

Before Independent Commissioners Appointed by the Canterbury Regional Council and Selwyn District Council

In the matter of The Resource Management Act 1991

And

In the matter of Applications by **Fulton Hogan Limited** for all resource consents necessary to establish, operate, maintain and close an aggregate quarry (**Roydon Quarry**) between Curraghs, Dawsons, Maddisons and Jones Roads, Templeton

**REBUTTAL EVIDENCE OF ERIC ROLAND VAN NIEUWKERK ON
BEHALF OF FULTON HOGAN LIMITED**

GROUNDWATER

DATED: 21 OCTOBER 2019

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Introduction

1. My name is Eric Roland Van Nieuwkerk. I hold the position of Senior Hydrogeologist at Golder Associates (NZ) Limited (Golder).
2. I have previously provided a written brief of evidence in relation to the Roydon Quarry Proposal. That evidence is dated 23 September 2019. I confirm my qualifications and experience as set out in paragraphs 4 to 8 of that evidence.
3. I also confirm I have read and agree to comply with those parts of the Environment Court Practice Note that bear on my role as an expert witness, in accordance with paragraph 9 of my earlier evidence.
4. For this rebuttal I have considered the following documents:
 - (a) Bligh, K., 2019, Evidence from Kevin Bligh in relation to applications CRC192408, CRC192409, CRC192410, CRC192411, CRC192412, CRC192413 and CRC192414 by Fulton Hogan Limited for a suite of resource consents to establish a quarry operation.
 - (b) Ministry for the Environment (MfE), 2017, Preparing for Coastal Change, a summary of coastal hazards and climate change guidance for local government, Wellington: Ministry for the Environment, ISBN: 978-1-98-852535-8, Publication number: ME 1341.
 - (c) Ministry for the Environment (MfE), 2018, Climate Change Projections for New Zealand: Atmosphere Projections Based on Simulations from the IPCC Fifth Assessment, 2nd Edition. Wellington: Ministry for the Environment, ISBN: 978-1-98-852587-7, Publication number: ME 1385.
 - (d) S42a officer's report and appendices for applications CRC192408, CRC192409, CRC192410, CRC192411, CRC192412, CRC192413 and CRC192414 by Fulton Hogan Limited for a suite of resource consents to establish a quarry operation.
 - (e) Van Nieuwkerk, E R, 2019, Evidence from Eric Roland van Nieuwkerk in relation to applications CRC192408, CRC192409, CRC192410, CRC192411, CRC192412, CRC192413 and CRC192414 by Fulton Hogan Limited for a suite of resource consents to establish a quarry operation.

- (f) Weir, JJ, 2009, Supplementary Evidence of Julian James Weir, Hearing evidence for applications by Central Plains Water Trust to Canterbury Regional Council for resource consents to take and use water from the Waimakariri and Rakaia Rivers.

Scope

- 5. In my rebuttal evidence I address the evidence of the following witnesses:
 - (a) Mr Murray England of Selwyn District Council in relation to concerns about drinking water supply well M36/7575 and groundwater monitoring consent conditions;
 - (b) Ms Jolene Eagar of the Templeton Residents Association in relation to concerns about a possible rise in groundwater levels and whether maintaining a separation distance between the quarry floor and the seasonal high water table of 1 m is sufficient.
 - (c) Mr Martin Flanagan in relation to the same matter as Ms Eagar.

Mr Murray England of Selwyn District Council

- 6. In the evidence of Mr England the following conditions are requested to be included should the resource consent for the Roydon Quarry be granted:
 - (a) That groundwater monitoring is implemented throughout the lifetime of the quarry and appropriate mitigation measures taken if a groundwater contamination plume develops from the site.
 - (b) That two additional monitoring wells are installed on the site at the boundary. These should be installed downgradient in respect to the groundwater flow and assist in identifying groundwater quality changes.
 - (c) That water quality monitoring undertaken from the Selwyn District Council public water supply well, M36/7575 be included within the applicants monitoring report and any trends identified in relation to the quarry operation are noted and mitigated if the effects are adverse.
- 7. In paragraph 79 of my evidence in chief I note that no groundwater flow pathways from the quarry site to the deeper aquifers are likely to exist and no discharges to groundwater from the site will be transported to community drinking supply well M36/7575. This is consistent with paragraph 87 of Dr Lisa Scott's S42a report. Therefore, as I conclude in paragraph 73 of my

evidence in chief, I do not anticipate any adverse groundwater quality effects on this well from the quarry activities.

8. Nonetheless, I agree with Mr England's request to include conditions (a) and (b) stated in paragraph 6 above. I refer to paragraph 78 and 96 of my evidence in chief respectively, in which I also recommend these conditions. These matters are addressed in proposed conditions 24 to 28¹ as listed in Mr Kevin Bligh's evidence.
9. I also agree with Mr England's request that the results from water quality monitoring undertaken by Selwyn District Council from public water supply well M36/7575 are included in the applicants monitoring report. Any trends in the water quality monitoring results will be identified in this report and whether these trends indicate if the well's water quality could be adversely affected. If the potential for adverse effects can be attributed to the quarry operation, I agree that the applicant should mitigate these effects. This is consistent with my recommendation in paragraph 84 of my evidence in chief. I propose to add the following to condition 24(e)¹ listed in Mr Kevin Bligh's evidence (addition underlined):

The water quality monitoring results, and those of public water supply well M36/7575 as provided by the Selwyn District Council, shall be supplied annually to the Canterbury Regional Council, RMA Compliance and Monitoring Manager.

Ms Jolene Eagar of the Templeton Residents Association and Mr Martin Flanagan

10. Both Ms Eagar and Mr Flanagan suggest in their respective statements that the 1 m separation distance between the quarry floor and the seasonal high water table is not sufficient to protect the groundwater resource.
11. To provide context, I would like to emphasise that the proposed quarry floor level will be at least 5 m above the groundwater table most of the time. Based on monitoring data presented in paragraph 41 to 49 of my evidence in chief, the groundwater level at the site would have risen close to 1 m below the proposed quarry floor depth for a maximum of only one month in the past 30 years. Similar groundwater table and unconfined aquifer conditions exist naturally over a large part of the Canterbury Plains to the southeast of State

¹ Amended proposed conditions for CRC192408 & CRC192409 Land use consent to excavate material and deposit cleanfill material over an unconfined/semi-confined aquifer.

Highway 1, which includes various industrial, residential and agricultural land uses. Mitigation measures proposed for the site to minimise the risks to groundwater quality, are in keeping with those required under the rules of Canterbury's Land and Water Regional Plan (LWRP) for areas with similar groundwater conditions. I note that a 1 m separation distance is what is specified for a permitted activity for excavation, by Rule 5.175 of the LWRP.

12. Ms Eagar refers to the possible effects of the Central Plains Water scheme which over time could raise groundwater levels beneath the site. In paragraph 50 of my evidence in chief I note that according to Weir (2009) the Central Plains Water scheme may cause a rise in groundwater levels. I note that it may take several years until these groundwater level effects manifest themselves, if they occur at all. I also note that climate change effects could result in lowering of the groundwater levels beneath the site. MfE (2018) expects evapotranspiration to increase by 15% as a result of climate change over the next 30 years and, if any, this will have the effect of lowering of the groundwater table.
13. Mr Flanagan notes sea level rise and that this could raise groundwater levels beneath the site. Climate change and sea level rise predictions presented by MfE (2017) conclude that the sea levels may rise approximately 0.4 m over the next 40 years. This may have an effect on the groundwater table in low lying coastal areas, but will not change groundwater levels beneath the site, located some 25 km from the coast.
14. I acknowledge there is an uncertainty about the future groundwater levels at the site. I therefore consider it appropriate to review the maximum quarry depth level every five years, as stated in paragraph 50 of my evidence in chief and addressed in proposed condition 6¹ in Mr Kevin Bligh's evidence. I also consider ongoing groundwater quality monitoring throughout the lifetime of the quarry appropriate, as stated in paragraph 69 of my evidence in chief, and addressed in proposed condition 24 to 28¹ in Mr Kevin Bligh's evidence. However, I consider my analysis of the seasonal high water table and proposed quarry floor level as outlined in paragraph 41 to 49 in my evidence in chief, appropriate to use in the first five years of quarrying.

Eric van Nieuwkerk

21 October 2019