CASE STUDY - RIVER MODELLING PROJECT

BACKGROUND

In 2008 the Northland Regional Council sent out a Request for Proposals through the GETS tendering website.

"Undertake the assessment of flood hazard risk and the development of river management plans for identified priority rivers for the purpose of flood risk reduction."

There are 20 flood risk management plans that need to be prepared throughout the region. The RFP was comprehensive and included amongst the usual criteria:

- Anticipated outcomes
- Information availability
- Previous reports
- NRC information technology environment
- Compliance
- Responsibilities of NRC and the vendor
- Selection and engagement process
- RFP evaluation criteria

REQUIRED IMPROVEMENTS TO THE ORIGINAL REQUEST FOR TENDERS

Given the comprehensive requirements outlined above why did NRC feel that a framework needed to be in place by using a Modelling Policy Statement™?

Because of the diverse nature of the community needs, the data available (or lack of it) and the need to identify the right type of modelling consultant, a process was put in place to ensure that no stone was left unturned.

5 examples of components that were not part of the original RFP document are:

The **purpose for the work** had to be articulated to the modellers……..all of them. In this case the key purposes are a) long-term community plan consultation, b) assessment of existing infrastructure, c) a risk analysis and d) a catchment overview. In addition to this the NRC clearly stated that the work was not being undertaken to obtain resource consents. Therefore the energies of the modeller are put into flood risk assessment and not resource planning …. yet.

The Modelling Policy Statement™ also describes the requirement of the **Gap Analysis Report** that must be approved by the NRC before the main modelling work begins. This part of the work allows "breathing-space" for the modeller to assess all the data needs and then report in a formal manner to the client. This is to prevent a situation where the project is almost finished and then somebody discovers data that could have been available at the start which could have changed the course of the project. The benefit of the Gap Analysis Report is for the modeller to declare at the outset that….

"Unless we obtain the following data the MPS™ can not be complied with and the end product will be below your expectation".

This allows a prudent assessment of data before rushing headlong into the work.

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INTELLIGENT MODELLING FRAMEWORK

For many projects the modeller does not know what **Standards or Guidelines** are to be used. For this project the following was stated in the MPS™:

The following standards and documents must be complied with at all times:

- *Resource Management Act*
- *The Northland River Management Policy (Appendix 1).*
- *The New Zealand Standard for Managing Flood Risk – A Process Standard (NZS 9401:2008) (Appendix 2).*
- *Surface Water, Document E1, Building Industry Authority*

The following references should be considered:

- *Roughness characteristics of NZ rivers, NIWA, September 1998, ISBN 0-477-02608-7*
- *Guidelines for stormwater runoff modelling in the Auckland Region, Auckland Regional Council, 1999, TP108*

A common issue in hydraulic modelling projects is **"What is a good calibration?"**. Calibration is not an exact science but the client needs to understand the margins of error. The limitations of data can compromise results and mislead end-users. In this MPS™ it has been agreed that:

- *The modelled flow volume should be within at least 15% of that measured by the gauging site for any 24 hour period or the storm duration whichever is shorter*
- *The modelled peak flow should be within 15% of that measured*
- *The modelled peak flood level should be within at least 100mm of that measured*

Finally another section in the MPS™ is the **model integrity check**. This is a simple exercise that has to be reported. In this case the NRC wanted the following stated clearly in the Appendix for each scenario:

- *Continuity: INFLOWS = OUTFLOWS within the model, anything greater than a 5% difference is unacceptable*
- *Volume: Check that the volume generated by the run-off model is similar to a hand or spreadsheet calculation*
- *Calibration: Are the calibration requirements met?*

This case study demonstrates how clients who are not experienced in modelling can safely deal with a number of issues. Many modellers do many of these tasks based on experience but unless there is formal documentation using a MPS™ (or new modellers who are trained thoroughly), mistakes will continue to occur to the detriment of the profession and client budgets.

CLIENT COMMENTS

With regard to the case study that has been outlined, the NRC felt that:

- The technical parameters may be too prescriptive, experts should already know them,
- There is clarity of purpose for both the Council and consultant,
- It is easy to understand,
- It will reduce the commercial risk.