

A toilet facility within the Elanora Heights Community Preschool provides a suitable site for the public with a short walking distance from local shops. However access and safety issues for the children of the Preschool should prevail in any consideration, therefore this site is not suitable for a public toilet facility.

Council may investigate the option of purchasing private land for the purpose of a new public toilet. In discussion with Council's Commercial Property & Projects Unit, the creation of such a separate Lot is permitted.

3.1.2 Public Toilet Facility by Lease Arrangement within Non-Council Managed Land

The costs associated with a leasing arrangement with private property owners (commercial or body corporate) has been investigated. There are legal, insurance, security, and infrastructure issues with this option that presents a hurdle in establishing this solution. Costs associated with this option are discussed in section 3.5 Financial Issues.

Local businesses are aware of the public need for toilets but may not be prepared to provide access to their facilities. Under the Building Code of Australia, retail food outlets such as cafes need to provide toilet facilities when approved customer seating reaches 20 patrons. However this is required for patrons and not the general public, noting that public liability insurance coverage does not cover incidents when access is granted to the general public.

3.1.3 Garbage Bin

Council have recently received the finished bike rack and have been able to determine the spatial requirements and location in relation to the bin enclosure. The fifth bin has been on order for site delivery expected to be dispatched on 26 November 2015, and its installation will be included as part of the bike rack installation in December 2015.

3.2 POLICY IMPLICATIONS

Nil

3.3 RELATED LEGISLATION

The Disability Discrimination Act 1992 will apply in the provision of 'access' to a 'public toilet' as public toilets are listed in the Act.

The Act provides protection for everyone in Australia against discrimination based on disability, including: "Access to premises used by the public."

3.4 FINANCIAL ISSUES

3.4.1 Public Toilet Facility on Council Managed Land

The costs associated with the implementation and ongoing management of a toilet facility at Elanora Heights are discussed hereafter (does not include purchase of land).

Council has recently completed the procurement of a new toilet facility at the Callistemon Way Warriewood Playground. The costs of the works totalled \$147,790 plus GST. These works occurred on Council managed land.

Market rates for public toilets from various suppliers range from \$80,000 to \$180,000 dependant on the facilities and extent of automation, as well as existence of sewer, water and electrical services.

Ongoing operational costs (twice daily cleaning, minor repairs, maintenance, consumables, water, electrical) of public toilets have been investigated utilising rates reported by other Councils, including:

City of Ballarat (Victoria) – Public Toilet Strategy 2015

Average cost per public toilet	\$ 5,000 per year
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Glen Eira City Council (Victoria) – 2014

Average cost per public toilet	
(Automated Toilet)	\$ 8,987 per year
(Standard Toilet)	\$ 16,827 per year

Moreland City Council (Victoria) – Public Toilet Strategy 2012

Average cost per public toilet	
(Automated Toilet)	\$ 7,500 per year
(Standard Toilet)	\$ 10,500 per year

Redland City Council (Queensland) 2011

Average cost per public toilet	\$ 12,878 per year
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Pittwater Council

Average estimated cost per public toilet	\$ 12,480 per year
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Based on the above figures, it is anticipated that the annual operational costs would be in the range of \$ 7,500 to \$ 9,000 for automated toilets, and an average rate of \$11,540 for standard toilets.

Please note, no cost figure is provided within this report on the cost for purchasing land, including legal costs required to purchase private land.

Additionally, other costs are associated with public toilets that are not included in the above costing, including:

- Damages to structure and services
- Hot water service requiring additional infrastructure
- Access and Security

3.4.2 Public Toilet Facility by Lease Arrangement within Non-Council Managed Land

The costs associated with this option are provided hereafter.

The market rate to lease retail space at Elanora Heights as suggested by Hardy's 1 (Mona Vale office) is currently \$ 600 / per m2 plus GST for a 30-40 m2 retail space.

The lease area must include not only the toilet room facility but also the access way to the toilet. This may require a total area of 40 m2. On this assumption, the annual cost to lease the retail space for access and use of the toilet facility is \$ 24,000.

Ongoing annual operational cost is applied at an average rate of \$ 11,540 for a traditional toilet.

Additionally, other costs are associated with providing public access to a toilet facility within a commercial or body corporate allotment that have not been costed, including:

- Legal costs on lease agreement
- Public Liability Insurance
- Upgrade of access and toilet facility to comply with Disability & Discrimination Act
- Access and Security
- Damages to structure and services
- Hot water service

3.4.3 Garbage Bin

The costs associated with the fifth bin along Kalang Road Elanora Heights is \$3,241.70 for supply of the bin enclosure, with additional costs involved for installation, which is being assigned to Council's outdoor staff.

3.4.4 Budget

Public Toilet Facility on Council Managed Land

Currently there is no allocation of Funds

Public Toilet Facility by Lease Arrangement within Non-Council Managed Land

Currently there is no allocation of Funds

Garbage Bin

The costs associated with the garbage bin are allocated to the Capital Works budget.

3.4.5 Resources Implications

The proposal to implement a public toilet will add costs to capital works and to annual recurring costs, as identified in 3.4 Financial Issues.

No income generation opportunities are available.

4.0 KEY ISSUES

- 4.1 It is recognised that the provision of public toilets contributes and improves the quality of the public domain area for community stakeholders and provides liveability to the shopping precinct.

Public toilets within local government areas (LGA) are generally provided throughout the Sydney region along 'main streets', parks and reserves, shopping centres, and within public buildings.

Council seek to implement a voluntary scheme to encourage retailers, cafes and body corporates to provide public access to their toilet facilities.

Local neighbourhood centres of this size generally do not have public toilets available for use by the community. Small retail food outlets are not required to provide toilet amenities for customers.

The options for consideration include: 1. a new public toilet on Council managed land, or 2. seeking access and use of a toilet facility contained within private land.

A public toilet facility must meet the requirements of the Disability Discrimination (DDA) Act 1992, entrusting thereby the provision of barrier free access.

- 4.2 Four new garbage bins were recently installed as part of the Kalang Road streetscape works to Elanora Heights. A fifth bin, located outside of the IGA store, was put on hold as this area was selected for the installation of the new 'art competition' bike rack, and requires co-ordination of the spatial arrangement of the two elements.

4.3 **Way forward:**

The commercial centre at Kalang Road Elanora Heights poses limitations in delivering a public toilet facility owned and managed solely by Council. This is due to limited council owned land in precinct and unknown costs associated with the purchase of private land to provide a public toilet facility.

Council may investigate the option of purchasing private land for the purpose of delivering a new public toilet facility. However this is a long term solution and should be investigated in line with the delivery of Stage 2 of the masterplan.

It is therefore recommended that council staff explore short to medium term solutions, by entering into discussions with business owners and commercial landlords within the precinct to explore options for public access to toilet facilities.

5.0 ATTACHMENTS

Attachment 1 - Elanora Heights Masterplan Stage 2 Works

6.0 SUSTAINABILITY ASSESSMENT

6.1 GOVERNANCE & RISK

6.1.1 Community Engagement

The Kalang Road Elanora Heights Village Shopping Centre was the subject of extensive community consultation resulting in the Elanora Heights Shopping Centre Masterplan 2012.

Within the recommendations, a *potential* public toilet was identified within the proposed 'village square' that is identified as Stage 2 of the Masterplan.

Stage One works are now complete.

6.1.2 Risk Management

To make the Village Centre accessible to all, any provision of toilet facilities must satisfy the DDA requiring barrier free access, and to reduce public liability risks.

Council will be required to manage the safety, insurance and liability risks of persons entering a 'public' facility contained within private land.

6.2 ENVIRONMENT

6.2.1 Environmental Impact

Insignificant impact to pollution levels from waste are expected from an additional toilet in the provision of a new toilet facility.

Nil impact to pollution levels from waste exist with the use of an existing toilet for public use.

6.2.2 Mitigation Measures

Proposals are not affected by climate change.

6.3 SOCIAL

6.3.1 Community Need & Aspirations

The proposal within Stage 2 of the Masterplan for a public toilet within the Kalang Road shopping area provides community amenity and access to a public health facility for the increasing young families in the area.

6.3.2 Strengthening local community

The proposal within Stage 2 of the Masterplan for a public toilet within the Kalang Road shopping area will provide a community benefit for young families specifically to allow families to extend their time use of the shopping area knowing that their children's health needs are catered for.

6.4 ECONOMIC

6.4.1 Economic Development

The proposal to gain access to a public toilet facility will encourage shoppers to spend more time within the shopping area and thus potentially increasing business revenue for the local shops.

Report prepared by
Joseph Tramonte – Landscape Architect

Paul William-Smith
ACTING MANAGER PLACE MANAGEMENT

Elanora Heights Masterplan

Potential Location of Public Toilet – item 12

4.6. LANDSCAPE MASTER PLAN - SOUTH - STAGE 2



Elanora Heights Village Centre Master Plan

LANDSCAPE MASTER PLAN

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C10.3 Northern Beaches Flood & Coastal Storm Education Strategy update

Meeting: Natural Environment Committee

Date: 7 December 2015

COMMUNITY STRATEGIC PLAN STRATEGY: **Beach & Coastal Management**
Catchment Management
Community Education & Learning
Disaster, Emergency & Risk Management

COMMUNITY STRATEGIC PLAN OBJECTIVE:

To promote a well-informed community and that the Council knows how to effectively respond to disaster and emergency situations before during and after.

To increase community awareness on effective risk management.

DELIVERY PROGRAM ACTION:

- Distribute, communicate and ongoing review of flood & coastal storm education information in partnership with SES.
-

1.0 EXECUTIVE SUMMARY

1.1 SUMMARY

The implementation of the Northern Beaches Flood & Coastal Storm Education Strategy 2012-2016 (the Strategy) by Pittwater Council, Warringah Council, Manly Council and the New South Wales State Emergency Service (NSW SES) has resulted in a range of actions that build community's flood and coastal storm resilience.

More recent initiatives from the Strategy include the delivery of all-hazard workshops to child care providers and the all-hazards historic photographic exhibition, "Floods, Fires & Storms happen here!"

A review of The Northern Beaches Flood & Coastal Storm Education Strategy 2012-2016 is anticipated as the current strategy will expire at the end of 2016.

2.0 RECOMMENDATION

That the progress of actions completed under the Northern Beaches Flood & Coastal Storm Education Strategy 2012-2016 be noted.

3.0 BACKGROUND

3.1 PURPOSE

To report on the actions completed under the Northern Beaches Flood & Coastal Storm Education Strategy 2012-2016.

3.2 BACKGROUND

The Northern Beaches Flood & Coastal Storm Education Strategy 2012-2016 is a shared strategy between Pittwater Council, Warringah Council, Manly Council and the New South Wales State Emergency Service (NSW SES). The Strategy aims to “build community resilience to flood and coastal storms by improving the capacity of the Northern Beaches community to prepare, respond and recover from major flood and storm events and learn from their experiences to improve future preparedness.” The Strategy was reported to Pittwater Council on 17 December 2012.

The implementation of actions in the Strategy is facilitated by a project agreement between all parties and is overseen by a project working group comprising of council staff representatives, SES and the Office of Environment and Heritage (OEH).

The actions in the Strategy are set out under the following four outcome areas:

1. Increased community concern for the potential risk and impact of flooding and coastal storm hazards on the Northern Beaches.
2. Increased community preparedness for flood and coastal storm hazards as evidenced by home emergency kit ownership and establishing an evacuation plan.
3. Increased community understanding of, and willingness to engage in, appropriate emergency response behaviour.
4. Strengthened regional networks with stakeholders for ongoing community support.

3.3 POLICY IMPLICATIONS

The Strategy supports the NSW Flood Prone Land Policy 1984 by delivering flood education that promotes community preparedness to floods so that flood damages and the social disruption caused by flooding could be reduced. The aim of the Strategy is also consistent with Council's Climate Change Policy No. 176 and its Climate Action Plan Framework which lists community resilience planning as an adaptation action.

3.4 RELATED LEGISLATION

Community engagement on hazards is recognised by the NSW State Emergency Management Plan (EMPLAN 2012) which was prepared under the *NSW State Emergency and Rescue Management Act 1989* as a facet of building community resilience.

Community resilience is also listed as a strategy in preparing for floods under the NSW State Flood Plan which is in accordance with the National Strategy for Disaster Resilience.

The NSW State Flood Plan defines *Community Resilience* as “Communities and individuals harnessing local resources and expertise to help themselves in an emergency, in a way that complements the response of the emergency services. Resilient communities are better able to withstand a crisis event and have an enhanced ability to recover from residual impacts”.

3.5 FINANCIAL ISSUES

3.5.1 Budget

The Strategy is being supported by the project participants from existing budgets or by the addition of grant funds.

3.5.2 Resources Implications

Resourcing for the Strategy implementation is reliant on the time of staff and agency representatives. Any future update of the Strategy would need to be incorporated into delivery and operational plans to reflect staff resources allocated to the project.

4.0 KEY ISSUES

4.1 Actions completed under the Northern Beaches Flood & Coastal Storm Education Strategy

Significant progress has been made in the delivery of actions in the Northern Beaches Flood & Coastal Storm Education Strategy across Pittwater, Warringah and Manly Local Government Areas (LGAs) (**Attachment 1**). The following specific projects and programs have been undertaken to address the outcomes of the Strategy:

Outcome area 1: Increased community concern for the potential risk and impact of flooding and coastal storm hazards on the Northern Beaches.

- Ran a historic floods & storms photograph competition.
- Established an online gallery with the images collated from the historic photograph competition.
- Created an all-hazard historic photographic exhibition: Floods, Fires & Storms happen here!

Outcome area 2: Increased community preparedness for flood and coastal storm hazards as evidenced by home emergency kit ownership and establishing an evacuation plan.

- School and child care facilities – all hazards workshops.
- Aged care, senior living areas, nursing homes – scheduled to run all-hazard workshops for this target group in 2016.
- Produced and distributed tailored Floodsafe and Coastal Erosion StormSafe guides for Pittwater.
- Flood affected residents (owners and occupiers) – attempted through neighbourhood mapping/SES Manly Unit undertook a door knocking exercise.
- Businesses in flood affected areas – SES Manly Unit undertook a door knock of businesses on the Corso.
- Residents with coastal properties – Coastal Erosion StormSafe leaflet created.

Outcome area 3: Increased community understanding of, and willingness to engage in, appropriate emergency response behaviour.

- Temporary residents (holiday accommodation) – information provided by the SES to the Sydney Lakeside Holiday Park.
- Tourists/visitors – information provided by the SES to the Sydney Lakeside Holiday Park.
- Participated in WOW Wednesday including SES volunteers distributing oranges and Floodsafe information at the Enliven night markets in November 2014.
- Developed StormSafe storyboards which were displayed at a number of events, the Mona Vale library and flood study community working group meetings in the lead up to the 2015 April coastal storm event. The StormSafe storyboards were subsequently displayed at the Coastal Environment Centre (CEC), Avalon Customer Service Centre, SES/NSW Rural Fire Service (RFS) and workshops.
- Ran a Climate Change & Coastal Storms event at the Avalon Beach SLSC as part of Earth Hour.
- Residents who live and/or work in the area who may need to travel through flood affected areas – targeted on social media and through the distribution of FloodSafe materials.

Outcome area 4: Strengthened regional networks with stakeholders for ongoing community support.

Pittwater Council, as part of the Northern Beaches Flood & Coastal Storm Education Strategy working group, was selected to participate in Ku-ring-gai Council's Climate Wise Communities Facilitator training program which provided training in the delivery of community resilience workshops. The Climate Wise Communities initiative builds local resilience and preparedness to the extreme weather events of bush fire, drought, storm and heat stress.

Working group members also participated in the Australian Red Cross Child emergency planning workshops for children's services, "Beyond the Emergency Assembly Point", which has a focus on the psychological preparedness and recovery of staff, children and parents in response to an emergency event.

4.2 Projects funded by the NSW Government Community Resilience Innovation Program

The NSW Government Community Resilience Innovation Program (CRIP), a funding program between the State and Commonwealth National Disaster Resilience Program, is currently funding the following two key projects:

- "Get Ready" emergency planning for children's services workshops
- "Floods, Fires & Storms happen here!" all-hazards historic photographic competition

The "Get Ready" workshops were run in October to November 2015 with child care providers from each of the Pittwater, Warringah and Manly Local Government Areas invited to attend either a northern or southern workshop. The workshops focused on building community resilience with representatives from the SES, RFS, Fire & Rescue NSW, Police, Red Cross, the Ku-ring-gai Council Climate Wise Communities program and council technical staff assisting participants to identify hazards that could impact their facilities and how to best respond in the event of a flood, fire or storm.

The "Floods, Fires & Storms happen here!" all-hazards photographic exhibition aims to communicate the risk of natural hazards on the northern beaches and the increase in frequency of these types of events which are projected to occur with climate change. Local artist Cherry Corr was engaged to design and curate the exhibition of all-hazards historic photographic exhibition. The exhibition was launched at Avalon Market Day on 21 November 2015 with Council staff and members of the SES and RFS in attendance. The exhibition will pop-up at markets and events across the northern beaches from November to December 2015 with three held in each LGA (nine locations in total).

4.3 Future scope of actions and updating of Strategy

A review of The Northern Beaches Flood & Coastal Storm Education Strategy 2012-2016 is anticipated as the current strategy will expire at the end of 2016. A consideration for future actions is the success of the all-hazards approach used in the emergency planning for children's services workshops, in which multiple agencies were involved. Any future update of the Strategy could consider expanding on regional network opportunities that incorporate multi-hazard community resilience initiatives and learnings, whilst maintaining the primary focus of coastal storm and floods education.

5.0 ATTACHMENTS

Attachment 1 - Northern Beaches Flood & Coastal Storm Education Strategy 2012-2016 – progress of actions

6.0 SUSTAINABILITY ASSESSMENT

6.1 GOVERNANCE & RISK

6.1.1 Community Engagement

The Northern Beaches Flood & Coastal Storm Education strategy is aimed at improving community knowledge, attitudes and actions towards flooding and coastal storms on the northern beaches by implementing a participatory, tailored and ongoing education program that builds disaster resilience within the northern beaches community.

6.1.2 Risk Management

Any reputational risks are managed by ensuring that all agencies that are party to the Strategy (Pittwater Council, Warringah Council, Manly Council and the NSW SES) obtain written approval for any projects undertaken to address the actions listed under the Strategy.

6.2 ENVIRONMENT

6.2.1 Environmental Impact

Actions listed under the Northern Beaches Flood & Coastal Storm Education Strategy do not have an impact on flora and fauna nor levels of pollution.

6.2.2 Mitigation Measures

The Northern Beaches Flood & Coastal Storm Education Strategy addresses building community resilience to the projected increased occurrence of extreme weather events.

6.3 SOCIAL

6.3.1 Address Community Need & Aspirations

The desired outcomes that are listed as part of the Northern Beaches Flood & Coastal Storm Education Strategy include an increased:

- Community concern for the potential risk and impact of flooding and coastal storm hazards on the northern beaches.
- Community preparedness for flood and coastal storm hazards as evidenced by home emergency kit ownership and establishing an evacuation plan.
- Community understanding of, and willingness to engage in, appropriate emergency response behaviour.

6.3.2 Strengthening local community

An additional desired outcome listed under the Northern Beaches Flood & Coastal Storm Education Strategy is for strengthened regional networks with stakeholders for ongoing community support.

6.3 **ECONOMIC**

6.4.1 **Economic Development**

The Northern Beaches Flood & Coastal Storm Education Strategy includes actions that aim to engage local businesses and tourism operators in order to ensure that financial losses due to floods and storm damage are avoided.

Report prepared by
Melanie Thomas - Climate Change Adaptation Officer

Jennifer Pang
MANAGER, CATCHMENT MANAGEMENT & CLIMATE CHANGE

Northern Beaches Flood & Coastal Storm Education Strategy 2012-2016 – progress of actions

OUTCOME 1: INCREASED COMMUNITY CONCERN FOR THE POTENTIAL RISK AND IMPACT OF FLOODING AND COASTAL STORM HAZARDS ON THE NORTHERN BEACHES		
Number	Action	Status
1	Increased presence in national, state and local media outlets, including media articles, images, oral history, including the Manly Daily and in Council newsletters/mail-outs – particularly after big rainfall events to show flooding around the Northern Beaches	Ongoing
2	Update Council websites with relevant information/photos of historical flooding and damage, links and current flood maps where possible	80% complete
3	NSW SES attendance at festivals, markets, outdoor events using SES displays	Ongoing
4	Distribution of FloodSafe brochures, magnets etc at community events with specific flood guidance for each community	Ongoing
5	Use of Facebook and Twitter Council/NSW SES pages to upload historical images and anecdotal stories about flooding on the Northern Beaches	Ongoing
6	Develop working partnership with local businesses through Chamber of Commerce for the distribution of Business FloodSafe toolkits and guides	50% complete
7	Presentation in primary and secondary schools with catchment model to demonstrate local flooding – distribution of FloodSafe certificates	Ongoing
8	Use of displays in libraries and community centres to highlight historical flooding in your area and information on how to prepare	StormSafe Storyboards displayed with FloodSafe brochures & SES information provided
9	Community workshops on WSUD with local flooding issues incorporated into it or implement a cross-hazard approach where there are similar behaviours required across different hazards.	To be revised

10	Investigate signage for previous flood markers on roadways.	N/A
11	Compile a list of all extreme weather events over the past 100-150 years to show frequency of events on Northern Beaches area and display to community (from Green Cross Harden Up Project http://hardenup.org/be-aware.aspx).	Partially through the historic photograph exhibition
OUTCOME 2: INCREASED COMMUNITY PREPAREDNESS FOR FLOOD AND COASTAL STORM HAZARDS EVIDENCED BY OWNING A HOME EMERGENCY KIT AND ESTABLISHING AN EVACUATION PLAN		
12	Increased presence in national, state and local media outlets, including media articles, images, stories, particularly the Manly Daily and in Council newsletters/mail-outs about what a Home Emergency Kit is and the importance of having one (perhaps a story "Having a HEK saved me/house" etc....).	Ongoing
13	Distribution of collateral with national SES number.	Ongoing
14	Use of Manly Precinct Committees (or other for respective Councils) to disseminate information and train members in flood education.	Ongoing
15	Use of SES banners to display during NSW SES week.	Annually
16	Increase the number of trained NSW SES volunteers, particularly young adults, to increase volunteer capability during extreme events (such as the Green Cross Extreme Weather Heroes Project - http://www.extremeweatherheroes.org/our-heroes.aspx).	Ongoing support
17	Investigate opportunity for Home flood kit to be provided with every DA issued in flood zone.	To be revised
18	SMS texting system – investigate options for opt-in system.	Cost required to provide this service with no budget allocated
19	Hold problem-solving meetings related to flooding scenarios with community groups, such as retirement villages, schools, sports clubs etc or post-flooding briefings to identify problems in preparation, response and recovery – link to lots of natural hazards not just flooding and coastal erosion.	Workshops undertaken with child care services & planned with aged care providers. Attempted with surf life saving clubs

20	Include 'Flood and Storm Preparedness' as criteria in Manly Sustainable Business Awards	Not addressed
OUTCOME 3: INCREASED COMMUNITY UNDERSTANDING OF, AND WILLINGNESS TO ENGAGE IN, APPROPRIATE EMERGENCY RESPONSE BEHAVIOUR		
21	Distribution of NSW SES collateral to promote emergency hotline number	Ongoing
22	Use of FloodSafe display, with NSW SES where appropriate, at outdoor events/festivals to quiz participants on "who would you call if.....".	Ongoing
23	Awareness raising of the various emergency services and their key roles and responsibilities and who to contact via Emergency Services Expo days.	Australia Day event
24	Distribution of FloodSafe Kits and other associated material.	Ongoing
25	Inclusion of emergency response behaviour key messages in all media.	Ongoing
26	Investigate possibility of road signage – "never enter floodwaters".	To be advised
OUTCOME 4: STRENGTHENED REGIONAL NETWORKS WITH STAKEHOLDERS FOR ONGOING SUPPORT AND ADAPTIVE CAPACITY WITHIN THE COMMUNITY		
27	Further linkage with relevant regional networks such as Red Cross, Green Cross as appropriate.	Worked with Red Cross to develop and deliver all-hazard workshops
28	Roll out of this Strategy as a regional network.	Ongoing
29	Flood and Coastal Hazard Education representatives meet quarterly to maintain roll out, planning, sharing of resources and networking.	Ongoing
30	Reporting on regional actions through relevant media.	Ongoing
31	Maintain regular contact with Chambers of Commerce.	Ongoing

C10.4 Minutes of the McCarrs Creek, Mona Vale & Bayview Flood Study Community Working Group on 5 November 2015

Meeting: Natural Environment Committee

Date: 7 December 2015

COMMUNITY STRATEGIC PLAN STRATEGY: Disaster, Emergency & Risk Management

COMMUNITY STRATEGIC PLAN OBJECTIVE:

- To promote a well-informed community and that the Council knows how to effectively respond to disaster and emergency situations before during and after
- To effectively respond to disasters, emergency situations and provide effective relief measures
- To work effectively with all emergency and utility agencies to improve emergency response
- To adhere to best practice risk management principles to facilitate more effective decision-making
- To manage public liability and risks associated with public infrastructure
- To increase community awareness on effective risk management
- To incorporate risk management in all business activities
- To plan for risks due to natural and manmade hazards
- To provide for business continuity in the event of a major disruption to the Council
-

DELIVERY PROGRAM ACTION:

- Develop and implement programs to increase resilience to flood and coastal storms
 - Develop, review and implement flood and coastal storm risk studies and plans in accordance with NSW Government guidelines
-

1.0 EXECUTIVE SUMMARY

1.1 SUMMARY

1. A presentation was provided by the flood consultant from Royal HaskoningDHV to the McCarrs Creek, Mona Vale & Bayview Flood Study Working Group on the progress of work on the flood study.
 2. The Draft Working Paper 4 has been completed for the Flood Study.
-

2.0 RECOMMENDATION

That the information provided in the report on the Minutes of the McCarrs Creek, Mona Vale & Bayview Flood Study Community Working Group be noted.

3.0 BACKGROUND

3.1 PURPOSE

To consider the draft minutes of the McCarrs Creek, Mona Vale & Bayview Flood Study Community Working Group meeting held at the conference room, Mona Vale Customer Service on 05 November 2015 (refer **Attachment 1**).

3.2 BACKGROUND

- The McCarrs Creek, Mona Vale & Bayview Flood Study Community Working Group is a forum that assists Pittwater Council in the preparation, development and implementation of floodplain management plans for all flood prone properties in the suburbs of Mona Vale, Bayview, Church Point and parts of Ingleside. The Working Group is administered by Pittwater Council.
- The formation of the Floodplain Working group by Council is the first formal step in the Floodplain Management Process, as outlines in the NSW Governments Floodplain Development Manual.
- The primary function of this working group is to be an advisory body to Council on matters concerning the development, implementation and review of the McCarrs Creek, Mona Vale & Bayview Flood Study. The working group meetings provide a forum for the discussions between Council staff, local residents, interested groups and government authorities on technical, social, economic, environmental and cultural issues.

3.3 POLICY IMPLICATIONS

- Nil

3.4 RELATED LEGISLATION

NSW Government Flood Prone Land Policy and Floodplain Development Manual (2005)

3.5 FINANCIAL ISSUES

3.5.1 Budget

Nil.

3.5.2 Resources Implications

Nil.

4.0 KEY ISSUES

Pittwater Council is commencing the first stages of the Floodplain Management Process with the McCarrs Creek, Mona Vale & Bayview Flood Study to identify possible flood risks and hazards for the study area.

Royal HaskoningDHV, an independent company specializing in flooding and floodplain risk management, is currently undertaking the study.

Under the NSW Government Flood Prone Land Policy, management of flood prone land is primarily the responsibility of councils. The Floodplain Management Process that councils follow in order to identify, understand and manage flood risk is outlined below:

- The Flood Study (current stage) defines the nature and extent of the flood problem.
- The Floodplain Risk Management Study assesses management options with respect to existing and proposed development.

- The Floodplain Risk management Plan provides Council with a management plan for the floodplain, and is often undertaken in conjunction with the Floodplain Risk Management Study.
- Implementation of the Plan involves enacting the recommendations of the Floodplain Risk Management Plan to mitigate flood risks to life and property.

Community consultation is an important component of the McCarrs Creek, Mona Vale & Bayview Flood Study. The local knowledge of residents and business operators personal experiences of flooding are an important source of information.

There are a number of ways Council is engaging with the owners of flood prone land in the study area:

- Through an online questionnaire. The questionnaire greatly assists in collating people's knowledge and experience about previous flooding history and existing flood problem areas.
- A Community Working Group has been formed from self-nominated community representations.
- A webpage has been established to keep the community informed on the study progress.

McCarrs Creek, Mona Vale & Bayview Flood Study Update – A verbal update by Royal HaskoningDHV was provided on the progress of the flood study.

5.0 ATTACHMENTS

Attachment 1: Draft minutes of the McCarrs Creek, Mona Vale & Bayview Flood Study Community Working Group Meeting on 05 November 2015

6.0 SUSTAINABILITY ASSESSMENT

A sustainability assessment is not required as a consequence of this minutes report.

Report prepared by
Melanie Schwecke, A/Principal Officer – Floodplain Management

Jennifer Pang
MANAGER, CATCHMENT MANAGEMENT & CLIMATE CHANGE



DRAFT Minutes

McCarrs Creek, Mona Vale & Bayview Flood Study Community Working Group

Held in Mona Vale Conference room, Mona Vale Customer Service Centre, 1
Park Street, Mona Vale on

05 November 2015

Meeting commenced at 4:00 pm



WWW.PITTWATER.NSW.GOV.AU

McCarrs Creek, Mona Vale & Bayview Flood Study Community Working Group

Established:	5 May 2014
Function:	To enable community participation during the preparation of the McCarrs Creek, Mona Vale and Bayview Flood Study in accordance with the NSW Government's Floodplain Development Manual (2005).
Administration:	This Working Group is administered by Pittwater Council
Composition / Membership as at establishment:	<p>One (1) Councillor (who shall be Chairperson of Community Working Group) plus one (1) alternative councillor. All Councillors are invited to attend.</p> <p>Up to five (5) community representatives who reside or work within the McCarrs Creek, Mona Vale or Bayview catchment study area.</p> <p>Up to two (2) community representatives from Pittwater community groups, subject to the group's inclusion on Councils "Register of Community Groups".</p> <p>Interested observers are invited to attend.</p> <p>State Government representatives as required, including:</p> <ul style="list-style-type: none"> • NSW Office of Environment and Heritage • NSW State Emergency Service (representing State Headquarters, Region Controller and Local Controller) • NSW Roads and Maritime Services • Sydney Water • NSW Crown Lands Division • Department of Planning & Infrastructure.
Quorum:	Three (3) members provided one is a Councillor.
Reporting Procedures:	Business of the Community Working Group to be reported directly to Council as required.
Responsible Business Unit:	Catchment Management and Climate Change
Meetings	At least twice during the project timeframe
Council Members Appointed:	Cr Ferguson (Chairperson) Cr Young (Delegate)



Members of the Working Group namely

Pittwater Council Members

Cr Kylie Ferguson (Chairperson)
Cr Sue Young (Delegate)

Citizen Representatives

Rob Conroy
John Lindsay Gordon
David Stone (Bayview Golf Club)

Stakeholder Representatives

Dr Jenny Rosen (Bayview Church Point Residents Association)
Chris Kavanagh (Mona Vale Chamber of Commerce)

State Government Representatives

NSW Office of Environment and Heritage (OEH)
State Emergency Service – Warringah/Pittwater Unit
State Emergency Service – Sydney Northern Region
Sydney Water
Roads and Maritime Services

and the following Council Advisors

Manager, Catchment Management and Climate Change
Principal Officer – Floodplain Management

are requested to be in attendance.

Copies to:

Director – Urban & Environment Assets
A/Manager – Urban Infrastructure – Les Munn
Manager – Place Management – Melinda Hewitt
Risk Officer – Marnie VanDyk
EA to General Manager – Fiona Garrity
A/EA to Mayor and Councillors – Anna Power

All other Councillors are free to attend as Observers, and are invited to do so and to engage in discussion



Attendance:

Pittwater Council Members

Cr Kylie Ferguson (Chair)
Cr Sue Young

Citizen Representatives & Stakeholder Representatives

Rob (Roberta) Conroy
Dr Jenny Rosen

State Government Representatives

Daniel Cunningham (Sydney Water)
Greg Davis (OEH)
Wayne Lyne (Unit Controller, SES Warringah/Pittwater Unit)
Lyn Larri (SES Warringah/Pittwater Unit)
Allison Flaxman (SES Sydney Northern Region)

And the following Council Advisors

Dr Melanie Schwecke (Principle Officer – Floodplain Management)
James Chan (Technical Assistant, Catchment Management & Climate Change)

In attendance

Paul Hart – Consultant - Royal HaskoningDHV



1.0 APOLOGIES

Jennifer Pang (Manager, Catchment Management & Climate Change)
John Lindsay Gordon (Citizen Representative)
David Stone (Bayview Golf Club)

2.0 DECLARATION OF PECUNIARY AND CONFLICTS OF INTEREST

NIL

3.0 CONFIRMATION OF MINUTES OF PREVIOUS MEETING

Confirmation of the minutes from the working group meeting held on the 13 August 2015:

Moved: Rob Conroy

Seconded: Wayne Lane

4.0 MATTERS ARISING FROM PREVIOUS MEETING

NIL

5.0 COMMITTEE BUSINESS

5.1 MCCARS CREEK, MONA VALE & BAYVIEW FLOOD STUDY COMMUNITY WORKING GROUP

A verbal update along with a presentation was given by Paul Hart (Royal HaskoningDHV). This presentation is provided in Attachment 1.

Working Group Recommendation

- The working group note the information presented by Royal HaskoningDHV.

6.0 GENERAL BUSINESS

- The draft McCarrs Creek, Mona Vale and Bayview Flood study is proposed to be placed on public exhibition in February next year (2016).
- The flood modelling showed that over half of the properties in the study area are affected by flooding during a PMF event.
- The 20% AEP flooding is mostly confined to the creek lines.
- There is concern that development in Ingleside could impact flood behaviour such as increasing overland flow caused by an increase in impervious surfaces resulting in greater downstream flooding.
- There is an issue of schools not being able to be engaged. Schools need to be aware of the flooding issues.
- The median tide (1.4m AHD) was used in the study to develop the scenarios and maps.



- The findings from the Grantham Floods Commission of Inquiry had a common theme and are relevant to flooding issues in Pittwater. Witness statements described the perceived improbability of flooding in the area, as well as outlining that properties built in H6 hazard categories got washed away/destroyed by the forces of the floodwaters. These and other findings of the inquiry reinforce the validity of Councils flood controls. The report can be downloaded from:
<http://granthaminquiry.qld.gov.au/assets/grantham-floods-report-october-2015.pdf>

7.0 NEXT MEETING

The Chair thanked everyone for their participation in this very effective forum and requested that the next meeting be scheduled for Thursday 4 February 2016 from 4pm – 6pm in Mona Vale Conference Room, Mona Vale Customer Service Centre, 1 Park Street, Mona Vale.

There being no further business the meeting concluded at 5:06pm



ATTACHMENT 1



McCarrs Creek, Bayview and Mona Vale Flood Study

*Community Working Group Meeting
5 November 2015*

Contents

1. Study Aims and Objectives
2. Study Area
3. Work Undertaken To Date
4. Properties at Risk
5. Draft Flood Maps
6. Community Consultation
7. Programme & Next Steps.....

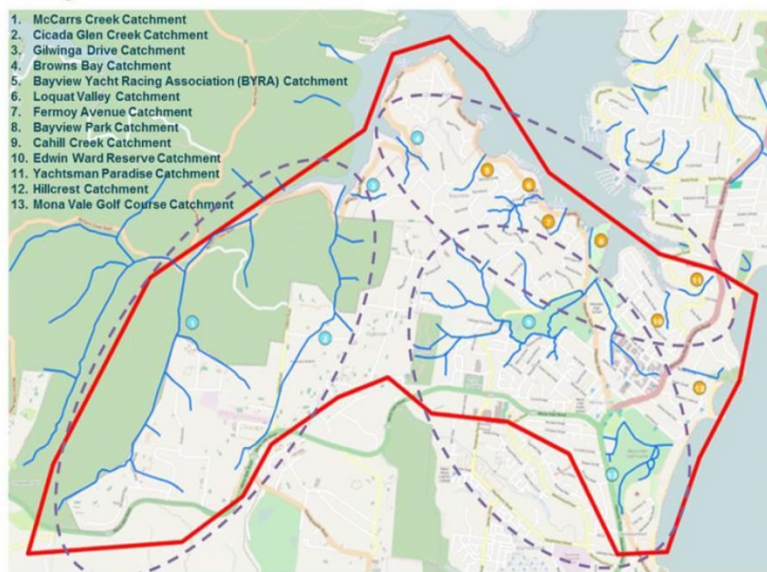


Page 7

Flood Study Aims and Objectives

1. To understand the nature of the flood risk within Mona Vale, Bayview, Church Point and Ingleside suburbs – 13 sub catchments;
2. To take into account all potential sources of flooding: mainstream, overland and tidal;
3. To understand the existing and future flood risk. Climate change being taken into account through increased rainfall and sea level rise;
4. To understand the potential change in flood risk associated with the Ingleside land release area development.

Study Area





Work Undertaken To Date

1. Community consultation
2. Data collection and review
3. Topographic survey
4. Hydrologic and hydraulic model development
5. Calibration of models to historic events (as far as possible)
6. Preparation of draft flood maps
7. Ground truthing of draft maps
8. Draft Flood Study written



Properties at Risk (Preliminary)

- Property 'Tagged' if flood waters encroach on lot boundary (Council criteria).
- Detailed database to include the following information:
 - Address, lot and DP No.
 - Land use
 - Flood levels for all design events
 - Flood depth for all design events
 - Flood planning levels and minimum floor levels
 - Flood velocity and hazard categories
 - Council's flood categories
 - Percentage of property affected by flooding
 - Climate change levels



Properties at Risk (Preliminary)

Table 2: Properties at Risk (Preliminary Numbers)

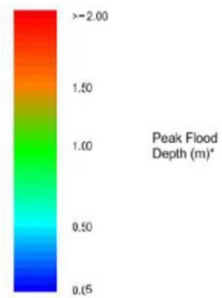
Annual Exceedance Probability	Average Recurrence Interval	Number of Flood Affected Properties in Study Area
10%	10 Years	1,482
5%	20 Years	1,676
2%	50 Years	1,817
1%	100 Years	1,959
0.5%	200 Years	2,092
0.2%	500 Years	2,284
PMF Event	$\approx 1E^6$ Years	3,577

NOTE: Total of 6,181 properties exist within the study area (based on cadastral boundaries)

Draft Flood Maps

LEGEND

- Cadastral Boundaries
- Catchment Boundaries
- 4.14
★ Peak Flood Level (mAHD)



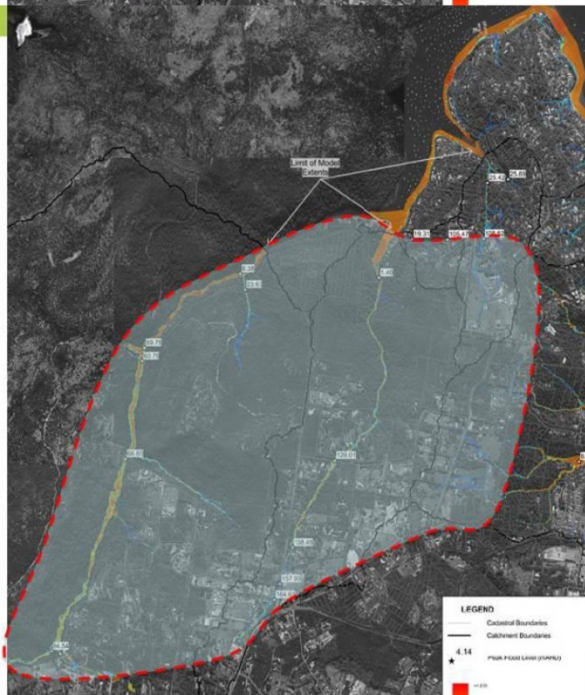
*NOTE: Direct rainfall model results have been filtered to display realistic flood extents. The filtering process is outlined in documentation issued with this figure.



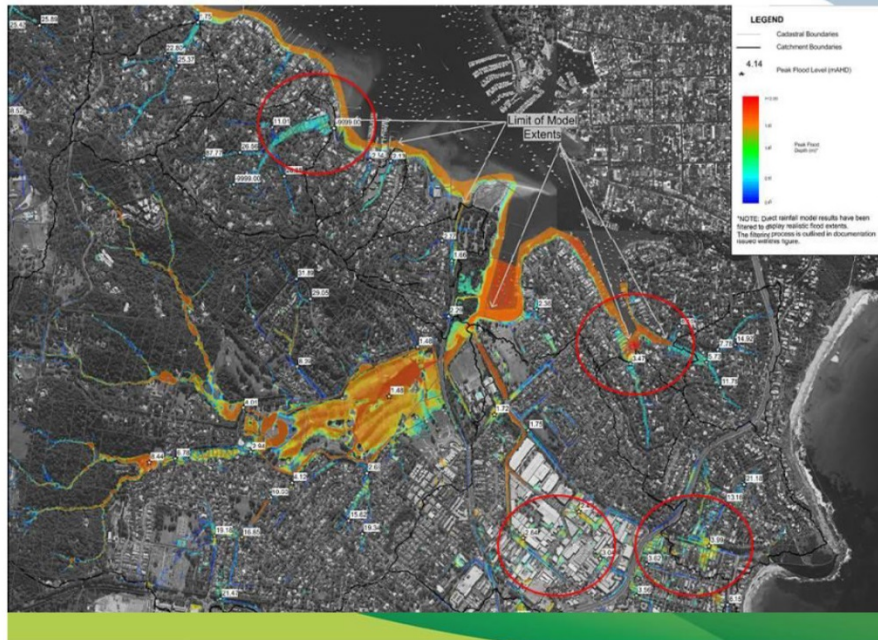
Draft Flood Maps:
20% AEP / 5 Yr ARI



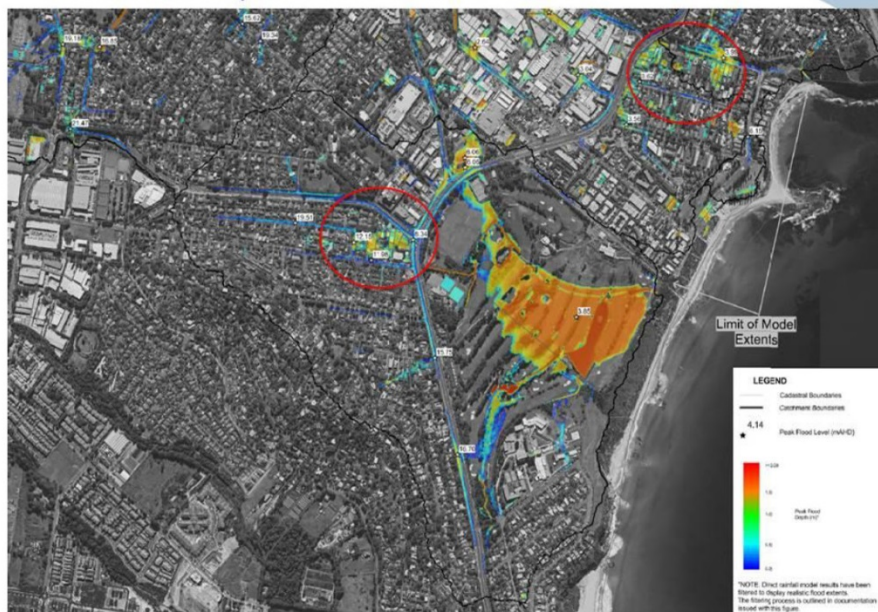
Draft Flood Maps:
20% AEP / 5 Yr ARI



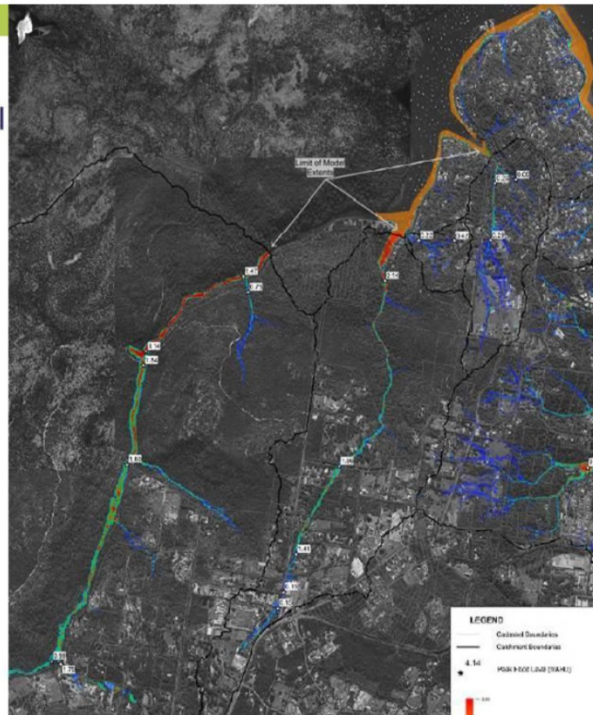
Draft Flood Maps: 20% AEP / 5 Yr ARI



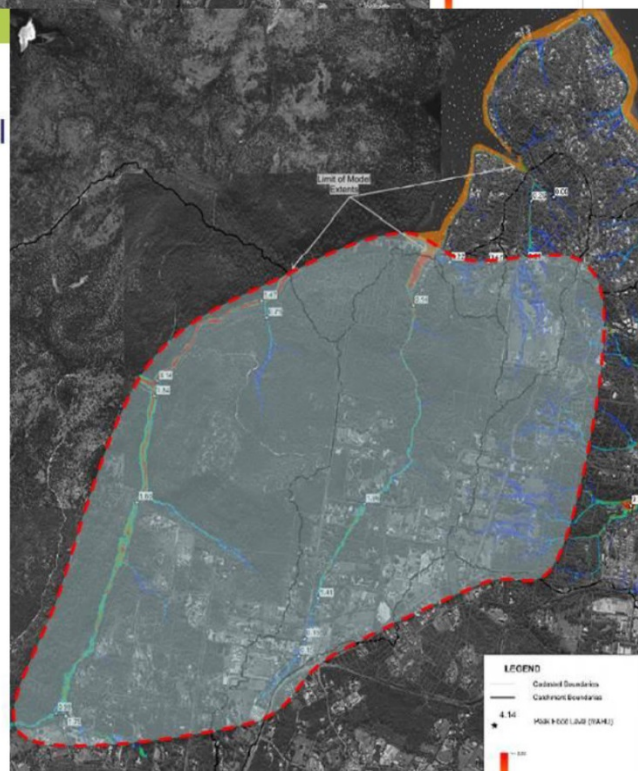
Draft Flood Maps: 20% AEP / 5 Yr ARI



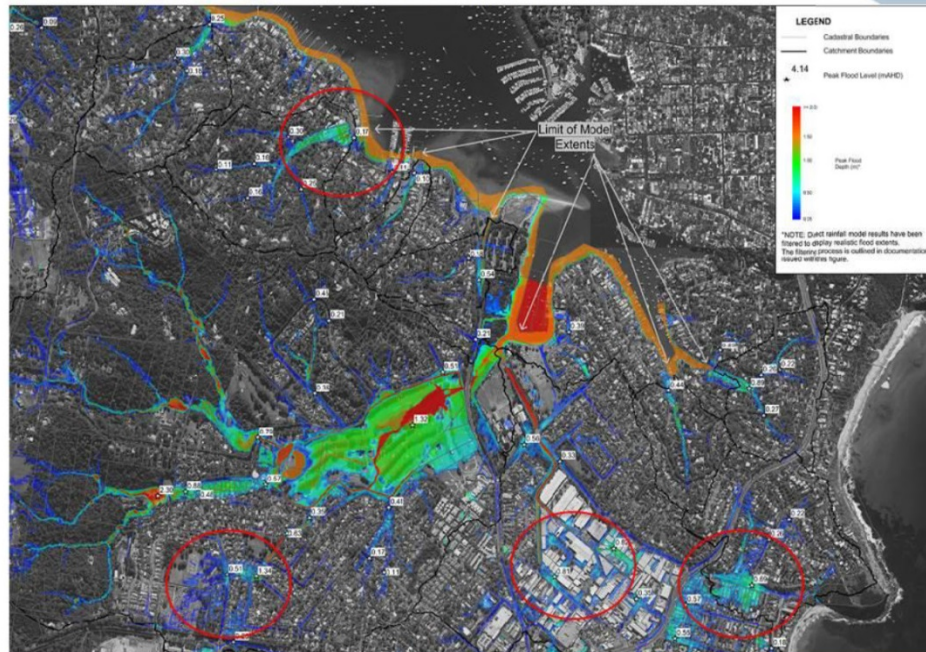
Draft Flood Maps:
1% AEP / 100 Yr ARI



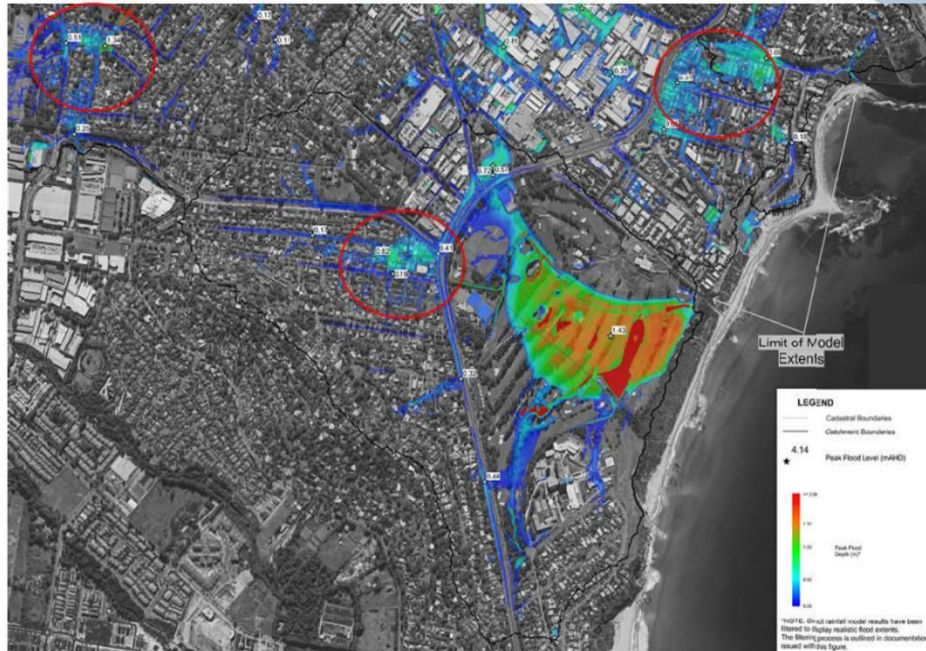
Draft Flood Maps:
1% AEP / 100 Yr ARI



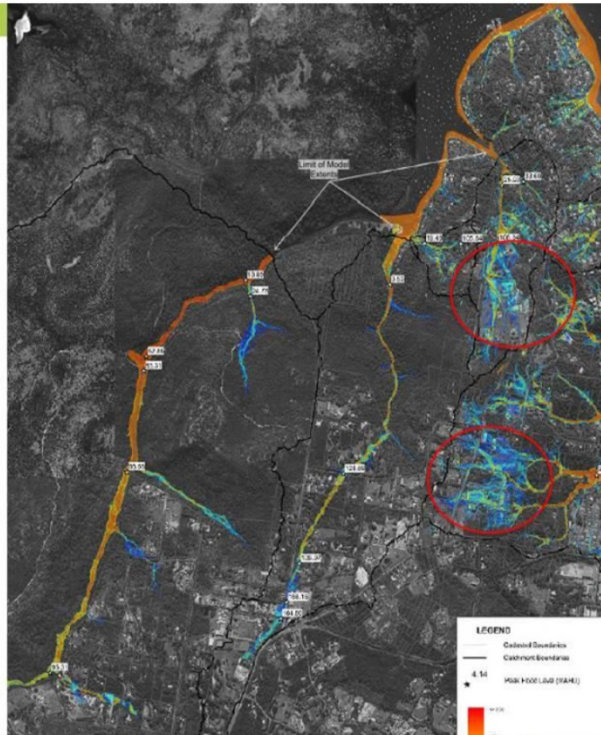
Draft Flood Maps: 1% AEP / 100 Yr ARI



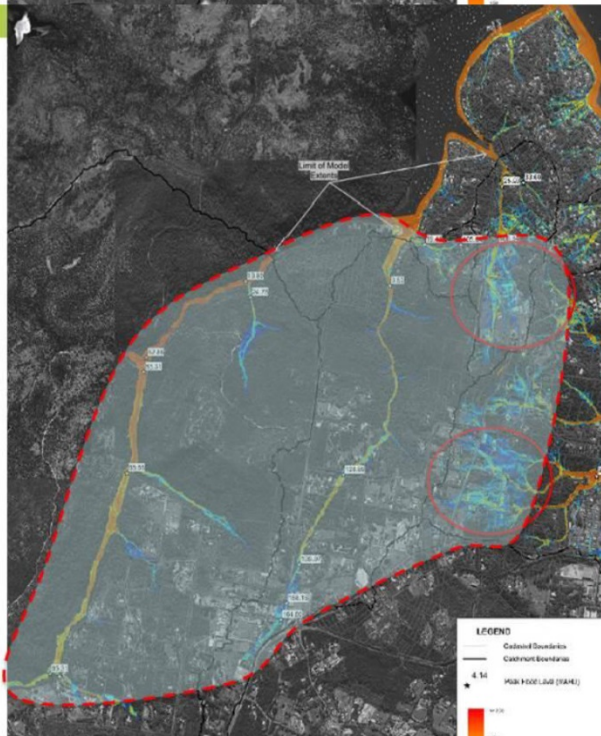
Draft Flood Maps: 1% AEP / 100 Yr ARI



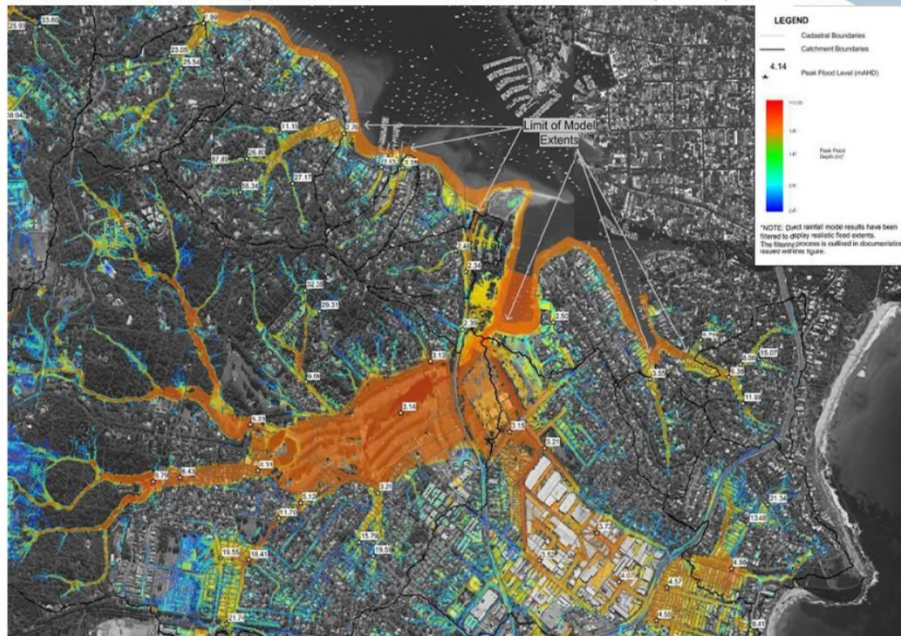
Draft Flood Maps: PMF



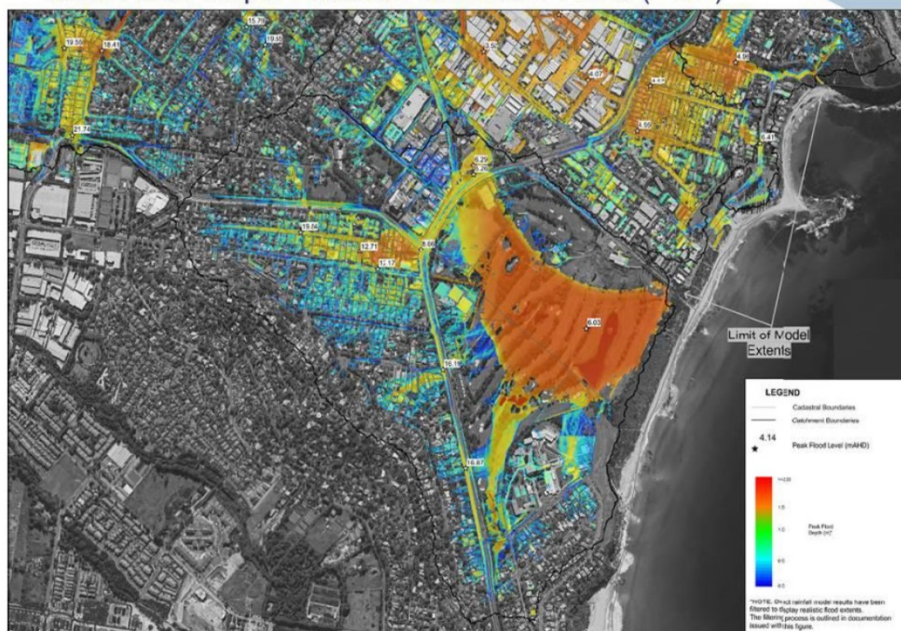
Draft Flood Maps: PMF



Draft Flood Maps: Probable Maximum Flood (PMF)



Draft Flood Maps: Probable Maximum Flood (PMF)

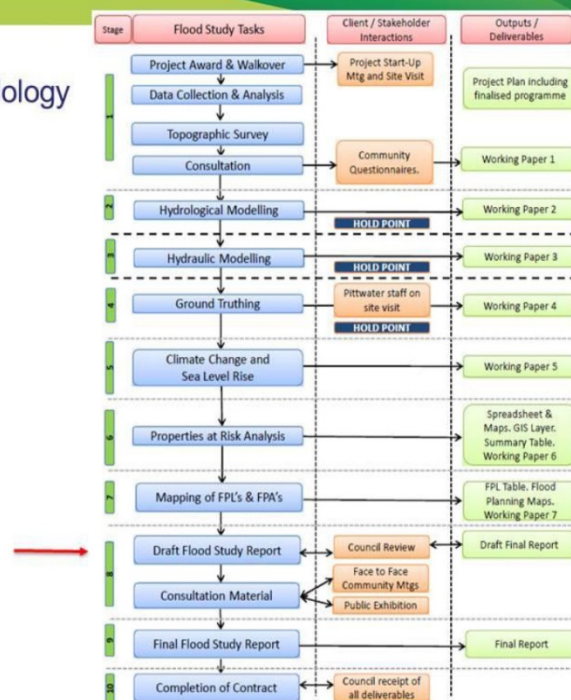


Community Consultation

- Central to the study.
- Community confidence in process and results very important
- Two way process.
- 4 stages
 - Community Questionnaire. Online Survey & hardcopy
 - Ground Truthing of Initial Results
 - **Public Exhibition of Draft Flood Study (February 2016)**
 - 1:1 Consultation Meetings (February 2016)



Methodology



Programme and Next Steps....

Stage	Task	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16
Stage 8	Write draft flood study						
	Council review of draft						
	3 x Face to face community meetings						
	Public Exhibition						
Stage 9	Collate and review all consultation findings						
	Finalise flood study						
Stage 10	Completion of Contract						

- November – January: Council and Stakeholder Review of Draft Report
- February 2016: Public Exhibition and 1:1 Resident Consultation
- March 2016?: Council Adoption



C10.5 Minutes of the Avalon to Palm Beach FRMS&P Working Group 12 November 2015 Meeting Report

Meeting: Natural Environment Committee

Date: 7 December 2015

COMMUNITY STRATEGIC PLAN STRATEGY: Disaster, Emergency & Risk Management

COMMUNITY STRATEGIC PLAN OBJECTIVE:

- To promote a well-informed community and that the Council knows how to effectively respond to disaster and emergency situations before during and after
- To work effectively with all emergency and utility agencies to improve emergency response
- To adhere to best practice risk management principles to facilitate more effective decision-making
- To increase community awareness on effective risk management
- To incorporate risk management in all business activities
- To plan for risks due to natural and manmade hazards
-

DELIVERY PROGRAM ACTION:

- Develop and implement programs to increase resilience to flood and coastal storms
 - Develop, review and implement flood and coastal storm risk studies and plans in accordance with NSW Government guidelines
-

1.0 EXECUTIVE SUMMARY

1.1 SUMMARY

1. The working Group has been formed to provide advice in the preparation of the Avalon to Palm Beach Floodplain Risk Management Study and Plan.
 2. The Draft Working Paper 4 and 5 has been completed for the Flood Risk Management Study and Plan.
-

2.0 RECOMMENDATION

That the information provided in the report on the minutes of the Avalon to Palm Beach Floodplain Risk Management Study and Plan Working Group be noted.

3.0 BACKGROUND

3.1 PURPOSE

To consider the draft minutes of the Avalon to Palm Beach Floodplain Risk Management Study & Plan (FRMS&P) Working Group meeting held at the Avalon Recreation Centre on 12 November 2015 (refer **Attachment 1**).

3.2 BACKGROUND

- The Avalon to Palm Beach Floodplain Risk Management Study and Plan (FRMS&P) Working Group is a forum that assists Pittwater Council in the preparation, development and implementation of floodplain management plans for all flood prone properties between Bilgola Beach to the South to Palm Beach in the North. The Working Group is administered by Pittwater Council.
- The formation of the Floodplain Working group by Council is the first formal step in the Floodplain Management Process, as outlines in the NSW Governments Floodplain Development Manual.
- The primary function of this working group is to be an advisory body to Council on matters concerning the development, implementation and review of the Avalon to Palm Beach Floodplain Risk Management Study and Plan. The working group meetings provide a forum for the discussions between Council staff, local residents, interested groups and government authorities on technical, social, economic, environmental and cultural issues.

3.3 POLICY IMPLICATIONS

NIL

3.4 RELATED LEGISLATION

NSW Government Flood Prone Land Policy and Floodplain Development Manual (2005).

3.5 FINANCIAL ISSUES

3.5.1 Budget

NIL

3.5.2 Resources Implications

NIL

4.0 KEY ISSUES

Pittwater Council is continuing the next stages of the Floodplain Management Process with the Avalon to Palm Beach Floodplain Risk Management Study and Plan to identify possible flood mitigation and management options for the study area.

The study area covers the suburbs of Bilgola Beach, Bilgola Plateau, Clareville, Avalon Beach, Whale Beach and Palm Beach. This floodplain Risk Management Study and Plan will follow on from the 2013 Careel Creek Catchment Flood Study (WMA Water) and the 2013 Overland Flow Mapping and Flood Study (Cardno) for the study area.

NSW Public Works (Manly Hydraulics Laboratory), a company specialising in flooding and floodplain risk management, is currently undertaking the study.

Under the NSW Government Flood Prone Land Policy, management of flood prone land is primarily the responsibility of councils. The Floodplain Management Process that councils follow in order to identify, understand and manage flood risk is outlined below:

- The Flood Study (completed) defines the nature and extent of the flood problem.
- The Floodplain Risk Management Study (current stage) assesses management options with respect to existing and proposed development.

- The Floodplain Risk management Plan (current stage) provides Council with a management plan for the floodplain, and is often undertaken in conjunction with the Floodplain Risk Management Study.
- Implementation of the Plan involves enacting the recommendations of the Floodplain Risk Management Plan to mitigate flood risks to life and property.

Community consultation is an important component of the Avalon to Palm Beach Floodplain Risk Management Study and Plan. The local knowledge of residents and business operators personal experiences of flooding are an important source of information.

There are a number of ways Council is engaging with the owners of flood prone land in the study area:

- Through an online questionnaire. The questionnaire greatly assists in collating people's knowledge and experience about previous flooding history and existing flood problem areas.
- A Community Working Group has been formed from self-nominated community representations.
- A website has been established to keep the community informed on the study progress.

Avalon to Palm Beach FRMS&P Update – A verbal update by MHL (NSW Public Works) was provided on the progress of the Floodplain Risk Management Study and Plan.

5.0 ATTACHMENTS

Attachment 1: Draft minutes of the Avalon to Palm Beach Floodplain Risk Management Study & Plan Working Group Meeting on 12 November 2015

6.0 SUSTAINABILITY ASSESSMENT

A sustainability Assessment is not required for Minutes of Meetings

Report prepared by
Melanie Schwecke, Principal Officer – Floodplain Management

Jennifer Pang
MANAGER, CATCHMENT MANAGEMENT & CLIMATE CHANGE



Draft Minutes

Avalon to Palm Beach Floodplain Risk Management Study and Plan Working Group

Held at Avalon Recreation Centre, 59 Old Barrenjoey Road, Avalon
Beach

12 November 2015

Meeting commenced at 4:05pm.



WWW.PITTWATER.NSW.GOV.AU

Avalon to Palm Beach Floodplain Risk Management Study & Plan Working Group

Established:	30 October 2014
Function:	To enable community participation during the preparation of the Avalon to Palm Beach Floodplain Risk Management Study and Plan in accordance with the NSW Government's Floodplain Development Manual (2005).
Administration:	This Working Group is administered by Pittwater Council
Composition / Membership as at establishment:	<p>One (1) Councillor (who shall be Chairperson of Community Working Group) plus one (1) alternative councillor. All Councillors are invited to attend.</p> <p>Up to six (6) community representatives who reside or work within the study area.</p> <p>Up to four (4) community representative from Pittwater community groups, subject to the group's inclusion on Councils "Register of Community Groups".</p> <p>Up to one (1) representative from another registered Floodplain Working Group</p> <p>Interested observers are invited to attend.</p> <p>State Government representatives as required, including:</p> <ul style="list-style-type: none"> • NSW Office of Environment and Heritage • NSW State Emergency Service (representing State Headquarters, Region Controller and Local Controller) • NSW Roads and Maritime Services • Sydney Water • NSW Crown Lands Division • Department of Planning & Infrastructure.
Quorum:	Five (5) members provided one is a Councillor, two Community representatives and one NSW Government representative.
Reporting Procedures:	Business of the Community Working Group to be reported directly to Council as required.
Responsible Business Unit:	Catchment Management and Climate Change
Meetings	At least quarterly
Council Members Appointed:	Cr McTaggart (Pittwater) Cr Grace (Pittwater)



Members of the Working Group namely

Pittwater Council Members

Cr Alex McTaggart (Chairperson)
Cr Bob Grace (Delegate)

Citizen Representatives

Mr Roger Alsop
Mr Allen Telling
Mr Stuart Davidson
Mr Vince Nicholson

Stakeholder Representatives

Mr John Warburton (Palm Beach – Whale Beach Residents Association)
Mr Stephen Branch (Avalon Beach Village Chamber of Commerce Inc)
Ms Kerry Mc Ewan (Barrenjoey High School)
Mr Spiro Daher (Narrabeen Lagoon Floodplain Risk Management Working Group Member)

State Government Representatives

NSW Office of Environment and Heritage (OEH)
State Emergency Service – Warringah/Pittwater Unit
State Emergency Service – Sydney Northern Region
Sydney Water
Roads and Maritime Services

and the following Council Advisors

Manager, Catchment Management and Climate Change
Principal Officer – Floodplain Management

are requested to be in attendance.

Copies to:

Director – Urban & Environment Assets
Manager – Urban Infrastructure
Manager – Place Management
Risk Officer
EA to General Manager
A/EA to Mayor and Councillors

All other Councillors are free to attend as Observers, and are invited to do so and to engage in discussion



Attendance:

Pittwater Council Members

Cr Bob Grace

Citizen Representatives

Mr Allen Telling

Stakeholder Representatives

Mr John Warburton (Palm Beach – Whale Beach Residents Association)

Mr Spiro Daher (Narrabeen Lagoon Floodplain Risk Management Working Group Member)

State Government Representatives

Mr Greg Davis (NSW Office of Environment and Heritage)

Mr Wayne Lyne (NSW SES – Warringah/Pittwater Unit)

Mrs Lynn Larri (NSW SES – Warringah/Pittwater Unit)

Mr Daniel Cunningham (Sydney Water)

and the following Council Advisors

Ms Jennifer Pang (Manager, Catchment Management and Climate Change)

Dr Melanie Schwecke (Principal Officer – Floodplain Management)

In attendance

Mr Bronson McPherson (MHL/NSW Public Works)

Dr Stephen Yeo (Consultant – Risk Frontiers)



1.0 Apologies

Cr Alex McTaggart
Mr Vince Nicholson
Mr Stephen Branch (Avalon Beach Village Chamber of Commerce Inc)
Ms Alison Flaxman (State Emergency Service – Sydney Northern Region)

2.0 Declaration of Pecuniary Interest

Nil

3.0 Confirmation of minutes of previous meeting

Confirmation of the minutes of the Avalon to Palm Beach Floodplain Risk Management Study and Plan Working Group held on 3 September 2015.

Moved: Lynn Larri
Seconded: Wayne Lyne

4.0 Matters arising from previous meeting

Nil

5.0 Committee Business

5.1 Progress update on the flood risk management study & plan

An update and presentation was provided by Bronson McPherson and Dr Stephen Yeo on the progress and findings of Avalon to Palm Beach Floodplain Risk Management Study & Plan. The presentation is provided in Attachment 1.

Discussion points:

1. Detention basins –Could these systems be dual -purpose and also provide incorporate water quality treatment benefits? Yes
2. In assessing the mitigation options, how were the benefits/costs determined? The benefits are based on a reduction in property damages, whilst the costs are determined on standard rates of construction.



3. The current state government funding for floodplain management is at 2:1 with council paying a third of the costs. The total funding available for the State is about \$20 million and it is therefore fairly limited in comparison to the median cost of houses.
4. Strategic rezoning – an option being considered by the consultant as a mechanism to raise funds through developer contributions. The concept is based on increasing development density in areas with less flooding potential to fund the purchase of more highly flood affected areas to be used as open space. This is proposed as a long term strategy that would be market driven and needs further investigation.
5. House raising – Fairfield Council provides subsidies for house raising and floodproofing.
6. Recommended actions in the final flood risk management plan would need to be subject to further feasibility investigations.

RECOMMENDATION

The Working Group note the information presented by NSW Public Works

Moved: Spiro Daher

Seconded: Daniel Cunningham

6.0 General Business

Nil

7.0 Next Meeting

The next meeting of the Avalon to Palm Beach FRMS&P Working Group is scheduled to be held Avalon Recreation Centre, Room 4 - Upstairs on Thursday 11 February 2016 from 4pm to 6pm.

There being no further business the meeting concluded at 5.32pm.



Attachment 1



Public Works

A division of the Department of Finance & Services

Avalon to Palm Beach Floodplain Risk Management Study and Plan Working Group

Bronson McPherson – Project Manager
Stephen Yeo – FRM specialist

12 November 2015

Overview of Presentation

- Study Milestones
- Evaluating Flood Risk Management Options
 - Recap preliminary options
 - Detailed assessment
 - Flood modification
 - Property modification
 - Response modification
- Impacts of Climate Change
- Next Steps



Image: 2008 Flood, Careel Creek, Source: Pittwater Council



Public Works



Study Milestones

- Review Information - **complete**
- Flood Model update - **complete**
- Initial Community Consultation - **complete**
- Flood Damage Assessment - **complete**
- Emergency Response - **complete**
- Assess Floodplain Management Options - **complete**
- Flood Risk Management Study and Plan - **Nov 2015**
- Public Exhibition - **Feb 2016**
- Council Adoption


Image: 2008 Flood 2yr to 5yr ARI
Source: Pittwater Council

NSW GOVERNMENT | Public Works

Recap – Preliminary options

Modify the Flood - Basins and Reserves

- Detention Basin in Catalpa Reserve
- Jamieson Park Detention Basin upgrade
- Detention Basin in Toongarrie Reserve
- Toongarrie Reserve swale
- Detention Basin in Angophora Reserve upstream of Ruskin Rowe
- Augmentation of Golf Course basin



NSW GOVERNMENT | Public Works



Recap – Preliminary options

Modify the Flood

- Drainage

- Improved drainage from Barrenjoey Road through Careel Bay Oval, North Avalon
- Drainage upgrades between Albert Road, Burrawong Road and Barrenjoey Road
- Therry Street drainage upgrades
- Drainage upgrades between North Avalon Road, Tasman Road and Catalina Crescent
- Careel Creek Flood Off-take Pipe



Public Works

Recap – Preliminary options

Modify the Flood - other

- Raise footbridge / pipe crossing of lower Careel Creek
- Careel Creek Dredging & clearing of the lower reaches of Careel Creek from the Careel Bay
- Careel Creek vegetation review
- Debris Control US of key structures e.g. US of Ruskin Rowe
- Bilgola Beach open channel enlargement & erosion control



Public Works



Recap – Preliminary options

Modify Response

- Flood Warning for Avalon CBD
- Flood Emergency Response Plan template for Commercial Sector
- Flood-proofing brochures

Modify the Property

- Voluntary House Purchase Scheme
- Voluntary House Raising Scheme
- Install flood compatible fencing on properties within the floodplain
- Implement updated flood risk management DCP



Public Works



Floodplain Management Options for Detailed Assessment

Option/Criteria	Impact on Flood Behaviour	Number of Properties Benefited	Technical Feasibility	Economic Merit	Financial Feasibility	Environmental and Ecological	Impact on Risk to Life	Impacts on SES	Long-term Performance	Legislative	Social Impact / Community
Flood Education	3	3	5	5	5	3	5	5	4	4	4
Flood Warning for Avalon CBD	3	3	4	5	5	3	5	5	4	4	4
Flood Emergency Response Plan template for Commercial Sector	3	3	5	5	5	3	4	4	4	5	4
Implement updated flood risk management DCP	3	3	5	5	5	3	5	4	5	4	2
Flood-proofing brochures	3	3	5	5	5	3	3	3	4	5	4
Detention Basin in Catalpa Reserve	4	4	4	3	4	2	3	3	4	3	4
Jamieson Park Detention Basin upgrade	4	4	3	2	4	3	3	3	4	3	4
Improved drainage from Barrenjoey Road through Careel Bay Oval, North Avalon	4	4	4	3	4	2	4	3	2	2	3
Therry Street drainage upgrades	4	4	3	2	3	3	3	3	4	3	4
Drainage upgrades Albert Road, Burrawong Road and Barrenjoey Road	4	4	2	3	3	3	4	3	3	2	3
Detention Basin in Toongarie Reserve	4	4	2	3	3	2	3	3	4	2	4



Public Works



Options for Detailed Assessment

- Flood Education
- Improved drainage from Barrenjoey Road through Careel Bay Oval, North Avalon
- Drainage upgrades between Albert Road, Burrawong Road and Barrenjoey Road
- Therry Street drainage upgrades
- Detention Basin in Catalpa Reserve
- Jamieson Park Detention Basin upgrade
- Detention Basin in Toongarri Reserve
- Flood Warning for Avalon CBD
- Flood Emergency Response Plan template for Commercial Sector



Public Works

Flood Modification Measures

- Jamieson Park Detention Basin
- Careel Head Rd Drainage Upgrades
- Therry St Drainage Upgrades
- Catalpa Reserve Detention Basin
- Toongarri Reserve Detention Basin



Public Works



Jamieson Park Detention Basin upgrade

- Benefit \$0.4M
- Cost \$1.4M
- Benefit Cost Ratio 0.3
- Not recommended



Public Works



Carrel Head Rd drainage upgrades

- Benefit \$0.7M
- Cost \$1.4M
- BCR 0.5
- Not recommended



Public Works



Therry Street drainage upgrades

- Benefit \$0.05M
- Cost \$0.5M
- BCR 0.08
- Not recommended



Catalpa Reserve

- Benefit \$0.9M
- Cost \$0.7M
- BCR 1.4
- Will be recommended



Toongarri Reserve detention basin

- Benefit \$2.2M
- Cost \$1.75M
- BCR 1.75
- Will be recommended



Public Works



Property Modification Measures

Voluntary House Purchase
Flood proofing guidelines
Planning Policy Revision



Public Works

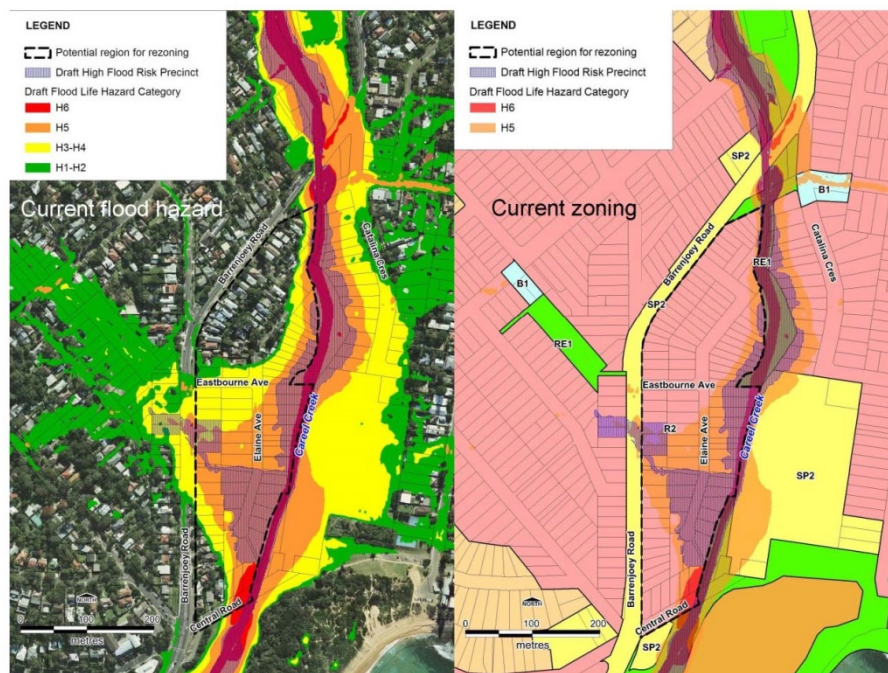


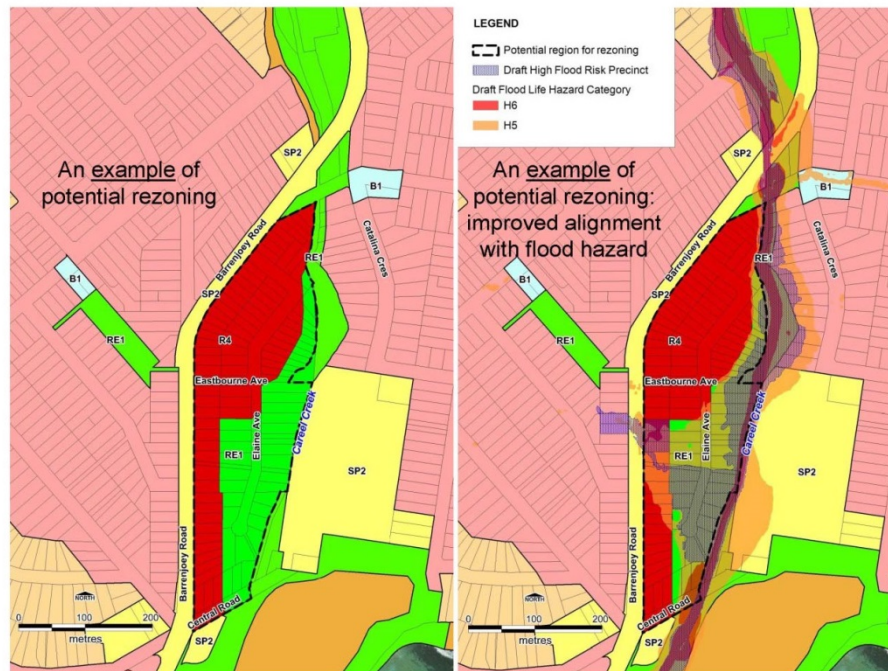
Voluntary House Purchase (VP)

- VP removes dwellings where there is an unacceptable risk to life for which no other 'treatment' options are feasible
- Flood risk to life in houses in 1% AEP event is low in study area
- Median house prices are high
- State-funded VP scheme impractical
- Strategic rezoning could provide means for funding conversion of existing dwellings in high flood risk areas to open space, via developer contributions



Public Works





Voluntary House Purchase (VP)

Recommendation:

Consider rezoning to facilitate redevelopment in such a way that existing dwellings in high flood risk areas are converted to open space, funded by an increased residential density in adjacent areas of low or no flood risk (Council)



Public Works



Voluntary House Raising (VHR)

- VHR reduces risks to property
- Standard house raising for timber/fibro dwellings
- 'Knock down and rebuild' for brick/slab dwellings
- Add second storey then 'gut' the ground floor



Public Works

Flood Proofing

'Dry'



'Wet'



Public Works

