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

IN THE MATTER OF	the Resource Management Act 1991
AND	
IN THE MATTER OF	Applications CRC204106, CRC204107, CRC204143 and RC205104 – to establish, operate and rehabilitate an aggregate quarry at 309 West Belt, Rangiora

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STATEMENT OF EVIDENCE OF MICHAEL DURAND FOR TAGGART EARTHMOVING LIMITED

19 APRIL 2021

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1. INTRODUCTION

Qualifications and experience

1.1 My name is Michael Durand. I am a Service Leader (Environmental Planning) at Pattle Delamore Partners Ltd (PDP) where I have worked since June 2020. I hold an honours degree in Physical Geography from the University of Plymouth (UK) and a PhD in Earth Sciences from the University of Wales, Aberystwyth (UK).

1.2 I have 15 years professional experience working in resource management in New Zealand, primarily in consenting of developments under the control of regional councils, the development of regional policy for the use of water and land, and nationally in environmental policy and regulatory design.

1.3 Between 2006 and 2012 I was a Consents Planner, Senior Consents Planner and Team Leader at Tasman District Council and Nelson City Council (both unitary councils), processing and managing teams processing applications for regional land use consents, water permits, discharge permits and coastal permits. Between 2012 and 2015 I was Senior Analyst at the Ministry for the Environment where I led policy development and implementation of the Resource Management Amendment Act 2013 and contributed towards other RMA policy development.

1.4 From 2015 to 2020 I was the Consents Manager at Southland Regional Council leading the regional council's consent processing, and the making of approximately 900 delegated decisions on resource consent applications annually.

1.5 I have appeared as a planning witness before consent hearings and have been involved in many Environment Court mediations (where I carried Council delegation to settle appeals). I have also written about the RMA's practical implementation in the form of technical guides for the Ministry for the Environment and discussion pieces for planners, particularly on cognitive bias in planning and the implementation of the National Policy Statement for Freshwater Management 2020.

1.6 I am also a certified Hearings Commissioner under the Ministry for the Environment's Making Good Decisions programme and am on decision-making panels at

Marlborough District Council, Nelson City Council and Tasman District Council.

1.7 Of particular relevance to the this proposal are my past roles in regional and unitary councils where I was responsible for assessment (as processing officer) or decision making on a number of consent applications for land and river based gravel extraction, and other activities such as discharges to land, bulk earthworks, air discharges and river works where potential or actual environmental effects arose from dust or smoke emissions to air, diversion of flood waters, flooding, and contamination of land or water.

Preparation of this evidence

1.8 In preparing this evidence, I have read and considered the following documents:

1.8.1. The application documents including all technical reports;

1.8.2. Submissions on the proposal;

1.8.3. The s 42A report and its appendices;

1.8.4. The evidence of Paul Taggart, Jon Farren (noise), Matthew Noon (traffic), Jeff Bluett (air) , Ben Throssell (flooding), Neil Thomas (groundwater) and Tracy Singson (controls in relation to VENM) on behalf of the applicant.

Expert Witness Code of Conduct

1.9 While this is a Council hearing, I acknowledge that I have read and agree to comply with the Environment Court's Code of Conduct for Expert Witnesses, contained in the Environment Court Practice Note 2014. My qualifications as an expert are set out above. Other than where I state that I am relying on the advice of another person, I confirm that the issues addressed in this statement of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Involvement in the Proposal

1.10 I have been familiar with the Taggart Earthmoving Ltd (Taggart) proposal since June 2020 when I became the lead planner at PDP working on the application. At that time, Taggart had received requests for further information on an

AEE (now superseded) that had been lodged with WDC and CRC in September 2018.

1.11 I inspected the site and surrounds on 16 July 2020. I also visited parts of the site during the 23 September 2020 open evening described by Mr Taggart in his evidence.

1.12 I prepared the AEE that was part of the October 2020 re-submission of the application.

1.13 Key elements of the proposal have been amended since my involvement including:

1.13.1. Virgin excavated natural material (VENM) is now proposed to be used to backfill the excavation, rather than cleanfill.

1.13.2. More detailed monitoring of meteorological conditions and air quality at the site is proposed, with corresponding dust control measures to minimise deposition of dust outside the site.

1.13.3. Refinement of flood path modelling that now shows that floodwater diversion by the acoustic bunds will not cause any effects on dwellings.

1.14 These amendments and others have led to broad agreement between a number of the technical experts for the applicant and the consent authorities that many of the effects of the activity are acceptable in their expert opinions. Ms Dawson states at paragraph 565 of her s 42A report that she considers that the effects of the proposal may be acceptable if the applicant:

a. Provides further information on the presence of any soil contamination associated with the potential historic waste area and the soil stockpiles on site. If there may be contaminants present, a methodology for addressing that contamination is required.

b. Adopts stricter waste acceptance protocols which go beyond the requirements of the WasteMINZ guidelines;

c. Provides a robust groundwater quality monitoring programme;

d. Describes in further detail how the groundwater alert system will enable management of the 1 metre separation to real-time groundwater levels relative to excavation depth;

e. Demonstrates that the proposed noise limit can be achieved based on the location of the proposed access road and assesses potential vibration effects; and

f. Upgrades the site access in accordance with Waimakariri District Council Engineering Code of Practice "Typical Rural Zone Commercial Access" and provides information to determine the appropriate access width.

1.15 Further changes to the proposal have been recommended by Ms Dawson in the s 42A report in light of her planning assessment, her assessment of the submissions, and in light of the technical evidence of the regional council's other experts.[1] Those suggested changes are acknowledged and discussed (where relevant) elsewhere in my evidence.

1.16 There is also a number of issues raised in the s 42A report which are not accompanied by a suggested amendment. Rather, these are issues or questions raised by the Councils' technical experts without expert guidance from the report's authors on how they might be resolved. These issues suggest to me that Taggart can helpfully provide further information to help officers understand how the proposed quarry is intended to operate. That information is provided in the evidence of Mr Taggart in particular, as well as within the evidence of other relevant experts.

1.17 Throughout this report I have referred the proposal as amended in light of a number of recommendations of the s 42A report writers.

Purpose and scope of evidence

1.18 My evidence addresses:

1.18.1. The proposal, including the resource consents required;

1.18.2. General planning matters not in dispute;

1.18.3. Environmental effects not in dispute;

1.18.4. Environmental effects with technical or policy disagreements (potential effects on groundwater quality).

[1] I acknowledge the useful summary of those submissions provided by Ms Dawson in her s 42 A report.

2. THE PROPOSAL

Summary of proposal and adverse effects

2.1 Taggart proposes to establish a quarry at the site of the Rangiora Racecourse, being land at 309 West Belt, Rangiora. The site and its surrounds have been described in the application and Ms Dawson agrees with that description for the purposes of her s 42A report. Therefore I will not repeat those details here.

2.2 In summary, Taggart's proposal is to establish an (excavation only) quarrying operation at the site with the key elements being:

2.2.1. Enabling works to establish access off River Road, internal site access including passing bays and a rumble strip, security fencing and signage;

2.2.2. Construction of acoustic bunds to deflect sound of quarry operations away from proximal neighbours on the eastern and western margins of the site;

2.2.3. Establishment of groundwater, meteorological and dust monitoring equipment;

2.2.4. Detailed site surveying;

2.2.5. Extraction of gravel, backfilling and rehabilitation across an area totalling 14.5 ha. A maximum volume of 750,000 m^3 of material will be excavated in total (685,000m^3 of aggregate);

2.2.6. Extraction of the gravel in a process including:

1. stripping and retaining of topsoil and overburden;

2. extraction of gravel in stages to a maximum of 5 m below surveyed ground level;

3. a maximum area of 2 ha disturbed land surface (including the extraction area but excluding internal access roads);

2.2.7. Backfilling of excavated areas with material on the site (including with the excavation) and with imported virgin excavated natural materials (VENM);

2.2.8. Rehabilitation to current ground level using, as a top and final layer, stripped overburden and topsoil from the next stage of extraction, and re-establishment of vegetation;

2.2.9. There is to be no processing of gravel or backfill material at the site.

2.3 The program of work overall is expected to take 15 years and consent for that term has been sought.

2.4 The AEE, s 42A report and submissions all cover the potential and actual effects of the proposal. In my opinion the most significant of these are:

2.4.1. Potential effects on groundwater quality arising from reduced protection of groundwater (as a result of extraction) and the risk of contamination from materials used for backfilling (as a result of materials other than VENM being discharged as backfill) should appropriate controls not be put in place. This is especially important as the site is within a community drinking water protection zone where WDC has consent to take and use water for community supply purposes. There are also a number of other bores accessing shallow water within the drinking water protection zone. Measures to avoid potential contamination are discussed in detail by Mr Singson in his evidence. The potential effects of the proposal on groundwater are considered in detail by Mr Thomas in his evidence.

2.4.2. Nuisance and health effects of transport of dust from the site to neighbouring properties, arising from exposed or unconsolidated surfaces, loading and unloading of materials and vehicle movements. This is considered in detail by Mr Bluett in his evidence.

2.4.3. Noise effects arising on neighbouring properties, primarily from machinery, considered in detail by Mr Farren in his evidence.

2.4.4. Diversion of flood waters by the acoustic bunds, in the event of a flood event in the Ashley River where flood defences are breached and floodwaters reach the site. This is considered in detail by Mr Throssell in his evidence.

2.4.5. Traffic effects arising from arrivals and departures at the River Road site access, covered in detail by Mr Noon in his evidence.

2.5 I have noted that, in many respects, the relevant experts for Taggart and the Councils agree that the potential and actual environmental effects will be acceptable. I also note that, in relation to those effects, Ms Dawson in her evidence has not raised any significant matters of disagreement with the AEE's assessment of planning matters or the level of environmental effects provided the matters she identified in her paragraph 565 can be addressed. I have highlighted areas of agreement on planning and technical matters throughout my evidence.

2.6 Mr Taggart in his evidence has set out the detail of Taggart's operations including how gravel will be extracted and backfill placed in the excavation, including in relation to groundwater levels.

2.7 I will elaborate on particular aspects of the site's proposed operations when I address particular environmental effects elsewhere in my evidence – especially, and critically, operational measures proposed to ensure groundwater is not contaminated by either extraction of gravel or the backfilling of the excavation with imported material.

2.8 Through the remainder of my evidence I will address each of these effects in turn.

Summary of resource consents required

2.9 The consents identified in the AEE which were considered to be required were as follows:

2.9.1. Land use consent for the use of land to conduct earthworks, which requires resource consent from the Waimakariri District Council; and

2.9.2. Land use consent for the emission of noise, which requires resource consent from the Waimakariri District Council; and

2.9.3. Land use consent for the use of land for earthworks over an aquifer, which requires land use consent from the Canterbury Regional Council; and

2.9.4. Discharge permit for the potential discharge of contaminants from the deposition of backfill material

(proposed as Virgin Excavated Natural Material) into the pit, which requires a discharge permit from the Canterbury Regional Council; and

2.9.5. Discharge permit for the discharge of contaminants to air from an industrial and trade premises, which requires a discharge permit from the Canterbury Regional Council; and

2.9.6. Water permit for the taking of water, which requires resource consent from the Canterbury Regional Council.

Further resource consents required

2.10 Ms Dawson outlines in paragraphs 37 to 50 of her report that *"it has been determined that additional resource consents are required to fully authorise the proposed activities"* (paragraph 37).

2.11 Below I address each of those matters in turn.

Variation to existing air discharge permit at Cones Road

2.12 Taggart operates a processing facility at Cones Rd, as outlined in Mr Taggart's evidence. That facility holds a discharge permit (to air) from CRC authorising discharges of particulate matter arising from the screening and crushing of aggregates, and the storage, handling and transportation of aggregates and landscape material (CRC970192).

2.13 A condition of that consent requires that the activity is undertaken *"as described in the application."* The application stated that aggregates subject to the consent were to be extracted from the Ashley River.

2.14 Under Taggart's proposal, if granted, aggregate from the Racecourse site will be processed at the Cones Rd site. Read strictly, consent CRC970192 precludes this as the aggregate will not be from the Ashley River.

2.15 Ms Dawson contends that if gravel from the racecourse site is to be processed at the Cones Rd site, this could only occur legally if CRC970192 is varied. She noted that *"to authorise the processing of material from the racecourse, a variation of conditions* [a successful application to change resource consent conditions under s 127] *to CRC970192 is required."*

2.16 I agree with her position that, assuming similar characteristics in the aggregate itself, the effect of screening, crushing, storing, handling and transporting aggregates from this site will likely be indistinguishable from the effects occurring under the current consent.

2.17 The total volume of material to be processed at Cones Road in the future will remain similar to that originally envisaged by CRC970192.

2.18 Applying the established principle of the existing environment, in my view there would be no adverse environmental effect arising from the screening, crushing, storing, handling and transporting gravel from this site at Cones Road, given that all of the effects of processing gravel from the Ashley River are part of the existing environment (under CRC970192). The caveat is that this assumes Ashley River and the aggregate within the racecourse site are sufficiently similar in composition that their effects profile is also similar. I am not aware of any reason why that would not be considered the case.

2.19 Therefore I agree that a change to the conditions of CRC970192 will need to be made under s 127 if the present applications are granted. I support Ms Dawson's view that a s 127 change is appropriate and her view that there was no need to suspend processing of the present applications under s 91 to enable this variation to be sought in due course.

Variation to existing water permit

2.20 As outlined in Mr Bluett's evidence and agreed by Mr Chilton, Taggart proposes a suite of dust management protocols to ensure effects of dust emissions from the site are appropriately controlled. As I understand it, Mssrs Bluett and Chilton agree that overall, Taggart's proposed measures are consistent with good practice and will be effective.

2.21 A key element of those management protocols is the use of water to dampen unconsolidated material and supress dust. The site is subject to CRC160231 held by Canterbury Jockey Club Inc and Rangiora Harness Racing Club Inc to take and use groundwater for irrigation and dust suppression purposes.

2.22 Ms Dawson outlined in paragraphs 43-44 of her s 42A report that the use of this water is limited to the area identified on a

plan attached to that consent. Taggart proposes to use this water for dust suppression inside and outside of that area.

2.23 Ms Dawson suggested, and I agree, that a s 127 change to that consent is needed before the water can be used outside of the area shown on CRC160231's map. I also agree that that there was no need to suspend processing of the present applications under s 91 to enable this variation to be sought in due course.

Discharge consent for discharge of stormwater

2.24 Ms Dawson notes in paragraph 45 of the s 42A report that:

> *"it has come to light that there is a requirement to authorise stormwater discharges from the access road. Stormwater discharges have not been described in the applicant's revised AEE and* [this] *has therefore not formed part of their assessment against the Canterbury Land and Water Regional Plan (CLWRP)."*

and in paragraph 47:

> *"Rainfall falling on these hardstand areas will run off and meet the CLWRP definition of stormwater. As the site is now considered potentially contaminated, I consider that any stormwater discharges cannot comply with Rule 5.96 of the CLWRP and that resource consent is required under Rule 5.97 as a discretionary activity."*

2.25 In the appendix to the s 42A report prepared by Ms Iles, she suggests that an area of soil disturbance on the eastern margin of the site may be a waste pit. On that part of the site Taggart intends to create an access road to allow transport of gravel between the racecourse interior and River Road. Ms Iles states in paragraph 30 of her report:

> *"Disturbance of waste material during construction of the access road may result in migration of contaminants to groundwater or surface water in stormwater runoff."*

2.26 She also notes, however, that:

> *"A targeted soil sampling investigation was completed by Pattle Delamore Partners (PDP, 2020). The investigation was completed in accordance with appropriate guidelines and concluded that the risk of*

soil contamination from establishment and maintenance of the track was low."

2.27 In her report, Ms Dawson concludes a discharge permit for stormwater is likely needed but considers that this is outside of the scope of the applications lodged and notified. Therefore a new application is needed.

2.28 I do not agree that to grant a consent for the discharge of stormwater would be out of scope of the applications lodged, or that a discharge permit was not applied for. The application AEE stated on page 13 that:

"For the avoidance of doubt, Taggart is seeking consent under the above rules and any other rules which may apply to the activity, even if not specifically noted."

2.29 I agree that an analysis of the relevant rule was not provided in the AEE. This does not, however, render the granting of a consent for the activity beyond the scope of the application. I note too that this was not an issue raised by the Councils during the processing of the applications.

2.30 The text of Rule 5.96, the relevant rule of the CLWRP, states:

5.96 The discharge of stormwater, other than into or from a reticulated stormwater system, onto or into land where contaminants may enter groundwater is a permitted activity, provided the following conditions are met:

1. The discharge <u>is not from, into or onto contaminated or potentially contaminated land</u>;

and

2. The discharge:

(a) does not cause stormwater from up to and including a 24 hour duration 10% Annual Exceedance Probability rainfall event to enter any other property; and

(b) does not result in the ponding of stormwater on the ground for more than 48 hours, unless the pond is part of the stormwater treatment system; and

(c) is located at least 1 m above the seasonal high water table that can be

reasonably inferred for the site at the time the discharge system is constructed; and

(d) is only from land used for residential, educational or rural activities; and

(e) does not occur where there is an available reticulated stormwater system, except where incidental to a discharge to that system; and

(f) is not from a system that collects and discharges stormwater from more than five sites.

2.31 Ms Dawson has stated that *"it has been determined that additional resource consents are required to fully authorise the proposed activities" and, specifically in relation to stormwater, "there is a requirement to authorise stormwater discharges from the access road"* [emphasis added]. The language used is definitive.

2.32 However, in my view, an assessment of the proposed activities against Rule 5.96 does not necessarily lead to the need for a discretionary consent.

2.33 My analysis of the rule is that:

2.33.1. There will be a discharge of stormwater and this will not be from a reticulated system;

2.33.2. The discharge will be to land;

2.33.3. Contaminants in the stormwater (hydrocarbons) may enter groundwater;

2.33.4. Conditions (a) to (f) of subpart (2) will all be met (in particular, the proposed quarry is a rural activity);

2.33.5. The remaining part of the rule required to be met for a permitted activity is subpart (1), which requires the discharge to be *"from, into or onto contaminated or potentially contaminated land"*.

2.34 Conceivably, any land is potentially contaminated land until a DSI or similar assessment has proven that it is not contaminated. In this case a PSI showed the site most likely not contaminated, and a targeted soil sampling investigation was completed by PDP. That investigation was completed in accordance with appropriate guidelines and

concluded that the risk of soil contamination from establishment and maintenance of the track was low.

2.35 However there is now some evidence of previous ground disturbance which has become apparent. In that light I agree with Ms Dawson's assessment that the site should technically be treated as potentially contaminated. However, there seems to be relatively little evidence to hand to confirm whether the rule applies. Rather, there is photographic evidence of a small area of historic ground disturbance and two submitters whose statements support that, without being specific.

2.36 I accept that, at this stage, the land is correctly to be regarded as potentially contaminated. To confirm whether this is in fact the case, an investigation of that part of the site can be undertaken, including laboratory analysis of potentially contaminated soils, if consents for this proposal are granted.

2.37 If a resource consent is required, this can be obtained separately.

2.38 I note that CRC did not raise this issue in the s 92 request on the first application lodged, nor the s 92 request on the second (current) application lodged. A determination on s 91 matters was not made at any time that any other consents were required.

Other permissions required

2.39 Minute 2 of the Commissioners addressed a matter raised by submitter Mr John Mather regarding section 21 of the Racing Industry Act 2020 (RIA). Section 21 of the RIA relates to the use of racing venue land for purposes other than racing. The submitter contended that the hearing of the resource consent applications could not proceed in the absence of approval from the appropriate racing code to use to the land as proposed by Taggart.

2.40 The Commissioners acknowledged that often several forms of permission are needed under various legislation before developments can proceed. Permission under the RMA, in this case via the granting of resource consents, is one such form of permission. They also noted that it is Taggart's responsibility to address, separately from the RMA resource consent process, any other permissions required.

2.41 The minute noted in paragraph 12 that this RIA matter is not an RMA matter, but nevertheless that:

"we will allow parties if they wish to, to address us further on this point at the hearing" (paragraph 15)

2.42 For the record I agree with the position reached by the Commissioners and confirm that, in my opinion, the Commissioners only have jurisdiction to consider and decide on RMA matters.

3. GENERAL PLANNING MATTERS NOT IN DISPUTE

Bundling and class of activity

3.1 Ms Dawson addressed bundling in paragraphs 190 to 193 of the s 42A report. I agree with her assessment and confirm that, in my opinion, the resource consents sought from CRC are collectively discretionary and the resource consents sought from WDC are also discretionary.

The existing environment

3.2 Ms Dawson noted that she largely agreed with the description of the environment provided in the application. The s 42A notes that the description of the existing environment is accurate with the exception of details relating to the depth and variability of groundwater beneath the site and in the wider area. That matter is addressed by Mr Thomas in his evidence and below where I address matters relating to groundwater monitoring and potential effects on groundwater.

3.3 Later in my evidence I will address the matter of the potential for contamination of groundwater in the Community Drinking Water Protection Zone (CDWPZ). The location of the site within the CDWPZ has been well canvassed in the evidence of Mr Simpson and Mr Thomas. I will not repeat their evidence here (and will return to it in detail later), but I do wish to briefly address the question of the existing environment as it relates to the back up water supply.

3.4 Waimakariri District Council holds resource consent CRC160704 (granted 1998, expires 2032) which allows the take and use of groundwater for a backup community supply.

3.5 Mr Simpson stated (paragraph 8 of his appendix to the s 42A report) that bores are *"kept ready to operate at any time as part of contingency plans for the supply [to Rangiora]."*

3.6 The existence of that consent requires us, in accordance with accepted caselaw on what forms part of the existing environment for the purposes of s104, to consider the authorised take to be considered as part of the existing environment – assuming it either has been implemented or is likely to be implemented. Mr Simpson has stated in his appendix to the s 42A report that their readiness to operate is *"part of contingency plans for the supply, and as such are included within the Water Safety Plan for the scheme, which are part of the scheme's compliance with the Health Act."*

3.7 Since the consent is clearly intended to be implemented, the remaining question is whether the consent has lapsed. There is no lapse date specified in CRC160704, so it would lapse in accordance with the default 5 years in s 125(1)(a). I am not party to any detailed information on the exercise of the consent. In being an explicit part of the Water Safety Plan and as Mr Simpson wrote the bores are ready to use "at any time", it seems that substantial progress has been made towards giving effect to the consent, even if it has not yet in fact been given effect to.

3.8 In my assessment, therefore, it seems that consent CRC160704 should reasonably be considered as likely to be implemented in the future (if it is not been already). This means, in my opinion, that the takes authorised by CRC160704 should be considered as part of the existing environment.

Permitted baseline

3.9 Section 104(2) of the RMA states that when forming an opinion for the purpose of section 104(1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a National Environmental Standard or relevant plan permits an activity with that effect.

3.10 No permitted baseline arguments were advanced in the AEE and I agree with Ms Dawson's opinion that none of the activities permitted in the Rural Zone, on the site, would be sufficiently similar in character, scale or effects to the proposed quarry to warrant applying a permitted baseline in this instance.

Bond

3.11 The RMA provides in section 108A for a bond to be required to secure performance of consent conditions. Ms Dawson suggested in the s 42A report that a bond may be necessary. Such a bond may continue for a specified time beyond the expiry of a consent if the consent authority considers that an adverse effect may continue or arise beyond the consent's expiry.

3.12 Taggart did not canvass the issue of a bond in the application as lodged and Mr Taggart says in his evidence that this had not previously been raised with the applicant.

3.13 I support the notion that a bond is held jointly with Canterbury Regional Council and Waimakariri District Council. The permanence of the backfill material in the environment suggests it is worthwhile investigating a bond of a longer term than the duration of the consents sought. The release of Taggart from the bond should be contingent on reasonable understanding from both councils that the activity has not caused environmental effects that were not anticipated or allowed by any consent granted.

3.14 The s 42A report provided no information on the appropriate value of the bond. I am not able to comment on the appropriateness of any figure as to do so would be outside my expertise.

Term

3.15 A consent duration of 15 years has been sought and I note Ms Dawson agrees that, if the consent is granted, that is an appropriate term.

4. EFFECTS NOT IN DISPUTE

Positive effects

4.1 The AEE identified a number of positive effects of the development. Ms Dawson agreed these are relevant and positive.

4.2 Significantly, allowing the proposal would enable cost-effective processing of aggregates to continue at Cones Road. The proximity of the two sites supports this, as well as providing for lesser traffic effects (as an example) than might occur if extraction occurred from more distant sites.

Regional policy speaks to this matter in particular, in Objective 5.2.1 of the Canterbury Regional Policy Statement 2017, which states:

Objective 5.2.1 Location, design and function of development (Entire Region)

Development is located and designed so that it functions in a way that:

1. *achieves consolidated, well designed and sustainable growth in and around existing urban areas as the primary focus for accommodating the region's growth; and*

2. *enables people and communities, including future generations, to provide for their social, economic and cultural well-being and health and safety; and which:*

    (a) maintains, and where appropriate, enhances the overall quality of the natural environment of the Canterbury region, including its coastal environment, outstanding natural features and landscapes, and natural values;

    (c) encourages sustainable economic development by enabling business activities in appropriate locations;

    (d) minimises energy use and/or improves energy efficiency;

    (e) enables rural activities that support the rural environment including primary production;

    (i) avoids conflicts between incompatible activities.

4.3 Taggart's proposal supports Canterbury's progress towards achieving this objective, by locating its gravel extraction site close to its existing processing facility and close to current urban demand for aggregates for urban developments. It is '*consolidated, well designed and sustainable growth in and around existing urban areas'* as well as a development that '*encourages sustainable economic development'* and '*minimises energy use and/or improves energy efficiency.'*

4.4 Evidence of Mr Bluett and Mr Chilton (on air quality), Mr Noon and Mr Morahan (on transportation effects), Mr Farren and Mr Reeve (on noise effects) and Ms Dawson (on site

amenity and rural character) all confirm that, in their view, the proposal avoids conflicts between incompatible land uses (in respect to those potential effects).

4.5 The proposal, in my view, sits squarely within the type of development envisaged by the Canterbury Regional Policy Statement 2017, provided that sub-part (2)(a) of Objective 5.2.1 can also be achieved: *to ensure that the overall quality of the natural environment is maintained.* Evidence of Mr Thomas and Mr Singson, in particular, shows that this can be achieved with appropriate controls on the operation of the site in order to avoid potential effects on groundwater.

4.6 Security of gravel supply in the region certainly enables economic activity and beneficial urban and rural developments. My understanding based on the evidence of Mr Taggart is that the demand for aggregate in north Canterbury is likely to continue. If extraction sites are located far from the demand, this will result in increased costs for aggregate and also increased transportation effects.

4.7 For the Canterbury Jockey Club and the Rangiora Harness Club, who jointly own the site, the proposal's benefits are twofold: first, it will provide financial support to enable their activities on an ongoing basis. Second, it will enable their own ongoing support for the wide range of community activities that occur at the racecourse grounds (outside of the proposed quarry footprint). These include a Sunday market, various club activities, police dog training, emergency management training, fundraisers and other events for the benefit of the wider community.

4.8 Collectively these are positive effects of Taggart's proposed development that will, importantly, contribute towards achieving the community's aspirations on appropriate location, design and function of developments.

Air quality effects

4.9 There is no disagreement between Ms Dawson and I, nor between Mr Bluett and Mr Chilton, that quarries give rise to dust emissions and that the potential effects of such discharges can include health effects, nuisance effects and effects on operational safety, particularly of airfields or roads.

4.10 The sources of dust emissions from this particular proposal have been well canvassed in the evidence of Mr Bluett and

Mr Chilton and generally include wind blown or mechanical release of dust into the air from site preparation works, aggregate extraction, stockpiles, loading of trucks, haul roads, backfilling, and site rehabilitation.

4.11 Mr Bluett considers the key dust generating activities, in order of the amount of dust discharged, to be:

4.11.1. Vehicle movements – especially on un-consolidated surfaces;

4.11.2. Gravel handling; and

4.11.3. Gravel extraction.

4.12 Mr Bluett and Mr Chilton also agree that the most significant air pollutant from quarries, and potentially generated by these elements of the proposal, is particulate matter.

4.13 In relation to health effects of exposure to dust, the risk of acute and chronic health effects is generally limited to exposure to particulate matter in respirable size fractions (i.e. less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$). These particles are sufficiently small that (a) they remain suspended in the atmosphere long enough to be transported away from their emission site, and (b) they are sufficiently small to enter the lungs when inhaled.

4.14 There is also some community concern expressed in submissions that discharges of respirable crystalline silica (RCS) may occur from the site. Long term exposure to RCS can cause silicosis and other respirable diseases.

4.15 Mr Bluett notes that:

> *"Unlike at a typical quarry, and an important feature of this proposal, no gravel processing will occur on site. Therefore, the nature of the dust discharged will be determined solely by the base material being extracted and will be comprised mainly of larger dust particles of >30 μm in diameter. The impacts of dust of this size are limited to nuisance effects."*

4.16 The absence of processing at the site distinguishes Taggart's proposal from the series of other quarrying operations that have recently sought resource consents to establish around Christchurch. Fulton Hogan Ltd's "Roydon" quarry at Templeton and SOL Aggregates Ltd quarry at Conservators Road, Christchurch, are examples. Taggart proposes no

gravel processing on site and instead for all processing to occur at Cones Road, where this operation is already established and is part of the existing environment.

4.17 A Mr Bluett also discusses the Mote (2018) study[2] of dust emissions and air quality arising at and around the Yaldhurst quarries. That study found that, in Mr Bluett's words (paragraph 9.16 of his evidence):

> *"PM_{10} concentrations measured at a distance of greater than 160m from the quarry boundary show very little impact from the quarry compared to data collected at a background site."*

4.18 Mr Chilton and Mr Bluett have noted the relatively small size of the proposed Taggart quarry – with a maximum unconsolidated surface (excluding roading) of 2 ha, compared (as an example) to the Yaldhurst quarry in the Mote study, which has 230 ha of unconsolidated surface (115 times larger).

4.19 In Mr Bluett's opinion, generation of dust (principally from vehicle movements, gravel handling and gravel extraction), combined with the absence of processing at the site, means that any dust generated will typically be particles of >30 μm and RCS is unlikely to be present. Particles of >30 μm are, in his opinion, too large to be transported off site to sensitive receptors where they would cause a potential health effect. Mr Chilton appears to agree with that assessment.

4.20 The potential generation of dust from these elements of the operation can be avoided or mitigated by the adoption of on-site practices for dust management. Taggart has proposed a suite of mitigation measures including controlling dust suppression with water. Ms Dawson in the s 42A report accepted Mr Chilton's assessment of these mitigation measures, which is that they are generally acceptable.

4.21 She noted that there is a degree of uncertainty in the AEE and further information Taggart provided around the exact quantities of water needed for dust suppression, and whether use of water to irrigate rehabilitated areas was included in those calculations. I acknowledge that uncertainty (although note that Mr Taggart explains that

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[2] Mote 2018. Yaldhurst Air Quality Monitoring Programme – Summary Report: 22 December – 21 April 2018. Report prepared for Environment Canterbury by Mote Limited.

rehabilitation activities will occur in spring and autumn where possible) and note that, despite that uncertainty, Ms Dawson accepted that "*there should be sufficient water available for use under the existing water permit at the site for dust suppression and rehabilitation purposes*" (paragraph 221). I agree with that conclusion.

4.22 With these mitigations in place, Mr Bluett and Mr Chilton agree overall that the dust control methods on the Taggart site will be examples of good practice. One exception to this is their disagreement on whether loads should be covered for the short travel distance between the site and Cones Rd (a route which passes eight dwellings).

4.23 Ms Dawson notes that an AQMP was not provided with the application, and rather that the specifications of such a plan were provided, along with a description of the mitigation measures Taggart proposes to adopt, and a set of suggested resource consent conditions. If consent is granted Ms Dawson proposes that an AQMP is developed and approved by the CRC before the consent is exercised. This is a common practice and I agree generally with the approach proposed.

4.24 In my opinion the AQMP should be developed so that it is generally in accordance with the specifications of the management plan described in the application (a copy is also attached to Mr Bluett's evidence), prepared in accordance with the consent conditions, and prepared in consultation with the CRC's compliance staff.

4.25 Both Mr Chilton and Mt Bluett agree, while acknowledging the significant concerns of submitters to the contrary, that the health and nuisance effects of dust discharges will be 'less than minor'— if the mitigation measures as proposed are adopted and followed by Taggart.

4.26 Ms Dawson's assessment of the proposal and its effects against the Canterbury Air Regional Plan (CARP) was set out following paragraph 533 (pgs. 122-126) of the s 42A report.

4.27 I agree with her assessment that the proposal:

4.27.1. Will assist in achieving Objectives 5.1 to 5.9 of the CARP, since the air quality effects of the proposal are considered to be acceptable;

4.27.2. Has sufficient site management of dust generation and emissions to ensure the effects in Policy 6.1 will be avoided (adverse effects on human health and wellbeing; adverse effects on the mauri and life supporting capacity of ecosystems, plants or animals; significantly diminished visibility; and significant soiling or corrosion of structures or property);

4.27.3. In protecting the life supporting capacity of the air, is consistent with Policy 6.2 (to recognise the value of air quality as a taonga and manage adverse effects in accordance with that);

4.27.4. Does not include any discharge will not cause any increase in PM_{10} in the Rangiora Airshed;

4.27.5. Site management protocols, to be set out and followed in the AQMP, will ensure offensive and objectionable effects are avoided;

4.27.6. That the requested duration of consent of 15 years is not inconsistent with Policy 6.12; and

4.27.7. That granting consent would not cause a significant increase in the discharge of PM10 (Policy 6.23).

Effects of noise and vibration

4.28 The proposal involves activities that generate sound (preparatory works, topsoil removal, formation of the perimeter bunds, gravel extraction, backfilling and operation of associated machinery and trucks). The application noted that sound which is undesirable is noise, and proposed a suite of mitigations to ensure sound and noise are limited to acceptable levels at the notional boundary of any other site. These were set out in Appendix C of the application and have also been described in an operational sense in Mr Taggart's evidence and assessed in Mr Farren's evidence.

4.29 Mr Farren's evidence confirms the position presented in the AEE, that:

> *"the maximum noise levels of the proposal are predicted to exceed the applicable daytime noise limits in the District Plan by 1 dB. While I consider this exceedance to be negligible, it is nonetheless a technical exceedance of the daytime noise limit. As a result, the activity status is discretionary, and it is*

appropriate to consider the potential adverse noise effects." (paragraph 6.2)

4.30 Mr Farren has emphasised, as has Mr Bluett, that the proposal is not an operation that includes gravel crushing or any other potentially noisy processing activities such as screening. Rather, the proposal is to extract gravel and either stockpile it on the site or transport it off site, and backfill the excavated area with VENM. Operation of machinery such as the motor scraper has the potential to generate noise, but the absence of processing distinguishes this proposal from most other quarry proposals in the region in recent years.

4.31 Mr Farren (paragraphs 6.6 to 6.10) and Ms Dawson (paragraphs 397 to 402) both explained that a number of noise standards apply by virtue of the range of noise-generating activities and the relevant rules of the district plan. I will not repeat those explanations here.

4.32 Advising the Waimakariri District Council, Mr Reeve reviewed the AEE and has prepared an appendix to the s 42A report on the matter of noise.

4.33 I note as well that the s 42A report, the appendix prepared by Mr Reeve and Mr Farren's evidence cover a small number of new matters. For completeness, these matters and Mr Farren's response to them are:

4.33.1. Ms Dawson and Mr Reeve were concerned the focus of vehicle activity close to eastern margins of the site may not have been accounted for (and could actually cause a greater noise effect on adjacent properties than initially modelled). Mr Farren has presented remodelling of the noise effects from the proposal. He has stated in his paragraphs 9.4 to 9.8 that, though there is an increase in noise received at properties on West Belt, the total noise effect there is below 50 dB L_{Aeq} and is acceptable:

"My analysis shows noise levels are identical at most dwellings. However, a 1 dB increase is noted for some dwellings immediately to the east of the site (in Huntington Drive) which is a negligible change and noise levels will remain below the 50 dB L_{Aeq} criterion."

4.33.2. That the height of the stockpiles may exceed the height of the acoustic bunds, and result in reduced

acoustic screening if noisy activities occur on the stockpiles. Mr Farren considered this matter and confirmed that the operation of trucks or other vehicles on the stock piles still comply with the 50 dB dB L_{Aeq} daytime noise limit.

4.33.3. That despite the differing analysis of traffic noise effects presented by Mr Reeve and Mr Farren, in Mr Farren's assessment: *"the conclusions we each reach are the same – that traffic noise effects will not be significantly different with the proposal."* [as opposed to the proposed quarry activities not occurring].

4.34 Mr Farren concluded that he considers the proposed activity will result in acceptable noise and vibration effects. Having read his evidence on noise including the s 42A report and Mr Reeve's report, the experts appear to agree that the appropriate level of daytime and night-time residential amenity will be maintained at the nearest dwellings, as long as the controls Taggart proposes are required. I have noted and acknowledged the detailed analysis provided in Ms Dawson and Mr Reeve's s 42A reports, but overall I consider their conclusions align with those of Mr Farren.

Effects of the diversion of floodwater

4.35 At the time the revised AEE was lodged, the construction of bunds to deflect sound away from sensitive receptors appeared to have the particular additional effect of diverting flood waters onto properties in the area of the Priors Road / Lehmans Road intersection. This was proposed to be avoided by a channel around the southern tip of this bund, designed to increase the speed of flow and reduce the depth of water backing up. The modelling showed some increases in flood water depth on those properties.

4.36 The effect was subject to a s 92(1) request from Ms Dawson who considered the AEE did not provide sufficient information on the effect of this increased flooding (as opposed to its depth and flow velocity).

4.37 On remodelling, it was found that an error had been made in the original modelling. This was explained to Ms Dawson in my letter to her of 25 February 2021:

> *"Flood modelling inputs include surface 'roughness', which is one factor influencing the conveyance of*

water over the land in the event of a flood. Accurate representation of surface roughness in the model is critical to the accuracy of the results.

In the suite of modelling undertaken for the AEE and s92(1) response [of January 2021]*, the Mannings 'n' value which describes roughness was incorrectly identified for River Road and Priors Road between Lehman's Road and Merton Road. The model mistakenly treated these roads as rougher surfaces than they are in reality.*

The high roughness on Priors Road resulted in a portion of the floodwaters being slowed and deflected onto properties to the immediate north, along Lehmans Road and onto properties on Lehmans Road and Priors Road. This effect was discussed in the AEE and illustrated in the maps of flood modelling results of that document (Appendix G)."

4.38 The remodelling showed that flood waters will not back up in the vicinity of the bund in the manner originally thought. Rather, the flow will be concentrated along the major (existing) flow path and then conveyed through the proposed excavated channel at the southern end of the western bund.

4.39 The implications for flooding at the site and in the vicinity are that, as a result of the construction of the bunds and flow channel:

4.39.1. A decrease in flood water depth relative to the status quo is predicted in the Lehmans Road / Priors Road area, and no change is predicted to the flood water depths for properties at the northern end of Lehmans Road. This reduction in depth arises as a result of the excavated channel to the south of the bund.

4.39.2. An increase in flood water depths relative to the status quo is predicted along River Road and on land to the immediate east of the eastern bund. Here, flood waters are predicted to back up on the site itself and flow into River Road around the northern tip of the bund. In the Q500 event, the difference in depth is less than 100 mm where the modelled flood water leaves River Road north east

of the bund. This flood water depth was originally modelled to increase by 0 to 30 mm and this will likely increase to between 0 mm and 100 mm.

4.39.3. No increase in the flood hazard for the Q500 event (outside of the site footprint). Previously, in the AEE, some increase in flood hazard was predicted for the area adjacent to Lehmans Road.

4.40 Mr Throssell has outlined in detail in his evidence the manner in which this modelling was conducted. He has also presented maps showing the difference in flood water levels in the vicinity of the site and described key aspects of the distribution of flood waters. He has confirmed that (in paragraph 8.12) *"for all three flood events, no flood level increases are predicted for any existing dwellings."*

4.41 Ms Dawson discusses whether flooding is an issue in detail in her s 42A report. She noted in paragraph 392, as does the AEE in section 3.6.4, that the Waimakariri District Plan's policies are directive on the matter. Policies 8.2.1.3 and 8.2.1.4 state:

"8.2.1.3: Avoid floodwaters entering residential, commercial and industrial buildings"

And

"8.2.1.4: Avoid, remedy, or mitigate the adverse effects of activities that impede or redirect the movement of floodwater on a site, and/or exacerbate flood risk."

4.42 In light of these policies, the revised flood modelling results presented to her on 25 February 2021, and on the advice of Mr Simpson, Ms Dawson has concluded in paragraph 395 of the s 42A report that:

"Overall, I consider that provided the applicant adheres to the proposed conditions, the effects of diverting floodwater will be minimal."

4.43 I agree with her assessment and consider the effects of diversion of flood waters will be acceptable and in accordance with Policies 8.2.1.3 and 8.2.1.4 of the District Plan.

Traffic / transportation effects

4.44 Vehicles travelling to and from the site, particularly trucks carrying extracted gravel or backfill material, have been identified to generate potential effects relating to traffic volumes, road user safety, and road maintenance.

4.45 Taggart intends to access the site from the already partially established access at River Road, with an upgrade of that access proposed to provide a safe road environment with trucks entering and exiting. This is described in the AEE and in Mr Noon's evidence, in which he notes (at paragraph 4.15) that *"In my opinion there are no issues associated with site access that have not been addressed."*

4.46 He explains that the application is compliant with all applicable permitted activity rules within the Waimakariri District Plan with one exception. I agree with his assessment of the relevant rules and agree with him that Rule 30.6.1.34 (which relates to parking and loading spaces) should not be applied to this proposal. A strict interpretation of that rule would require the site to provide 2000 parking spaces and 140 loading spaces, owing to its size (which strictly counts as "Gross Floor Area" under the Waimakariri District Plan.

4.47 Mr Noon and Ms Dawson appear to agree, and I concur, that whilst the activity could be argued to breach permitted standards in Rule 3.6.1.34, the rule was clearly not intended to capture activities such as quarries nor to manage on-site vehicles in the same manner as activities on smaller sites with true "floor area".

5. POTENTIAL GROUNDWATER QUALITY EFFECTS

5.1 In my opinion the most significant potential environmental effect of Taggart's proposal is the potential for effects on groundwater. These effects could potentially occur in three ways:

5.1.1. The excavation depth, combined with fluctuating depth to groundwater, causing groundwater to be exposed, or causing insufficient separation to groundwater and allowing contaminants such as microorganisms to enter groundwater.

5.1.2. Material used as backfill containing contaminants that leach from the material or otherwise become dissolved or entrained in groundwater.

5.1.3. Spills from machinery refuelling or maintenance entering groundwater via the soil.

5.2 Before addressing each of those possibilities, I believe it is worth restating the relevant parts of the proposal and stating my understanding of the outcome (at the time of writing) from expert caucusing between Ms Kreleger, Ms Iles, Mr Thomas, and Mr Singson and Mr Simpson. Expert conferencing addressed the connected matters of groundwater and the backfill (VENM) quality assurance, acceptance and screening processes.

5.3 The relevant parts of the proposal and my understanding of agreements reached between these experts are that:

5.3.1. There is to be no maintenance of machinery or vehicles at the site, and refuelling will only be undertaken away from the excavation area and in accordance with standard handling procedures for ecotoxic chemicals such as fuel. This was stated in the AEE and is confirmed by Mr Taggart in his evidence.

5.3.2. Backfilling is proposed with VENM only. Mr Singson addresses this matter, including quality control and record keeping procedures, in detail in his evidence. VENM is:

- *"Virgin excavated natural materials such as clay, soil and rock that are free of:*
- *combustible, putrescible, degradable or leachable components;*
- *hazardous substances or materials (such as municipal solid waste) likely to create leachate by means of biological breakdown;*
- *products or materials derived from hazardous waste treatment, stabilisation or disposal practices;*
- *materials such as medical and veterinary waste, asbestos, or*
- *radioactive substances that may present a risk to human health if excavated;*

- *contaminated soil and other contaminated materials; and*
- *liquid waste.*
- *When discharged to the environment, clean fill material will not have a detectable effect relative to the background."*[3]

5.3.3. Ms Kreleger, Ms Iles, Mr Thomas, Mr Singson and Mr Simpson all appear to agree that if the backfill material is VENM only, then any potential effects on groundwater will be minimal and acceptable. They also appear to agree that repeated saturation of VENM with groundwater rising and falling through it will not lead to any unacceptable effects on groundwater.

5.3.4. At all times at least 1 m of separation is to be maintained between the lowest exposed ground surface and the groundwater, with a maximum excavation depth of 5 m below ground level. Ms Kreleger, Ms Iles, Mr Thomas, Mr Singson and Mr Simpson all appear to agree that maintaining at least 1 m of separation is appropriate.

5.4 Given these elements of the proposal and my understanding of the areas of apparent agreement between technical experts, in my view there are three particular elements to consider in a planning context:

5.4.1. The sensitivity of the environment;

5.4.2. The extent of potential environmental effects arising from VENM and non-VENM material being used as backfill;

5.4.3. The appropriateness of Taggart's proposed methods to ensure 1 m separation from groundwater is maintained, and only VENM is used as backfill.

Sensitivity of the environment

[3] *Technical Guidelines for Disposal to Land* (WasteMINZ, 2018)

5.5 There is no doubt the groundwater environment potentially affected by Taggart's proposal is sensitive.

5.6 Several relevant policy documents and standards apply to the groundwater, its use, and land use activity affecting it. These been canvassed in detail by Ms Dawson and Ms Kreleger in particular. Relevant documents include the New Zealand Drinking Water Standards, National Environmental Standard for Sources of Human Drinking Water Regulations 2007, and the Canterbury Land and Water Regional Plan.

5.7 The Canterbury Land and Water Regional Plan, as an example, has a pertinent objective, 3.8A, that *"High quality fresh water is available to meet actual and reasonably foreseeable needs for community drinking water supplies."* This is intended to be implemented by Policies 4.23 and 4.14 in particular:

Policy 4.23: 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 and community drinking water supplies are protected so that they align with the CWMS drinking-water targets and meet the drinking-water standards for New Zealand.

Policy 4.14: Any discharge of a contaminant into or onto land where it may enter groundwater (excluding those passive discharges to which Policy 4.26 applies):

> *will not exceed the natural capacity of the soil to treat or remove the contaminant; and*
>
> *will not exceed available water storage capacity of the soil; and*
>
> *where meeting (a) and (b) is not practicable, the discharge will:*
>
> > *i. meet any nutrient limits in Schedule 8 or Sections 6 to 15 of this Plan; and*
> >
> > *ii. utilise the best practicable option to ensure the size of any contaminant plume is as small as is reasonably practicable; and*
> >
> > *iia. ensure there is sufficient distance between the point of discharge, any*

other discharge and drinking-water supplies to allow for the natural decay or attenuation of pathogenic micro-organisms in the contaminant plume; and

iii. not result in the accumulation of pathogens, or a persistent or toxic contaminant that would render the land unsuitable for agriculture, commercial, domestic, cultural or recreational use or water unsuitable as a source of potable water or for agriculture; and

iv. not raise groundwater levels so that land drainage is impeded.

5.8 This policy framework gives prominence to the community's aspiration to protect drinking water supplies.

5.9 Interestingly, the NPSFM 2020 now gives higher prominence to the protection of water generally in accordance with Te mana o Te Wai, than it gives to the protection of drinking water:

> *Objective 1: The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises:*
>
> - *first, the health and well-being of water bodies and freshwater ecosystems*
> - *second, the health needs of people (such as drinking water)*
> - *third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.*

5.10 This does not seem in my opinion to suggest that drinking water now requires any less protection than it did in the past (and indeed, provisions of the New Zealand Drinking Water Standards, National Environmental Standard for Sources of Human Drinking Water Regulations 2007 set bottom lines unaffected by the NPSFM). Rather, I interpret the NPSFM as giving greater prominence to the protection of water generally in accordance with Te Mana o Te Wai than had been the case before the NPSFM 2020.

5.11 Mr Simpson cited a principle of drinking water protection in the Havelock North Drinking Water Inquiry: Stage 2 Report, that:

> *"Protection of source water is of paramount importance*
>
> *Protection of the source of drinking water provides the first, and most significant, barrier against drinking water contamination and illness. It is of paramount importance that risks to sources of drinking water are understood, managed and addressed appropriately."*

5.12 Ms Kreleger and Mr Thomas agree that the subject groundwater is generally of good quality at present.

5.13 As I described above, there is little doubt that the community water supply from this groundwater is part of the existing environment and so, under s 104, regard must be had to any potential or actual effects upon it.

5.14 Notwithstanding this, the AEE and various technical evidence and s 42A reports have also pointed out there are other users of the groundwater besides the WDC. Whilst the CDWPZ is not in place for their protection per se, they are certainly beneficiaries of it, and regardless proper regard must be had to the prevention of contamination of groundwater.

5.15 In my opinion, having considered the parts of the relevant policy framework applying to the groundwater as a source of drinking water, there is no doubt the groundwater environment under and around the site is sensitive.

5.16 Mr Simpson concluded his appendix to the s 42A report with a similar position (paragraph 42):

> *"There are many potential risks to groundwater quality and it is accepted that they are not likely to be high risk in most cases. However, given the fact that the application is for an activity within a CDWPZ, these risks should be taken seriously and appropriate measures put in place to minimise the risk."*

5.17 I agree with his conclusion and note, as described by Mr Taggart, Mr Singson and Mr Thomas in their evidence, that groundwater sensitivity has been given appropriately careful consideration, especially in the manner in which separation

from groundwater is to be managed and backfill quality is to be appropriately controlled.

The potential environmental effects arising from VENM and non-VENM material being used as backfill

5.18 Mr Singson describes two sources of VENM that will be used as backfill to replace excavated gravel:

5.18.1. On site/in situ VENM – being scrapings from the site, and if needed, pit walls and margins that may be used for rapid backfilling to protect rising groundwater). A PSI and other investigations have lead Mr Singson to conclude these materials on site are VENM.

5.18.2. External sources – being surplus material from bulk earthworks projects. Mr Singson supports a three-stage process for selecting, receiving and verifying VENM described in paragraph 8.9.1 of his evidence.

5.19 Ms Dawson noted the situation that has now endured for some time, where cleanfill and backfill operators in New Zealand have been subject to two sets of standards: The Ministry for the Environment's "A Guide to the Management of Cleanfills" (2002) and the more recent "Technical Guidelines for Disposal to Land (Updated August 2018)", published by WasteMINZ.

5.20 Whilst a number of district plans still reference the MfE guide, the WasteMINZ guide is increasingly the industry standard being adopted. Ms Dawson supports that, as her recommended amendments to the proposed consent conditions show. My understanding is that the WasteMINZ guide provides a more refined suite of standards for different waste streams (including VENM) than the MfE guide.

5.21 Taggart's proposed procedures for managing backfill, as Mr Singson has noted, adopt:

> *"the current best practice guidelines outlined in the WasteMINZ 2018 document* [which] *will provide greater confidence in the acceptability and quality of the backfill material. Some aspects of the proposed acceptance procedure even go beyond the requirements of WasteMINZ including the lower acceptance limits for DDT and petroleum*

hydrocarbons and the restriction of backfill material to VENM only."

5.22 I note that the WasteMINZ document cites contaminant risks from Class 5 cleanfills (VENM-only cleanfills) as "Sediment contamination of surface water; dust" (Table 2-2). Managed fills and controlled fills, as examples, cite "*contaminant mobility, risk to groundwater and surface water*" as contaminant risks, but groundwater risk was not considered by WasteMINZ to be a risk factor for siting and managing cleanfill operations using only VENM.

5.23 Nevertheless, it is agreed the groundwater environment is sensitive and that if there is a risk that material other than VENM is deposited, that risk must be appropriately minimised.

5.24 Mr Singson sets out in his evidence a detailed procedure for the identification and acceptance of VENM. This incorporates recommendations of Ms Iles' and Ms Dawson, which I understand meet or go further than the procedures recommended by WasteMINZ.

5.25 I agree with Mr Singson's analysis of the issues and suggested procedures. These procedures appear to me to exceed good practice and to be appropriate for the site given the sensitivity of the groundwater.

5.26 Nevertheless in theory, despite these measures, in my view it is worth noting that the risk of potential effects on groundwater cannot be completely eliminated should material other than VENM be deposited in the excavation as backfill. This arises because not every load is to be tested, and there is a chance (however small) that a load which does not meet the Waste Acceptance Criteria could go undetected. Conceivably this risk could be virtually eliminated by either:

5.26.1. Testing, tracing, verifying, and recording every load of backfill, along with adopting an extremely advanced groundwater quality monitoring program; or

5.26.2. Managing backfill as if the site were a higher classification of disposal facility, with design features to prevent ingress of groundwater into the fill material and to prevent movements of any contaminant out.

5.27 The sensitivity of the environment is recognised by Ms Dawson and I agree with her position, as do the other relevant experts, but I note that neither of these measures (including testing every load or an alternative design for the filling of the site after excavation have been suggested as being required. This must be because, in their expert view, it is unnecessary.

5.28 Considering all this information, I agree with Mr Singson that if the protocols he recommends are adopted, the likelihood of any material effects on groundwater and the risk of groundwater contamination will be acceptably low.

The appropriateness of Taggart's proposed methods to ensure 1 m separation from groundwater is maintained, and only verifiable VENM is used as backfill

5.29 I understand that maintaining adequate separation between groundwater and any potential contaminant is, as a general statement, a useful approach to ensuring groundwater quality is not placed at undue risk.

5.30 In the situation of quarrying material from land above groundwater, the very nature of the activity is to reduce the separation of the land surface from the groundwater. In this case, it becomes important to establish:

5.30.1. What potential contaminants could affect groundwater and how;

5.30.2. What the required separation is, considering the sensitivity of the groundwater environment and the risk of groundwater being affected in an unacceptable way;

5.30.3. How the depth of extraction will ensure groundwater is protected;

5.30.4. How groundwater depth varies spatially and over time; and

5.30.5. How fluctuations in groundwater depth across the site or over time will be accounted for so that adequate separation is maintained.

5.31 In the case of Taggart's proposal, Mr Thomas and Ms Kreleger (in conjunction with expert input from Mr Singson and Ms Iles) have considered these matters extensively. The evidence of Mr Taggart also covers operational elements

relating to these matters. From their evidence, analysis and agreements reached in expert conferencing I have concluded:

5.31.1. That potential effects on groundwater could arise from, principally, direct exposure of the groundwater to the air (from rising into and ponding within the excavation), and subsequently to faecal deposits from animals such as birds;

5.31.2. That excavations deeper than 5 m below ground level are to be avoided;

5.31.3. That a minimum of 1 m separation will be maintained between the deepest part of any excavated area and actual groundwater;

5.31.4. That a 1 m separation is sufficient to protect groundwater during extraction campaigns;

5.31.5. That groundwater depth varies across the site and over time, but generally may be said to reach approximately 2 m below ground level when at its highest;

5.31.6. That a risk of insufficient separation and, later, of exposure of the groundwater at the surface, may be present when groundwater rises if backfilling does not occur in a timely way;

5.31.7. That the risk of groundwater exposure or insufficient separation can be avoided by backfilling with material before rising groundwater is closer than 1 m from the surface.

5.31.8. That to achieve this, sufficient backfill material must be able to be moved at sufficient pace, meaning:

1. It likely must be available on site;

2. It must be known to be VENM; and

3. It must be able to be moved into the excavation more quickly than the rising of the groundwater.

5.32 Mr Taggart has described in his evidence how the excavation will be backfilled in the event of rising groundwater. I refer to his evidence for the detail of this methodology, but in summary it involves:

5.32.1. Practical limits on the area excavated to 5 m depth (an excavation down to 5 m below ground level across a whole 2 ha stage is not physically possible due to the requirement for batters and benches);

5.32.2. Adjacent to the excavation, having an area of the site with overburden stripped (in preparation for gravel extraction);

5.32.3. Maintaining stockpiles of VENM being 11,500 m^3 and 23,000 m^3 of material imported and gravel from the site itself;

5.32.4. In the event of rising ground water, moving material within the excavation itself (including pit walls and stockpiled gravel) and VENM from the stockpiles and the adjacent unconsolidated area into the excavation.

5.33 The order of the layering of material will depend on the status of the excavation. If already down to 5 m depth or close, overburden will be placed first, followed by imported VENM – as a 'final' placement that will not subsequently be disturbed or removed. If, alternatively, the extraction is unfinished, aggregate (unprocessed gravels) from the site will be placed first and later re-extracted when groundwater depth allows. Imported VENM, if needed, will be placed in a layer on top which can be re-extracted separately and re-stockpiled.

5.34 Mr Taggart's evidence includes a table which shows that for a 1 ha and 5 m deep extraction, to bring material up to 1 m above the highest groundwater level would require 40,000 m^3 of material. Stockpiles A and B will hold 34,500 m^3, leaving a shortfall of 5500 m^3. The adjacent unconsolidated area alone (of up to 1 ha - 10,000 m^2) will be large enough to rapidly source a further 5500 m^3 of material.

5.35 Mr Taggart's evidence confirms that in his view these works, if necessary, can be undertaken at sufficient pace.

5.36 I understand and support this proposed methodology and consider that it will be sufficient to ensure that groundwater is not exposed in the event of rapidly rising levels.

5.37 This is consistent with policies and objectives cited earlier (e.g. Policy 4.23 of the Canterbury Land and Water Regional Plan) to ensure "*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".

Policy position on groundwater quality effects

5.38 Ms Dawson expressed some reservation about the consistency of Taggart's proposal with relevant policy documents in terms of potential effects on groundwater. Broadly I agree with most parts of her assessment (those parts in relation to noise, traffic, air quality and flooding) and only disagree with elements of her assessment relating to potential effects on groundwater.

5.39 Since the s 42A report was prepared I have read the evidence of Mr Taggart, Mr Singson and Mr Thomas. On the basis of that evidence and my own planning assessment of the proposal as it now stands, in my opinion the proposal and its effects are consistent with policy and the potential effects on groundwater quality will be acceptable.

5.40 It remains important that the site is managed so that groundwater is not exposed and so that the proposed controls on the use VEMN (including stringent application of the Waste Acceptance Criteria) are carefully followed. My overall opinion in relation to the consistency of the proposal with planning documents is based on a requirement that the site will be operated in accordance with the practices described here, and that those practices will be reflected in any conditions of consent.

6. CONCLUSION

6.1 Taggart Earthmoving Ltd has applied for a suite of resource consents to enable the establishment and operation of an (extraction only) quarry at 309 West Belt, Rangiora.

6.2 The proposal has potential environmental effects that have raised significant interest and opposition in the community. I have read all those submissions, the expert evidence on behalf of the applicant, and the s 42A report and appendices.

6.3 My view on many elements of the application is shared by Ms Dawson – that the effects will be acceptable and not inconsistent with policy.

6.4 My assessment in relation to potential effects on groundwater and the measures to be taken to ensure that risk is appropriately managed has been informed by the expert views of, in particular, Mr Thomas, Ms Kreleger, Ms Iles, Mr Singson and Mr Simpson who reached agreement on various matters in expert conferencing after the s 42A report was published. Those agreements have informed Taggart's evidence.

6.5 Overall I consider that in light of national, regional and district policy documents and given the controls proposed, the environmental effects of the proposal are acceptable and the proposal is not inconsistent with policy.

Michael Durand

19 April 2021