

A COMMUNITY'S ACCEPTANCE OF RISK AND FLOOD MANAGEMENT

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ABSTRACT

Investigations have shown that the Lower Motueka River stop banks, originally constructed in the 1950's, would be unlikely to survive severe flooding completely intact. The Tasman District Council identified that a complete stop bank replacement would cost approximately \$20 million, and considered that the cost would need to be borne by the Motueka community.

The Motueka community has told the Council that this is not an acceptable option.

This paper will outline how a paradigm shift (for both Council and community) represents a leading approach to flood and river management for a local authority. Solutions are being developed from the community up, rather than just presented as worked-up options from Council, as would normally be the case.

The paper will include:

- A desire to provide river protection for the community now and into the future
- Bridging the gap between perception and reality
- The difference between a holistic approach rather than a single engineering solution
- How to get a community to accept risk
- Multi Criteria Analysis methodology
- The time and commitment required to resolve the issues
- The way forward.

KEYWORDS

Future proofing, the four wellbeings, climate change, best practice, river management.

PRESENTER PROFILE

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1 INTRODUCTION

The town of Motueka in the South Island lies close to the mouth of the Motueka River on the western shore of Tasman Bay. It is, after Nelson and Richmond, the third largest centre in the Tasman Region, with a permanent population of around 6-7000. The surrounding area has a population around 14,000.

Although the centre of many tourist activities, especially during the summer season, Motueka is a thriving town in its own right, with a varied economy based largely on productive horticulture and agriculture. Essentially, Motueka is a service town, with the district economy based on horticulture, agriculture, fishing, forestry and tourism.

The surrounding district has a number of orchards as well as growing a variety of specialised crops such as hops and formerly serving as the main centre of tobacco growing in New Zealand.

The Lower Motueka River is susceptible to flooding during significant storm events. The original Motueka stopbanks were constructed between 1951 and 1956 by the Nelson Catchment Board to accommodate a 2% Annual Exceedance Probability (AEP) of 2830 cumecs with a freeboard of 600mm.

The scheme consisted of 20.4 kilometres of stop-banking, channel improvements and realignment along with bank protection. The scheme was primarily designed to prevent flooding of the Motueka flood plain where tobacco and hop growing yielded high returns.

The scheme at the time also included control of other main waterways flowing across the Motueka and Riwaka coastal plains. This included stopbanks along the Riwaka River and improvements to the Brooklyn and Little Sydney Streams.

At some time after the original scheme construction, additional banks were constructed on the eastern side of the river. The stopbanks below the State Highway Bridge have also been modified and extended since the scheme was constructed.



2 BACKGROUND

2.1 CURRENT CONSIDERATIONS

Tasman District Council's Ten Year Plan released in 2009 identified the need to review the existing banks. A full rebuild option was proposed and cost estimated by The Council to reconstruct the current stopbanks on the Motueka River. Tasman District Council has more recently reconsidered this intention, and continues to consult with the community on this matter. Council concluded that there was a need to determine the best practicable and affordable flood control option.

Although the stopbanks have prevented major flooding in the past, they do not meet modern standards. It is known that the construction methods used did not provide adequate compaction of the central core of the banks. Recent investigations have shown that the current engineering fitness of the stopbanks is such that they would not hold up

under sustained or repeated flooding events. It is therefore considered that, in their current state, they do not provide adequate protection to local residents and their assets. The initial review of the Motueka flood control scheme occurred in 2006 with a view to upgrading the scheme to a 1% AEP protection standard. Phase 1 of the review involved a feasibility study, and a preliminary design and costing report, for this level of design.

The 1% AEP standard of protection was adopted in principle, by TDC, to bring the Motueka Township and the Motueka Flood Plain up to the nationally recognised minimum standard of protection provided by similar flood protection schemes in New Zealand. The current NZ Flood Risk Management Standard [NZS 9401:2008] puts the onus on the local community to decide on the level of residual risk it is willing to accept.

The current flood control measures and stopbanks were discussed at length by submitters during the Ten Year Plan consultation processes. While many submitters acknowledged the need for action, it was on the condition that adequate on-going public consultation was an integral part of the process. At the heart of the conditional agreement by the community was the need to better understand the risks posed by the current state of flood defences. The community was concerned that any decision should take account of the balance between what is an acceptable level of risk, versus what the community believes is affordable given current economic circumstances.

3 THE NEED TO ALIGN THE COUNCIL AND THE COMMUNITY

3.1 COMMUNITY UNDERSTANDING

With a population of around 6–7000, the catchment has a relatively low number of rate-payers. Criticism had been given that the voice of the community had not been taken into account during the initial scheme upgrade options considerations. Different sections of the wider community also have different views about the relative merits of flood management for the Motueka River.

There is a range of perceptions held by members of the community. Some believe the existing banks are 'fine' and will provide adequate protection. Some perceive that a flood would not cause significant adverse effects. Others, particularly in Motueka's urban area, are concerned about the potential damage a flood could cause to their homes and livelihoods.

Like all communities, Motueka has been affected by changes in the economy. As many Local Bodies around New Zealand are experiencing, the Tasman District Council has found that the community is no longer accepting major pieces of work, or increases in their rating systems, without question.

The Council also has to gain an understanding of the community's perception of the stop banks and the risk associated with flooding. This becomes even more complicated for the Council when the existing stopbanks have protected the community since the late 50's.

Engineering knowledge provided a 'reality' view of the likely performance of the stopbanks and the consequence of flooding. The Council then gathered viewpoints from the community to identify the most commonly held perceptions. This was done by holding public meetings, feedback forums, market day stalls, website feedback options and linking into a local community chat site that posted a site for the Motueka Flood Control Project feedback.

With this list of more common perceptions The Council could plan how to bridge the gap between community perceptions and engineering reality. It was therefore decided to

follow The Local Government Act approach as it was considered that this would provide a structured method of communicating with the community.

3.2 COMMUNITY OUTCOMES

Community outcomes are important because they provide the opportunity for communities to talk about and describe a vision for their future. Achieving these desires will improve and ensure the well-being of New Zealand communities into the future.

Community outcomes are what the local authority aims to achieve in order to promote the social, economic, environmental, and cultural well-being of its district or region, in the present and in the future. Community outcomes describe the aspirations and priorities of New Zealand's communities, and can therefore provide a guide for Local Bodies.

3.3 THE COUNCIL'S RESPONSIBILITY

Section 90 of the LGA gives guidance to Local Bodies on adopting a policy of significance, when looking to change or implement large proposals. The Motueka Flood Control project meets this threshold due to the extent to which there is or is likely to be a change in the level of service in carrying out any significant activity, and the extent to which any decision is likely to be controversial in the context of numbers of people affected, the area affected or the duration of the effect.

Section 78 of the Local Government Act (LGA) 2002¹ required Tasman District Council to consider community views about these significant proposals.

The process, to be undertaken in considering these views, follows several stages.

Stage A: definition of problems and objectives

Stage B: identification of reasonably practicable options

Stage C: assessment of reasonably practicable options and development of proposal(s)

Stage D: adoption of proposal(s).

4 THE APPROACH TO GAIN ALIGNMENT

The Council produced a newsletter that was distributed to the Ward of Motueka. Included in this newsletter was acknowledgement of the concerns and queries raised by the community, plus flooding history, stopbank construction information, environmental facts and other factors that should be considered.

The Council has commenced a 'journey' to provide information to the community and receive feedback over several cycles and iterations. By continuing to listen and discuss the comments, issues, concerns, perception of the community over the Motueka River Flood Protection scheme the outcome will be a closing of the gap between the community's perception, the reality of the situation, and the understanding between both groups.

4.1 TAKING A HOLISTIC APPROACH

The approach presented to the community in the Ten Year Plan, identified a single engineering solution for the replacement of the existing stopbanks. Prior to this being presented, the community did not have an opportunity to discuss the merits, or

¹¹ Now repealed, (November 2010) Tasman District Council considers that this still represents best practice.

otherwise, of other approaches to the perceived issue. During the consultation phase many submitters acknowledged the need to have the investigations continue, but it was on the condition that ongoing public consultation during the planning stage continued.

Rather than just selecting a single best practice engineering solution, The Council is embracing a more holistic view of flood protection. This has entailed a more encompassing process to include consideration of:

- The four well beings: social, cultural, environmental and economic
- Future proofing
- Climate Change
- River management in short and long term horizons.

5 ACCEPTANCE OF RISK

5.1 THE COMMUNITY

Because the community is unwilling or unable to pay for a high level of protection, there is a need for the Council to gain the community's acceptance of risk. This will be done by taking a risk management approach that engages the community and The Council in working towards an acceptable solution. This will be done by undertaking a lot of communication with the community; such as identifying scenarios that are likely by taking a high cost, medium cost, low cost or the do nothing approach, and providing information on possible "failure" events and different "flood events".

Three key questions are being asked when looking at different options these are:

- What risks are posed by the current state of affairs?
- What is an acceptable level of risk?
- What is the community prepared to pay for?

A consultation process was undertaken during 2010 to establish the community's perception of the Motueka stopbanks. Public consultation was carried out in individual and group format. A series of Public Feedback Forums were also held, these involved five public meetings at various halls around Motueka. In addition to this, other forms of consultation such as information stands at the Motueka Sunday market were run to capture a different demographic of the community. There were two workshops attended by Councillors and invitees who were involved because of their long associations or experiences of the Motueka River or the area around it. A further workshop covered interested parties, including Department of Conservation, Fish & Game, local iwi, landowners and others.

A facility to receive feedback on the Tasman District Council's web site was also created, a local community website set up a feedback site, plus mail and phone feedback was also accepted. Submissions that had been made via the previous LTCCP process were also brought into the equation.

One particular response of significance, is that twice the number of submitters stated that they did not think that Motueka needed protection from flooding compared to those that did think protection was required.

Several respondents appeared to be happy to accept the possibility of the following:

- Town centre cut off

- No services for 12 hours or more
- Agricultural land underwater.

The feedback received in this initial round of consultation indicated that the community was resoundly against full replacement of the Motueka Stopbanks. The main reason for this was that it was not considered affordable and people do not want to pay for this sort of infrastructure through their rates.

This process is taking time and commitment from all, but it is an excellent way to build trust and understanding with the community. This intensive consultation/feedback process will result in a well-informed community that understands the risks associated with potential flooding and protection scenarios.

5.2 MULTI CRITERIA ANALYSIS (MCA)

Prior to moving into a full MCA process the consultation outputs were “work-shopped” to determine and confirm an initial selection of options for flood hazard mitigation. The workshop participants were chosen to continue the holistic approach to the selection process. The group included representatives from local iwi, landowners, farmers, community board, Councilors, Engineers, and members of the project team.

As the group considered the options they took a “fatal flaw” approach utilising the following three criteria:

- a) Affordable
- b) Consentable
- c) Technically feasible, (in terms of meeting the required design standard over the chosen design life).

The options that were identified were then shortlisted down to six that moved forward into the MCA workshops.

5.3 THE WORKSHOP

The project team facilitated a two day workshop that focused on the six shortlisted options.

Participants were divided into two groups, experts and evaluators, and were chosen to participate for a specific reason. The experts were chosen due to their knowledge and expertise, and the evaluators were chosen to again ensure that a fair representation and holistic approach was taken.

The workshop also provided education and understanding of the MCA approach. Nine different criteria were developed and used in the MCA exercise to make judgments about the relative merits of the different flood management options. The criteria were developed by discussion and agreement with Council staff as being representative of the various issues that needed to be considered in choosing the most appropriate scheme. Each criterion was assigned to one of the four well-beings that underpin the Local Government Act 2002. This assignment was made on the basis of the well-being that most closely relates to the criterion, ensuring a balanced treatment of the issues.

The workshop also needed to account for different community views, to allow these differing views to be represented, and scores were elicited separately for six distinct groups, based on the community’s location.

5.4 OUTCOME FROM THE MCA PROCESS

The outcomes from the workshop were then put through a sensitivity and robustness test. Following this some options were identified as more practicable. (Yet to be published)

The Council has so far nearly achieved Stage B of the LGA Section 78 requirements, being the identification of all reasonably practicable options for the achievement of the objectives identified in Stage A.

6 THE WAY FORWARD

6.1 A PRUDENT APPROACH

The community has embraced the consultation process, but continues to want specific information on possible solutions, particularly when it is associated with possible increases in their annual rate contributions.

The Project team, working with The Council, has had to balance the needs of the community for further information and the costs to produce this information. The prudent approach has been taken that the ideas, risks, options and solutions would go through a further process of refinement before further technical analysis would be undertaken.

The options are to be presented back to the community without any identified preferences. The process is to engage the community in discussion and understanding of what all of these options mean, and for the community and the Council to be satisfied that they have been heard and that there are no further options that need consideration.

Whilst this is happening the project team is also undertaking further technical analysis around the existing stopbanks and the river.

6.2 BENEFIT COST ANALYSIS PROCESS

An economic analysis using a risk-based Cost Benefit Analysis approach is being performed on four short-listed options identified from the earlier MCA. This process enabled a quantified assessment of the options costs to be made against the benefits from the flood protection each option provides. It also provides a quantification of the residual flood risk that remains should any of the options be selected. This information, once published, will provide (for the first time) quantitative information on which The Council and the community can decide the affordability and value of improved flood protection.

Once completed the BCA will form part of Stage C of the LGA Section 78 requirements. It will also provide the basis for informed decisions to be made by the community as to level of residual risk they are prepared to tolerate as required by the Flood Risk Management Standard NZS9401:2008.

6.3 AND THEN:

The feedback received from the community goes back into the pot of options, analysis is undertaken to understand if there is anything new or any valid reason to go back to the MCA process and reassess the outputs.

From here the shortlisted options will then go back to the community for further discussion and agreement. To ensure that the community can make informed decisions

the options will be presented with enough information to allow the community to have a robust debate.

The debate goes back to the initial three questions being:

- What risks are posed by the current state of affairs?
- What is an acceptable level of risk?
- What is the community prepared to pay for?

The challenge is how to convey succinct and understandable information based on complex arguments, risks, return periods, specialist technical information, and more, in a way that the community can make sound decisions.

6.4 WHAT IS THE LEVEL OF RISK ACCEPTANCE IN THE COMMUNITY

This is one of the big debates. The acceptance of risk is different for each and every member of the community, therefore the project is focused on getting the community as a whole to accept a risk level that will allow the Council to supply an acceptable solution for flood management.

Recent flood situations in both Australia and New Zealand have provided the community with further information on the likelihood of an event affecting them. A flood in the top of the Motueka River in early 2010, and a recent flood in Takaka approximately 50km away from the Motueka River, has highlighted the very real possibility of a 1% AEP flood in the River.

This information, along with information provided by the Project, may or may not influence members of the community to want to accept new flood control options. The balancing act for The Council is to get to the point that the majority of the community accepts a solution. The Council must then make a final decision to accept this solution and the risks associated with this or enforce a different solution.

The solution that is chosen will then go back to the community to allow further debate and discussion, prior to the option being fully implemented.

7 WHY SHOULD YOU CONSIDER THIS?

Financial times are tough. Infrastructure must be maintained and provided for the well-being of your community. A balance must therefore be struck. Traditional best practice solutions can be costly in the short-term. Your community may be willing to accept higher risk(s) to reduce these short term costs.

Following a robust process of working with the community the Council will have complied with Section 78 of the Local Government Act, and will have followed an acceptable process; this clearly confirms that the community has been involved in the decision making process.

In current times, communities are no longer accepting a "big brother" approach of informing them what they need and require within their environments, and passing these costs onto them. Local Bodies need to embrace the changes and ensure that they listen to, and work with, the community to reach decisions that not only sustain the existing community but meet the obligations to provide sustainable and forward focused solutions.

Ultimately the community will be happier and will value its Local Authority more highly.

8 THE CHALLENGES OF FOLLOWING THIS PROCESS

8.1 THE COMMITMENT

The time and commitment is great, and in this instance it is expected to take approximately three years before an acceptable solution is agreed and final design and construction is underway. In saying this, there is still a possibility that the community and Council will agree to do nothing more than an ongoing river maintenance strategy.

8.2 THE COST

There is a cost associated with a process of this nature, however, in this instance had this process been undertaken prior to a single engineering solution being presented, costs may have been saved. In the long term the decision may still result in the initial recommendation, however there is every likelihood that a cheaper option will be found that is acceptable, and an overall saving in costs to the community.

8.3 THE TENURE OF ELECTED COUNCILLORS

One of the challenges for any Local Body is to move large impact projects forward in a timely manner that may not be achievable within an elected Councillor's tenure. In this instance it will take approximately three years to achieve a decision, the physical works (if any), could take between 3 years and 20 years to implement dependent on the solution and the funding streams. In this instance there has been a change in Councillor's during this period, and the challenge is to continually engage, inform and move forward during these changes.

8.4 POSSIBILITY OF A MAJOR FLOOD DURING THE PROCESS

The unpredictability of a flood event lives with the community at all times. The balance for the Council is to be seen to be moving forward even if an event occurs. Like any Local Body decision, doing nothing for a period of time may result in major problems. Again by following this type of process the community is engaged and aware that it is part of a solution and the Council is not sitting back and waiting.

9 CONCLUSION

The Tasman District Council has embraced a change in the way it works with communities for this project. It has recognized a change in community attitude, a change in economy, and is working to engender a trusted and open working environment.

More and more Councils are being faced with the challenges of making robust decisions about when and if to invest in costly works to improve a community's resilience to low-probability-high consequence natural events. This is especially challenging when the funding base may be very limited as in the case of Motueka. Faced with high uncertainty and high costs the importance of a robust decision making process is of paramount importance. Deferring decisions or choosing inappropriate solutions may mean that future generations will face even greater challenges and greater costs.

REFERENCES

NAMS, 2004

Water New Zealand 7th South Pacific Stormwater Conference 2011

Optimised Decision Making Guidelines – A Sustainable Approach to Managing Infrastructure

NZ National Asset Management Steering Group Version 1.0 Nov 2004

Keenan N, 2010

Lower Motueka River Flood Scheme – Hydraulic Modelling and Preliminary Costings for Upgrade Options

MWH Report, Sept. 2010

Woods, S, 2010

Motueka Stopbanks – Assessment of Potential Failure Modes

MWH Technical Note, Aug. 2010

NZS 9401:2008 Managing flood risk – a process standard