

SUBJECT Public Meeting - Mangaroa River Flood and Erosion Hazard Assessment -
Record of the meeting and responses to questions

WHEN Tuesday 23 September 2008

WHERE Hapai Room

FILE NUMBER N/03/80/02

1. **Introduction of Officers**

Mayor Wayne Guppy introduced the Greater Wellington (GW) and Upper Hutt City Council (UHCC) officers present:

Graeme Campbell – Manager, Flood Protection (GW), Richard Harbord - Director Environmental Services (UHCC), Sharyn Westlake – Team Leader, Strategy and Technical Support (GW), Tracy Berghan - Planner (GW), Mike Hurley – Planning Manager (UHCC), Andrea Hilton – City Solicitor (UHCC) and Ben Fountain (SKM)

2 **Presentation by Sharyn Westlake (GW)**

Sharyn's presentation set out why we are here, what GW/UHCC intends to do, and next steps.

3 **Presentation by Andrea Hilton / Mike Hurley (UHCC)**

Andrea and Mike's presentations set out UHCC's position regarding the flood hazard assessment and its interpretation in terms of building and resource consents as well as the PIM/LIMS process and lack of effects on certificates of title.

4 **Questions from the meeting and GW/UHCC response**

People at the meeting raised the following questions. Where appropriate questions have been grouped together and one response provided.

Floodplain Management

1 Is Mangaroa being singled out?

Flood hazard mapping is the responsibility of local and territorial 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.

Within the Wellington Region, Greater Wellington has prepared Floodplain Management Plans for the Hutt River (2001), Otaki River (1998) and Waikanae River (1997). 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).

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

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

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 ratepayer's who include the direct beneficiaries of the scheme works, the district council, network utilities 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 schemes 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.

The risk assessment process

- 2 *How accurate is the report?*
- 3 *The consensus from the meeting appears to be that you have got the report wrong.*
- 4 *We do not believe you have got this report right and are you prepared to come back and talk to the community about the detail?*

The assessment is to a similar or better standard to those undertaken for other Flood and Erosion Hazard Assessments within the region. The process by which the work was undertaken was based on appropriate and defensible industry standards for a catchment wide assessment of these types of risks.

The methodology used to investigate these hazards was necessarily tailored to account for the scope and budgets. While the results have met the required objectives and accuracy it is the nature of these studies that further information can be used to refine the identified risks. Typically this is an ongoing process.

Any information that you have that could assist in this process would be gratefully received.

Hydrology

- 5 *In April 2000 – 100 year return period was 230 in 2005 the new levels are 10 % larger – now 300?*

There were two models used to produce the flood maps – a rainfall runoff model that produces flow graphs (hydrographs), and a hydraulic model that predicts the flooding that would result. The amount of rainfall applied to the rainfall runoff model was based on analysis of long-term records from the Mangaroa and adjacent catchments. The rainfall was varied across the catchment following an analysis of spatial rainfall patterns. The model was verified for actual storm events using flow records from our monitoring site Mangaroa River at Te Marua. The verified model was then used to produce input flow hydrographs for the hydraulic model. Details of the modelling for specific parts of the catchment can be found in the reports.

Flow monitoring at the site Mangaroa River at Te Marua began in May 1977 and the largest flood since that time was on 16 February 2004. The flood has an estimated return period of 15 years. The flood frequency analysis estimate is based on internationally accepted methods and has been peer-reviewed by NIWA.

Without seeing the details of the April 2000 analysis it is difficult to say why there is a difference. However, as the length of flow records increases our flood frequency estimates change. In addition,

GW has seen an overall increase in flood frequency in the Hutt Valley and several investigations have noted this change.

Although there may not have been an apparent increase in annual rainfall since 2000, it is the frequency and magnitude of storms (particularly, in this catchment, short but heavy rainfall events) that are the key controlling factors for flooding.

Modelling results

- 6 *How did you come up with the modelling results?*
- 7 *In your modelling – how much water did you use and what discharges did you assume?*
- 8 *Do you have flood spreads that show flood events other than the 1 in 100 year flood e.g. 1 in 50 year event?*
- 9 *How does GW do its mapping?*
- 10 *Why have the reports changed and why are they different?*
- 11 *Peer Review?*

The hydraulic modelling process carried out for the Mangaroa River was a 1D/2D (1-dimensional model of the river, 2 dimensional model of the floodplain) coupled model including specified tributaries and the floodplain, run for various design flood scenarios.

Results from the model have been collected and analysed for the design 5, 10, 20, 50, 100 and 100_{150%} (extreme event of 1.5 times the 100-year discharge) year flood events, however only the 50 and 100 year floods have been converted to flood hazard maps. The 50 and 100 year return period flood events only have been mapped because the 100 year return period event is the design event GW recommends to UHCC for providing resource consent and building levels, and the 50 year return period event is the minimum Building Act standard that must be provided for.

The hydraulic model of the Mangaroa River was calibrated against the records from the Mangaroa River gauging station. In the hydraulic model the peak flows around the gauging station in the design 10 and 100 year storm events were approximately 320m³/s and 430m³/s respectively.

Sensitivity scenarios were also considered, to evaluate the potential effects of channel sedimentation (at critical locations and points of change in grade) plus partial bridge and culvert blockages. The

sensitivity analysis was used to develop the appropriate freeboard to be applied to the raw model results.

Approximately 170 channel cross-sections were surveyed to develop the one-dimensional hydraulic model for the main river channel. Bridges, culverts and other structures were also modelled. Initial runs with this model identified areas where additional ground survey was needed to improve the detail associated with significant overflows from the main channel. In particular, the lower portion of the Black Creek channel (and the Wallaceville Hill Road embankment across the floodplain) was surveyed to improve the modelling of the overflow into the swamp area and its subsequent effect on flood storage. LiDAR (aerial survey) mapping of ground levels was used for the floodplain modelling.

The results of the flood hazard investigations have shown that while regular inundation of parts of the floodplain can be expected, the hydraulic model only identified four significant areas of flooding that affect dwellings. These are:

- Upper Mangaroa, near the intersection of Russells Road and Whitemans Valley Road.
- The main channel breakout point downstream of the Mangaroa River and Huia Stream confluence.
- Upstream of the Mangaroa Hill Road Bridge.
- The Residential Area properties on Maymorn Road, near the confluence of the Mangaroa River and Collins Stream.

Neither SKM nor GW carried out a community consultation programme as part of this study. However SKM did talk to some property owners as opportunities arose during the field investigation.

The report was peer reviewed within SKM by Craig Martell, Team Leader Wellington Environmental Engineering prior to release by SKM. When the work was received by GW it was checked for completeness, that it met the terms of the contract and also that the results appeared reasonable and as expected when used in practice by GW's team of experienced engineers.

The hydraulic modelling report was first issued in June 2006. However, it was found by GW that in places the freeboard had not been applied correctly. This had no impact on the depths or extents of flooding but did require some changes to the Recommended Building Levels. The report was corrected and reissued in March 2007. At that time all resource consents issued since June 2006 were checked to ensure the accuracy of the information provided.

Erosion hazard

12 *How did GW work out the erosion zone – particularly moderate to extreme?*

13 *Why use such emotive terms in the report?*

14 *How did GW work out the McClaren Street erosion hazard risk?*

A river channel morphology and catchment geology investigation was included in the study to assess areas of erosion hazard associated with flooding in the Mangaroa River. Composite geological maps were used together with the results of the hydraulic model to provide the base information on river morphology and areas of significant erosion risk. Areas of alluvium that has been active recently were assessed as being highly susceptible to erosion, while the older alluvium deposits appeared to be more stable. The steeper greywacke and argillite hills surrounding the valley were considered to have a low susceptibility to erosion.

An “erosion hazard corridor” was developed using the LiDAR survey mapping and geological information, and ‘likelihood of failure’ levels assigned. The ‘consequences of failure’ were assessed for each area, and overall ‘risk’ levels assigned. For each erosion risk area recommended building set-backs were then given, which are 1, 2 or 3 times the slope height (depending on risk level) plus a safety factor of 15m. As stated in the Erosion Hazard Report, the assessment is qualitative in nature and relies on subjective judgements by erosion and slip experts. The rating is provided as a tool for identifying and comparing the areas of risk, and can be reviewed following specific detailed assessments of individual sites by qualified engineers.

The terms used to rate the “likelihood” and the “consequence” in the risk matrix are standard terms used for risk assessments as used in the guidelines to the Risk Management Standard NZS4360.

Contesting the Report

15 *Is UHCC prepared to contest the report?*

UHCC has no basis on which to contest the report. It has been prepared by engineers who are skilled and experienced in this type of work and adopted by GW which is the controlling authority for the river.

Timelines

- 16 *Where has the GW report been since June 2006?*
- 17 *I do not appreciate finding out about this through the Upper Hutt Leader.*
- 18 *You have not handled this at all well.*
- 19 *It is pretty obvious that there is a lot of concern about this report. It is sad that you release the information first then talk to us rather than the other way around.*

The Mangaroa investigations commenced with a report on the Flood Hydrology of the Mangaroa River, prepared by the GW's Resource Investigations Department following the successful completion of the Waiwhetu Stream hydrology report a year earlier. The opportunity was also taken to add a LiDAR survey of the Mangaroa Valley to the already commissioned joint GW-HCC survey for the Lower Hutt Valley, with the ensuing digital elevation model enabling a two dimensional hydraulic model to be considered for the Mangaroa River floodplain.

The project was discussed with the UHCC at the scoping stage so that the investigations could be matched to their needs in relation to the provisions of the UHCC District Plan and the likely future trends in the development of the floodplain. These discussions also helped determine the upstream extent of the study, to ensure that all areas where they had concerns about flooding would be modelled.

As stated in the GW report to its Landcare Committee on the 8 June 2006, it was intended that the Mangaroa river flood hazard information be used for planning purposes to ensure that any future development in the valley takes account of the flood and erosion hazards. As such, it was expected that the primary use of the information would be by the UHCC.

The delay in communicating the Flood Hazard Study to the community is regrettable and it is acknowledged that this should have been done much earlier.

Use of the information presented in the report

- 20 *At least 12 houses have been built with UHCC permission – please explain.*
- 21 *Why when there is a Council road between the river and our houses are we included in the erosion area – surely UHCC has a duty to maintain its road in the first instance?*

- 22 *At the bottom of Maymorn Rd – this is a public road as long as UHCC protects council land then I haven't got a problem?*
- 23 *In circumstances where the community has done everything right and people have built on the advice of Council – what is going to be done for these people?*
- 24 *My consent was issued last year – why was this current information not available then?*
- 25 *What is the legal stance when people have been approved to build houses – surely Council should be enforcing protection of these houses?*
- 26 *When we asked for information – and have been given a 1 in 100 year flood level and now have the wrong level – surely UHCC has a duty to protect us?*
- 27 *Has this been legally challenged?*
- 28 *Should I tell people to buy in Mangaroa*

New dwellings and other habitable buildings have been built over time within the Mangaroa and Whiteman valleys. Applications for resource consent and for building consent received prior to the Mangaroa river study would have been assessed on the basis of the best information available at the time. For example applications for subdivision consent lodged under the Resource Management Act prior to the study within areas anticipated to be at risk of flooding have been required to include an assessment of flood risk as part of the application. The Beechwood Lane development is one such example (see Q30 and 31). In such cases UHCC's decisions and requirements, as well as the landowners' decisions, took into account the findings of these investigations.

The Mangaroa River study represents a most recent and comprehensive study of the catchment as a whole. The fact that its findings may vary from those of assessments commissioned in support of individual consent applications in the past does not invalidate decisions taken in the past to approve development proposals. Neither can UHCC impose additional requirements in retrospect. GW is a potential source of advice as to the extent of flood risk for individual properties and a starting point for discussion as to what measures may be possible and appropriate to address that risk.

In relation to the processing of building consents and information provided since the date of the study, if any property owner considers that they have been given incorrect or incomplete advice by UHCC, then they should approach UHCC directly.

Parkes Line Rd is a significant route and UHCC will undoubtedly protect the road as long as this can economically be done.

The SKM study has not been legally challenged to either the City or Regional Council's knowledge.

Erosion Protection works

- 29 *Erosion caused by Council's storm water drain consents costs and engineers fees makes it about 18K to fix. I approached UHCC to waive consent fees and give me engineering advice and I would pay the costs of the work – still no joy.*

UHCC is unsure of the exact location referred to. The property owner concerned should approach UHCC directly.

Beechwood Area

- 30 *Subdivision and houses have been consented in Beechwood yet this area is well known by locals to flood. Why when previous developments have been knocked back did UHCC approve this subdivision in 2004?*
- 31 *I have brought a property in Beechwood about a year ago and I did not know it flooded – I am quite upset.*

The site referred to above has been zoned residential in UHCC's District Plan for a considerable period of time. The subdivision at the south-eastern end of Beechwood Lane was first granted consent in 2004, and a revised proposal was granted in November 2005. These applications were lodged with UHCC during the preparation of the Mangaroa River FHA. At this time UHCC did not have the benefit of the study's findings when considering those proposals.

Notwithstanding this point, UHCC and the applicants did liaise with GW in respect of flooding and erosion hazard information. The applicant supplied information concerning recommended flood levels from their consultants (Spencer Holmes) and as a result of that information, the site underwent filling to achieve a level above the predicted 1 in 100 year extent of the Mangaroa River for building development. The Mangaroa River study findings subsequently identified a slightly higher 1 in 100 year flood level for the site. This updated information was communicated to the then lot owners at the time it became available. Erosion mitigation works were also required by condition attached to the later subdivision consent.

LIM Reports

- 32 *LIM reports should be individualised?*
- 33 *Why this is all up in the air can we suspend information going onto LIM's?*

34 *If we got the UHCC district plan up-to-date would the information come off our LIMS?*

The information disclosed in LIM reports includes extracts from the SKM report to identify the hazard particular to a property, where appropriate. UHCC do not propose to further individualise the LIMs. Like other information supplied with a LIM it is then up to the individual whether they seek to find out any more detail on the issue.

The Flood Protection Team at GW are happy to discuss the flood and erosion hazard for any particular property on request and at no cost.

UHCC does not have the option of suspending the information. If UHCC has any information on a natural hazard not apparent in its District Plan then under the Local Government Official Information and Meetings Act 1987 it must disclose the information as part of the LIM.

Information in a district plan does not need to be disclosed in a LIM. If a plan change to the district plan was undertaken that incorporated the flood and erosion risk into the district plan then the SKM report itself would not need to be disclosed in a LIM. However, any information from the SKM report that is not incorporated into the district plan would still need to be disclosed (refer to Q35 response). UHCC's practice is to provide relevant extracts of the district plan with a LIM.

Property Values

35 *I have lost 50 % of the value of my house since this hazard information has been released.*

36 *When QV re-did the valuation of our properties did they know about this information?*

39 *What is UHCC going to do about our valuations as they will no longer be accurate?*

Please refer to the attached letter from Peter O'Brien.

QV's advice to UHCC is that that they did not know about the SKM study at the time of their undertaking rating revaluations. However, for the various reasons set out in the attached letter from Peter O'Brien regarding the valuation process, this is not considered to have distorted the valuation. QV note that their valuations follow the market rather than set the market and they would not expect to discount a valuation without there being market data to support that approach and this was not the case from their observations of the market in the Mangaroa Valley at the time of their valuations.

Proposed Growth Area

40 *The Leader identified Mangaroa as a growth area? Is this true and how will this information affect that?*

The Upper Hutt Urban Growth Strategy identified Maymorn as an area for possible future urban growth. UHCC has commissioned consultants to begin work on examining the potential of this area into the future. One of the first stages of this process will be to identify and map opportunities and most importantly constraints to any future growth into this area. Clearly flooding potential of the Mangaroa River is one of the main constraints in this area and the implications of this will need to be carefully considered as a part of this work.

Road Culverts

41 *When you did the assessment did you identify road culverts that are causing blockages?*

42 *Practical suggestions include road blockages and other mitigation.*

The model takes into account 15 bridges and culverts along the Mangaroa River and its major tributaries. The modelling results agreed with eye witness accounts that indicated that most of the culverts were constraints to large flood flows in the river. The model was also used to investigate the impacts of partial blockages of the culverts during flooding events.

Upper Hutt City Council have recently upgraded some culverts at end of Gorrie Rd, but other than that have no record of flood problems caused by culverts.

Flooding occurring in the Russell/Johnsons Rd area is due to the river level preventing the land from draining. For specific problems, please contact UHCC directly.

43 *UHCC has had 2 years to look at undersized road culverts what have you done?*

Upper Hutt City Council has a continuous program of upgrading rural drainage that has been in place for the last 10 years, based on an investigation done at that time.

A concrete dish channel has been placed in a section of the Whitemans Valley Rd 'gorge' area including new sumps and some culvert replacement. Other work has been carried out in Gorrie Rd and Mangaroa Valley Rd. Road culverts are not causing flooding. Flooding from the Mangaroa River is not caused by road culverts which are mainly there to drain the road. The significant streams that contribute to Mangaroa River flow are generally bridged over the roads.

Miscellaneous Questions

44 *How much money has been spent on this report to date?*

GW costs for the Mangaroa study to date, excluding Council officers' time and disbursements are:

- Hydrology \$11,760
- Lidar survey \$25,845
- Erosion and Flood Hazard Assessment \$157,994

45 *What is the difference between Mangaroa and the Hutt River in terms of money spent?*

46 *Flood Protection Ops depot at Mabey Road have said they are restricted in terms of what they can do where on the Mangaroa.*

47 *Why am I being asked to pay again when I do not have to lower down the valley?*

48 *GW should get a resource consent for the entire river.*

GW Responsibilities and the Administration of Watercourses Agreement

Under the 1976 Administration of Watercourses Agreement, GW has administrative control over the Mangaroa River. Within the urban section of the river, GW has a cost-share arrangement in place with the UHCC for maintenance work. As shown in the UHCC District Plan 2004, the most southerly extent of the urban (or residential) zone adjacent to the Mangaroa River is 1066 Maymorn Road.

In administering the rural section of the Mangaroa River, GW has a small budget to provide advice on the watercourse. This does not extend to carrying out any physical work. For the urban section of the river, maintenance is restricted to clearing the watercourse of obstructions to flood flows (such as fallen trees and debris). Protecting private property from erosion or remedying erosion on private property is specifically excluded from GW's maintenance responsibilities.

Historical Background to the Administration of Watercourses Agreement

The historical background to the watercourses agreement is that during the 1976 floods significant damage occurred to urban properties as a result of poorly maintained streams. Local government in the Wellington metropolitan area decided that it was unrealistic to expect urban dwellers to keep streams clear for flood flows. To avoid a repeat of the 1976 situation, local bodies themselves needed to ensure that critical watercourses were maintained sufficiently to pass flood flows. Accordingly, local government took on some of this responsibility on behalf of the landowners. The watercourses agreement sets out which local government agency would take responsibility for which

urban stream. In some cases the costs are shared between local government agencies and the cost sharing mechanism is also in the watercourses agreement. The watercourses agreement also sets the “standard” to which watercourses will be maintained, which generally is restricted to clearing watercourses of obstructions to flood flows.

Landowners Risks and Responsibilities

Common law suggests that in general, landowners take any risks relating to flooding and erosion on their property. Maintenance of watercourses is also generally the responsibility of the landowner, particularly where the benefits accrue to the landowner. If landowners want to protect their private assets or land then the landowner would fund the protection work and any ongoing maintenance. In most cases resource consents are also necessary and clearly, landowners have no rights to protect their property where that would cause a problem to another owner (e.g. works which might result in erosion at a neighbour’s property).

In addition, landowners have an obligation to maintain water bodies free from obstruction so that water can drain away quickly. However, particularly in urban areas, it can be both difficult and inefficient for each landowner to act independently so public bodies were formed with the power to provide flood and erosion protection “on behalf” of groups of landowners. Regional councils and their predecessors, catchment boards, are such public bodies. The Soil Conservation and Rivers Control Act 1941 empowers GW to develop flood and erosion protection measures for the community if GW so chooses. Other legislation provides similar empowerment to territorial authorities.

In some areas (e.g. in the Hutt, Waikanae, Otaki and Wainuiomata Rivers), GW (or its predecessors) have chosen to undertake capital works in addition to the maintenance responsibilities under the watercourses agreement. In these areas GW is responsible for maintaining the works in good order and repair and may choose to upgrade them or create new works at its discretion. These works are generally carried out as part of a scheme plan, where the benefits accrue to the wider community.

Isolated Works Policy

GW Flood Protection has an annual budgeted amount for a contribution to river works that fit within the Isolated Works policy. Isolated works are privately owned flood or erosion protection works that are constructed outside areas where GW manages community flood protection schemes e.g. outside the urban area for the Mangaroa River. The intent of the contributions is to provide a level of service to areas that are not eligible for rate funded community flood protection schemes. The maximum contribution is set at 30% of the actual cost of an eligible isolated work, and has traditionally been provided on a first in first served basis.

GW Budgets

The GW annual budget to maintain a channel way in the Mangaroa River urban section under the watercourses agreement is \$1,942. 2/3 of this is GW funded, and 1/3 funded by UHCC.

The total budget for GW Western Operations maintenance in the scheme area of the Hutt River is \$1.8 million.

Where to now?

- 49 *The issue with my house – is that I am not allowed to do any work in the river.*
- 50 *In the meantime landowners are not allowed to do any work – you are backing us up against a wall.*
- 51 *GW can't just dump this "bomb" and expect us to be happy and then walk away.*
- 52 *We get eroded up the back of our property - problems are caused further up the river.*
- 53 *Any future plans for the valley and who pays?*
- 54 *What is GW planning to do in the short-term?*
- 55 *Can you not give some leniency to these people?*
- 56 *Community would be happy to work with you.*
- 57 *You have changed the rules – what are you going to hide behind – statistics/RMA or are you going to put it right?*
- 58 *You have to come up with a plan to put this right – otherwise it is playing brink-man-ship.*
- 59 *UHCC, GW and the community need to work together to put this right.*

Further work proposed to be carried out by GW is as follows:

- Define flood spread as river corridor, overflow and ponding areas. This will enable recommendations to be made regarding proposed development, subdivision etc to allow the flood risk to be managed and avoided for future development. E.g. people subdividing sections can ensure that proposed sections each have a house site out of the hazard area.

- Undertake the next part of the process to decide how to manage flood and erosion risk in the long term. This process would include:
 - Defining a ‘design channel’ for the river
 - Reviewing the results of the flood and erosion hazard study, and properties affected, and deciding what to do to manage the hazard(s) (i.e. if as part of this process UHCC undertake to protect Parkes Line Road from river erosion, the consequences of this on the erosion hazard to the properties will need to be taken into account.)
 - Putting planning measures in place to recognise the existing risk, and avoid new development in flood and erosion hazard areas.