

# Memo - Response to Hearings Panel question

**Date:** 27 March 2019

**To:** Hearings Panel - Proposed Plan Change 1: Waikato and Waipa River Catchments

**From:** Matthew McCallum-Clark, Section 42A Lead Author

**Prepared by:** Howard Ettema, Spatial Analyst, Waikato Regional Council

**Subject:** Nitrogen load to come – Dairy conversions map

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## Purpose

1. The purpose of this memo is to provide a response to the following question from the Hearings Panel regarding the nitrogen load to come, dated 27 February 2019.

## Hearings Panel Question

*To give some context to this issue [Nitrogen load to come], can the Panel please be provided with maps focusing on the approximate areas where dairy conversions have occurred in two time steps, say 2000-2010 and from 2010 to the most recent point in time that Council has data available (the maps supporting the s32 analysis combine all land uses in different time periods and it is difficult to identify the scale of the changes over time).*

## Introduction

2. This response to the above question has been prepared by: Howard Ettema, Spatial Analyst, Waikato Regional Council and includes a note by Dr Bryce Cooper, NIWA.
3. In preparing this response the authors have complied with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014.

## Response

4. The data used to map dairy conversions (Job No: REQ145675) for the Proposed Plan Change 1 hearing panel request<sup>1</sup> is property evaluation data sourced from Territorial Authority District Valuation Rolls. The results are shown on the attached map (Attachment 1). The results of this mapping should not be compared to approaches using other methods<sup>2</sup>.
5. The valuation coding was used in preference to using Agribase and Land Resource Inventory as these are known to be inaccurate in the earlier years.

## Data interpretation limitation

6. The selected properties data is dependent on the veracity of the valuation coding undertaken by the individual Territorial Authorities. There are known anomalies, particularly in the earlier years.
7. The valuation codes are only for the purpose of valuing the land and not a definitive description of land use. From 2002 to 2019 these codes may have been updated to better reflect land use without an actual change in land use.
8. The spatial accuracy of the property boundaries have increased over the years as a result of improved technology. Some anomalies may be due to inaccuracies in the earlier years.

## Methodology for calculation of properties converted to dairying

9. The results of our analysis is shown on the attached map. The number of conversions were estimated over three time periods, using three steps for each period, as described below:

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<sup>1</sup> <https://www.waikatoregion.govt.nz/assets/WRC-Minute-Panels-questions-for-the-Council-at-the-opening-of-the-hearing.pdf>

<sup>2</sup> Pers comms Dr Bryce Cooper, General Manager NIWA 20/3/2019. The Technical Leadership Group commissioned a review of historical land use and nitrogen leaching: Waikato and Waipa catchments (Hudson *et al.* 2015 WRC TR 2018/35). The method used to assess land use change is described on page 15 and uses land use data from various sources for various periods to assess land use change over time (1972-2012). This report also estimated changes in the intensity within land uses over that time. The authors used this information to estimate changes in N leaching over time by land use, sub-catchment and FMU. The authors concluded that N leaching summed over the entire Waikato-Waipā catchment has increased by an estimated 66% over the period, with nitrogen leaching from dairy land use increasing by 240%, driven mostly by intensification and partly by expansion.

### 2002 to 2010

10. Using the 2002 property layer, the properties within the PC1 area with one of the following valuation codes were identified:
  - Valuation code = 'FE' (Forestry Exotic) or
  - Valuation code = 'FV' (Forestry Vacant & suitable for planting) or
  - Valuation code = 'PF' (Pasture – fattening) or
  - Valuation code = 'PG (Pasture – Grazing)
  
11. Using the 2010 property layer, the properties within the PC1 area with the following valuation code were identified:
  - Valuation code = 'DF' (Dairy - milk production)
  
12. These 2 features were intersected to obtain the properties that have changed from forestry or pasture in the period 2002-09 to dairying in 2010.

### 2010 to 2016

13. Using the 2010 property layer, the properties within the PC1 area with one of the following valuation codes were identified:
  - Valuation code = 'FE' (Forestry Exotic) or
  - Valuation code = 'FV' (Forestry Vacant & suitable for planting) or
  - Valuation code = 'PF' (Pasture – fattening) or
  - Valuation code = 'PG (Pasture – Grazing)
  
14. Using the 2016 property layer, the properties within the PC1 area with the following valuation code were identified:
  - Valuation code = 'DF' (Dairy - milk production)
  
15. These 2 features were intersected to obtain the properties that have changed from forestry or pasture in the period 2010-2015 to dairying in 2016.

### 2016 to 2019

16. Using the 2016 property layer, select the properties within the PC1 area with one of the following valuation codes were identified:
  - Valuation code = 'FE' (Forestry Exotic) or
  - Valuation code = 'FV' (Forestry Vacant & suitable for planting) or

Valuation code = 'PF' (Pasture – fattening) or

Valuation code = 'PG (Pasture – Grazing)

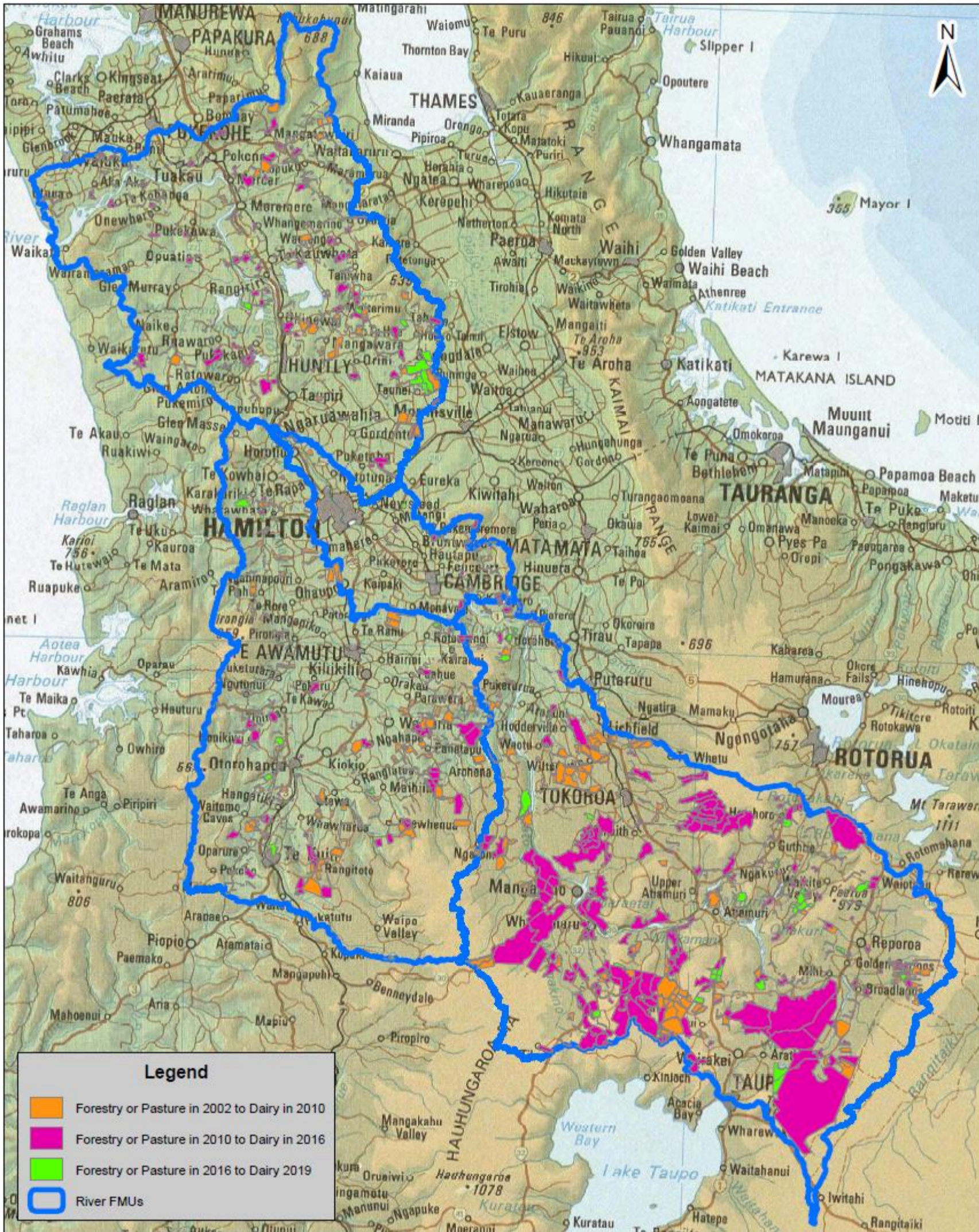
17. Using the 2019 property layer, select the properties within the PC1 area with the following valuation codes were identified:

Valuation code = 'DF' (Dairy - milk production)

18. These 2 features were intersected to obtain the properties that have changed from forestry or pasture in the period 2016-18 to dairying in 2019.



Attachment 1: Map of dairy conversions in the Waikato and Waipa river catchments



**Acknowledgements and Disclaimers**  
 Topographic Maps sourced from LINZ. Sourced from the LINZ Data Service and licensed for reuse under CC BY 4.0.

Cadastral information derived from Land Information New Zealand's Landonline Cadastral Database. CROWN COPYRIGHT RESERVED. Valuation Data Sourced from Territorial Authority District Valuation Roll.

## Waikato and Waipa River Catchment Dairy Conversions 2002-2019



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 Plan Change 1 Dairy



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