

**BEFORE THE CANTERBURY REGIONAL COUNCIL  
HEARING COMMISSIONERS**

**IN THE MATTER** of the Environment Canterbury (Transitional  
Governance Arrangements) Act 2016

**AND**

**IN THE MATTER** of submissions on Proposed Plan Change 7  
to the Land and Water Regional Plan and  
Proposed Plan Change 2 to the Waimakariri  
River Regional Plan

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**SUMMARY OF EVIDENCE OF GREGORY ALBERT BIRDLING FOR  
CHRISTCHURCH CITY COUNCIL**

**11 November 2020**

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## **INTRODUCTION**

1. My name is Gregory Albert Birdling. I here summarise key points of my evidence, which estimates the costs that Christchurch City Council could face if they were required to remove nitrate from the city's water supply; and also estimates a cost to supply Christchurch using treated Waimakariri River water as an alternative.

## **OVERVIEW**

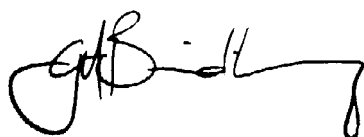
2. If nitrate levels in the groundwater that is currently used for the Christchurch water supply become higher than is permitted, either by contemporaneous drinking-water regulations or by Christchurch City Council's own requirements, then the nitrate levels will need to be reduced.
3. Removing nitrate from drinking-water requires a suitable treatment plant. An ion-exchange treatment process is a well-known and cost-effective way to reduce nitrate levels in large-scale drinking-water supplies; although there are other options available and new technologies emerging.
4. The installation of point-of-use nitrate treatment at individual properties is not considered a desirable option for a large water supply such as Christchurch. This is primarily because they require regular maintenance to maintain their performance, which is difficult to ensure over such a large number of private properties.
5. Christchurch's existing water supply network does not suit a centralised treatment model as this requires a bulk water distribution capability.
6. I have estimated the costs for addressing elevated nitrate levels in Christchurch's drinking water supply for the following options:
  - a) Adding nitrate removal treatment at the existing water supply station sites.
  - b) Sourcing, and treating, and distributing water from the Waimakariri River.

7. My cost estimates for the nitrate removal option assume a nitrate level in the source water of 7.9 mg/L (the upper range estimated by Kreleger<sup>1</sup> et. al.) for three treatment scenarios:
  - a) Reduction of nitrate levels to 5.65 mg/L (50% of existing DWSNZ MAV)
  - b) Reduction of nitrate levels to 3.8 mg/L (this value aligns with the PC7 objectives)
  - c) Reduction of nitrate levels to 1 mg/L (This is the minimum limit requested by Christchurch City Council in their submission)
8. The estimated Net Present Value costs to remove nitrate from the Christchurch water supply range from \$829M to \$1,507M for the scenarios above.
9. The estimated Net Present Value cost to provide an alternative water supply for Christchurch from the Waimakariri River is \$2,149M.

#### **CORRECTIONS**

10. Paragraph 29.1: Where sodium is stated, it should read chloride.
11. Paragraph 37.3: This paragraph should be discounted.

Dated at Christchurch this 11<sup>th</sup> day of November 2020



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Gregory Albert Birdling

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<sup>1</sup> Kreleger & Etheridge (2019): *Waimakariri Land and Water Solutions Programme Options and Solutions Assessment: Nitrate Management*