate the allowable end uses for the reuse water. In general however, household reuse systems can treat shower water and washing water to a standard suitable for reuse in the garden or toilet.

Wastewater Management

Wannon Water has indicated that all residential allotments will be connected to reticulated sewerage therefore no recommendations on wastewater management have been provided.

Urban run-off management

The objectives of this clause are to:

- Minimise damage and inconvenience caused to residents by urban run-off
- Ensure that the streets operate effectively during major storm events, and
- To minimise increased in stormwater run-off and protect the receiving waterways (this is generally achieved through Water Sensitive Urban Design)

Water Sensitive Urban Design (WSUD) forms a major component managing urban run-off. It is the practice of using stormwater as a resource while protecting the receiving environment. At a minimum, WSUD should ensure that run-off from any developed area does not exceed pre-development levels in either intensity or water quality.

Reducing Stormwater

One of the first elements of WSUD that should be considered for development in the Coastal / Hopkins River Environment area is to reduce the volume of stormwater created. This can be done minimising, as far as practical, the impervious areas within developments.

Sections of the Structure Plan Area are very steep, and thus considerable efforts will need to be made to prevent as far as practical any increase in stormwater volume due to the urbanisation.

The following are methods for reducing the effective impervious area of the development:

- Installing rainwater tanks on all houses, such that the rainwater is collected and used at the house, rather than discharged to the stormwater network
- Limiting as far as practical, the hardstand area of the house blocks.
- Utilising pervious pavements for the non-trafficked areas of the development, i.e. car parking areas.
- Limiting the areas of hardstand within the entire development
- Ensuring that individual house allotments are large enough to have individual stormwater retention systems such that there is no run-off from each block
- Avoid development on very steep sites where stormwater run-off can not be collected

Increasing Infiltration

Where it is not possible to reduce stormwater flows, it is recommended that technologies that encourage infiltration prior to discharge are utilised. If the collected stormwater can infiltrate within the development, there will be a reduced volume to discharge to the Hopkins River. Methods to encourage infiltration of the stormwater include:

- Grass swales for conveying stormwater rather than concrete stormwater pipes. The stormwater will have the opportunity to either evaporate or infiltrate. Large volumes of stormwater, such as that resulting from a storm, will still be conveyed downstream in a grass swale
- Perforated stormwater drainage pipes. Within a streetscape, grass swales may not always be practical, thus consideration should be given to using perforated stormwater drainage pipes. These pipes will allow small rainfall events to infiltrate and will convey the larger storm events to the water storage/detention basin.

Infiltration methods are best suited to sandy soil types that facilitate infiltration, rather than clayey soils. The dominant soil type in the Warrnambool area is weathered limestone. This has a relative high hydraulic conductivity and is therefore will be suitable for infiltration.

Stormwater Detention and Treatment

Any stormwater collected within the development must be stored and directed to the either the existing stormwater network (where it exists) or the Hopkins River on the north and west of the development. The rate of discharge should be consistent with predevelopment flows. All discharge must be directed away from Logans Beach in accordance with State Government Policies.

Stormwater detention is generally undertaken in a pond, where the pond forms part of a wetland system installed to treat water quality.

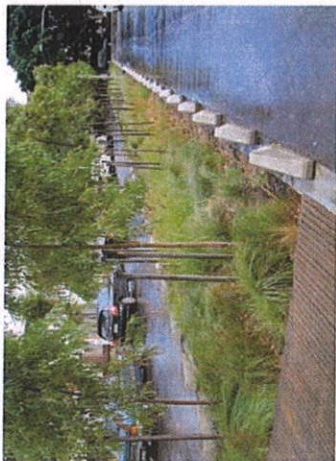
The elements of the stormwater detention/treatment system are:

- Sediment basin to remove the sediment pollutant loading
- Wetland to enhance sedimentation, fine filtration and nutrient uptake
- Pond to detain the water and release it into the receiving waterway at pre-development intensities.

Given the steep nature of the land, it may be difficult to position a constructed wetland system on the northern portions of the study area. The public open space on the western side of the development may be a suitable location for the southern and western portions of the site.

For the steeper portions of the site, bioretention swales or bioretention basins may be more suitable.

Bioretention swales look like a heavily vegetated nature strip and are used to convey the storm flows. The provide stormwater quality improvements. On steep sites, check dams may be required to ensure sufficient retention times within the swale. This is illustrated in the photo below.



Bioretention swale in Zetland, NSW

Source: WSUD Engineering Procedures – Stormwater (2005, Melbourne Water)

Bioretention basins operate by passing runoff through a filtration media, commonly vegetated, that provides water quality treatment and extended detention. A bioretention basin is illustrated below.



Bioretention basin in Richmond, Victoria

Source: WSUD Engineering Procedures – Stormwater (2005, Melbourne Water)

Potential Location for WSUD Elements

Each of the nominated housing areas as indicated in the Structure Plan is likely to require a detention pond. The ponds must be located so as to capture all the stormwater from within that area of the development. Housing Areas 1 and 6 will require careful design to ensure that stormwater is not discharged directly into either Logans Beach or Hopkins River.

Stormwater as an Alternative Water Source

The first priority within the Hopkins Road development should be given to minimising the generation of stormwater run-off, however stormwater will be generated, and should be collected as an alternative water source. It is likely that the detention ponds constructed as part of the Water Sensitive Urban Design elements, can be used to store stormwater prior to reuse.

5.9

Development Guidelines

Development Guidelines have been prepared to guide the design and public and private spaces in the study area. The guidelines cover the layout of allotments, the design of public open space and streetscapes, and the design of buildings and landscaping in private allotments. These guidelines set the direction for more detailed Building and Landscaping Design Guidelines that will need to be prepared at a later stage in the planning process.

Lot Layout

- Allotments should be orientated to maximise passive solar access.
- Allotments should be orientated so that dwellings front onto public open space and to roads.
- Design lot layouts so to maximise views from within allotments and to optimise view sharing opportunities.

Streetscapes

- Incorporate WSUD techniques into road design as outlined in Section 5.8 of this report.

- Incorporate the informal planting of indigenous vegetation in streetscape and undertake planting at an early stage of development so that streetscapes are established before or during dwelling construction.
- Incorporate informal road treatments such as spoon and grassed drains and avoid suburban detailing such as upstanding kerbs and channels.
- Carefully delineate the final street layout so that the visual impact of roads can be minimised and utilise landscaping to screen the impact of roads when viewed from surrounding areas.
- Powerlines should be undergrounded within the development areas.

Public Open Space

- Incorporate the planting of indigenous and native species in public open spaces.
- Consider the siting of vegetation, and the siting and design of structures on key views when designing open spaces.
- Consider the siting of vegetation, and the siting and design of structures on passive surveillance in open spaces
- Site passive recreation facilities such as tables and chairs to take advantage of key views.
- Undertake planting as early as possible so that vegetation is established prior to or during dwelling construction.
- Ensure that the slope of pedestrian and bicycle paths are minimised where possible.

Building Siting

- Prepare building envelope plans for allotments which aim to:
 - Provide for consistent front building setbacks within streets.
 - Provide for the reasonable sharing of views between buildings

- Minimise the visual intrusion of development on highly visible landscape areas.
- Contain buildings to a defined area within the site away from property boundaries
- Close to the ridge line, delineate an area where no buildings or structures can be located to ensure that built form does not protrude above the future tree canopy.

Building design and detail

- Buildings should achieve at least a 5 star energy rating or an equivalent home energy rating scheme.
- Buildings should be sited and designed to address all street frontages and public open spaces.
- Restrict building heights to one storey for areas close to the ridge.
- Encourage low scale building forms and if a 2nd storey is provided, it should be smaller than the ground level to minimise visual bulk and allow views between buildings.
- Design buildings to step down the topography and where appropriate to be excavated into the land form.
- Incorporate low single pitch roof forms or low hip, gable or flat roof forms, and avoid high pitch roof forms.
- Articulate forms of building and elevations, particularly front facades.
- Use simple building details and avoid excessive decoration and historical reproduction styles.
- Utilise colours and finishes that best immerse the built form within the landscape.

Landscaping and Fences

- Require a landscape plan to accompany new dwelling proposals showing vegetation species and locations along with any earthworks that are proposed.

- Provide for the planting of predominantly native and indigenous trees and shrubs in clumps and clusters and avoid formal row planting particularly along property boundaries.
- Use informal planting of vegetation in rear yards to delineate side and rear boundaries and create private open space.
- Require a higher amount of vegetation for allotments located close to the ridge so that the appearance of a heavily vegetated hillside is created.
- Limit the use of impervious surfaces to minimise runoff from residential areas.
- Provide no front fencing, or post and wire fencing if required.
- Provide post and wire side and rear fencing for Riverside bush lots, Lower density bush lots and Spacious Residential lots. For standard residential lots provide transparent side fencing with the possibility of solid rear fencing.

Services

- Encourage properties to install rainwater tanks in order to satisfy the Integrated Water Management principles outlined in Section 5.8 of this report.
- Promote the use of a separate water pipe system for the reuse of grey water for toilet flushing and gardens.

6. Implementation

6.1 Planning Scheme Implementation

The Coastal / Hopkins River Environment Structure Plan will be implemented in the Warrnambool Planning Scheme to provide the statutory basis for the future development of the area.

The statutory options proposed for implementation of the Structure Plan should be based on the following considerations:

- Strategies, policies and controls already contained in the Warrnambool Planning Scheme, and changes likely as a result of the Planning Scheme Amendment.
- The likelihood of success of approval of any planning scheme amendment to introduce statutory controls by an independent State Government appointed Planning Panel and the Minister for Planning. There is little point in recommending measures to the Council that are unlikely to be approved. The most important aspect of this consideration is the need to determine which areas are those that require additional planning controls and which areas can be successfully managed with existing controls.
- The extent of additional resources and time required to process planning applications as a result of new controls of policies.
- The likelihood of community / developer acceptance of new policies and controls.

All these factors must be taken into consideration in developing the eventual recommended approach to statutory implementation.

Local Planning Policy Framework

Municipal Strategic Statement (MSS)

The Municipal Strategic Statement is the Council's primary statutory tool, and it must provide the strategic rationale and

context for all statutory controls introduced into the Warrnambool Planning Scheme.

The Structure Plan is proposed to be an Incorporated Plan under Clause 81 and be referenced in the MSS under the Coastal/Hopkins River Environment Area section of Clause 21.05.

Local Planning Policy

Recent direction from the Minister for Planning is that specific Local Policies are not required if the intent can be expressed in the MSS and the required controls be expressed in zones and overlays. This is the case in this instance, thus no new Local Policy is proposed. Clause 22.01-2, which currently applies to the entire study area and land south of Hopkins Point Road to Logans Beach, will need to be amended to exclude the Structure Plan area.

Zoning

It is considered that the Residential 1 Zone should be used for all residential development within the Structure Plan area. Development and use of a convenience shop is permitted under the Residential 1 Zone if it is required in the future.

The Public Conservation and Resource Zone should be used for the primary dune at the coastal edge of the land on the south side of Hopkins Point Road and for a strip of land 40 metres wide along the Hopkins River on the north side of Hopkins Point Road.

These zones will replace the Farming Zone and the Rural Living Zone that applies to land on the western side of the Structure Plan area.

Overlays

Overlays are an additional level of control that can apply provisions mainly to the development of land, but can also include control over demolitions, tree controls and in limited circumstances, use of land. The VPP include a suite of overlays that can be applied to address specific planning issues in the Coastal / Hopkins River Environment Area.

An important consideration when selecting overlay controls is the extent to which existing overlays can control development. The following overlays should be considered for application to the Structure Plan area:

Development Plan Overlay (DPO)

"Development Plan Overlays (DPOs)"

Two DPOs are proposed. The first is to control the more conventional subdivision of land on the north side of Hopkins Point Road while a separate DPO is proposed for the land on the south side of Hopkins Point Road. There are sufficient differences in lot sizes and lot configuration to warrant the application of separate DPOs.

The DPOs will guide and restrict the subdivision of the land to meet the lot size ranges required by the Structure Plan and to ensure that the quantum and location of open space, either in public or in common property ownership is provided and developed to the degree envisaged by the Structure Plan. The DPOs will also specify road layout and revegetation in accordance with the Structure Plan.

The DPOs will guide the location of buildings and structures on the lots by requiring Appropriate Building and Access Areas for each lot. This requirement will work in tandem with the proposed Design and Development Overlays to achieve a site responsive housing layout.

The DPOs will also require a legally binding voluntary agreement under section 173 of the *Planning and Environment Act 1987* for financial or in kind contributions towards the road intersection upgrades, pedestrian/bicycle paths, works on public open space, rehabilitation of the Logans Beach dunal area and rehabilitation planting along the Hopkins River.

With regard to physical infrastructure, the DPOs will work in tandem with the requirements of Clause 56 of the Planning Scheme to ensure a site responsive and sustainable subdivision is achieved."

Design and Development Overlays

Two DDOs are proposed to be applied for the land north and south of Hopkins Point Road respectively to control built form outcomes that complement the separate DPOs described above.

The DDOs will restrict building heights, setbacks and materials in accordance with the objectives of the Structure Plan. The DDOs will also control fencing and revegetation as required by the Structure Plan. The DDOs will specify that buildings and structures are to be located within the Appropriate Building and Access Areas shown on the DDOs.

The DDO on the south side of Hopkins Point Road will also require covenants or other mechanisms to ensure that the revegetation of common property open space areas is maintained in accordance with the requirements of the Structure Plan.

The DPOs and DDOs will replace the existing Logans Beach DDO on land in the Structure Plan area

Significant Landscape Overlay (SLO)

The Significant Landscape DDO 1 (Coastal Hinterland Landscape Area), the Environmental Significance Overlay 1 (Coastal Environs) and the Environmental Significance Overlay 2 (Hopkins and Merri River Environs) will be retained on the land in the Structure Plan area.

Erosion Management Overlay (EMO)

The purpose of the EMO is to protect areas prone to erosion, landslip or other land degradation processes, by minimising land disturbance and inappropriate development.

It is considered that the EMO should be applied to the steeply sloping sites north of the ridge line.

Development Contributions Plan Overlay (DCPO)

A Developer Contribution Plan is not required for the Structure Plan as the legally binding agreements under section 173 of the *Planning and Environment Act 1987* as required by the DPOs will allow the Council to require financial contributions or in kind works from the landowners. An agreement is an appropriate

method given that there are only three landowners in the Structure Plan area.

It has been agreed that contributions to the upgrade of the Hopkins Road/ Marfell Street, Hopkins Road/ Otway Road and Flaxman/ Nicholson/ Bostock Streets intersections as part of the rezoning process. These contributions will be made by way of section 173 agreements prior to rezoning.

6.2 Physical Infrastructure and other Developer Funded Works

The provision of infrastructure such as water, sewerage, electricity and gas, are generally negotiated the infrastructure providers. Other works, such as those listed in the table below under the headings of Transport, Community Purposes and Environment will be the subject of the agreement under section 173 of the *Planning and Environment Act 1987* described above.

The infrastructure likely to be required in the Coastal / Hopkins River Environment area is:

Waterways	• WSUD measures • Drainage infrastructure along Hopkins Point Road
Transport	• New major pedestrian / cycle paths • New intersection works to Hopkins Point Road
Community Purposes	• Possible future community facilities • Public open space treatments and facilities
Environment	• Rehabilitation of Logans Beach dunal area • Rehabilitation planting along Hopkins River

6.3 Staging

Clause 21.05 of the Warnambool Planning Scheme designates the majority of the Structure Plan area within the immediate 15 year land supply. This includes most of the land north of Hopkins Point Road and all of the land south of Hopkins Point Road. The eastern most parcel of land north of Hopkins Point Road is designated within the longer term greater than 15 years land supply.

It is considered that all land within the Structure Plan area can be developed within the 15 year land supply provided there is a logical provision of services to the area. The relatively low number of dwellings that are to be developed and the anticipated high demand for properties will provide for a quicker development timeframe.

A key determinant of the staging of development will be the provision of sewerage and water to the development area. This will be determined by the water and sewerage plans prepared by Wannon Water.

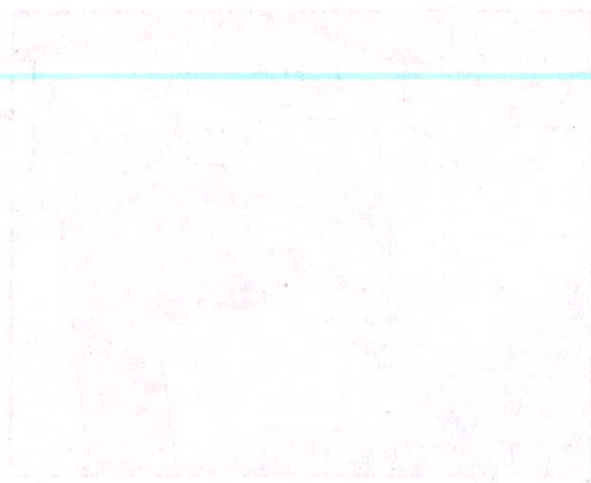
6.4 Next Steps

The next step is the preparation of a Planning Scheme Amendment to make the changes to the Planning Scheme that are required to implement the Structure Plan.

The Planning Scheme Amendment documents will be prepared by the landowners in consultation with Council and the Department of Planning and Community Development.

The Council will need to consider the Planning Scheme Amendment documents and resolve to seek authorisation from the Minister for Planning to exhibit the Amendment.

The exhibition of the Amendment will allow the community to make submissions on the proposed changes to the Planning Scheme and allow any unresolved issues to be considered by an Independent Planning Panel.



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Michael Natoli
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11 September 2007

Dear Michael

Hopkins Point Road Development

1.0 Traffic Assessment

This letter provides a brief impact of the proposed residential development on Hopkins Point Road, Warrambool on the road network surrounding the site.

1.1 Details and location of subdivision

The proposed subdivision is located approximately 4 kilometres east of central Warrambool, along Hopkins Point Road and south of the Hopkins River as shown in Figure 1.

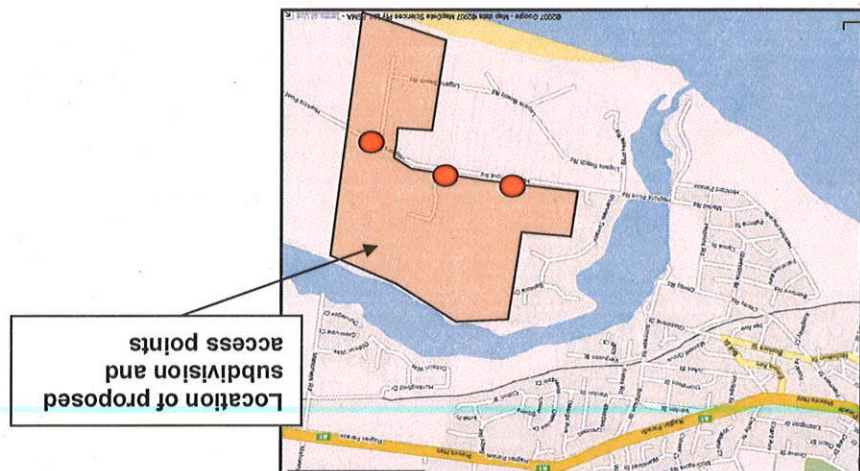


Figure 1: Location of subdivision

The area is to be subdivided into 700 lots.

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1.2 Proposed access points

It is proposed that the site will have access points along Hopkins Point Road only. Given that the proposed subdivision will consist of 700 lots, appropriately located access points will be required providing connection to Hopkins Point Road. The development straddles both the northern and southern sides of Hopkins Point Road with the bulk of the land on the northern side. As a minimum, two access points are therefore required in order to service both the northern and southern subdivisions. However, it is also considered that (given that there are such a large number of lots over a broad area in the northern subdivision), it is desirable to provide at least two access points from the northern subdivision along Hopkins Point Road. Therefore in total there will be two access points serving the northern subdivision and one serving the southern subdivision. By having two access points servicing the northern subdivision there will be a better spread of trips and enhanced flexibility for residents. The arrangement will also help to avoid long internal trips in order exit the development and there will be a greater dispersion of trips within the development itself, thus lessening the load on any individual internal intersection. Importantly there will also be less concentration of turning movements at a single location on Hopkins Point Road, thus ensuring that turning movements remain uncongested.¹

Assuming three access points along Hopkins Point Road, the absorption capacity of this road can be assessed in order to determine its ability to cater to the traffic from the development. In this analysis it has been assumed that:

- Total development consists of 700 lots
- 10 vehicle trip ends (vte's) for each lot per day
- In the AM peak there is a 70/30 percent outbound/inbound split to the development and vice versa in the PM peak
- 10% of trips from the development occur in each of the AM and PM peaks
- Traffic flows on Hopkins Point Road have been taken from existing traffic counts

Results from absorption capacity analysis at each of the access points along Hopkins Point Road are provided in Figure 2. As shown, the absorption capacity at each access point is well in excess of the actual egress movements at each point. This indicated that Hopkins Point Road adequately accommodates the additional traffic at each of the access points.

It is important to note that vehicular access to the southern subdivision will be via its intersection with Hopkins Point Road only. While maps and title documents suggest a connection to the development via Logans Beach Road, this will only be available to pedestrians and cyclists as indicated on the current Draft Structure Plan.

¹ The current Draft Structure Plan includes three access points for the northern subdivision resulting in a total of four access points for the entire development.

² The addition of a third access point serving the northern subdivision increases the total number of intersections to four along Hopkins Point Road. This additional intersection will not affect the overall absorption capacity of this road in relation to the development.

³ For a 60km/h environment ASD and ESD are 65m and 160m respectively (AUSTROADS Part5) – both of which are within current site conditions for all proposed access points.

As the proposed development is residential and given its location east of central Warmanmbool, it is assumed that all traffic will travel to/from the west of the development. As a result, the two main intersections that will be affected by development traffic will be Hopkins Road/Martell Road and Hopkins Road/Otway Road as shown in Figure 3.

1.3 Impact on existing intersections

At present, speed limits on Hopkins Point Road (heading east) are 60 km/h from the bridge to Casuarina Court, 80 km/h from Casuarina Court to Logan's Beach Road (eastern end) and then 100 km/h heading further east. Given that the proposed development is to consist of 700 lots and that residential properties already exist along this stretch of Hopkins Point Road, it is recommended that the speed limit of Hopkins Point Road be downgraded to 60 km/h from the bridge and past the end of the development heading east. With a 60 km/h speed limit along this stretch of road, each access point will be able to achieve appropriate Approach Sight Distance (ASD) and Entering Sight Distance (ESD) for this speed environment as specified by AUSTROADS.³

2.1.1 Layout of access points – sightlines

Figure 2: Absorption capacity analysis²

Intersection 1 - Absorption Capacity									
Development		Hopkins Two-way	Qp - veh/s	Absorption Capacity	Actual Movements	AM			
Lots	Trips					Ta	Tf	flow	4
						280	200	120	280
						1325	1325	1325	120

Intersection 2 - Absorption Capacity									
Development		Hopkins Two-way	Qp - veh/s	Absorption Capacity	Actual Movements	AM			
Lots	Trips					Ta	Tf	flow	4
						490	350	350	490
						1047	1047	1198	210

Intersection 3 - Absorption Capacity									
Development		Hopkins Two-way	Qp - veh/s	Absorption Capacity	Actual Movements	AM			
Lots	Trips					Ta	Tf	flow	4
						210	150	150	210
						691	691	1004	90

Figure 4: Intersection Analysis - Degree of Saturation

PM	0.446	0.447
AM	0.838	0.781
Hopkins Road/Otway Road	Hopkins Road/Martell Road	

Results from the Sidra analysis are shown below in Figure 4. As shown in this table, both intersections are below capacity during the AM and PM peak periods.

Degree of Saturation (DOS) – traffic volume divided by capacity.
>1.0 indicates over saturation and flow breakdown (very congested)
> 0.8 suggests that the intersection is at capacity (congested)
< 0.8 intersection is operating at or below practical capacity (less congested)

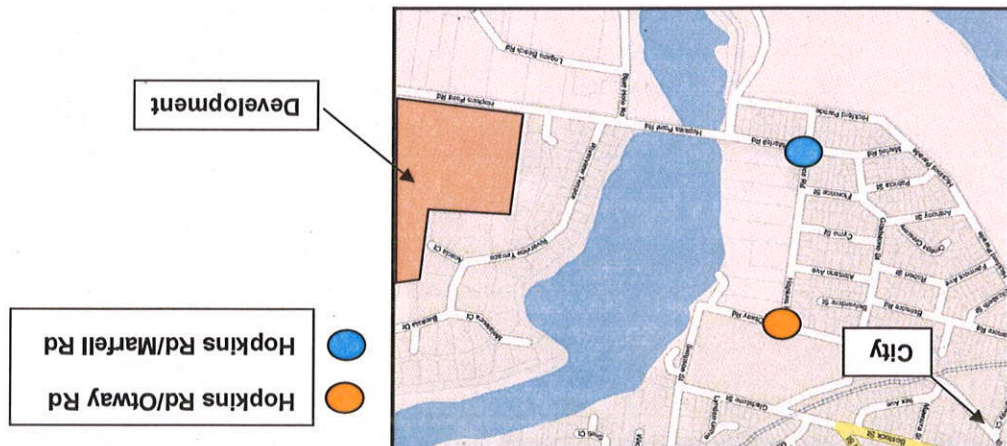
Flow at each intersection has been compared based on Degree of Saturation (DOS) which can be simply described as follows:

- Total development consists of 700 lots
- 10 vehicle trip ends (ve's) for each lot per day
- In the AM peak there is a 70/30 percent outbound/inbound split to the development and vice versa in the PM peak
- 10% of trips from the development occur in each of the AM and PM peaks
- At Otway Road 2/3 of development traffic is westbound (turns left) and 1/3 eastbound (turns right) and vice versa
- At Otway Road, the through traffic component in both directions is assumed to be 2/3 of traffic on that road
- Traffic flows roads surrounding these intersections have been taken from existing traffic counts

assumed that:

Both the intersections of Hopkins Rd/Otway Rd and Hopkins Rd/Martell Rd consist of give way arrangements. In order to analyse the impact of the proposed development on the operation of these existing intersections, Sidra analysis was carried out on each intersection with existing and projected AM and PM peak traffic volumes from the development. In this analysis it has been

Figure 3: Existing Intersections



2.0 Conclusion

The impact of the proposed development along Hopkins Point Road will generate traffic volumes which will be adequately catered by Hopkins Point Road and the surrounding road network. The three proposed access points along Hopkins Point Road provide absorption capacities beyond what is required of the development. The addition of development traffic on the immediate intersections of Hopkins Rd/Marrell Rd and Hopkins Rd/Otway Rd will not result in capacity issues at these intersections.

Yours sincerely

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1. The first step in the development of a management plan is to identify the problem or issue that needs to be addressed. This involves a thorough analysis of the current situation, including the identification of the stakeholders involved and the resources available. Once the problem is clearly defined, the next step is to set specific, measurable, achievable, relevant, and time-bound (SMART) objectives for the plan.

2. The second step is to develop a strategy to achieve the objectives. This involves identifying the key actions that need to be taken and the resources required to implement them. It also involves identifying potential risks and developing contingency plans to mitigate them.

3. The third step is to implement the plan. This involves putting the strategy into action and monitoring progress regularly. It is important to communicate the plan to all stakeholders and to involve them in the implementation process. Regular reporting and feedback loops are essential to ensure that the plan is on track and to make adjustments as needed.

4. The fourth step is to evaluate the results of the plan. This involves comparing the actual outcomes with the objectives and identifying any gaps or areas for improvement. It is important to document the results and to share them with the stakeholders. The evaluation should also identify any lessons learned and provide recommendations for future planning.

5. The final step is to review and update the plan. This involves assessing the overall effectiveness of the plan and making any necessary adjustments. It is important to keep the plan flexible and to be prepared to make changes as the situation evolves. Regular reviews and updates are essential to ensure that the plan remains relevant and effective.

Ref: 600 249 35

Michael Natoli
Planisphere
L1/160 Johnston Street
FITZROY
3065

15 June 2007

Dear Michael

Hopkins Point Road Development - Stormwater Management

Maunsell has been engaged by Planisphere to provide advice pertaining to Stormwater Management for the proposed development at Hopkins Road, Warrnambool to be used as input into the structure plan for this development.

Maunsell was requested by Planisphere to complete the following activities with respect to Stormwater:

- Consider visiting the site to review the physical challenges presented by the site with respect to Stormwater management
- Speak to council and Glenelg Hopkins CMA to determine their requirements with respect to stormwater management for the site
- Provide advice relating to stormwater management for the proposed 700 lot development as shown in the Draft Structure Plan Rev02 dated May 07
- Provide an indication for the possible location of retention ponds

Maunsell has not conducted a site-specific assessment of how the Stormwater Management elements could be incorporated into the proposed development. The advice in this letter is based on general understanding of the site's topography.

Neither the CMA nor the Council were contacted directly in relation to this proposed development. Through our work with these two parties, we have a general understanding of their requirements and have included these within our advice.

This letter outlines Maunsell's recommendations with respect to stormwater management for the proposed Coastal/Hopkins River development site, based on a desktop review of the information.

1.0 Clause 56.07 of the State Planning Policy

Clause 56.07 sets out the **integrated water management** requirements that must be met for residential subdivision proposals in an urban area. This clause was incorporated into the State Planning policy in October 2006 and applies to all subdivisions, excluding subdivision of existing buildings and car parking spaces.

Integrated Water Management considers all parts of the water cycle and optimises the water use. It involves the consideration of the three main water services, namely water supply, wastewater and stormwater and integrates their design with other infrastructure such as roads, drainage and waste.

The aims of Clause 56 are to:

- Integrate use of all water resources including rainwater, reused water, recycled water and stormwater
- Conserve the supply and reduce the use of potable water
- Use alternative water supplies where potable water quality is not required, and
- To use best practise water sensitive design techniques to conserve, reuse and recycle water and manage the quality of stormwater run-off.

This following section discuss how each element of Clause 56 could be addressed for the Hopkins Road development.

1.1 Drinking Water Supply

The objective of Clause 507-1 is to reduce the use of drinking water. Water of drinking water quality is not required for all uses of water within the household. Activities such as toilet flushing and garden watering can use a reduced water quality.

Reduced use of drinking water can be achieved in the Hopkins Road development via:

- Water saving appliances, especially washing machines
- Potable water mains designed to limit flow
- No supply of potable water to outside the house
- Supply of alternative water supplies
- Compulsory connection of rainwater tanks to both the garden taps and the hotwater service

1.2 Reused and Recycled Water

Alternative water sources should be supplied for those activities within the house where potable water quality is not required.

Alternative water sources include rainwater, stormwater, and recycled water.

Rainwater tanks should be compulsory on all houses within the Hopkins Road development. Rainwater tanks can be connected to the hotwater service and all outdoor water uses. Rainwater tanks should be sized such that there is at least a 90% probability that the rainwater tank can supply the intended uses for the entire year.

Serious consideration should be given to supplying household reuse systems, particularly those houses with occupancy rates of four or more people (ie households with families). The type of reuse system installed will dictate the allowable end uses for the reuse water. In general however, household reuse systems can treat shower water and washing water to a standard suitable for reuse in the garden or toilet.

1.3 Wastewater Management

The objective of Clause 56.07-3 is to ensure that appropriate wastewater treatment is included. At Hopkins Road, it is presumed that reticulated sewerage will be supplied to all houses. Maunsell has not considered this element in any more detail.

1.4 Urban run-off management

The objectives of this clause are to:

- Minimise damage and inconvenience caused to residents by urban run-off
- Ensure that the streets operate effectively during major storm events, and
- To minimise increased in stormwater run-off and protect the receiving waterways. This is generally achieved through Water Sensitive Urban Design.

The Hopkins Road site is very steep, and thus considerable efforts should be made to prevent as far as practical any increase in stormwater volume due to the urbanisation. It is inevitable that there will be an increase of hardstand areas as roads and houses are built, however there are measures that can be taken to limit the increase in stormwater volume. Measures that should be considered include:

- Avoiding any development on very steep sites where the stormwater run-off can not be collected
- Installing rainwater tanks
- Limiting the total impervious area of the development
- Using pervious pavements where practical
- Encouraging infiltration of stormwater, in preference to run-off

The following range of design elements that may be applicable for a steep river side development:

- Avoiding construction on steep sites
- Reducing stormwater generation
- Increasing infiltration

Avoiding Developing Steep Sites

The areas of the site adjacent to the Hopkins River are extremely steep. It will be difficult to construct roads or houses in this area using conventional techniques. Both the design and construction methods used on this steep area of land must take into consideration the need to:

- minimise the area of exposed land during construction to reduce as far as practical the potential for sediment run-off into Hopkins River
- Install high quality sediment and erosion control measures
- Ensure that all run-off from final developed areas is directed back into the road network, or is adequately treated prior to discharge into the Hopkins River.

Water Sensitive Urban Design

Water Sensitive Urban Design is the practice of using stormwater as a resource while protecting the receiving environment. In crude terms, it is ensuring that run-off from any developed area does not exceed pre-development levels in either intensity or water quality.

To achieve Water Sensitive Urban Design, stormwater design must be considered at the initial stages of site development to ensure there is sufficient space allowed for stormwater retention and passive treatment water quality systems such as wetlands.

The volumes of stormwater generated within a town depend on both the rainfall of the town and the impervious area of the town. The quality of the stormwater is, to a great extent, governed by the method that is used to collect and convey the water.

It is a minimum requirement of any development that the stormwater run-off quality and quantity from the developed site matches the pre-developed site. This is achieved through Water Sensitive Urban Design (WSUD)

The main elements of Water Sensitive Urban Design are:

- Collection of all stormwater run-off
- Treatment of the stormwater to ensure that it meets the required quality to allow discharge to the receiving environment
- Detention of the stormwater to ensure that it is released to the receiving environment at the pre-development run-off volumes for each design storm.

The receiving environment for the Hopkins Road site is either the Hopkins River or Logans Beach, however it is Maunsell's opinion that discharge to Logans Beach should not be considered for this project. The State Government has policy to reduce the volume of effluent discharged to the ocean via ocean outfalls. While this policy applies to treated sewerage, it is Maunsell's opinion that the Environment Protection Authority (EPA) would not favourably view a new stormwater release to the ocean.

Stormwater as an Alternative Water Source

The first priority within the Hopkins Road development should be given to minimising the generation of stormwater run-off, however stormwater will be generated, and should be collected as an alternative water source. It is likely that the detention ponds constructed as part of the Water Sensitive Urban Design elements, can be used to store stormwater prior to reuse.

Infiltration methods are best suited to sandy soil types that facilitate infiltration, rather than clayey soils. The dominant soil type in the Warrnambool area is weathered limestone. This has a relative high hydraulic conductivity and is therefore will be suitable for infiltration.

- Perforated stormwater drainage pipes. Within a streetscape, grass swales may not always be practical, thus consideration should be given to using perforated stormwater drainage pipes. These pipes will allow small rainfall events to infiltrate and will convey the larger storm events to the water storage/detention basin. There are commercially available perforated stormwater pipes.
- Grass swales for conveying stormwater rather than concrete stormwater pipes. The stormwater will have the opportunity to either evaporate or infiltrate. Large volumes of stormwater, such as that resulting from a storm, will still be conveyed downstream in a grass swale

Where it is not possible to reduce stormwater flows, it is recommended that technologies that encourage infiltration prior to discharge are utilised. If the collected stormwater can infiltrate within the development, there will be a reduced volume to discharge to the Hopkins River. Methods to encourage infiltration of the stormwater include:

Increasing Infiltration

- Installing rainwater tanks on all houses, such that the rainwater is collected and used at the house, rather than discharged to the stormwater network
- Limiting as far as practical, the hardstand area of the house blocks. This however is difficult to control once the houses have been sold, although can be managed to some extent through council planning controls
- Utilising pervious pavements for the non-trafficked areas of the development, ie carparking areas. Pervious pavements, will generate run-off, however the volumes of run-off will generally be less than for say asphaltic pavement.
- Limiting the areas of hardstand within the entire development
- Ensuring that individual house allotments are large enough to have individual stormwater retention systems such that there is no run-off from each block

The following are methods for reducing the effective impervious area of the development:

- One of the first elements of WSUD that should be considered for the Hopkins Point Road site is to reduce the volume of stormwater created. This can be done minimising, as far as practical, the impervious areas within the development.

Reducing Stormwater

1.5 Comparing IWC & WSUD

The following table outlines some of the advantages of using Integrated Water management as outlined in Clause 56 of the State Planning Policy over water sensitive urban design.

Water Source	Integrated Water Management	Water Sensitive Urban Design
Potable Water	Use minimised by providing both installation of water efficient appliances and supplying alternative fit-for-purpose water sources for non-potable uses, such as rainwater tanks for hotwater and household greywater recycling for garden watering	No impact
Rainwater	Used as an alternative water supply source to reduce the reliance on potable water supply.	Directed into the Stormwater network
Stormwater	Generation minimised at a household scale by having rainwater tanks installed.	Captured, and stored at a sub-division scale, and returned to the environment at pre-development levels
	At a sub-division scale, water captured, stored and used for locally beneficial uses such as tree watering, or other uses as allowed by the EPA	
Greywater	Reuse encouraged at a household scale.	No impact
Blackwater (sewerage)	Volume minimised by installation of water efficient appliances at household scale	No impact

The individual elements of Water Sensitive Urban Design are discussed below.

2.0 Stormwater Detention and Treatment

Any stormwater collected within the development must be stored and directed to the either the existing stormwater network (where it exists) or the Hopkins River on the north and west of the development. The rate of discharge should be consistent with predevelopment flows. All discharge must be directed away from Logans Beach.

Stormwater detention is generally undertaken in a pond, where the pond forms part of a wetland system installed to treat water quality.

The elements of the stormwater detention/treatment system are:

- Sediment basin to remove the sediment pollutant loading
- Wetland to enhance sedimentation, fine filtration and nutrient uptake
- Pond to detain the water and release it into the receiving waterway at pre-development intensities.

Given the steep nature of the Hopkins Point Road site, it may be difficult to position a constructed wetland system on the northern portions of the site. The public open space on the western side of the development may be a suitable location for the southern and western portions of the site.

For the steeper portions of the site, bioretention swales or bioretention basins may be more suitable.

Bioretention swales look like a heavily vegetated nature strip and are used to convey the stormflows. The provide stormwater quality improvements. On steep sites, check dams may be required to ensure sufficient retention times within the swale. This is illustrated in the following figure.

Figure 1 – Bioretention swale in Zelanda, NSW



Source: WSUD Engineering Procedures – Stormwater (2005, Melbourne Water)

Bioretention basins operate by passing runoff through a filtration media, commonly vegetated, that provides water quality treatment and extended detention. A bioretention basin is illustrated in the following figure.

Integrated Water Management as outlined in Clause 56.07 of the State Planning Policy provides a framework for sustainable water management. It requires that all elements of the water cycle, not just stormwater are considered at the planning stage of any new sub-division.

It is Maunsell's strong recommendation that all elements of the Integrated Water Management are incorporated into the Hopkins Road development. One benefit of this will be the reduced volume of stormwater generation. The site is very steep, and it is likely to be difficult to site the detention basins necessary to treat and detain the storm flows from this site.

Stormwater will however be generated from the site, thus measures to encourage infiltration at source should be utilised in the first instances. These include grass swales, and perforated pipes. Stormwater should also be collected as an alternative water supply source to reduce the reliance on potable water.

4.0 Conclusion

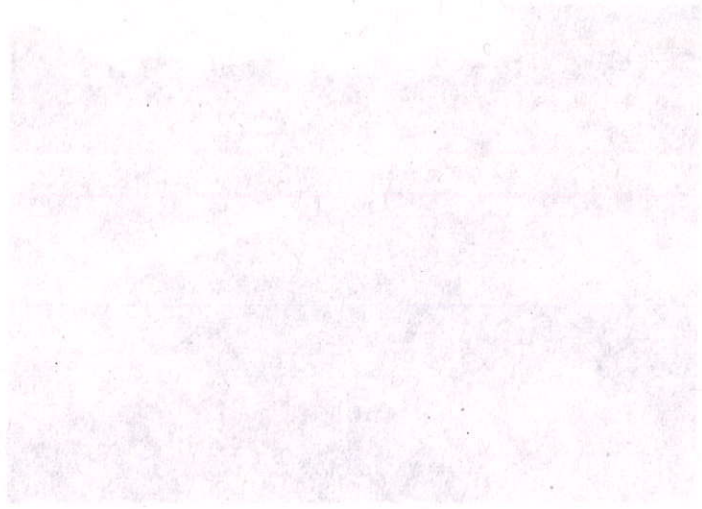
Each of the nominated housing areas as indicated in the Draft Structure Plan – Coastal/Hopkins River Structure Plan (dated may 07) is likely to require a detention pond. The ponds must be located so as to capture all the stormwater from within that area of the development. Areas 1 and 6 will require careful design to ensure that stormwater is not discharged directly into either Logans Beach or Hopkins River.

3.0 Possible Location for WSUD Elements

Source: WSUD Engineering Procedures – Stormwater (2005, Melbourne Water)



Figure 2 – Bioretention basin in Richmond, Victoria



will not be used for any other purpose than that for which it was intended. The information contained in this letter is confidential and may be subject to legal review. It is not to be distributed outside the project team without the written consent of the project manager.

4.0 Conclusion
The information provided in this letter is for your information only and is not intended to constitute an offer of any financial product or service. It is not to be used for any other purpose than that for which it was intended. The information contained in this letter is confidential and may be subject to legal review. It is not to be distributed outside the project team without the written consent of the project manager.

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Yours faithfully

Maunsell would be pleased to provide more detailed advice pertaining to either Water Sensitive Urban Design or Integrated Water Cycle Management.
Should you have any questions or queries relating the information contained in this letter, please do not hesitate to contact me directly on 03 9653 8459.

22 submissions were received during the public exhibition process with 5 being from public authorities and 17 from the general public. The main issues from these submissions and responses made are presented below.

Main Issues raised in submissions

Environment

The impact of the subdivision and residential development on the coastal reserve, the primary dune system adjacent to Logans Beach and the Hopkins River environment was raised by many submitters. The proximity of housing to the coastal dune area was an area of concern.

These were seen as fragile areas that needed to be properly managed. It was submitted that access to the coastal reserve should be either prohibited or extremely limited and that public access or other activities should be significantly setback from the river banks.

Response:

The area of open space includes the entire primary dune. The road layout has been changed to veer away from the dune area to discourage vehicular access to this area. The possibility of a single pedestrian access to the beach will be investigated in detailed planning of this area on the basis that a single, properly managed access would discourage the creation of multiple informal beach access paths over time. The setback of access and activities from the river banks has been noted and will be included at the detailed design stage.

Housing Density and Design

Concerns were raised regarding the density of housing on the south side of Hopkins Point Road. A preference for contemporary, environmentally sustainable housing design was expressed. Further detail on the 'cluster housing' proposed on the southern side of Hopkins Point Road was sought with concern raised about the impact on views from adjoining properties. (Restrictions such as single storey should be added to the development controls).

Response:

Detailed design guidelines are proposed for the entire Structure Plan area. Substantial open space areas and specific development controls are proposed for the south side of Hopkins Point Road to promote outcomes that reflect the sensitivity of that area. The Structure Plan does not need to be changed in response to this issue.

Views

The impact on views from existing properties was raised as a matter to be addressed in the Structure Plan.

Response:

The proposed Development Guidelines require that any future development is designed to minimise impacts on views. Section 3.8 on *Issues and Opportunities* has been expanded to refer to the importance of respecting the views of the existing properties south of Hopkins Point Road by the careful placement of buildings and vegetation.

Open Space

Submissions raised the importance of setting aside significant areas of open space to retain the quality and character of the landscape and to ensure that views from existing properties could be taken into account. Concerns were raised regarding the on-going maintenance of common property open space.

Response:

The Structure Plan map shows substantial areas of open space, particularly on the south side where a maximum of 50% of the entire area is proposed to be private land for subdivision and development. Section 5.4 of the Structure Plan, on the *Open Space Network* has also been amended to refer specifically to the on-going maintenance of the common property open space.

Landscaping

Many submissions raised the importance of revegetating the site as an outcome of the Structure Plan. This revegetation would lessen the impact of new housing when viewed from adjoining areas. Concerns were raised regarding the landscaping of common property open space.

Response:

The proposed Development Guidelines require landscaping to be considered at every stage of the development process. The planting of indigenous vegetation is proposed for streetscapes and open space areas and a landscaping plan will be required at the construction stage for each dwelling. Front and side setback controls are proposed to ensure that sufficient land is set aside for landscaping of lots.

Flora and Fauna

The importance of revegetating with locally indigenous species and of providing wildlife corridors in the subdivision was emphasised. The necessity of protecting existing native vegetation, particularly on the south side of Logans Beach Road and providing adequate buffers between the development and areas of natural significance was emphasised.

Response:

The title of Section 3.2 of the Report has been changed from *Vegetation to Vegetation, Flora and Fauna* and more information on the Ecological Vegetation Classes (EVC's) of this area has been included in this section. The fragile nature of soils in the primary dune area and the importance of maintaining wildlife corridors has also been included in this section.

Traffic

Residents on adjoining land sought confirmation of local traffic issues including ensuring there was no vehicular access from the Structure Plan area to Riverview Terrace. Alternatively, the CFA submitted that existing courts should be linked to new streets in the Structure Plan area to avoid residents having only one means of access during a fire. Concerns were raised regarding the impact of traffic on the wider street network and Flaxman Street in particular. Confirmation was sought that a car park was not proposed on the coastal reserve.

Response:
The existing trig survey marker has been retained in the Structure Plan. Fire hydrants will be required at the time a planning permit is sought for subdivision. The Structure Plan Layout Map has been amended to remove the pedestrian path leading to adjoining properties.

Other
Specific requirements such as retention of the existing trig survey marker (DSE) and provision of fire hydrants (CFA) were raised.
The proximity of pedestrian paths to adjoining properties was a concern.

Response:
Reticulated water and sewerage supply plans for the Structure Plan area are required. These plans relate to the Structure Plan area only. Natural gas supply is not a mandatory requirement thus will be at the developer's discretion.

Infrastructure
A number of submissions sought improvements to existing services including the provision of natural gas, reticulated sewerage and better water pressure. The proper management of stormwater was also raised as a matter to be resolved.

Response:
The proposed rezoning of adjacent land is outside the ambit of the Structure Plan. No changes have been made to the Structure Plan in response to this issue.

Rezoning
Numerous submissions sought a review of the land use controls on the land to the west of the Structure Plan stating that the controls no longer reflect current land use or development.

Response:
The Open Space network of the Structure Plan has been designed to ensure pedestrian access is provided to the river environment in appropriate locations.

Pedestrian Access
Improved pedestrian access to the river environment was supported.

Response:
Emergency vehicular access from the Structure Plan area to Riverview Terrace and Logans beach road should be provided through an informal reserve, where public vehicular access is prohibited, except in times of emergency. It has been agreed that contributions to the upgrade of the Hopkins Road/Martell Street, Hopkins Road and Flaxman/Nicholson/Bostock Streets intersections will be made as part of the rezoning process to ensure that the impact of the development on traffic issues off-site is minimised. These contributions will be made by way of section 173 agreements prior to rezoning. A car park is not proposed on the coastal reserve and is not indicated in any way in the Structure Plan.