

**BEFORE INDEPENDENT HEARINGS COMMISSIONERS APPOINTED BY
CANTERBURY REGIONAL COUNCIL AND CHRISTCHURCH CITY COUNCIL**

IN THE MATTER OF the Resource Management Act 1991

AND

IN THE MATTER OF Applications by SOL Quarries Ltd to extend the existing
SOL quarry onto land at 93 and 133 Conservators Road,
Christchurch (RMA 2019 373 CRC193563, CRC193564,
CRC193773)

**SUMMARY STATEMENT OF EVIDENCE OF PETER FRANCIS CALLANDER
ON BEHALF OF SOL QUARRIES LIMITED**

GROUNDWATER QUALITY

Dated: 30 November 2020

1. My name is Peter Francis Callander. I am a water resources scientist with a specialization in groundwater and am employed by Pattle Delamore Partners Ltd. I have prepared this summary statement to provide a brief overview of the key points from my evidence in chief for SOL Quarries Ltd dated 20 November 2020. My qualifications and experience are as stated in my evidence in chief and I have prepared this summary statement in accordance with the Environment Court's Code of Conduct for Expert Witnesses, contained in the Environment Court Practice Note 2014.

Scope of Evidence

2. My evidence deals with the potential effects of the proposed cleanfill operation on groundwater quality downgradient of the cleanfill that might be used for drinking-water purposes. The key water quality impact that may cause chemical concentrations to approach the limits specified in the Drinking-water Standards for New Zealand 2005 (revised 2018) (DWSNZ) is water hardness, which is calculated from the concentrations of calcium and magnesium dissolved in the groundwater. The DWSNZ does not specify any adverse health effects for hardness, but it does indicate that adverse aesthetic effects can occur that impact on the taste of the water and may lead to the formation of scale and scum if very high hardness concentrations occur.
3. Slightly elevated hardness has affected some groundwater close to existing quarry sites at Miners Road, located around 4km to the south-west of the SOL Quarry. However, such effects are not expected to occur at the SOL Quarry because it is a smaller quarry, with stricter controls on excavation depths and allowable cleanfill and is located in an area that has lower background hardness values.
4. Consequently, based on the proposed cleanfill deposition proposed by the applicant, it is possible that some increase in groundwater hardness concentrations may occur at SOL Quarry, but based on groundwater quality monitoring in the area, I do not expect that will be to an extent that causes any adverse effects for downgradient drinking-water supplies.
5. The quarry activity will not cause any detectable widespread effects on the aquifer system.
6. It is a common, and good, management practice for groundwater quality to be monitored in the vicinity of the quarry and I support the trigger level approach proposed by Environment Canterbury, with the adjustments described in paragraph 18 of my evidence in chief.

Peter Callander

30 November 2020