



Request for Proposal - Pinehaven Stream Flood Mapping Audit

Alistair J N Allan

For more information, contact the Greater Wellington Regional Council:

February 2015

www.gw.govt.nz
info@gw.govt.nz

Contents

1.	Purpose	5
2.	Deadline for submission of proposal	5
3.	Assessment of proposals	5
3.1	Attribute weighting	5
3.2	Description of Attributes	5
3.2.1	Relevant Experience	5
3.2.2	Performance Record	6
3.2.3	Technical Skills (Personnel)	6
3.2.4	Methodology	6
4.	Introduction	7
5.	Programme	7
6.	Purpose of the audit	8
7.	Terms of reference for audit	8
7.1	General	8
7.2	Numbers	8
7.3	Assumptions	8
7.4	Additional Work	9
7.4.1	Guidance on how to set storm water neutrality provisions within the district plan	9
7.4.2	Guidance on how to define the impact of intensification of development on the run off characteristics of the Pinehaven hills	9
8.	Available reports and data	10
8.1	Additional information supplied	10
9.	Deliverables	10

1. Purpose

The purpose of this document is to request a proposal for an independent audit of the Pinehaven Stream flood hazard mapping and carry out two related pieces of work.

2. Deadline for submission of proposal

Proposals will be received up until **12pm** on the **13th of February 2015**. We will accept proposals in hardcopy or electronic format.

The proposal or any related questions may be directed to;

Alistair Allan
Greater Wellington Regional Council
Shed 39, Harbour Quays
Wellington 6142
Alistair.allan@gw.govt.nz

3. Assessment of proposals

3.1 Attribute weighting

The proposals will be assessed on the following criteria;

Attribute	Weighting
Relevant Experience	15
Performance Record	15
Technical Skills (Personnel)	30
Methodology	10
Price	30

3.2 Description of Attributes

The proposal shall present capability to carry out the work, by submitting a brief resume for each of the attributes. Specific requirements are noted below.

3.2.1 Relevant Experience

A statement of recent relevant experience in carrying out work similar to that required for this audit. Where a Consultant's experience has not been directly relevant, the Consultant should establish how previous studies and investigations bear on this audit. Knowledge of local conditions should be included in this statement. The information shall be in the form:

- Name of project
- Date of completion
- Client
- Value of project

- Services provided
- Project description
- Key personnel involved (identify the involvement of key personnel nominated for this Contract)

3.2.2 Performance Record

A listing of completed projects relevant to this Contract and names of clients who can provide references to the tenderers past performance shall be in the form:

- Name of project
- Client contact name, telephone number, fax number and address
- Value of project
- Completed within time / budget
- Comments

3.2.3 Technical Skills (Personnel)

The Consultant shall nominate the Project Manager and other Key Personnel who will be assigned to this audit. For each person their area of expertise is to be recorded together with a summary of their relevant experience. Where any portion of the work is proposed to be subcontracted this should be identified together with sufficient background information. Curricula Vitae should be attached as an appendix.

3.2.4 Methodology

The methodology shall outline the work methods and approaches that will be used to achieve the specified outcomes. Items, which the consultant considers significant, shall be emphasised. The consultant shall also identify any uncertainties and opportunities in the methodology.

The consultant is invited to propose additional items not covered within the scope of this request for proposal that, from their experience, would add value to the outcomes of the audit.

4. Introduction

The development of flood hazard maps is a key part of flood risk management and subsequent floodplain management planning. They establish the context of flood risk to both life and property within the catchment and affecting the community that resides within it.

The development of these maps relies on a combination of hydrology (rainfall run off modelling and flow estimations) and hydraulic modelling (how these flows interact with the river channel and the floodplain), the outputs from which are then calibrated against measured and observed flood events. These are then subjected to technical review by an individual or agency considered suitably qualified and experienced to be a peer to those who created the model.

A key output of this process is the flood hazard map for the 1-in-100 year return period/1% Annual Exceedance Probability flood event including the modelled effects of climate change. This is a standard recommended by GWRC and adopted by local and regional authorities in the Regional Policy Statement for establishing planning controls and identification of flood risk.

The Pinehaven Stream catchment has a good record of past flood events including a flood estimated to be of 1-in-100 year return period/1%AEP in 1976. The records from these events include a collection of photographs and an engineer's report of the 1976 flood that contains flood extent mapping.

The outputs from this flood risk modelling process were developed for the purposes of:

- Identifying and defining the known flood hazards to life and property affecting the communities of Silverstream and Pinehaven;
- Raising awareness of the flood risk for current and future property owners;
- The development of methods to manage known existing flood risk, including planning and building controls to prevent future inappropriate land use.

5. Programme

The programme outlined below indicates key milestone dates;

- Community meeting to discuss and review draft terms of reference **23rd January 2015**
- Approval of terms of reference and appointment of auditor to be sought from the Hutt Valley Flood Management Subcommittee at their **24th February 2015** meeting
- Appointment of auditor from **25th February 2015**
- Delivery of the audit before **1st May 2015**

6. Purpose of the audit

The audit builds upon previously completed investigations and peer review work and elevates this to an additional level of scrutiny and analysis. These previous investigations and peer reviews found both the hydrology and hydraulic model fit for purpose, however some of the community still had concerns that the scope of the reviews done to date was not extensive enough, and therefore an additional more comprehensive audit has been requested by the Hutt Valley Floodplain Management subcommittee, (the governing body for the development of the floodplain management plan). This audit is to contain a review of the hydrology, hydraulic model and the application of freeboard. The terms of reference for the audit and appointment recommendation for this are subject to community scrutiny.

The community expectations for the audit are best summarised by the following two statements;

“Full audit that reviews not only modelling and processes, but the actual numbers and assumptions in the flood maps”

“The public need to be involved in the terms of reference”

7. Terms of reference for audit

The audit will comment on the appropriateness and fitness for purpose of the following criteria. We invite additional suggestions for assessment criteria as part of the proposal.

7.1 General

The following are *general* assessment items to be included in the audit;

- The type of software and modelling package used for the hydrology and hydraulic model
- The modelling method used and its appropriateness for both hydrology and the hydraulic model
- The use of freeboard and method by which it was applied
- Representation of the flood hazard through the way in which maps are displayed and information provided

7.2 Numbers

The assessment of the *numbers* used to create the flood model shall include;

- Rainfall data
- Measured flood flows
- Cross section surveys
- Lidar surveys

7.3 Assumptions

The assessment of *assumptions* used to create the flood maps include:

- Run-off coefficients
- Predicted flood flows
- Roughness coefficients of the channel
- How the buildings and structures on the floodplain are treated through use of roughness coefficients
- Treatment of bridges, culverts and pipe crossings
- Use of freeboard to define flood hazard
- How the freeboard has been applied to the model and suitability of the freeboard values used

7.4 Additional Work

In addition to the key audit tasks above, it has been agreed with the community that the following additional investigations would be carried out by the appointed auditor.

7.4.1 Guidance on how to set storm water neutrality provisions within the district plan

As part of the floodplain management plan implementation, Upper Hutt City Council will set storm water neutrality controls through the District Plan. The council is seeking independent guidance about how these should be established and how these should be measured.

This independent guidance will be considered when developing the plan change that will incorporate these controls.

Key information sought is:

- How to establish a base line against which any development proposal will be measured in a District Plan context
- What are appropriate levels at which to set controls

7.4.2 Guidance on how to define the impact of intensification of development on the run off characteristics of the Pinehaven hills

As part of the flood hazard study carried out by SKM, a future case scenario was carried out to determine the impact of a worst case development scenario for the Pinehaven Hills. This made some assumptions about the run off changes that would occur as a result of this development.

We would like a comment on assumptions about the impact of intensification of development within the Pinehaven catchment and how this would affect the run-off characteristics of the current usage if it was changed from pine forest into a partly developed or intensively developed area.

Key information sought is;

- What impact a high intensity development may have on run-off from the Pinehaven hills area
- What impact a medium intensity development may have on run-off from the Pinehaven hills area

- What impact a low intensity development may have on run-off from the Pinehaven hills area

8. Available reports and data

The Pinehaven stream study comprises a number of component investigation works. These are listed below. Reports and files relating to these will be made available to the appointed auditor, or on request by the shortlisted candidates at any time prior.

- WGN# 719427 - MWH 2008 Hydrology Investigation Report
- WGN# 1420495 GWRC review of 2008 Hydrology Report
- WGN# 815058 SKM Flood Hazard Assessment – Volume 1
- WGN# 815061 SKM Pinehaven Stream Flood Hazard Assessment – Volume 2
- DHI Australia Ltd review of the Hydraulic Model (*Included as an appendix to the Flood Hazard Assessment Volume 1*)
- Photographic records of the 1976 flood event for the Pinehaven Catchment
- WGN# 1420619 – 20 December 1976 Storm Report
- WGN# 1414871- Proposed Pinehaven Stream Floodplain management plan

8.1 Additional information supplied

The Save Our Hills group have supplied the results of case studies carried out by one of their members. They have requested that these are considered as part of the audit. The Save Our Hills group believe that these case studies highlight errors in the model.

Methodology used to generate these results has not been supplied by the Save Our Hills group.

9. Deliverables

The key Deliverable is a **Single Volume Audit Report**. This should contain:

- Executive summary including comment about whether the output flood maps and the process by which these were derived makes them fit for purpose;
- A completed checklist with a series of YES/NO questions that answer the key question on a topic by topic basis as to whether that particular aspect of the process used to develop the flood maps is fit for purpose;
- A summary explanation of any issue which is deemed as being not fit for purpose and what remedial work would be required to make this fit for purpose and deliver a positive audit result;
- Results of the additional investigation requesting guidance on how to set storm water neutrality provisions, and how to define the impact of intensification of development.