greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

BEFORE	Upper Hutt City Council
Under the	Resource Management Act 1991
and	
In the matter of	Plan Change 42: Mangaroa and Pinehaven Flood Hazard Extents
Date	27 September 2017

STATEMENT BY SHARYN WESTLAKE ON BEHALF OF THE SUBMISSION MADE BY GREATER WELLINGTON REGIONAL COUNCIL

Introduction

My name is Sharyn Westlake. My current position at Greater Wellington Regional Council (GWRC) is Team Leader, Investigations, Strategy and Planning in the Flood Protection Department. I am a Chartered Professional Engineer and Fellow of the Institution of Professional Engineers New Zealand (IPENZ). I have over 20 years' experience in river and coastal engineering and over 13 years dealing directly with flood risk management.

GWRC has carried out flood hazard assessments for the Mangaroa River and Pinehaven Stream and an erosion hazard assessment for the Mangaroa River. Upper Hutt City Council (UHCC) Plan Change 42 seeks to introduce provisions into the UHCC District Plan to manage the risks from these hazards.

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1. Natural Hazard Management

1.1.1 One of GWRC's key roles is to help communities protect themselves from the effects of natural hazards. To do this, our communities need to understand the risk from natural hazards and have affordable and acceptable management solutions in place. We also want to ensure that inappropriate developments don't create new problems.

1.1.2 Identifying hazards, such as those caused by river flooding and erosion, is the responsibility of local ~~errit~~authorities under the Resource Management Act. Since this legislation was passed, each authority has prioritised and undertaken flood hazard mapping of the catchments that fall under its jurisdiction. In some rural areas, this is driven by development pressures.

2. Floodplain Management Planning

2.1.1 Floodplain management planning is an internationally recognised process that provides a comprehensive long-term strategy for managing areas at risk from flooding. However, effective management of risk requires political leadership and widespread community understanding and acceptance of the range of flood risk measures available, and this can present particular challenges in selecting and implementing an appropriate response (for example, avoiding development in flood-prone areas versus structural protection measures).

2.1.2 Floodplain management planning generally involves the following steps:

- Investigating and understanding the probability and likely extent of flooding (including a Flood Hazard Assessment), and the economic, social, cultural and environmental values within a defined catchment;
- Identifying, evaluating and selecting a range of appropriate management options to reduce the probability and impact of flood risk; and
- Implementing a preferred option(s) for managing the flood risk in a way that ensures a co-ordinated response by relevant agencies and/or individuals.

2.1.3 This process results in a Floodplain Management Plan (FMP).

2.1.4 Within the Wellington Region, Greater Wellington has prepared Floodplain Management Plans for the Hutt River (2001), Otaki River (1998,) and Waikanae River (1997, reviewed 2013). Greater Wellington carried out a stream study and produced a Stream Management Plan for the Waitohu Stream (2006); carried out Flood Hazard Assessments for the Mangaone Stream (2002) and Waiwhetu/Awamutu Streams (2006); and has carried out Flood and Erosion Hazard Assessments for the Wainuiomata River (2000) and Mangaroa River (2006-).

2.1.5 Greater Wellington Regional Council (Greater Wellington) is also responsible for ten river management schemes in the Wairarapa.

2.1.6 The ten schemes are:

- Kopuaranga River Management Scheme
- Lower Wairarapa Valley Development Scheme
- Waingawa River Management Scheme
- Waiohine/Mangatarere River Management Scheme
- Waipoua River Management Scheme
- Lower Whangaehu River Management Scheme
- Lower Tauera River Management Scheme

- Upper Ruamahanga-Mt Bruce-River Management Scheme
- Upper Ruamahanga-Te Ore Ore-River Management Scheme
- Upper Ruamahanga-Gladstone-River Management Scheme

2.1.7 Each Wairarapa River scheme has largely been set up as a result of community pressure to improve flood mitigation. Funding is provided by each schemes ratepayers who include the direct beneficiaries of the scheme works, the district council, network utility operators and Greater Wellington. Schemes have an agreed level of service which determines the design levels of stopbanks, floodways and bank protection works. The design level varies from rural stopbanks which may provide fairly low levels of flood mitigation to urban stopbanks which are usually designed to have a minimal level of up to a 1 in 100 year return period flood event. Each scheme has an advisory committee made up of representatives from the scheme ratepayers. At least one meeting a year is held with scheme advisory committee members to discuss scheme issues, levels of services, work programmes and funding.

3. Flood Hazard Mapping Background

3.1 Pinehaven Stream

3.1.1 The Pinehaven Stream is jointly managed by GWRC and Upper Hutt City Council (UHCC). UHCC manages the catchment and its upper tributaries until they combine in Pinehaven Reserve. GWRC then manages the stream channel from the reserve until it meets Hulls Creek.

3.1.2 GWRC and UHCC were equal partners in the flood management investigations that have been undertaken in Pinehaven Stream. These investigations, along with community consultation (focused on identifying the flood hazards and how they should be managed) have led to the development of the Pinehaven Floodplain Management Plan.

3.1.3 The first phase of the Pinehaven Stream flood hazard investigation was undertaken by Sinclair Knight Merz (SKM). The investigation sought to identify the flooding issues related to the Pinehaven Stream through hydraulic modelling, flood hazard mapping, flood damage assessment, erosion hazard assessment and a planning review.

3.1.4 As the primary analysis tool, a combined 1D and 2D hydraulic model was constructed of the Pinehaven Stream to assist in the development of flood hazard maps and to further understand the hydraulics contributing to the flood hazard. The model was calibrated with historical flood records and (limited) stream gauge data and community consultation. Following this, an external methodology peer review of the model was carried out to ensure it was acceptable to assess the flood hazard within Pinehaven.

3.1.5 A further external audit review of the hydrology, hydraulic model and the application of freeboard hydraulic modelling was undertaken by Mr Michael Law. I note that Mr Law concluded that ”the hydrological and hydraulic modelling underlying GWRC’s flood extent and hazard maps is fit for purpose,

but the way that flood information is presented in map form could be modified, which may increase the understanding and acceptance of the maps by the community". Mr Law also made suggestions regarding the determination of hydraulic neutrality. These are described in his evidence.

3.1.6 The points raised in Mr Law's evidence have been addressed by GWRC, including updating the flood hazard maps as shown in the Pinehaven Stream Floodplain Management Plan Volume 2, with ways that the identified flood hazard can be more easily identified by the public.

3.1.7 The community consultation process carried out by GWRC for the Pinehaven Stream Floodplain Management Plan is set out in Appendix 1, which is an extract from the report to the GWRC Council meeting of 29 June 2016 in which this Plan was adopted.

3.1.8 I note that the Pinehaven Stream flood hazard maps have been available as 'Flood Hazard Information Sheets' on the GWRC website since 2010, and the Volume 2 maps are also available on the website.

3.1.9 I am satisfied that the modelling and mapping used to derive the flood hazard maps for Plan Change 42 is appropriate and that this information provides a suitable basis for the plan change.

3.2 Mangaroa River

3.2.1 In June 2006, the initial Mangaroa River Flood Hazard Assessment was completed by GWRC and the results of the assessment forwarded to UHCC, followed by discussions between officers regarding the use of the information. GWRC intended that this information would be used for planning purposes, to ensure that any future development in the valley takes account of flood and erosion hazards. UHCC used this information to inform applications for building and resource consent, and disclosed it in Land Information Memorandum (LIM) reports.

3.2.2 Public meetings were held in September and November 2008 to discuss the hazard information. A key outcome from these meetings was that residents wanted the flood and erosion hazard to be put into the UHCC District Plan.

3.2.3 In January 2010, all property owners with properties affected by flood and erosion hazard from the Mangaroa River were sent hazard maps, and a design river channel for the Mangaroa River specific to their property. This information was drawn up for planning purposes, and was to ensure that the development of the Mangaroa and Whitemans Valleys took into account the flood and erosion hazards of the Mangaroa River. The information was used to inform a proposed plan change to the UHCC District Plan.

3.2.4 In 2013 Proposed Plan Change 15 to the Upper Hutt City Council (UHCC) District Plan sought to introduce flood and erosion hazard information for the Mangaroa River. At the Upper Hutt City Council meeting of September 2013, Council resolved that the decision to approve Plan Change 15 was deferred, pending completion of an independent review into the accuracy of the model and

data used for the Hutt and Mangaroa Rivers. This decision was later amended to a review of the Mangaroa River information.

3.2.5 UHCC Peer Review of the Mangaroa River flood hazard information resulted in some issues to be addressed, which are discussed in the evidence of Mr Kyle Christensen. As the 2006 version of the hydraulic model is no longer able to be run, addressing these issues has necessitated updating the hydrological and hydraulic models and remodelling and remapping the flood hazard. The updated Mangaroa River flood hazard mapping formed the basis for the Plan Change 42 maps.

3.2.6 Using the updated modelling information, the River Corridor was also revisited, and mapped using the following general criteria

- The wide design channel from Gary Williams design channel work
- Outside the historic river channels
- Not through houses or way up a hill
- Where a narrow strip of overflow is adjacent to the river corridor, then the strip of overflow is also included.

The River Corridor (placement and reasoning) were discussed with Mr Kyle Christensen, as UHCC's Peer Reviewer.

3.2.7 Consultation around the use of these maps was led by Upper Hutt City Council within their Plan Change process and is discussed in the Officers Report.

3.2.8 The erosion hazard from the 2006 study was considered by the peer reviewer to be fit for purpose and remains generally unchanged (save for small areas where detailed site specific analyses have been accepted).

3.2.9 I am satisfied that the modelling, mapping and erosion hazard used to derive the flood hazard maps for Plan Change 42 is appropriate, and that this information provides a suitable basis for the plan change.

3.3 Plan Change 42 Maps

3.4 As a result of submissions, UHCC requested that the Proposed Plan Change 42 flood hazard maps have the flood water depth less than 0.1m removed.

3.5 The mapping exercise to change the Mangaroa and Pinehaven flood hazard maps to the amended Plan Change 42 maps (with water depth <0.1m removed (from the lateral extent of the flooding)) was carried out by myself and Mr Kyle Christensen (as UHCC's peer reviewer). No remodelling of the flood hazard was required for this mapping. It was a relatively simple exercise involving a GIS (Geographical Information System) routine with final checking and smoothing to ensure the results made sense.

3.6 The hazard posed by a flood hazard of less than 0.1m was considered to be sufficiently low over this area that regulatory control was not required. In my opinion, applying regulatory control under the District Plan only to flood hazard greater than 0.1m deep is acceptable provided the remaining flood hazard less

than 0.1m deep is managed through building controls (Building Act and Building Code).

3.7 I note that the GWRC flood extent maps are not changing, which means that the GWRC original flood hazard information will be used for all other purposes, such as:

- Providing flood hazard advice about extent, depth etc of flooding
- Recommended building levels for new houses
- Setting fill levels for subdivisions
- Information on the GWRC webmap; etc

4. Pinehaven Stream Floodplain Management Plan and Structural Works

4.1.1 GWRC and UHCC have jointly funded and developed the Pinehaven FMP. The development of the FMP was governed by the Hutt Valley Flood Management Subcommittee, a joint subcommittee of elected councillors from GWRC, UHCC and HCC, plus appointees from Iwi.

4.1.2 The process that was followed for GWRC's adoption of the Pinehaven Flood Management Plan (FMP), was as follows. The Pinehaven Stream Floodplain Management Plan is a non-statutory document. It was recommended by a Hearing Panel of the Hutt Valley Flood Management Subcommittee (HVFMSc) to be endorsed by the full HVFMSc, GWRC Environment Committee and then was adopted by GWRC Full Council. Links to the meetings are as follows:

http://www.gw.govt.nz/committee-meetings-calendar/detail/7366
http://www.gw.govt.nz/committee-meetings-calendar/detail/7339
http://www.gw.govt.nz/committee-meetings-calendar/detail/7337
http://www.gw.govt.nz/committee-meetings-calendar/detail/7341

4.1.3 The Pinehaven FMP works are a package of structural and non-structural works, of which PC 42 is a key element. GWRC and UHCC have a Memorandum of Understanding (MOU) regarding the FMP outcomes. The MOU states "Commencement of the construction of structural works will not begin until the Pinehaven Plan Change methods/controls outlined in the floodplain management plan have been included in the District Plan by way of a decision of Upper Hutt City Council."

4.1.4 Regarding funding the proposed structural works for the Pinehaven Stream, from Section 7.4 of the Pinehaven FMP- GWRC has allocated $5.1M for the Pinehaven FMP Implementation in its current 2015 to 2025 LTP, UHCC have budgeted a similar amount for their 50% share of the works. UHCC are leading the implementation phase of FMP, and their agents Wellington Water are project

managing the structural implementation outcomes, and will therefore be the entity lodging any Notice of Requirement in the Consenting stage of the project.

5. Anticipated Flow Volumes in the Pinehaven Stream

5.1.1 The question has been raised with regard to detail around the anticipated flow volumes in the Pinehaven and Mangaroa waterways during model level events (1:25 and 1:100). The answers to this question depend on location and if this is pre or post works being completed, and whether the flow volumes are with or without climate change.

5.1.2 Appendix E of the Pinehaven FMP includes a table of peak flow at each sub-catchment boundary for the 1-in-100 year event, excluding climate change effects. This table does not account for time to concentration for flows at a chosen point in the catchment.

5.1.3 Both the 1-in-25 and 1-in-100 scenarios are being re-run upon completion of the detailed design of channel improvements to confirm that the design will deliver the FMP outcomes. This is being done to support the consent applications/Notice of Requirement and/or designations required for the implementation of the physical works. Engineering consultants, Jacobs who are carrying out this work, will need to supply any detailed flow information for specific points in the catchment.

6. Response to the Officer's Report recommendations

6.1 I support the recommendations in the Officer's Report and ask that the recommendations be accepted.

7. Decisions requested

7.1 I request that the Hearing Commissioner notes GWRC's support for the plan change and changes recommended to the flood hazard extent maps for the Proposed Plan Change.

Sharyn Westlake

Appendix 1

From Report 16.309 by Alistair J N Allan, Team Leader, FMP Implementation. File CCAB-8-653 to the 29 June 2016 Greater Wellington Regional Council meeting.

Pinehaven Floodplain Management Plan Community Engagement

The Pinehaven and Silverstream communities have been included in the development of flood risk management for the Pinehaven Stream catchment since completion of the draft flood modelling in 2009. The community engagement has predominantly involved public open days and meetings with the flood and proposed stream work affected property owners. In addition, information and resources have been made available to the community through both printed and web based material.

Letter Drop

At the start of this project, an initial letter drop was undertaken. This included information on the local flooding history and the sharing of experience was invited from the residents in the Pinehaven catchment. Pinehaven has numerous long term residents who have valuable knowledge of past flooding events, including the flooding in 1976. Council staff and Jacobs (formerly SKM) met and discussed flooding history with a number of residents, whose local knowledge proved to be invaluable in verification of the modelling work and in understanding the catchment.

Drop-in Sessions and open days 2009 to 2012

A community ‘drop in’ session was held in Pinehaven on 12 September 2009 where residents had the opportunity to comment on draft flood hazard maps prepared from initial modelling results for the 10 and 100 year storms. Over 150 residents took the opportunity to comment and a large amount of detailed information relating to the catchment was collected. Where applicable, this information was used to enhance the hydraulic model and assist in the mapping of the flood hazard. The overall consensus of the residents was that the predicted flooding extents matched what they had personally observed and experienced. This endorsement adds further confidence to the outcomes of the investigations.

An open day and evening was held on 18 July 2012 to discuss and develop combinations of options with the community. The open day was visited by 60 residents and the general attitude was supportive of the need to undertake direct action to increase the management of the risk.

The open day highlighted high level community values of the stream, including discussion of: impacts of the project on ecological values of the stream; the cost

of the project; cost and fear of damages; development and planning controls; and timeframes for implementation.

Property Owner Consultation 2012

Individual meetings with property owners impacted by potential structural options have been on-going since these were identified in 2012. These relationships will be maintained between the property owners, GWRC and UHCC throughout implementation of the floodplain management plan.

These meetings discussed the direct impacts on the particular property owners and identified the values which were important to those owners. These discussions aimed to identify the social, environmental, cultural and economic values held by property owners. The meetings covered broad topics including; spiritual attachment to the area, visual appeal, recreational opportunities, ecological health, flood risk, security, access, affordability, connectedness, community, resilience and emergency management.

2014 consultation and submissions

The draft Plan was notified to the community in October 2014, which gave the community an opportunity to make submissions. Thirty-two submissions were received, predominantly from private property owners within the catchment. The primary concern raised by the community was if the flood modelling and map extents were accurate. As part of this, many submitters requested an independent audit be undertaken. In direct response to the submitters concerns, an independent audit was undertaken. This review concluded that the modelling was accurate and fit for purpose.

Other issues raised by two submitters included making sure trees and native bird populations in Pinehaven were recognised and managed through the design of structural improvements. The first stage of the ecological survey for future works has now been undertaken and will inform future design activity.

2015 consultation and submissions

A revised draft Plan was released for consultation in 2015. The purpose of this consultation was to not only outline how the independent review of the flood modelling had been undertaken and influenced the design of the updated Plan, but to undertake further engagement on the Plan Change request to the Upper Hutt District Plan and to understand any further views on the proposed structural works.

Open days were held alongside other related activities that were being consulted on by UHCC. Over the two open days 40 people attended who noted they were there to understand the Plan.

Attendees represented a broad area of the catchment, drawing residents and owners from the lower, middle and upper catchment, and included both those

who were subject to potentially significant flooding, and those who were outside the identified flood prone area.

The majority of the questions or submission points could be answered through the Plan document. However, one point that needed to be addressed in this update of the document was the provision of a clearer definition of stormwater neutrality and how this could be addressed in the development of a future Plan Change.

Iwi Consultation

The Council project group has a memorandum of understanding with Te Tangata Whenua o te Upoko o te Ika a Maui, a grouping of local iwi (from the Rangitāne and Te Atiawa hapu). The project group met with representatives from Rangitāne, Wellington Tenths Trust and Te Atiawa to discuss the cultural significance of the Pinehaven Stream catchment. In addition a cultural likelihood of discovery database held by GWRC was checked. The outcomes of this were that the Pinehaven catchment had significance as a waterway, but was not known to be an area of historic cultural significance or current cultural significance to Māori.

2016 community meetings

Two community meetings have been held in May 2016 with members of a Pinehaven and Silverstream Focus Group established by UHCC. Each meeting involved the independent auditor.

Community representatives attended each meeting. The discussion was focused on flood mapping. The community was asked for their preferences regarding representation of the flood hazard on the maps. They voiced their concerns and demands during the first meeting. These were used to develop an updated set of flood hazard maps that was presented to the community during the second meeting. The updated maps were well received.

The updated maps are available on in the Pinehaves Stream Floodplain Management Plan Volume 2 http://www.gw.govt.nz/assets/floodprotection/Pinehaven-for-web-FMP-volume-2-update-6-September-2016.pdf