

**BEFORE THE MANAWATU – WANGANUI REGIONAL COUNCIL (HORIZONS  
REGIONAL COUNCIL)**

*In the matter of*            **The Resource Management Act 1991; and**

*In the matter of*            **The Proposed One Plan: Consolidated Regional  
Policy Statement, Regional Plan and Regional  
Coastal Plan for the Manawatu - Wanganui Region**

---

**STATEMENT OF EVIDENCE BY DAVID RICHARD MURPHY  
FOR PALMERSTON NORTH CITY COUNCIL**

**CHAPTER 10**

**HAZARDS**

---

Dated: 17 April 2009

---

## Introduction

---

1. My name is David Richard Murphy. I hold the position of Senior Policy Planner with the Palmerston North City Council. I have the tertiary qualification of Bachelor of Resource and Environmental Planning (honours) from Massey University and I am a full member of the New Zealand Planning Institute. I have seven years planning experience, of which five years have been in local government with the Palmerston North City Council (PNCC).
2. I have read the One Plan Hearing Procedures and Directions and Requests from the Chairperson circulated to all submitters by Horizons Regional Council (Horizons) on 9 May 2008. I have read the Code of Conduct for Expert Witnesses (section 5 of the Environment Court Consolidated Practice Note 2006). I agree to comply with this Code of Conduct.
3. I have overseen PNCC's formal response to the Proposed One Plan: Consolidated Regional Policy Statement, Regional Plan and Regional Coastal Plan for the Manawatu - Wanganui Region (the One Plan) since the initial submission on the One Plan "Road Map" in October 2005. This work has included attendance at a number of meetings, including pre-hearing meetings, with Horizons officers; the preparation of PNCC's submissions on earlier One Plan working documents; and the preparation of PNCC's formal submission and further submission on the Proposed One Plan.
4. While this is my own expert planning evidence, given the strategic importance of the One Plan to PNCC's long term planning, I do refer, in parts, to the collective view PNCC has on the One Plan.
5. While PNCC has not commissioned specific hydrological engineering evidence for this hearing, I have discussed the approach recommended by Mr. Phillip Percy with senior engineering officers at PNCC.
6. In my role at PNCC I have been involved in a number of recent developments, including extensions to the City's urban limits, which have raised the flood hazard management issues that are the subject of Mr. Percy's s42A report and my evidence that follows. These developments have also involved significant communication with Horizons' planning and engineering staff.

---

## Structure of Evidence

---

7. My evidence is structured in the following manner:
  - (a) Introduction (above)
  - (b) Structure of Evidence (this section)
  - (c) Scope of Evidence

- (d) PNCC's interest in the Hazards sections of the One Plan
- (e) PNCC's submission points on the Hazards sections of the One Plan
- (f) Planning Analysis
- (g) Horizons Regional Council s42A Reports

---

### Scope of Evidence

---

8. My evidence focuses on recommended policy 10-2: *Development in floodways and other areas prone to flooding* and policy 10-4: *New critical infrastructure*. These policies are very significant to long term strategic land use planning within Palmerston North City.

---

### PNCC's Interest in the Hazards Sections of the One Plan

---

9. PNCC lodged a submission on the One Plan in August 2007. PNCC also lodged a further submission on the One Plan in December 2007.
10. PNCC has a statutory duty to the Palmerston North community to ensure the sustainable management of the City's natural and physical resources is achieved in an integrated manner. It follows that the City's interest in the Hazards sections of the One Plan rests on the following grounds:
- PNCC is responsible for the provision and ongoing maintenance of critical infrastructure including the provision of water, wastewater, stormwater and roading services.
  - PNCC is continuing to undertake reviews of residential and industrial growth options for the City. Determining appropriate areas to meet the City's demand for residential and industrial growth is challenging and made difficult by a number of constraints, including the avoidance or mitigation of natural hazards.
  - Preferred residential and industrial growth paths are best determined based on a robust analysis of all possible constraints and key considerations. It is important that the One Plan achieves its purpose under the RMA while also providing sufficient flexibility to provide for the continued growth of the City in a sustainable manner.
  - In general PNCC is seeking three key outcomes within the One Plan to assist with its urban growth planning. These are:
    1. A flexible **flood hazards policy**;
    2. A decision that is consistent with the approach proposed within the One Plan that regional direction is not required on the loss of **Class I and II soils** due to urban expansion.

3. Greater regional direction on the need for the **strategic integration of infrastructure with land use.**

---

### **PNCC's submission points on the Hazards section of the One Plan**

---

14. The decisions requested by PNCC within its original submission on the Hazards section of the One Plan are outlined within Appendix A.

---

### **Planning Analysis**

---

15. As mentioned above, my evidence focuses on recommended policy 10-2: *Development in floodways and other areas prone to flooding* and policy 10-4: *New critical infrastructure*.

#### **Policy 10-2: Development in floodways and other areas prone to flooding**

16. This policy was the focus of PNCC's submission on the Hazards section of the One Plan. The reason for this is the significant effect it will have on long term strategic land use planning within Palmerston North City.
17. The notified version of the One Plan had two parts to Policy 10-2. Policy 10-2(a) covered floodways while Policy 10-2(b) covered floodable areas.

#### **Policy 10-2(a) Floodways**

18. The PNCC submission on the One Plan submitted in strong support for Policy 10-2(a).
19. Policy 10-2(a) has been recommended to be amended. I support the recommended amendments to Policy 10-2(a), in particular the removal of the phrase "by generally not allowing" for the reasons outlined within Phillip Percy's s42A report.

#### **Policy 10-2(b) Floodable Areas - recommended as Policy 10-2(b), (c) and (d)**

20. The practical implications of Policy 10-2(b) dominated the PNCC submission on the Hazards section of the One Plan.
21. PNCC submitted in strong opposition to the avoidance only approach of the notified version of Policy 10-2(b). The reasons for this were:
  - a) It does not allow for the optimum amount of protection to be calculated and adjusted over time as knowledge of flood frequency and consequences changes over time;
  - b) It may not be economically efficient for some large scale urban developments;
  - c) It raises potentially significant issues for adjoining properties (displacement of flood water);

- d) It may rule out a number of desirable urban and industrial growth options for Council;
  - e) It raises potential landscape effects;
  - f) It may threaten overriding City objectives such as compactness and sustainable transport;
  - g) It removes natural stormwater / drainage patterns;
  - h) It is not based on a rigorous section 32 analysis;
  - i) In working with PNCC to find solutions to a number of proposed developments Horizons has agreed to mitigation meaning Horizons is effectively in breach of its own Policy;
  - j) A strict interpretation of the Policy may not allow for infill subdivision to occur in areas already protected by the existing flood protection scheme;
  - k) PNCC prefers Policy 24.3 of the current RPS; and
  - l) Overall the Policy is not consistent with the purpose of the RMA 1991 which is to promote the sustainable management of natural and physical resources.
22. In reviewing the s42A reports prepared for the Hazards hearing it is apparent that a significant amount of analysis has gone into assessing the PNCC submission and this has resulted in quite substantial changes to the recommended version of Policy 10-2(b). The detailed response and analysis of Horizons reporting officers is much appreciated by PNCC.
23. Recommended Policy 10-2(b) goes some way to addressing PNCC's submission points, however, in my opinion, recommended Policy 10-2(b) leaves some issues unresolved and raises other potential implementation problems.
24. I support the explicit shift from avoidance to avoidance or mitigation within recommended Policy 10-2(b).
25. I support the 0.5% annual exceedence probability flood event (AEP) as being the starting point or minimum requirement for Policy 10-2(b). I acknowledge a higher level of protection may be required in certain circumstances within Palmerston North City given the majority of the existing City is afforded 0.2% AEP protection from the lower Manawatu River flood protection scheme.
26. My concerns with recommended policy 10-2(b) relate to the following matters:
- a) The definition of residual inundation
  - b) The availability of 0.5% AEP and 0.2% AEP flood modelling data and flood levels
  - c) The phrase "within any other area likely to be inundated by a 0.5% AEP flood"
  - d) Infill development within existing areas
  - e) The "functional constraints" of non critical infrastructure that is not covered by Policy 10-4

The definition of residual inundation:

27. The definition of residual inundation is critical to the operation of the policy as it essentially sets the minimum performance standard should flood mitigation fail during a 0.5% AEP flood or a 0.2% AEP flood occur. The difficulty I have with the definition of residual inundation is it completely removes the ability for any robust risk assessment process to be carried out in relation to the merits of the flood mitigation measures that may be put in place. It essentially puts in a place a “backstop” based on an assumption that the proposed flood mitigation will fail at some point in time in the future.
28. The definition of residual inundation places no weight at all on the scale, design or level of maintenance that will occur on the proposed flood mitigation measure. The Policy is set up for when the flood mitigation fails as opposed to allowing for a thorough assessment of the relative risk of it failing.
29. Hypothetically speaking, under the recommended policy flood mitigation could be provided against a 0.1% AEP flood (1000 year flood) but the filling or raising of land behind the flood mitigation would still need to occur to ensure the minimum requirements of Policy 10-2(b)(ii) are met (residual inundation will be no deeper than 0.5m above finished ground level with a maximum water velocity of 1m/s or some other combination of water depth...)
30. The recent Te-Matai residential development and second bridge scenario is a relevant “real life” example.
31. I appreciate that the Te-Matai residential development is no longer part of PNCC’s urban growth planning and I am not advancing the idea that it should be promoted again. It is purely being used as a real life example.
32. Horizons are in the process of upgrading the Te-Matai road drain stop-bank system to ensure the desired level of flood protection is maintained for Palmerston North City. One proposal suggested for the Te-Matai residential development and second bridge crossing was that the new 2 lane approach road be placed on top of a significant stop bank designed to provide protection against the 0.2% AEP flood.
33. My understanding is such a proposal would have provided a significant level of protection to the Te-Matai area and improved the overall functioning of the wider Manawatu flood protection scheme, whilst also removing the requirement to upgrade the narrow Te-Matai road drain stop bank. It is also my understanding that such a proposal was generally well supported by the engineering officers within Horizons.
34. Despite the significant benefits to the wider operation of the flood protection scheme and the relative minor risk of such a substantial form of flood mitigation failing, the form of recommended Policy 10-2(b) would still require all land behind the proposed flood mitigation to be filled to ensure the minimum requirements of Policy 10-2(b)(ii) are met. The Policy provides no flexibility for local decision makers to take into account the overall benefits of the proposed flood mitigation measures or associated level of risk.
35. As noted in the PNCC submission, one of the most significant benefits of the current RPS flood mitigation policy is the flexibility it provides to decision makers to take into account the benefits and costs of the flood avoidance or flood mitigation measures proposed.

36. The current operative RPS flood hazard policy is:

*To ensure that activities and development of areas at risk from natural hazards minimise risks to human life, infrastructure and property, and the natural environment. In areas of high risk to people and communities, hazard avoidance is to be advocated. Where costs of hazard avoidance outweigh its benefits local authorities are to promote hazard mitigation. This includes education, planning, response and recovery procedures.*

37. Substantial investment and new development can only occur within areas zoned for such purpose within a District Plan. The rezoning of land is a significant and substantial planning process that involves full public notification, a requirement to consult Horizons at the earliest stage in the process (clause 3, 1<sup>st</sup> Schedule) and will in every case require a public hearing. In my opinion, the proposed flood mitigation or flood avoidance measures of any proposed rezoning in an area that is subject to any form of inundation is likely to be the one of the dominant resource management issue in question at the required public hearing. Recommended Policy 10-2(b) severely limits the opportunity for a thorough and robust risk assessment process of the proposed flood avoidance or flood mitigation measures to be carried out at the public hearing. This is because the default position of Policy 10-2(b)(ii), which TAs must give effect to in District Plans, will require the filling or raising of land to within 0.5 metres of the 0.2% AEP flood levels (due to the definition of residual inundation).

The availability of 0.5% AEP and 0.2% AEP flood modelling data and flood levels

38. No reference is made to the 0.2% AEP flood within the notified One Plan.
39. The default position of recommended Policy 10-2(b)(ii) will require the filling or raising of land to within 0.5 metres of the 0.2% AEP flood levels, regardless of what flood mitigation measures are put in place.
40. Taking into account the drafting of Policy 10-2(b), every planning decision within an area likely to be inundated by a 0.5% AEP flood will require detailed flood level information on the 0.2% AEP flood. This is because the definition of residual inundation includes the scenario where 0.5% AEP mitigation fails or a 0.2% AEP flood occurs.
41. Historically data on the 1% flood has been used to assist planning decisions. In more recent times Horizons has provided flood data on the 0.5% AEP flood to assist with pending District Plan reviews. PNCC has recently been provided flood data by Horizons for limited areas within the City for the 0.2% AEP flood (the Whakarongo / Napier Road area).
42. As mentioned above, every planning decision made under the One Plan will now require detailed flood data on the 0.2% AEP flood. I am not sure how widely available this information is at present or will be in the future. It is also outside of my expertise to determine whether or not 0.2% AEP flood data can be extrapolated from the 0.5% AEP flood data that has been made available to PNCC.
43. It is noted that recommended policy 10-1(c) of the One Plan only requires District Plans to map areas known to be inundated by a 0.5% AEP flood.

“Within any other area likely to be inundated by a 0.5% AEP flood”

44. Recommended Policy 10-2(b) starts out by requiring the Regional Council and TAs to *prevent the established of any new structure or activity, or any increase in the scale of any existing structure or activity, within any other area likely to be inundated by a 0.5% AEP flood event unless either...*
45. It is unclear whether the land intended to be caught by this policy is the land that is *likely* to be inundated by a 0.5% AEP flood before or after flood mitigation measures have been put in place. Presumably it is land that is not currently afforded any protection as this is where the future risk lies.
46. Informal (and I appreciate without prejudice) discussions with the reporting officer suggest that new areas for development that are afforded significant levels of flood mitigation are areas that are unlikely to be inundated by a 0.5% AEP flood and would therefore not be caught by Policy 10-2(b). If this is the case, my concerns discussed in the evidence above would be significantly reduced.
47. Presumably an engineer that designs a flood mitigation measure would not design a structure that is likely to fail. Once flood mitigation is in place, one would assume that the area is unlikely to be inundated by a 0.5% AEP flood, in which case it would not be caught by the minimum requirements of Policy 10-2(b).
48. It is also noted that there is a stronger use of terminology within Policy 10-2(b) than Policy 10-1(c). Policy 10-2(b) refers to areas that are *likely* to be inundated by a 0.5% AEP flood whereas Policy 10-1(c), that requires TAs to identify areas subject to inundation on planning maps, only refers to areas that are *known* to be inundated by a 0.5% AEP flood. This may be deliberate.

Infill development within existing areas

49. This issue relates closely to the matter discussed above.
50. Depending on the way in which the phrase “areas likely to be inundated by a 0.5% AEP flood” is to be interpreted, there is a risk that Policy 10-2(b) may inadvertently restrict infill subdivision within existing developed areas.
51. Presumably Horizons does not intend on restricting further infill development within existing developed areas.
52. Significant areas within Palmerston North City that are subject to ongoing infill development are located in areas that are (naturally) likely to be inundated by a 0.5% AEP flood, however, they are unlikely to be inundated by a 0.5% AEP flood due to the lower Manawatu flood protection scheme. Presumably this means these areas are not caught by the minimum requirements of Policy 10-2(b) and infill subdivision in these parts of Palmerston North is not restricted.
53. From this one can conclude that the focus of the Policy is on new areas not currently afforded any form of flood protection. The question remains however, if significant flood mitigation is to be provided for new development areas, does this mean these areas are then unlikely to be inundated by a 0.5% AEP flood and therefore not have to meet the minimum requirement of Policy 10-2(b)?



The “functional constraints” of non critical infrastructure that is not covered by Policy 10-4

54. It is unclear what level of flexibility is provided to non-critical infrastructure not covered by Policy 10-4: *New critical infrastructure*.
55. Recommended Policy 10-4 specifically provides for the establishment of new critical infrastructure within areas likely to be affected by a natural hazard. Non critical infrastructure is covered by Policy 10-2(b).
56. Because critical infrastructure is defined it is much easier to establish the types of “functional constraints” that may be associated with such infrastructure, i.e. it is clear that a new bridge that forms part of the strategic road network has to cross a river and a flood plain; or a waste water treatment plant has to be located adjacent to a river (assuming it is not a land based disposal system).
57. The functional constraints of all non critical infrastructure (this is all other infrastructure) not covered by Policy 10-4 is much harder to establish, i.e. the most direct route for a new wastewater line may pass through an area likely to be inundated by a 0.5% AEP flood. Is the most direct route for a wastewater line a functional constraint? Should it be required to divert around areas subject inundation? It appears that more policy flexibility has been provided for critical infrastructure than the essential infrastructural components that support critical infrastructure.
58. In my opinion, the functional constraints of non critical infrastructure needs to be defined or the definition of critical infrastructure needs to be expanded to include a wider range of infrastructure.

**Policy 10-4: New critical infrastructure**

59. I support the changes recommended to Policy 10-4: *New critical infrastructure*
60. The main purpose of recommended Policy 10-4 is to ensure critical infrastructure is not placed in locations where it is likely to be affected by natural hazards. This is sensible and supported.

---

**Conclusion**

---

61. As mentioned earlier, I acknowledge the significant amount of analysis that has gone into responding to the PNCC submission on hazards, in particular Policy 10-2(b).
62. Flood hazard management is a complicated area that cuts across a number of disciplines within local government. The focus of this evidence is on the practical implications of the recommended policies.
63. It can be easy to criticise but harder to come up with alternative solutions. Due to time constraints I have been unable to prepare specific recommended amendments as part of this evidence (but have indicated where I think general changes are required).

64. If it is considered appropriate I would be willing to discuss possible amendments with the reporting officer prior to the scheduled hearing on this matter.

A handwritten signature in black ink, appearing to read 'DMurphy', with a long horizontal stroke extending to the right.

David Murphy  
**Senior Policy Planner**  
*City Future*  
PALMERSTON NORTH CITY COUNCIL

**APPENDIX A: Decisions requested by PNCC within its original submission on the Hazards sections of the One Plan**

*That Horizons adopt Issue 10-1, Objective 10-1 and Policy 10-1.*

*That Horizons adopt **Policy 10-2(a)** that provides for generally not allowing any new development in areas mapped as floodways.*

*That Horizons amend **Policy 10-2(b)** to better reflect the approach of the current RPS which provides for mitigation as an option and allows for decisions on flood hazard management to be individually optimised and justified by cost and benefit considerations.*

*That Horizons adopt **Policy 10-3**.*

*That Horizons amend **Policy 10-4** to exclude the proposed second bridge crossing or provide written confirmation to PNCC that in Horizons opinion there is no reasonable alternative to placing the second bridge crossing within an area prone to flooding.*

*That Horizons adopt **Policy 10-5**.*

*That Horizons adopt **Policy 10-6** and note that Policy 10-6(f) specifically refers to flood mitigation efforts as opposed to flood avoidance efforts.*