

**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

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**JOINT WITNESS STATEMENT**

**WATER QUALITY**

**DATED: 6 NOVEMBER 2019**

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## Introduction

1. This Joint Witness Statement (**JWS**):
  - (a) Relates to the water quality effects that may arise from Fulton Hogan Limited's proposal to establish, maintain and close the Roydon Quarry; and
  - (b) Reports on the outcome of expert conferencing between the four water quality experts<sup>1</sup> who have filed evidence in this matter.
2. The expert conference was held in the morning of 6 November 2019, at the Christchurch office of Golder Associates. John Hardie (Barrister and Mediator) facilitated the conference.
3. The experts involved have read Appendix 3 of the Environment Court Practice Note and confirm compliance with it.
4. In particular (and as set out in paragraphs 1(a) and (b) of Appendix 3):
  - (a) The witnesses acknowledge that the JWS is to clearly record the issues agreed and not agreed, between them. Succinct reasons are to be captured in the JWS. This will assist all parties and the decision-makers in focussing on the matters that remain in dispute and the significance of them;
  - (b) Expert conferencing is not a forum in which compromise or a mediated outcome between the experts is anticipated. Unlike mediation, the "aim" is not resolution. Rather, the aim is clear identification of and narrowing of points of difference.
5. Based on the evidence filed up to 5 November 2019, the Fulton Hogan witnesses have prepared a list of topics as a starting point for discussions:
  - (a) Effects on the aesthetic quality of groundwater below and immediately downgradient of the site;
  - (b) A condition requiring cleanfill to meet background concentrations at the applicant site (and not the site of origin);

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<sup>1</sup> Lisa Scott (section 42A officer for Canterbury Regional Council); Eric van Nieuwkerk, Victor Mthamo and Nick Eldred (witnesses for Fulton Hogan Ltd)

- (c) The need for restrictions on future land use;
- (d) Reviewing groundwater levels every 5 years (and wording of a condition) – paragraph 65 of Kevin Bligh's rebuttal evidence;
- (e) The need for an additional 1m buffer;
- (f) Several conditions of consent, as to which the Regional Council s42A officer suggested amendments and Mr Bligh responded.

### **Effects on the aesthetic quality of groundwater**

- 6. Dr Lisa Scott notes in paragraph 1 of her S42a officer's report that excavation and filling of Roydon Quarry is likely to cause localised changes to the aesthetic quality of groundwater below the site and immediately downgradient. It is unlikely to cause adverse health effects by contamination of drinking water in existing private domestic wells or public supply wells.
- 7. Policy 4.23 of Canterbury Regional Council's Land and Water Regional Plan (LWRP) states that any water source used for drinking-water supply is protected from any discharge of contaminants that may have any actual or potential adverse effect on the quality of the drinking-water supply including its taste, clarity and smell. This includes changes in aesthetic quality of groundwater.
- 8. Ms Scott's assertion is based on groundwater monitoring data downgradient from existing quarries in the Yaldhurst area near Christchurch. Both onsite and offsite wells (including domestic supply wells) up to 1 km downgradient show a change in groundwater quality in respect to the upgradient groundwater quality. In addition, there have been minor complaints from residents about an increase in hardness (which could cause scaling in appliances).
- 9. Mr Eric van Nieuwkerk considers it unlikely that there would be a change in groundwater quality downgradient from the site, and if there would be a change, it would be small and localised. Mr Nick Eldred and Mr Victor Mthamo agree with Mr van Nieuwkerk on this.
- 10. Mr van Nieuwkerk refers to paragraph 41 in Ms Scott's s42a report in which states that historically there was less control over what was filled at some of the quarries at Yaldhurst. It may not be clear if the recorded changes in

downgradient groundwater quality are associated with uncontrolled filling or with cleanfilling.

11. Ms Scott considers that the recorded downgradient groundwater quality changes at the Yaldhurst quarries would be associated with cleanfill materials. Ms Scott considers some leaching could occur from almost any material, even cleanfill deemed to be inert, and this would cause a change in groundwater quality. Ms Scott notes that based on the information presented to her so far, the change in groundwater quality at the proposed quarry site would not be worse than that recorded at the quarries in the Yaldhurst area.
12. Ms Scott, Mr van Nieuwkerk, Mr Mthamo and Mr Eldred all agree that the proposed amended draft groundwater monitoring conditions 24 to 28, in which ongoing groundwater quality monitoring at and downgradient of the site for the lifetime of the quarry is proposed, as well as responses if water quality trigger levels are exceedances are recorded, would be appropriate. Possible mitigation measures may have to be specified in those conditions as well.

#### **Cleanfill to meet background concentrations at the site**

13. Based on Ms Scott's S42a report and of Mr Rowan Freeman's S42a report, Ms Hannah Goslin has proposed in paragraph 275 of her S42a report to adopt a condition that requires any cleanfill material to be deposited on site would need to meet background concentrations at the applicant's site and not the site of origin.
14. Ms Scott notes she is not a contaminated sites expert and it is unclear to her whether this condition would make cleanfilling more stringent for the applicant.
15. Mr van Nieuwkerk considers that cleanfill quality that is in accordance with Canterbury regional background levels could be accepted for filling on the site. It is unclear to Mr van Nieuwkerk what the benefit to groundwater quality could be by the inclusion of a conditions requiring cleanfill to meet background concentrations at the applicant's site. However, Mr van Nieuwkerk acknowledges he is not a cleanfill expert.
16. Mr Mthamo notes that Fulton Hogan has adopted the regional background levels for the Canterbury region to be used as background levels of the site,

as stated in the Cleanfill Management Plan. However, Mr Mthamo also recommends that the proposed amendment by Ms Goslin should be re-worded to so that the background levels can be based on (i) the regional background levels as already provided for in the CMP or (ii) the applicant can undertake site specific sampling and testing to establish the current background levels.

17. Mr Eldred also considers himself not a cleanfill expert and has no opinion on this matter.

### **The need for restrictions on future land use**

18. Based on Ms Scott's S42a report, Ms Hannah Goslin considers a covenant listed on all land titles associated with the site to exclude high intensity land uses that may cause effects on groundwater quality is essential.
19. Ms Scott considers that there are future risks to groundwater quality beneath and downgradient of the site and these should be considered in the decision making. Ms Scott is concerned about potential breakthrough of contaminants or pathogens to groundwater, once top materials have been removed and the site is much closer to the groundwater level than before quarrying.
20. Mr van Nieuwkerk, Mr Mthamo and Mr Eldred all agree that removing top materials and brining the site closer to the groundwater level could increase the susceptibility of the groundwater to water quality effects.
21. Mr Mthamo considers imposing a covenant that excludes certain land uses in the future after quarrying unnecessary as there are sufficient statutory controls in both the LWRP and the Selwyn District Plan to control the types and intensity of land use post quarrying. Further plan changes are likely to impose even more restrictions on a would-be future land use.
22. Ms Scott sites a case in which a high intensity land use was permitted on land after it had been quarried even though that site was located in the Christchurch groundwater protection zone. There were no statutory limitations in place that could avoid high intensity land use to be permitted. Mr Mthamo noted that this was not the case within the Selwyn Waihora Zone where the sub-regional chapter had sufficient controls to manage land use intensities and the district council plan also had rules limiting the number of dwellings.

23. Ms Scott considers that whilst certain farming activities may be restricted by statutory provisions, onsite wastewater facilities could still be allowed, and it is these systems that could pose a risk to the groundwater quality.
24. Mr van Nieuwkerk and Mr Eldred both point out that after quarrying the site's groundwater conditions are very similar to those that already exist naturally over a large part of the Canterbury Plains to the southeast of State Highway 1. Mitigation measures proposed for the site to minimise the risks to groundwater quality, are in keeping with those required under the rules of the LWRP for areas with similar groundwater conditions. However, both Mr van Nieuwkerk and Mr Eldred acknowledge this may be a planning matter and that this is not their field of expertise.

### **The need for an additional 1m buffer**

25. Several submitters have raised concerns about groundwater quality effects when the site is brought much closer to the groundwater table. The submitters site uncertainty about the future groundwater levels at the site and that this may rise as a result of the implementation of the Central Plains Water (CPW) scheme, climate change and sea level rise. Therefore, they propose to include an additional 1 m separation distance between the quarry pit floor and the Seasonal High Water Table or SHWT (also referred to as the Highest Recorded Groundwater Level – HRGL), which would bring this separation distance to 2 m.
26. Ms Scott, Mr van Nieuwkerk, Mr Mthamo and Mr Eldred all agree that there is uncertainty about the future groundwater levels and that some processes may cause groundwater levels to rise, where others may reduce groundwater levels. However, all agree that including an additional 1 m separation distance between quarry pit floor and the SHWT would not necessarily be appropriate to reduce the risks to the groundwater quality beneath or downgradient of the site.
27. All agree that including conditions that required the applicant to continue groundwater level monitoring throughout the lifetime of the quarry and reviewing the maximum permitted quarry depth every 5 years, would be appropriate. It should also be clear that whenever a higher SWHT is recorded than ever before at any point in time during the lifetime of the quarry, the

maximum permitted quarry floor depth should be revised upwards and backfilling may be required.

### **Reviewing groundwater levels every 5 years**

28. Ms Scott is concerned about the wording chosen in condition 5 of the *Land use consent to excavate material and deposit cleanfill material over an unconfined/semi-confined aquifer*, presented in the consent application and also attached to Mr Kevin Bligh's evidence in chief. It appears to suggest only 5 years of data from onsite wells would be required to revise the SHWT at the site. Ms Scott considers all historical records from relevant monitoring wells at and surrounding the site would also need to be considered. Ms Scott also considers it appropriate to review the maximum permitted quarry pit floor every 5 years throughout the lifetime of the quarry, and not just once after the first 5 years have passed.
29. Mr van Nieuwkerk, Mr Mthamo and Mr Eldred all agree with Ms Scott that a review of the maximum permitted quarry pit floor every 5 years throughout the lifetime of the quarry would be appropriate.

### **Review of conditions of consent, proposed amendments and responses**

30. The experts present at this meeting reviewed the proposed conditions, proposed amendments to these and response from Kevin Bligh (Appendix 7 of Rebuttal Evidence), relevant to their field of expertise. Conditions of the following consents have been reviewed:

- (a) Land use consent to excavate material and deposit cleanfill material over an unconfined/semi-confined aquifer:

#### **Extraction depth**

- (i) Amended condition 5): all present agree that this condition requires rewording in which reference to depths below ground are no longer made and which includes a 5-yearly review of the maximum excavation depth during the entire lifetime of the quarry. Maximum permitted quarry pit depths should be referenced as elevation (m RL) in condition text and on maps.

- (ii) Amended condition 11): Ms Scott considers it appropriate to record groundwater levels daily so that any significant rise in groundwater is recorded. This should be specified in the consent conditions. Mr van Nieuwkerk disagrees and notes that whilst the applicant records groundwater levels every 15 minute currently with automatic water level loggers, a temporary system failure could occur and water levels may not be recorded daily. This would trigger a non-compliance. Ms Scott suggests the daily recording of groundwater levels is mostly required at times when the groundwater levels are high and comes close to the SHWT. Conditions could be developed to reflect this.

### **Cleanfilling**

- (iii) Amended condition 16): all agree that any rewording of this condition should reflect what was discussed in paragraph 13 to 16 of this statement.

### **Groundwater monitoring and response**

- (iv) Amended conditions 24) to 28): Ms Scott notes that the conditions related to the on-going groundwater quality monitoring and responses to this should also include wording as to what form of mitigation could be proposed should the water quality in downgradient water supply wells be adversely affected (i.e. this could be providing an alternative supply, drilling a deeper well, or providing a water treatment option). All agree this condition should include a description of possible mitigation to remedy affected wells.

### **Rehabilitation**

- (v) Amended condition 31): Ms Scott is concerned this condition does not make it explicit enough that any excavated part of the site requires to be rehabilitated after quarrying and not left as an open excavation at the end of the life of the consent. Mr Mthamo points out that the wording chosen by Ms Goslin could mean that the applicant could not quarry all the way to the expiry date of the consent. All agree that rewording is required to allow the applicant to quarry until the expiry date of the consent, but that



rehabilitation must still be completed within a certain timeframe after that.

- (vi) Ms Goslin proposes a condition for a covenant restricting future land use. This is discussed in paragraph 18 to 24 of this statement.
- (b) Discharge permit to discharge stormwater to land where contaminants may enter groundwater and discharge contaminants which may enter water from industrial or trade process:

### **Stormwater**

- (i) Amended condition 2): two different matters have been discussed:
  - (1) Mr Mthamo proposes to change ‘...stormwater basins.’ to ‘...stormwater treatment systems (e.g. basins, propriety systems, etc.) designed and installed in accordance with best practices.’ All agree with this change.
  - (2) Ms Scott is concerned about a potential spill of hazardous substances on the access roads from vehicles. This would not be captured and diverted to the stormwater treatment system. However, a requirement to immediately address spills on access roads could be made specific in the Spill Management Plan and in amended condition 9).
- (ii) Amended condition 3): Ms Goslin proposes amendments to this condition. Ms Scott considers it appropriate to include a requirement of maintaining 1 m separation between the SHWT at the site and invert depth of the basin. Mr Mthamo and Mr van Nieuwkerk note that limiting the size of the stormwater basins is not required or even desirable and should be removed. Mr Mthamo pointed out that the standard practice was to size the basins based on the depth of the first flush treatment requirements (usually 15-25 mm) and the size of the catchments.
- (iii) Amended condition 4): Ms Goslin proposes amendments to specify the removal efficiencies per contaminant as listed in NZWERF (2004). All agree this could be included in the condition.

## **Hazardous Substances**

- (iv) Amended condition 6): all agree to include a reference to a Stormwater Management Plan (SMP) to be developed and approved by the appropriate authorities in this consent condition, and that this is preferred over including maintenance conditions in the consent. This SMP would include the design, operation and maintenance requirements.
- (v) Amended condition 8): Ms Scott notes that if refueling is undertaken in a paved and roofed designated refueling area with provisions to avoid and capture any spills, it would not be required that this occurs at 'natural ground level'. However, if refueling or maintenance of machinery were to be undertaken beyond such an area, then it should be made clear in the spill management conditions that appropriate measures are taken immediately should a spill occur. All agree with this approach.
- (vi) Ms Goslin proposes a condition to ensure soil used to line the stormwater basins is not sourced from contaminated sites. Mr Mthamo considers this a reasonable condition to include. All agree with this approach.
- (vii) Ms Goslin proposes a condition to ensure trade waste and material removed from stormwater basins are disposed appropriately. All agree with this approach.
- (viii) Ms Goslin proposes a condition to ensure no refueling or maintenance is undertaken in the pit floor. All agree this would not be required provided that conditions are reworded in accordance with paragraph 30 (b) (v) of this statement. All agree that storage of hazardous substances should be addressed in conditions related to 'Hazardous Activities'.

A handwritten signature in black ink that reads "Scott". The letters are cursive and slightly slanted.

**Dr Lisa Scott**

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**Eric van Nieuwkerk**

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**Victor Mthamo**

A handwritten signature in black ink that reads "Nick Eldred". The letters are cursive and slanted.

**Nick Eldred**

6 November 2019