

**BEFORE INDEPENDENT HEARING COMMISSIONERS  
APPOINTED BY THE TASMAN DISTRICT COUNCIL**

**UNDER:** the Resource Management Act 1991

**IN THE MATTER OF:** Resource consent applications  
RM190877, RM190876, RM190878,  
RM190879, RM190881 and RM190880  
associated with the Pōhara drainage  
improvement project, Pōhara Village,  
Golden Bay–Mohua.

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**STATEMENT OF EVIDENCE IN CHIEF OF DAVID GORDON STEPHENSON ON  
BEHALF OF  
TASMAN DISTRICT COUNCIL**

Dated: **23 April 2021**

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## 1. INTRODUCTION

1.1 My full name is David Gordon Stephenson. I am employed at the Tasman District Council (**the Council**), in the Engineering Services Department as the Team Leader of Stormwater and Waste Management and have been employed by the Council for 15 years.

1.2 Prior to my current role at the Council I was employed as a utilities asset engineer, a network engineer and waste management engineer. My responsibilities have included the oversight of the Council's operations contracts, commissioning and oversight of computer modelling of stormwater networks, management of capital works projects and more recently management of wider operations. I have also been involved in several civil defence response and recovery operations.

### **Qualifications and experience**

1.3 I have a Bachelors Degree in Civil Engineering (University of Auckland, 1996) and 25 years of experience as a civil engineer, specialising (among other areas) in stormwater and river management and hydraulic and hydrological modelling. I am a member of Engineering New Zealand.

### **Background**

1.4 I have been involved in the proposed works at Pōhara through the civil defence response and recovery from December 2011 and the early evaluation of options from 2012 and subsequent modelling and options assessment from 2014 to 2016. From 2016 to late 2018 my role did not include responsibility for stormwater networks, but from time to time I contributed to the review of the modelling and options assessment. Since November 2018 I have been responsible for the day-to-day operation of the stormwater network through my team leader role.

1.5 The intent of my evidence is to summarise Council's approach to funding flood protection, give further context and background of flooding in the catchment and outline the options that the Council considered prior to adopting the proposal in the consent application.

1.6 I am familiar with the resource consent applications to which these proceedings relate. In preparing my evidence, I have reviewed:

- (a) The Resource Consent application and assessment of environmental effects, prepared by Tonkin & Taylor and dated June 2019, including the Pohara Stormwater Modelling – Drainage Network Improvement Options Report (November 2016) and results of the modelling work;
- (b) submissions to the Resource Consent application;
- (c) the evidence of Mr Velluppillai;
- (d) Pohara Catchment Stormwater – Issues and Options Assessment, MWH, June 2012
- (e) Pohara Subdivision Flooding Investigation, MWH, July 2009
- (f) Council stormwater records and files, including photos, correspondence, presentations and file notes
- (g) Council GIS data and aerial photography and Land Information New Zealand (LINZ) aerial photography

### **Code of Conduct**

- 1.7 I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court's Practice Note as updated in 2014. My evidence has been prepared in compliance with that Code. In particular, unless I state otherwise, this evidence is within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

## **2. SCOPE OF EVIDENCE**

- 2.1 My evidence is intended to provide further context to the resource consent application, to outline the events leading up to the proposal to reduce flooding in the Pōhara village catchment and to briefly confirm the benefits of the project.

- 2.2 My evidence is structured as follows:

- (a) Council's stormwater and flood management responsibilities,
- (b) a description of the catchment,
- (c) flood history in Pōhara and previous flood management works,

- (d) the December 2011 rainfall event and subsequent remedial works,
- (e) investigation of flood reduction options,
- (f) Council's engagement with the community, and
- (g) the benefits of completing the works.

### **3. COUNCIL'S STORMWATER, DRAINAGE AND FLOOD PROTECTION RESPONSIBILITIES**

- 3.1 Tasman District Council (the Council) is a unitary council, and as such provides the functions of a district and regional council. The stormwater, drainage and flood protection functions of the Council are provided by the Engineering Services department of Council.
- 3.2 These drainage functions are funded and provided through three engineering activities: transportation, rivers and stormwater. The proposed works outlined in this consent application are funded by the Council's stormwater activity.
- 3.3 The stormwater activity within Council manages and maintains a series of urban stormwater drainage networks across the district, servicing the majority of urban and semi-urban households. The assets used to provide this service include drainage channels, piped reticulation networks, tide gates, stormwater and flood detention areas, inlet structures, discharge structures and quality treatment assets.
- 3.4 The objective of the stormwater activity of Council is to "provide cost-effective and sustainable stormwater systems that reduce flooding and meet environmental standards" and the Council undertakes the activity to "minimise the risk of flooding of buildings and property from surface runoff and small urban streams".<sup>1</sup>
- 3.5 The Council's intent in the stormwater activity is to provide the safe and efficient drainage and disposal of stormwater and manage floodwater from extreme events in the urban drainage areas. Council does this by providing stormwater drainage networks, protects overland flow paths and provides flood protection works. The flood protection works funded by the stormwater activity (including this project)

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<sup>1</sup> Tasman District Council Stormwater Activity Management Plan, 2018.

improve the economic and social well-being of the District by protecting people and property from surface flooding.

- 3.6 In providing stormwater services, the Council aims to provide four levels of service, and these are:
  - 3.6.1 to respond to and reduce flood damage from stormwater to property and risk to the community,
  - 3.6.2 strategies to manage stormwater systems so that our community receives best value for money,
  - 3.6.3 management of the network at a level which satisfies the community, and
  - 3.6.4 that stormwater systems do not adversely affect or degrade the receiving environment.
- 3.7 The Council's Stormwater Activity Management Plan sets out the Council's 30 year programme of work to deliver these levels of service. This programme of work includes the operations and maintenance of the stormwater network, as well as new capital works and operational funding to improve the levels of service.
- 3.8 The Council funds the maintenance of the urban stormwater networks through a targeted rate, collected from ratepayers within 15 Urban Drainage Areas (UDA's). The Pōhara UDA (Figure 1) is one of these rating areas.

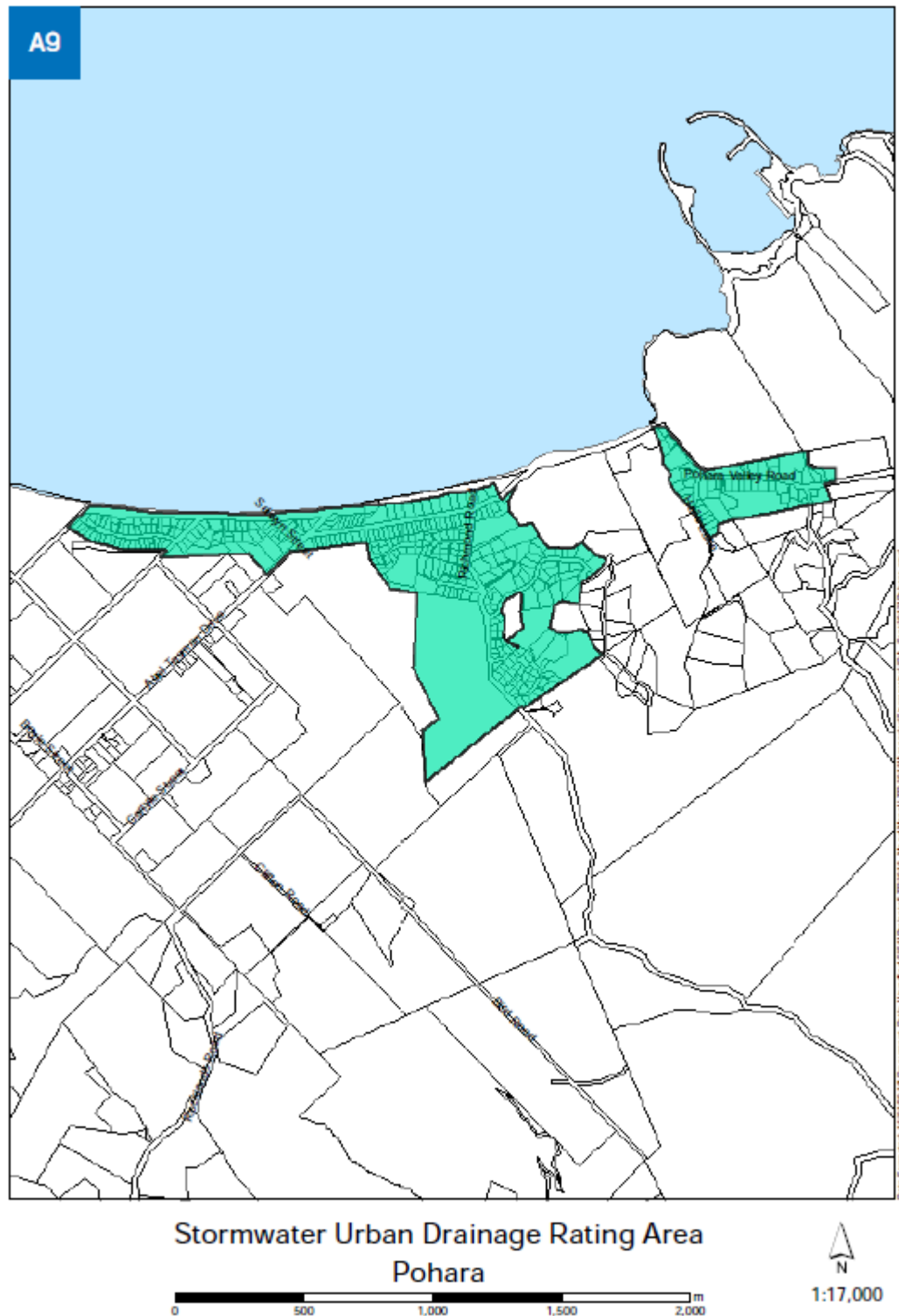


Figure 1: Pōhara UDA (Tasman District Council Long Term Plan 2018-2028, Volume II).

3.9 The works proposed in this consent are intended to improve levels of service in the Pōhara community by reducing flood risk and damage to property. The works were

first programmed in the 2015 Stormwater Activity Management Plan, and have been carried forward to succeeding years, due to delays in delivering the work.

- 3.10 In the proposed programme of work in the 2021 Stormwater Activity Management Plan the Council is planning for further levels of service improvements, including reduction of flooding and protecting and enhancing the natural environment.
- 3.11 A key programme of work to support this is the development of catchment management plans. These plans will assist the Council to identify integrated solutions to address flooding and environmental issues.
- 3.12 The development of catchment management plans has commenced with larger urban areas, and will progress to smaller urban areas over time. The Richmond catchment management plan was completed in 2019 and the Motueka catchment management plan is due for completion this year. We expect to complete the Pōhara catchment management plan in 2026.
- 3.13 In parallel with this work, in September 2019, Council applied for a global discharge consent for Council's stormwater activities across the district. This consent was publically notified, and received one submission in support of the consent. At the date of writing, this consent had not yet been granted.
- 3.14 Not all drainage in and adjacent to UDA is funded or managed by the stormwater activity of Council. The drainage of roading surfaces is a transportation function, and the maintenance of many open channels and streams on private land within UDA areas is the responsibility of private landowners.
- 3.15 In addition to the drainage of UDAs, the Council also maintains 285 kilometres of major rivers throughout the District. These rivers, known as classified rivers X and Y, are funded by a differential river rating system based on land value. The Council maintains and improves river assets in rivers X and Y, such as stopbanks and erosion protection. There are also many other rivers, streams and creeks that are on private land or on land owned by the Council or the Crown. These are collectively known as Rivers Z. The channels and river protection assets in these rivers are typically owned and maintained by the land owner, although the Council at times part funds maintenance and improvements in these rivers.
- 3.16 The works proposed in this resource consent application are within, or adjacent to land within the Stormwater Urban Drainage Rating Area in Pōhara and adjacent



and within three watercourses: Ellis Creek, and two unnamed tributaries referred to in this consent as Bartlett Creek and Clifton Creek.

- 3.17 While some of the proposed works is adjacent to or in these watercourses, such as the proposed widening at the confluence of Ellis and Clifton Creeks and bunding adjacent to the Bartlett Creek, the intention of the works is to improve the drainage capacity of these watercourses and to protect properties within the UDA boundary. Council's view is that under the Land Drainage Act 1908 the landowners adjacent to these watercourses have a responsibility to maintain the remainder of these channels free of obstructions.

#### **4. CATCHMENT DESCRIPTION**

- 4.1 The proposed works fall within the lower reaches of the Ellis Creek catchment, the general extent of which is shown in Figure 2. Ellis Creek flows from steep hill country to the south east of Clifton, across an alluvial fan and into the Motupipi Estuary west of Pōhara.
- 4.2 The proposed works will be immediately south and west of the Pōhara settlement, in the main stem of Ellis Creek, and in "Bartlett Creek", an informal name for the un-named tributary of Ellis Creek that flows from the east of the catchment, west of Richmond Road, under Abel Tasman Drive and joins with Ellis Creek around 300m downstream. This section of the stream flows west, parallel to the Pōhara Beach, and just south of the dune formations of the beach.
- 4.3 The eastern boundary of Ellis Creek is bordered by Kohikiko Place, in Pōhara. Stormwater to the east of this road flows to the eastern end of Pōhara Beach, via a series of constructed channel swales and natural channels, and a culvert under Richmond Road.



Figure 2: Ellis Creek catchment

## 5. PŌHARA FLOOD HISTORY AND PREVIOUS FLOOD MANAGEMENT WORKS

- 5.1 Since at least the 1940s the area immediately south of Selwyn Street and 734-800 Abel Tasman Drive has been in pasture with modified drainage channels. Council records indicate that the low lying area to the south of the Pōhara Beach dune areas has been subject to flooding over a sustained period of time.
- 5.2 Until the 1950's there was minimal development activity in Pōhara village (Figure 3), and flooding occurred mainly on rural land. From the 1960's further development occurred (Figure 4) and in 1975 the land in Pōhara adjacent to Abel Tasman Drive was subdivided into 46 residential sections (Figure 5).



5.3 Council records indicated that in 1959 the Nelson Catchment Board “cleaned out Ellis Creek and served notice on landowners to keep it clean”.<sup>2</sup>

5.4 In the early 1970’s the drainage board investigated options to improve drainage in this area and relieve flooding, but with a lack of agreement from largest land owners this did not proceed.<sup>3</sup> In April 1974 significant rainfall occurred and caused flooding in the camp ground and nearly entered a number of dwellings and motels<sup>4</sup>. In early 1976 a flood event was reported that indicated flooding on 31 sections and in 1976 a flood protection scheme was proposed, but this scheme did not proceed.

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Figure 3: Lower Ellis Creek and Bartlett Creek in 1952<sup>6</sup>



Figure 4: Lower Ellis Creek and Bartlett Creek in 1965<sup>7</sup>

<sup>2</sup> File notes, Doug Nottage, former Tasman District Council and Nelson Marlborough Regional Council staff member, August 1998.

<sup>3</sup> File notes, Doug Nottage, former Tasman District Council and Nelson Marlborough Regional Council staff member, August 1998.

<sup>4</sup> Nottage, 1998.

<sup>5</sup> Nottage, 1998.

<sup>6</sup> Crown aerial photos, SN579, LINZ CC-BY 3.0, sourced from retrolenz.co.nz

<sup>7</sup> Crown aerial photos, SN1739, LINZ CC-BY 3.0, sourced from retrolenz.co.nz



Figure 5: Lower Ellis Creek and Bartlett Creek in 1980<sup>8</sup>

- 5.5 Reports from 2001 indicate that “flooding has occurred in the past as a result of runoff from the limestone hill country being impounded behind the beach fore dune system. These included floods in April 1974 and January 1976 severe enough to cause significant flooding of the Pohara Camping Ground.”<sup>9</sup> This report also indicated flooding from Ellis Creek in July 1998, but not into the area adjacent to housing in Abel Tasman Drive.
- 5.6 Between 1991 and 2005 significant subdivision occurred to the east of the Ellis Creek catchment, on the east of Richmond Road. Between 2001 and 2006, further land in the eastern edge of the catchment was developed, in the area of west of Richmond Road: Sandridge Terrace, Watino Place and Kohikiko Place.
- 5.7 In 2008, following this subdivision creating Kohikiko Place, there were reports of flooding south of Abel Tasman Drive. This led to investigations of options to reduce flood risk in this area. These options included reinstating drainage capacity to the east through the subdivision, increasing capacity to the west (including additional culvert capacity under Abel Tasman Drive) and increasing the capacity of Bartlett Creek and providing bunding along the northern bank of Bartlett Creek.
- 6. DECEMBER 2011 RAINFALL EVENT AND REMEDIAL WORKS**
- 6.1 In December 2011 a significant rainfall event caused extensive flooding, slips and debris flows in the Nelson region. Some of the most significant flooding and debris flow occurred in the eastern Golden Bay, including Pōhara, Pōhara Valley and

<sup>8</sup> Crown aerial photos, SNC5676, LINZ CC-BY 3.0, sourced from retrolenz.co.nz

<sup>9</sup> Flood Hazard Report, Land and River Limited, 2001, cited in Issues and Options Assessment Pohara Catchment Stormwater, MWH, June 2012.

Ligar Bay. Tākaka received 674mm of rainfall in 48 hour period – a third of the normal annual rainfall (Figure 3).

- 6.2 During this flood event I was employed in the response effort, as part of the operations team, and then subsequently in the recovery team in the following months.
- 6.3 This event caused substantial flooding in the Pōhara village area, including the inundation of habitable floors on approximately five properties on the south side of Abel Tasman, west of Kohikiko Place. Figure 4 shows the extent of flooding in the Pōhara village area and was compiled by Council staff from a combination of ground observations and aerial photography commissioned shortly after the event.
- 6.4 Flooding in the Pōhara catchment was due to a combination of an overflow from Ellis Creek into Bartlett Creek from above Abel Tasman Drive, debris flows blocking Ellis and Bartlett Creeks and sustained high stormwater flows filling low lying areas.

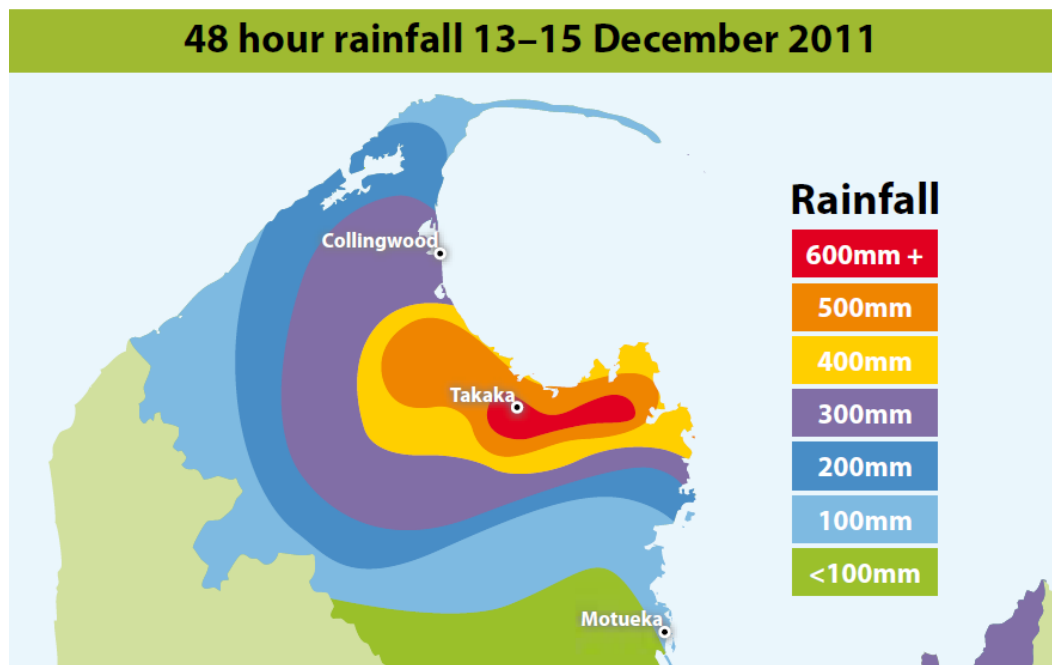
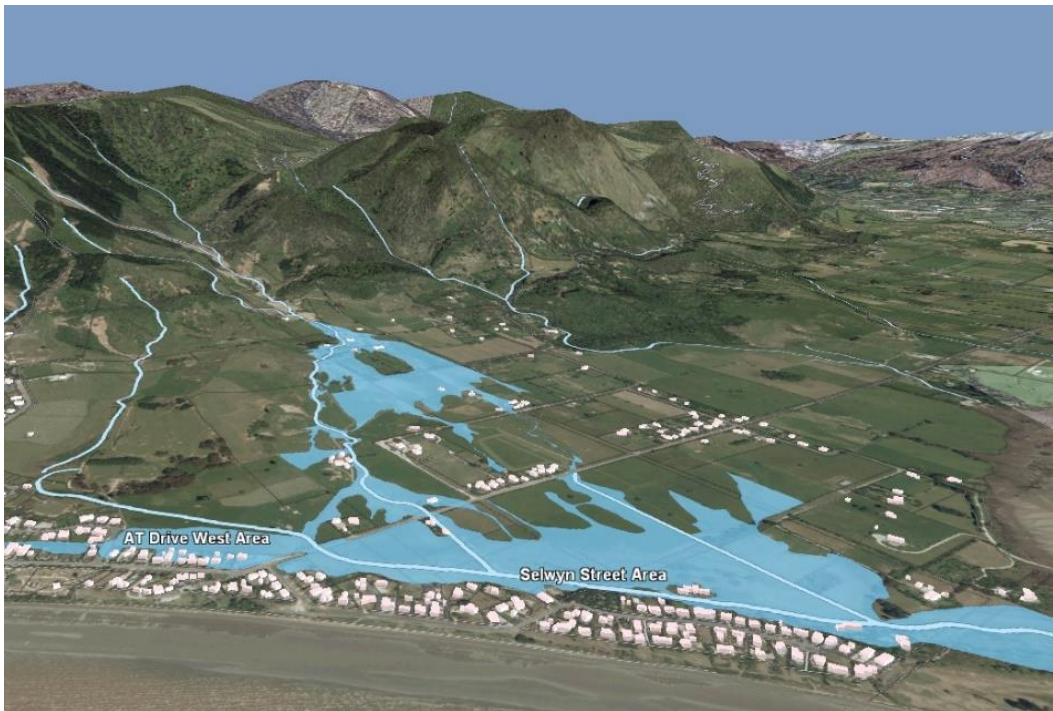


Figure 3 – December 2011 rainfall event<sup>10</sup>

<sup>10</sup> Newsline, Taman District Council, January 2012.



*Figure 4 – Extent of flooding in December 2011 event*

- 6.5 In the immediate response to the flood event Council, acting under the control of Nelson Tasman Civil Defence, arranged for clearance of Bartlett Creek from Abel Tasman Drive to the confluence with Ellis Creek, and clearance of Ellis Creek from Bird Road to approximately 190m downstream of Bartlett Creek.
- 6.6 This provided a measure of flood relief, but extensive slip activity in the upper Ellis Creek catchment resulted in on-going debris and sediment loading in the stream over the next two years. This sediment dropped out in the stream bed in the lower reaches of Ellis Creek and caused on-going surface flooding issues for properties in the area (Photos 1-4).





*Photo 1: Flooding in Bartlett Creek, upstream of Abel Tasman Drive July 2012, from Abel Tasman Drive, facing east*



*Photo 2: Flooding in Bartlett Creek, upstream of Abel Tasman Drive July 2012, from Kohikiko Place, facing west*



*Photos 3,4: Flooding around houses on Abel Tasman Drive: Left: July 2012 at 762 Abel Tasman Drive; Right June 2013 at 750 Abel Tasman Drive*

6.7 Over the next 18 months Council continued to work with local landowners and continued to clear sediment from the stream channel after flood events (Photo 5) and to implement small drainage improvements while investigating longer term

options for the Pōhara village. I had an on-going involvement in this work as it moved from civil defence recovery to business as usual stormwater management.



*Photo 5: Ellis Creek channel clearance upstream of 59a Selwyn Street, July 2012*

- 6.8 In July 2012, while clearing the channel, Council's contractor damaged three private culverts at 59a Selwyn Street, and these were subsequently replaced by Council with a single span bridge in March 2013 (Photo 8).





*Photo 8: New bridge on Ellis Creek at 59a Selwyn Street, March 2013*

- 6.9 The ongoing sediment deposition in the lower Ellis Creek caused water to back up into Bartlett Creek and caused regular flooding of land and residential properties adjacent to Abel Tasman Drive. In March 2012 Council installed a flap-gated culvert adjacent to Abel Tasman Drive to prevent flood waters from small events in Bartlett Creek entering these properties (Photos 6, 7).



*Photos 6, 7: Installation of flap gated culvert just south of 734 Abel Tasman Drive (March 2013, left) and operation in rainfall event (June 2013, right)*

- 6.10 In 2015 Council decided to include \$920,700 in the Council's 2015-2025 Long Term Plan to upgrade the drainage network and to provide flood protection to properties in the Pōhara village area.

## **7. INVESTIGATION OF FLOOD REDUCTION OPTIONS**

- 7.1 Prior to 2015 Council had been investigating options to reduce flooding in the Pōhara village area. This work intensified in 2012, following the December 2011 flood event. From 2012 to 2015 I was the lead staff member for the engineering department in this work.
- 7.2 In early 2012 we commissioned MWH New Zealand to produce an Issues and Options Assessment for Pōhara village, including the Ellis Creek catchment in the west and the Richmond Road catchments to the east. This report was finalised in June 2012 and assessed a wide range of options with cost estimated at an order of magnitude level. The report recommended further hydraulic modelling of the Ellis Creek and Bartlett Creek catchments to better understand the existing level of service and the effect of any proposed engineering works.
- 7.3 In early 2013 we engaged Tonkin & Taylor (T&T) to build a hydraulic model to determine flood hazard and assess the potential benefits of a range of flood reduction options. In early 2014 we received a finalised flood hazard report and engaged T&T to evaluate flood reduction options.
- 7.4 Through 2015 and 2016 Council worked with T&T to evaluate a range of options to reduce flooding in the Pōhara village. The details of this modelling are contained in the Pōhara Stormwater Modelling Report (November 2016) appended to the consent application.
- 7.5 From 2016 my involvement in this work diminished as I assumed responsibility for other engineering activities, but I continued to be involved from time to time in the review of some aspects of the work.
- 7.6 The early modelling evaluated a wide range of options, including diversion of parts of the catchment and direct discharge to the coast. The effectiveness of these options were reviewed and a shorter list of options were prepared for the next phase of modelling.
- 7.7 As outlined in the application and Mr Velluppillai's evidence, the subsequent modelling evaluated five combinations of improvement options. This assessment of options identified a preferred option, based on an assessment of estimated costs and benefits. This preferred option was further refined through the design process and following consultation with landowners.

## **8. ENGAGEMENT WITH THE COMMUNITY**

- 8.1 Tasman District Council has engaged extensively with the local community: during recovery from the 2011 flood event, while identifying the flood risk and causes of flooding, while identifying and assessing options and while developing the proposed solution. I was directly involved in this engagement between 2012 and 2014.
- 8.2 During the assessment of options Council staff have engaged with the community both on a one-to-one and public basis. The engagement has included site visits to meet with affected owners, engagement by phone and email and several public meetings. The proposal was finalised following feedback at a public meeting in August 2017.
- 8.3 At this meeting the proposed works were presented by Council engineering staff and Mr Velupillai. The presentation included a description of the proposed works and a demonstration of the change in flood risk to properties. Our records show that 41 members of the public attended.
- 8.4 I resumed my direct involvement in this project when assuming my team leader role in late 2018, with responsibility for Council stormwater and waste management operations.
- 8.5 When this consent was notified to 26 potentially affected property owners we also wrote to a further 155 landowners in the Pōhara village area and published information about the project on our website. I am advised by the project manager that we did not receive any negative feedback on our proposal.

## **9. THE BENEFITS OF COMPLETING THE WORKS**

- 9.1 In preparing this evidence I have reviewed the resource consent application, supporting documents and submissions to the consent, reviewed Council records and referred to my own experience and knowledge of the catchment. My review of Council records has included previous flood assessments, reports and file notes, including one which noted records back to 1959.

- 9.2 I am confident that the proposed works are the most practicable, achievable and affordable solution to reduce the flood risk presented to the residential properties in the Pōhara village area. It is clear that many of these properties have been at risk of flooding for several decades and the flood event of 2011, while an extreme event and beyond Council's design standards, has highlighted these flood risks.
- 9.3 I consider that the proposed works will significantly reduce the flood risk to residential properties on and near Abel Tasman Drive. The modelling Council commissioned has indicated that flood levels in a 1% AEP will decrease at 59 properties, and that this decrease will exceed 100mm on 40 properties.
- 9.4 Council acknowledges that further improvement is required in the stormwater activity. The Council is proposing to continue a programme of other stormwater improvement works across the 15 Urban Drainage Areas. This work will address the effects of growth, reduce flooding in flood prone areas and improve environmental outcomes. This work will be informed by modelling and catchment management plans, and in accordance with our global discharge consent, when granted. The works will balance the Council's and community's objectives with the ability of the community to pay for these works.
- 9.5 In parallel with this programme of works we will continue to work with our colleagues in the regulatory section of Council. With them we will ensure that landowners adjacent to the water courses in this and other catchments continue to keep them clear of obstructions and meet their obligations under the freshwater reforms.

**David Gordon Stephenson**

23 April 2021.