

**BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY CANTERBURY  
REGIONAL COUNCIL AND WAIMAKARIRI DISTRICT COUNCIL**

**IN THE MATTER** of the Resource Management Act 1991 (**RMA** or **the Act**)

**AND**

**IN THE MATTER** of the Waimakariri River Regional Plan (**WRRP**); the Canterbury Land and Water Regional Plan (**LWRP**); the Proposed Plan Change 7 to the LWRP (**pPC7**) and Proposed Plan Change 2 to the WRRP (**pPC2**); the Canterbury Air Regional Plan (**CARP**) and the Waimakariri District Plan (**WDC**)

**AND**

**IN THE MATTER** of applications to the Canterbury Regional Council by **Woodstock Quarries Limited** for various resource consents to establish and operate a hard rock quarry and a landfill (**CRC214073-CRC214077**)

**AND**

**IN THE MATTER** of an application to the Waimakariri District Council by **Woodstock Quarries Limited** for resource consents to establish a landfill and associated earthworks at 513 Trig Road within an area currently being used as a quarry (**RC215276 / 221101189245**).

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**EVIDENCE OF GERALD STRAYTON FOR THE APPLICANT  
IN REPLY TO MATTERS WHICH AROSE SINCE THE HEARING  
26 APRIL 2024**

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Presented for filing by:

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- 1 My name is Gerald Strayton. A full description of my qualifications and experience can be found in my Statement of Primary Evidence.
- 2 I have read the Environment Court's Code of Conduct and agree to comply with it. The matters addressed in my evidence are within my area of expertise. However, where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.
- 3 I provide this further statement of evidence in reply to matters that have arisen since the hearing of the applications.
- 4 In the s42A Report of Tim Johnstone dated 19 April 2024, he has stated:

*Pete Abernathy (CRC Landfill Engineer) has highlighted the following:*

*The elevated leachate level may have not been defined or clarified the applicant in their evidence. This should consider a case where leachate level possibly exceeds design levels and consent limits.*

*Typically consider 1m to 2m above the primary liner level. This should be clarified in the consent condition if unable to reference another document.*

*No technical justification has been provided for 1.1 recommend this be separated to be 1.3 as a minimum for longer term leachate levels and 1.2m for short term for elevated leachate cases as outlined in the NZGS Slope Stability Guidance-Draft For Comment December 22, 2023.*

*Therefore, based on the above advice, I recommend amending the Table in Condition 105.*

105. The analysis must adopt all the following relevant factors of safety (FOS) adopted for landfill industry practice, with justification provided for any deviations from these values.:



<b>Design Scenario</b>	<b>Minimum FOS</b>	<b>Or Maximum Displacement Base Liner</b>	<b>Or Maximum Displacement Capping</b>
Static long term	1.5		
Static short term	1.2		
Static – elevated short term leachate levels	1.2		
Static- elevated long term leachate levels	1.3		
SLS Earthquake (150 year)	1.0	<0.3m	<1.0m
ULS Earthquake (2500 year)	1.0	<0.3m	<2.0m

5. My Response to these comments is as follows:
6. Mr Abernathy raised this concern in his evidence dated 31 August 2023 as follows:

*Paragraph 14c. The elevated leachate levels considered, over 30m, in the stability analysis appear unrealistic and inconsistent with other documents presented by the applicant. The levels are undefined in terms of the consent condition, or supporting documentation, making it open to interpretation and not evidenced based. In my experience this would consider an elevated leachate level in the order of one to two meters above a design level, with an extreme case potentially considering a higher level such as the crest of the containment bund.*

7. The stability analysis considered an extreme scenario with the leachate levels being such that potential seepage would be noticed at the crest level of the containment bund and the top of the high wall on the northern edge of the landfill. Although such a level would be identified long before it achieved such an extreme level, it was considered to be a worst case (although an extremely unlikely) scenario in considering the stability of the landfill. The findings of the stability analysis for the extreme scenario showed that the Factors of Safety (FOS) achieved exceeded 1.3. The table 1 below shows the extreme scenario and the 2m high leachate level as postulated by Mr Abernathy.

Table 1		Proposed Min FOS Condition 105 (Supplementary Section 42A Officers Report)		Auckland Council Code of Practice (Min FOS)	
Scenario	Calculated FOS	Min FOS Static elevated short term leachate levels	Min FOS Static elevated long term leachate levels	Residential Subdivision / Development - Extreme (worst credible) groundwater condition	Low risk areas such as Parks and Bush Reserve Land - Extreme saturated condition
Static - elevated leachate level approx 30m	1.32	1.2	1.3	1.3	1.1
Static - elevated leachate level 2m	1.75	1.2	1.3	1.3	1.1

8. There is therefore just a difference of opinion between Mr Abernathy and myself with respect to what is an acceptable minimum FOS for the design scenario of “Static – elevated leachate levels”. In the analysis we followed the guidance of the Auckland Council code of practice in relation to minimum FOS for slopes under extreme saturated conditions in open spaces such as parks being a FOS of 1.1 as presented in my evidence in reply dated November 2023.
9. However, given that the FOS of the extremely unlikely (and therefore very conservative) scenario from the stability analysis exceeds 1.3 (see table 1 above) and that the leachate level scenario postulated by Mr Abernathy also exceeds 1.3, the proposed changes to Condition 105 are already met and therefore again out of an abundance of caution, WQL is willing to accept the changes to Condition 105 as proposed in the Supplementary Section 42A Officers Report dated 19 April 2024.

Gerald Strayton

26 April 2024