Joint Decision Report

Fulton Hogan Limited
Roydon Quarry, Templeton

Applications
to
Selwyn District Council
and
Canterbury Regional Council

April 2020

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1 Introduction

[001] Fulton Hogan Limited (Fulton Hogan or 'the Applicant') has sought a range of resource consents to establish a new quarry (to be known as 'Roydon Quarry') located between Curraghs, Dawsons, Maddisons and Jones Road, approximately 700 metres (m) to the west of Templeton township within the Inner Plains Zone of the Selwyn District Plan.

2 Appointments

[002] The Selwyn District Council (SDC) and the Canterbury Regional Council (CRC), acting under section 34A of the Resource Management Act 1991 (RMA or 'the Act'), appointed independent hearing commissioners Sharon McGarry[1], Paul Thomas[2] and Rob van Voorthuysen[3] to jointly hear and decide the applications.

3 Description of the proposal

[003] The history of the existing site and the current nature of the applications was comprehensively described in the Applicant's assessment of environmental effects (AEE) documents, their s92 responses and hearing evidence,[4] and the SDC and CRC Section 42A Officers' Reports. The CRC s42A Officer's Report is particularly fulsome[5] as is the Reply evidence of Don Chittock[6] for Fulton Hogan.[7] We recommend that readers of this Decision refer to those documents for a full description of the proposal and its background.

[004] We note that in response to s92 requests for further information from the Councils and further refinements made by Fulton Hogan during the course of the hearing, the current nature of the proposal has altered from that originally outlined in the applications as lodged. We discuss possible 'scope' issues arising from those refinements in section 5.3 of this Decision. In this section, we provide a brief overview of what we understand to be the nature of the Applicant's proposal, as it was amended throughout the process, and as considered by us in this determination.

[005] Roydon Quarry is proposed as replacement for Fulton Hogan's existing Pound Road Quarry. Its physical address is 107 Dawsons Road and 220 Jones Road, Templeton. It is named after the Roydon Lodge Stud which occupied much of the site over previous decades. The quarry will encompass 170 hectares (ha) of rural land within a block bounded by Curraghs Road, Maddisons Road, Dawsons Road and Jones Road. The site is located just within the Selwyn District, with Dawsons Road forming the border with Christchurch City along the quarry site's eastern site boundary.

[006] The quarry will involve site preparation activities, the removal of topsoil and overburden, and the extraction of aggregate material to a maximum depth of 9.9m below natural ground level, followed by progressive rehabilitation with cleanfill (as available), overburden and topsoil material and thereafter revegetation. It will be worked in five stages over an estimated 40-year period.

[007] Fulton Hogan will undertake baseline water quality monitoring, prior to commencement of excavation activities, for all down gradient domestic water supply wells within 500m of the site. It will provide contingency measures, including alternative water supply measures, if these wells were to become contaminated as a result of quarry activities.

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[1] Commissioner McGarry is an experienced independent commissioner, who since 2007, has sat on over 250 hearings throughout New Zealand under the RMA, Local Government Act 2002 and the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012. She has a MSc (honours) in resource management and a BSc in zoology.

[2] Commissioner Thomas has been a commissioner for over 13 years. He is a planner with over 40 years' experience with qualifications in urban and regional planning and business management. He is a full member of the New Zealand Planning Institute and Resource Management Law Association.

[3] Commissioner van Voorthuysen is an experienced independent commissioner, having sat on over 275 hearings throughout New Zealand since 1998. He has qualifications in natural resources engineering and public policy and was a full member of the New Zealand Planning Institute (NZPI) from 1998 to 2016.

[4] Particularly that of Kelvyn Jolly and Kevin Bligh.

[5] Section 42A Officer's Report, Report of Hannah Louise Goslin, paragraphs 42 to 89.

[6] National Environmental and Sustainability Manager at Fulton Hogan Limited.

[7] Supplementary Statement of Donald Gordon Chittock on behalf of Fulton Hogan Limited, Plans and Diagrams, 29 January 2020.

[008] Following the establishment of the Central Processing and Stockpiling Area (CPSA), over a two to five year period, aggregate extraction will begin in the eastern quadrant of the site (i.e. corner of Jones Road and Dawsons Road) progressing in an anticlockwise direction with each stage working from the CPSA towards the site boundary. The fifth and final stage will be in the southern corner (i.e. corner of Jones Road and Curraghs Road). The maximum aggregate extraction rate for site is proposed to be 625,000 tonnes a year.[8]

[009] However, no aggregate processing or truck movements on public roads will take place prior to the opening of the Christchurch Southern Motorway extension (CSM2), which we understand is planned for mid-2020; or prior to the completion of roading improvements proposed by Fulton Hogan for Jones Road (including a new Jones Road/Dawson Road roundabout) and the site perimeter bunds.[9]

[010] A maximum 26ha of land will be open to extraction and rehabilitation activities at any one time. Of that 26ha, only 5ha will involve activities that require dust suppression at any one time. No aggregate extraction will occur within 200m of any dwelling which presently exists, without the prior written consent of the owners of these dwellings.[10]

[011] Aggregate material will be transferred from the quarry face by wheeled loaders to fixed conveyors which will take the aggregate to the CPSA, located at least 500m from all site boundaries, where aggregate will be crushed, screened and stockpiled.[11] One mobile crushing plant may also be used within the CPSA for up to 120 days per annum. Around half of the aggregate will be crushed to produce a range of products between AP65 and AP20.

[012] From time to time, aggregate sourced from elsewhere might be brought onto the site for processing and eventually the Roydon site may be used to process aggregates sourced elsewhere once its own aggregate supply is exhausted.

[013] Other on-site activities will include stormwater ponds, truck wheel wash, diesel tank, weighbridge, workshops, staff amenity blocks and offices, along with 15-16m wide and 3m high earth bunds around the site perimeter and associated screen planting between the toe of the bunds and the site boundary. The bunds and landscaping will be established around the entire site prior to Stage 1 quarrying activities commencing, using material excavated from the CPSA.[12] A walking track will be provided around the outside of the site and a viewing platform will be established to enable members of the public to view the operational quarry.[13]

[014] Vehicles will enter the quarry from Jones Road west of Dawsons Road through a single point of access designed to a full intersection standard.[14] The access road will include overlapping bunding, or a planted island barrier, so as to obscure views into the quarry from Jones Road. The access road into the site, roads within the CPSA (including the entry exit to the extraction / cleanfill area, truck wheel wash and tray wash areas) and a ring road around the CPSA will all be sealed.[15] There will be a flashing neon sign and barrier arm system diverting non-site inducted drivers into a lay-by area where they will receive

[8] JWS Air Quality, 14 November 2019, paragraph 8 and Supplementary Statement of Kelvyn Mark Jolly on behalf of Fulton Hogan Limited, Operations, 29 January 2020, paragraph 6.
[9] Supplementary Statement of Kevin Michael Bligh on behalf of Fulton Hogan Limited, Project and Consent Conditions, 29 January 2020, paragraph 13.
[10] Ibid Bligh Supplementary Statement, 29 January 2020, paragraph 15.
[11] The original application included the discharge of aggregate wash water at the site. In the second further information response the Applicant removed this activity from the proposal.
[12] Evidence of David John Compton-Moen on behalf of Fulton Hogan Limited, Landscape and Visual, 23 September 2019, paragraph 17.
[13] Ibid Bligh Supplementary Statement, 29 January 2020, paragraphs 10 to 12.
[14] Evidence of Andrew Alan Metherell on behalf of Fulton Hogan Limited, Traffic Effects, Dated: 23 September 2019, paragraph 14.
[15] Evidence of Jon Farren on behalf of Fulton Hogan Limited, Noise, Dated: 23 September 2019, paragraph 26.

instructions on site operating rules before gaining access to the site.[16] Should audible vehicle reversing alarms be required on machinery, only broadband noise alarms will be used on quarry-based equipment.

[015] Before a truck leaves the quarry, it will pass under an automatic spray bar which is uphill of the weighbridge. The water will be applied whether or not the truck leaving the site has a load and irrespective of whether the load is covered.[17]

[016] There will be no more than 1,200 heavy vehicle movements per day (600 trucks in and 600 trucks out). In addition, heavy vehicle movements will not exceed more than 800 vehicle movements per day, as an average, over any consecutive 60 calendar day period. Fulton Hogan controlled trucks will only travel into or through Templeton township if a delivery is in the immediate vicinity of Templeton and any non-Fulton Hogan controlled truck drivers will be required to sign on to a code of practice committing to the same. During night time hours (8.00pm to 6.00am) all vehicle movements will enter and leave the site via State Highway 1 (SH1) and the eastern portion of Jones Road.

[017] Fulton Hogan's proposed core hours of full quarry operation including the processing of aggregates are 7.00am to 6:00pm, Monday to Saturday, excluding public holidays. In the early morning period (6.00am to 7.00am) on those days, the deposition of cleanfill, loading and transportation of material, and movement of vehicles associated with these activities is proposed can occur, along with site pre-start up including operational warm up of conveyors and machinery. During the early evening period (6.00pm to 8.00pm), but on no more than 150 of those days a year, the full range of quarry activities is proposed, excluding the processing of aggregates with mobile plant and the deposition of cleanfill.

[018] Proposed night time activities (8.00pm to 6.00am) are proposed to be further limited. On Monday to Saturday, but on no more than 60 nights a year and not on public holidays, it is proposed that the loading and transportation of material and movement of vehicles associated with those activities may occur. That same limited range of activates is also proposed for no more than 15 Sundays a year (but not on public holidays) during the core hours of 7.00am to 6.00pm. At the hearing, Mr Chittock advised that there would be no night time extraction of aggregate during the first five years of site setup and establishment.

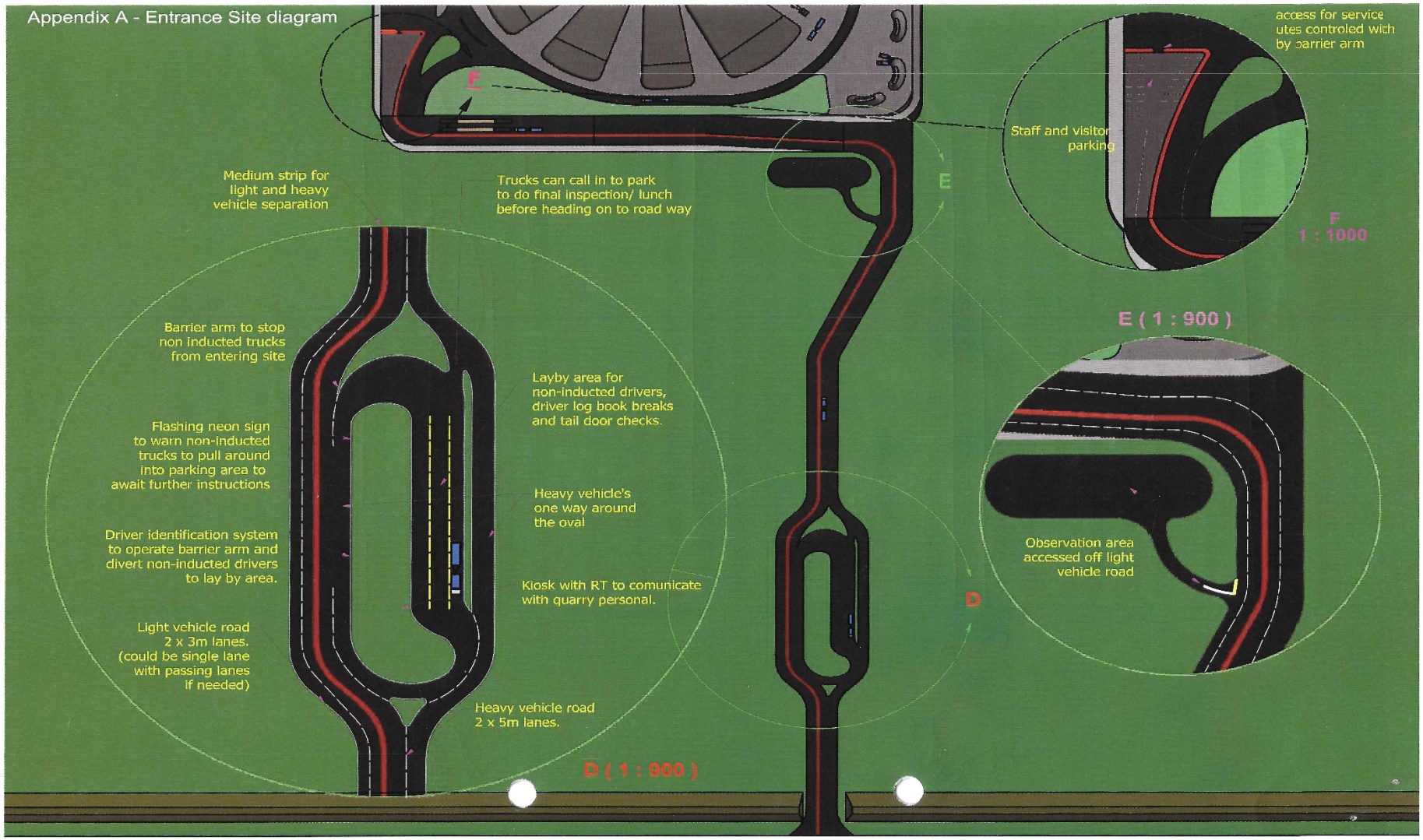
[019] The operation of the weighbridge and site offices, site security and light maintenance is proposed to occur at any time.

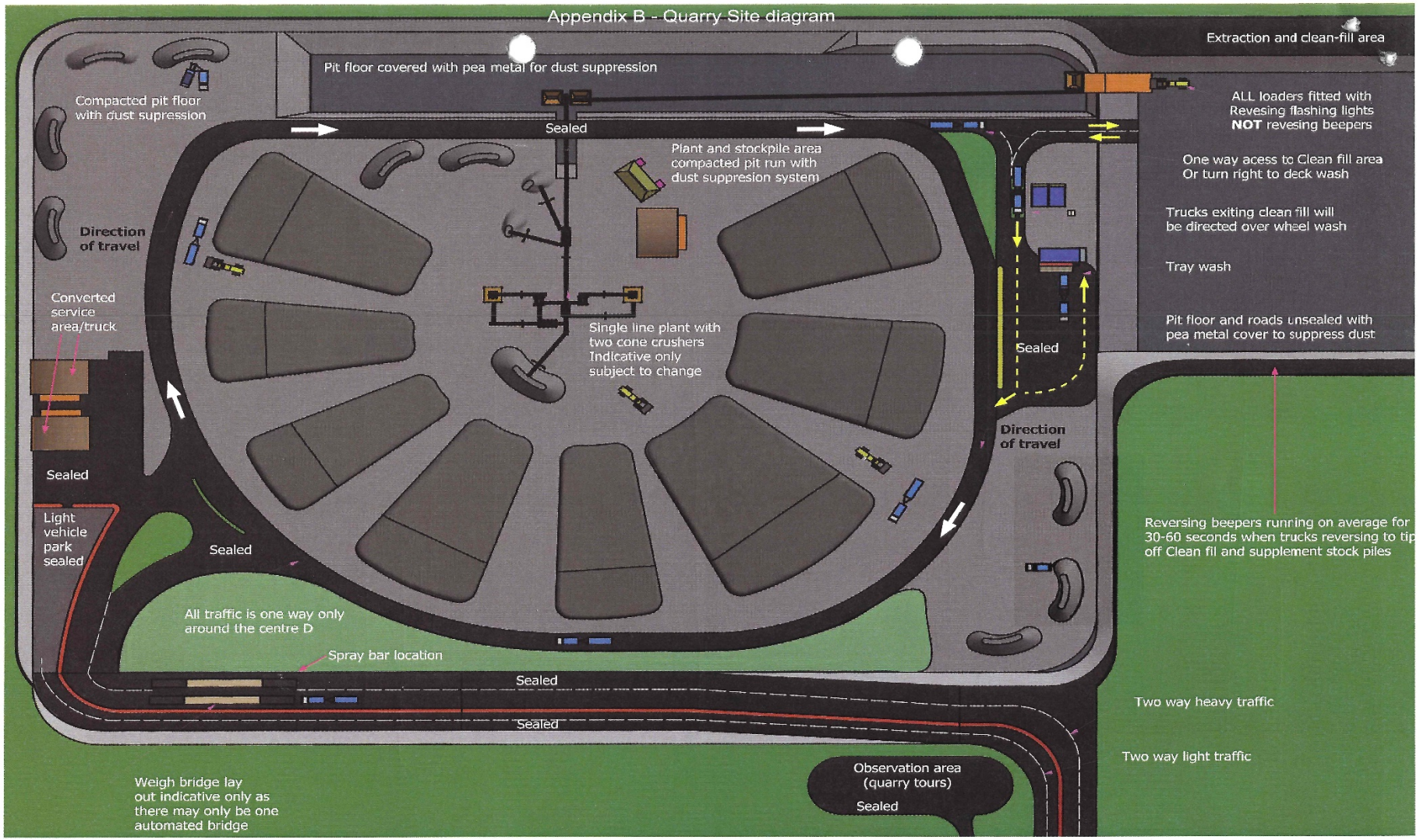
[020] The Applicant has accepted the imposition of a bond condition relating primarily to site rehabilitation.

[021] As part of the Applicant's Reply submissions, Mr Chittock provided us with two useful diagrams (titled 'Appendix A – Entrance Site' diagram and 'Appendix B – Quarry Site diagram') showing the revised layout of the CPSA and site access road. We have included these diagrams overleaf, as they illustrate many of the site management improvements offered by the Applicant during the course of the hearing, including:

- A driver identification system to operate the barrier arm and divert any non-inducted heavy vehicles to the lay-by area;
- A flashing neon sign to warn non-inducted heavy vehicle drivers to pull around into the lay-by area to await further instructions;
- A barrier arm to stop non-inducted heavy vehicle drivers from entering the site;
- A lay-by area for non-inducted heavy vehicle drivers, driver log book breaks and tail door checks;
- The one-way movement of heavy vehicle traffic around the entry / lay-by oval to the parking area;
- The separation of light and heavy vehicles by a median strip and required workplace safety separation or barrier;
- Staff and visitor parking, with access for service utility vehicles being controlled by a barrier arm between the carpark and the quarry road;

[16] Ibid Chittock Supplementary Statement, 29 January 2020, paragraphs 9 to 11.
[17] Ibid Chittock, 29 January 2020, paragraphs 15 and 20.


Appendix A - Entrance Site diagram
F
access for service utes controled with by barrier arm
Staff and visitor parking
F
1 : 1000
E
Medium strip for light and heavy vehicle separation
Trucks can call in to park to do final inspection/ lunch before heading on to road way
E (1 : 900)
Barrier arm to stop non inducted trucks from entering site
Layby area for non-inducted drivers, driver log book breaks and tail door checks.
Flashing neon sign to warn non-inducted trucks to pull around into parking area to await further instructions
Heavy vehicle's one way around the oval
Driver identification system to operate barrier arm and divert non-inducted drivers to lay by area.
Kiosk with RT to comunicate with quarry personal.
Observation area accessed off light vehicle road
D
Light vehicle road 2 x 3m lanes. (could be single lane with passing lanes if needed)
Heavy vehicle road 2 x 5m lanes.
D (1 : 900)


Appendix B - Quarry Site diagram
Extraction and clean-fill area
Pit floor covered with pea metal for dust suppression
Compacted pit floor with dust supression
Sealed
Plant and stockpile area compacted pit run with dust suppresion system
ALL loaders fitted with Revesing flashing lights NOT revesing beepers
One way acess to Clean fill area Or turn right to deck wash
Trucks exiting clean fill will be directed over wheel wash
Tray wash
Pit floor and roads unsealed with pea metal cover to suppress dust
Direction of travel
Converted service area/truck
Single line plant with two cone crushers Indicative only subject to change
Sealed
Direction of travel
Sealed
Light vehicle park sealed
Sealed
Reversing beepers running on average for 30-60 seconds when trucks reversing to tip off Clean fil and supplement stock piles
All traffic is one way only around the centre D
Spray bar location
Sealed
Sealed
Two way heavy traffic
Two way light traffic
Observation area (quarry tours)
Sealed
Weigh bridge lay out indicative only as there may only be one automated bridge

- The CPSA contained within the ring road;
- Sealed roads shown in black as sealed. The staff and visitor carpark (in the bottom left hand corner on the Appendix A diagram) is also sealed;
- Internal site roads that will have reject pea gravel on them, namely the extraction / cleanfill dark grey area outside the CPSA in the top right-hand corner of the Appendix B diagram;
- The direction of travel of quarry traffic with two-way traffic separated for light and heavy vehicles to the ring road and one-way traffic around the ring road (as shown by the white arrows);
- One-way access to the cleanfill area. The direction of travel in this area and the wheel and tray washes are shown by yellow arrows on the Appendix B diagram;
- One-way access from the cleanfill area to the wheel wash; and
- The heavy vehicle tray wash.

4 Applications lodged

[022] As noted above a number of consents for the proposed quarry are required from the SDC and CRC. The Applicant has requested an unlimited duration for all land use consents and a duration of 35 years for all discharge permits and the water take permit.

4.1 SDC

[023] The consents required from the SDC are:

- Land Use Consent (RMA s9) under the Selwyn District Plan to establish, operate and rehabilitate a quarry; and
- Land Use Consent under the Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

[024] We are satisfied, based on the evidence of the s42A authors and John Kyle[18], for the Applicant, that the proposed quarry qualifies as an 'industrial and trade process'.

4.2 CRC

[025] The consents required from the CRC are:

CRC No.	Consent Type	Description
CRC192408	Land Use Consent (RMA s9)	Use of land to excavate material
CRC192409	Land Use Consent (RMA s9)	Use of land to deposit cleanfill over an unconfined/semi-confined aquifer
CRC192410	Discharge Permit (RMA s15)	To discharge contaminants into air from an industrial or trade premise or process
CRC192411	Discharge Permit (RMA s15)	To discharge contaminants into land which may enter groundwater from an industrial or trade process within the Selwyn- Te Waihora sub-region
CRC192412	Discharge Permit (RMA s15)	To discharge stormwater into land where contaminants may enter groundwater
CRC192413	Discharge Permit (RMA s15)	To discharge contaminants into land where contaminants may enter groundwater associated with the deposition of cleanfill for site rehabilitation
CRC192414	Water Permit (RMA s14) Or Change of Conditions (RMA s127)	To take water for aggregate washing and dust suppression Or

[18] Planner and Managing Director at Mitchell Daysh Limited

CRC No.	Consent Type	Description
		To change the conditions of existing water permit CRC182422 to allow the take of water for aggregate washing and dust suppression

4.3 Consent status

[026] It was common ground that because the proposed quarrying activities requiring consent are all inextricably linked, best practice is that the various activity statuses are 'bundled' and the most restrictive activity status should apply to the entire proposal. Accordingly, the applications are all assessed as discretionary activities.[19]

5 Process issues

5.1 Notification, submissions, written approvals and JWS

[027] The applications were all publicly notified at the request of the Applicant. In addition to public notification, 327 parties were directly served notice of the application by the CRC. In total, 454[20] submissions[21] were received:

- 354 opposed the applications;
- 92 supported the applications;
- 8 indicated they were neutral to the applications;
- 177 indicated that they wished to be heard; and
- 277 indicated that they did not wish to be heard.

[028] The nature and content of the submissions were summarised in the two s42A Officer Reports.[22] They were also summarised in the evidence of the Applicant's experts. We adopt[23] those summaries but do not repeat them here for the sake of brevity. We record that we read each of the submissions in full.

[029] No written approvals were obtained. No formal pre-hearing meetings[24] were held.

[030] Expert conferencing occurred and we received Joint Witness Statements (JWS) relating to:

- Air quality – particularly $PM_{10;}$
- Landscape and visual amenity;
- Noise;
- Water quality;
- Groundwater take (annual volume of abstraction);
- Equine health; and
- Traffic effects.

[031] After the conclusion of the public hearings in December 2019, and prior to our reconvening on 5 February 2020 to ask questions arising from the Applicant's Reply submissions, the hearings administrator received

[19] The SDC s42A author, Mr Henderson, initially identified that a non-compliance with a roading access standard potentially resulted in a non-complying activity status due to a breach of Rule 4.5.1.6, which relates to accesses onto Arterial Roads. However, the proposed quarry does not have an access onto an arterial road, and the rule is therefore of no relevance to the application. There are no other rules that would make the proposal a non-complying activity.

[20] A total of 451 submissions were received within the statutory submission period, and three were received after the closing date. These late submissions were accepted by the Councils in accordance with s37 of the Act.

[21] We note that Fulton Hogan helpfully funded a 'Friend of the Submitter' service co-ordinated by SDC Council which included a qualified planner (Janette Dovey) helping potential submitters work on their submissions.

[22] CRC Officer's Report, paragraphs 35and 36; SDC Officer's report, paragraph 33.

[23] As provided for by section 113(3)(b) of the RMA.

[24] As provided for under s99 of the RMA.

correspondence from several submitters[25] who wished to either comment on the s42A authors' end of hearing advice to us or lodge further evidence in support of their original submissions. We declined to receive any of that material.

5.2 Samadhi Buddist Trust

[032] Many submissions were received from members of the Samadhi Buddhist Vihara, a Sri Lankan Buddhist Temple operated by the Trust at 358 Maddisons Road. The SDC s42A reporting officer, Andrew Henderson[26], advised that at the time the resource consent application was lodged, no resource consents were held by the Samadhi Buddhist Trust of NZ for the Temple and the range of activities it undertakes. The s42A author initially advised that a range of activities occurs on the Temple site throughout any given week, and that the scale of those activities exceeds the permitted thresholds for a spiritual activity in the Selwyn District Plan (SDP). Legal advice provided by counsel for SDC was that because the Temple is operating in the absence of any consents, any adverse effects on it are to be disregarded.

[033] However, in his end of hearing Summary Statement, Mr Henderson advised that he had incorrectly concluded that the Temple breached the permitted thresholds for a spiritual activity[27], whereas he should have stated that the Temple, as non-residential or non-rural activity breached the Rule 9.4.1 permitted activity threshold relating to 100 square metres (m^2) of built form.

[034] Regardless, the Temple activities currently undertaken at the site require resource consent as a discretionary activity. Mr Henderson advised that an application had been lodged on 5 September 2019, but that as of 11 December 2019 (when his Summary Statement was prepared) the application was subject to a s92 further information request. On that basis, we are comfortable with the s42A author's original approach of only assessing potential effects of the proposed quarry on the Samadhi Buddhist Trust activities that would be a permitted activity under the District Plan. Mr Henderson concluded that accordingly, the unconsented Temple and associated activities did not form part of the existing environment and submissions from Temple patrons could be afforded little, if any weight. We agree.

[035] However, we queried what might be the case if the Temple gained consent prior to our decision being made. Mr Henderson advised that decision may be unlikely before a decision on the quarry, as the Samadhi Buddhist Trust was in discussions with Christchurch International Airport Limited (CIAL) regarding its status as a sensitive receiver, and this issue may not be resolved for some time. Nevertheless, it was Mr Henderson's view that even if the Temple is consented, there would not be significant adverse effects on it arising from the proposed quarry. The reason being that Maddisons Road will be unlikely to carry large volumes of traffic associated with the quarry, and the noise evidence identifies that there will not be elevated levels of noise at the Temple site. In the absence of any evidence to the contrary, we accept Mr Henderson's planning opinion on this matter.

[036] In conclusion then, our consideration of the Temple and potential effects on it from the proposed quarry (regardless of the Temple's legal status) does not weigh against a grant of the consents sought.

5.3 Scope of revised proposal

[037] Prior to the hearing we received a Joint Memorandum from counsel for the SDC and CRC advising that some submitters considered that changes to the quarrying activities proposed by the Applicant in response to s92 information request queries were not within the scope of the original application. The submitters suggested that the Councils, in their capacity as consent authorities, should require the Applicant to lodge a new resource consent application. The Joint Memorandum advised both Councils considered that the changes were within the scope of the original application and in their view, there was no need for a new consent application or re-notification of the application.

[25] Including Wayne Tewnion, Laurence Greenfield, Davina Penny and Anne Thompson.
[26] Senior Associate – Planning at Beca Limited.
[27] The definition of 'spiritual activities does not appear in the Rural Chapter of the District Plan (it does in the Township volume) because 'spiritual activities' are not provided for as specific activities in rural parts of the district.

[038] We issued Minute 2 requesting that any submitter who considered that changes to the sequencing and staging of the quarry activities were not within the scope of the nature, scale and intensity of the environmental effects set out in the original application was to provide the Hearings Administrator with a legal opinion authored by counsel supporting their view.

[039] By the deadline set in Minute 2 the only legal opinion received was from counsel for the Applicant who agreed with the Joint Memorandum of the Councils. On the basis of the legal advice available to us, we find that the changes proposed by the Applicant to the nature of the intended quarrying activities at Roydon Quarry are within the scope of the original application and consequently no further consent applications nor re-notification of the applications are required.

5.4 Officer's recommendations

[040] In the initial section 42A Officer Reports, both authors recommended declining the applications.

[041] The SDC recommendation to decline was based on:

- significant adverse effects on road safety arising from trucks queuing between the Main Trunk railway line crossing and SH1; and
- the adverse effects arising from night time quarrying activities proposed to occur between 8pm and 6am.

[042] The CRC recommendation to decline was based on:

- potential non-compliance with Regulation 17(1) of the Resource Management (National Environmental Standard for Air Quality) Regulation 2004 (NESAQ) regarding a "*likely, at any time*" increase of PM_{10}[28] levels in the polluted Christchurch airshed by more than 2.5 micrograms per cubic metre ($\mu g/m^3$), as a 24-hour average, as a result of dust emissions from the proposed quarry and the lack of an PM_{10} offset in accordance with Regulation 17(3); and
- a potential shortfall between the volume of water required for dust suppression, aggregate washing and other ancillary uses in addition to irrigation due to the Applicant making two errors in determining the annual volume for water abstraction authorised by Water Permit CRC182422 for the existing well on the site.

[043] At the conclusion of the hearing, the SDC reporting officer, Mr Henderson, recommended that the applications be granted as his initial concerns had been addressed. In particular:

- the conferencing of traffic experts and the evidence of New Zealand Transport Agency (NZTA) on traffic modelling had satisfied his concerns regarding trucks queuing between the Main Trunk railway line crossing and SH1; and
- the amended night time activities (quarry operations limited to 60 nights a year between the hours of 8pm to 6am would (based on the conferencing of the noise experts) comply with the night time noise limits of the District Plan.

[044] At the conclusion of the hearing, the CRC reporting officer, Hannah Goslin[29], retained her recommendation that the discharge to air application be declined on the basis of potential non-compliance with Regulation 17(1) of the NESAQ. However, she was satisfied that the Applicant's revised intended annual volume of water required for dust suppression (119,920m^3) was consistent with Schedule 10 of the Canterbury Land and Water Regional Plan (CLWRP).

5.5 Hearings and site visit

[045] We held initial public hearings in the West Melton Community Centre, Wigram Base and the Phar Lap Room at Riccarton Park on 12 days over the period 18 November to 11 December 2019 and 5 February 2020.

[28] Particulate matter less than 10 microns.
[29] Resource Management Consultant at Incite.

[046] The SDC and CRC s42A Officer Reports, Applicant's evidence (including opening legal submissions) and submitter's expert evidence was pre-circulated in conformance with a procedural Minute issued by us prior to the hearing. The Applicant's Reply submissions and supplementary evidence (on matters apart from PM_{10} and Regulation 17 of NESAQ were provided in writing on Thursday 30 January 2020. We reconvened the hearing on 5 February 2020 at CRC to receive the Reply submissions and evidence. Reply submissions[30] and new evidence[31] on the NESAQ and PM_{10} offset matters were tabled at the reconvened hearing.

[047] In light of the importance of the NESAQ matters, we provided submitters with ten working days to comment on the NESAQ legal submissions and Fulton Hogan's new PM_{10} offset evidence. We then provided Fulton Hogan five working days to respond to any submitter comments. Fulton Hogan's final Reply submissions and rebuttal evidence was received by us on 4 March 2020.

[048] We closed the hearing on 11 March 2020, having concluded that we required no further information from any of the parties. Given the scale of the proposed quarry and the complexity of the material provided by the Applicant, submitters and the s42A report authors, we exercised our powers under ss37(1) and 37A(4) of the RMA to double the normal 15 working day period for issuing a decision on the applications. We did so having considered the interests of both Fulton Hogan and the community. We determined that those interests were best served by us achieving an adequate assessment of the effects of the proposal.

[049] Copies of the legal submissions, statements of evidence, our written questions and the answers provided to them, are held by the Councils and are available from the CRC website. We do not summarise all of the matters covered here, but we refer to or quote from that material as appropriate in the remainder of this report. We took our own notes of any answers given to verbal questions that we posed to counsel, witnesses and the reporting officers. The audio of the hearing was recorded and the recording was available to all parties on the CRC website.

[050] We conducted an initial site visit on Tuesday 3 September 2019, viewing existing Fulton Hogan quarries and the application site and its immediate surroundings, including local roads and sites within Templeton mentioned by submitters. We conducted a further site visit on Tuesday 4 February 2020, primarily to view a working aggregate conveyor in operation at Fulton Hogan's Miners Road quarry. We also visited the operating crusher plant at the Pound Road Quarry.

5.6 Management Plans

[051] The Applicant initially proposed to prepare and rely on a number of management plans that would be certified by the Councils at a later date. These include:[32]

- Rehabilitation Management Plan (Appendix G of the AEE)
- Landscape Management Plan
- Dust Management Plan (Appendix D of the AEE)
- Cleanfill Management Plan (Appendix F of the AEE)
- Spill Management Plan
- Noise Management Plan
- Stormwater Management Plan

[052] The SDC s42A author recommended the preparation of a 'Transportation Management and Routing Plan' should the applications be granted. Andrew Metherell[33], the Applicant's traffic expert, agreed that such a

[30] Addendum to Synopsis of Closing Legal Submissions for Fulton Hogan Limited, PM_{10} Emissions, 5 February 2020
[31] Supplementary Statement of Roger Steven Cudmore on behalf of Fulton Hogan Limited, PM_{10} Offsetting, 5 February 2020.
[32] Ibid Jolly, paragraphs 59 and 60.
[33] Transport Engineer at Stantec Limited.

plan was desirable and he included a draft Plan in his evidence.[34] In response to concerns about heavy vehicle queuing at the railway crossing Fulton Hogan have agreed to a 'Roydon Quarry, SH1 / Dawsons Road Queue Management Plan'.

[053] Some submitters suggested that the above management plans should be bundled together in an overall "Quarry Management Plan." A suggested condition to that effect was set out in the evidence of Gemma Conlon for the Templeton Residents Association (TRA). The Applicant agreed that there was benefit in developing an overall Quarry Management Plan.[35] However, after consideration of the different issues, purposes and requirements of the various management plans we have decided that the processes associated with them would be able to be more efficiently executed if they are separate documents. However, we do think it is important that they are publicly accessible on Fulton Hogan's web site.

[054] In our view, management plans are an appropriate mechanism to ensure that conditions of consent are complied with as they avoid the necessity for excessive detail in the consent conditions, particularly with regard to the detail of how certain rehabilitation works or mitigation actions will occur. The caveat is that each suite of management plan conditions should specify the purpose or objective of the plan, which conditions it is designed to assist with implementing, the minimum contents of the plan, how it is to be prepared and who should be involved in that process. The conditions should also specify that each management plan is to be submitted to the appropriate council and thereafter certified. A process must be set out for reviewing or amending the plans. If there is conflict between the management plan and the conditions, then the conditions must prevail.

[055] We issued Minute 11 setting out our expectations for conditions dealing with management plans and we have borne those requirements in mind when considering the applications before us.

5.7 Other matters

[056] During the course of the hearing, a number of submitters referred to conditions of consent applying to other terrestrial quarries within the Greater Christchurch area, particularly those located within the Yaldhurst 'quarry zone'. That caused us to ask the CRC and SDC s42A authors to provide us with a range of information regarding existing consented terrestrial quarries in the area, including details of:

- Consent numbers;
- Authorised activities and their location;
- The date of grant and the consent duration;
- Operating hours and days;
- Limits on vehicle movements;
- Setbacks from perimeter bunds to site boundaries;
- Setbacks from quarry faces to quarry site boundaries;
- Total quarry area and allowable open (or actively quarried) areas;
- Dust monitoring; and
- Groundwater monitoring.

[057] The s42A authors helpfully provided us with the above information in relation to existing consented quarries operated by K B Contracting and Quarries Limited, Fulton Hogan Limited, The Isaac Construction Company Limited, The Isaac Conservation and Wildlife Trust, the Isaac Conservation Trustees Limited, Road Metals Company Limited, Winstone Aggregates, Frews Quarries Limited, Harewood Gravels Company Limited, SOL Quarries Limited, Taggart Earthmoving Limited, Scion Limited, and Selwyn Quarries Limited.

[34] Ibid Metherell, paragraph 140 and his Annexure E.
[35] Rebuttal Evidence of Donald Chittock, paragraph 11 and Rebuttal Evidence of Kelvyn Jolly, paragraph 4.

[058] This information was made available to all hearing participants as it was posted on each Council's webpage.

[059] During the course of the hearing, a number of Court decisions on quarries were referred to us. We read and had regard to parts of the following decisions amongst others (some of which we cite in footnotes in this Decision):

- *Road Metals Company Limited v Christchurch City Council* [2006] NZEnvC 419
- *Canterbury Regional Council v Selwyn District Council* [1997] NZRMA 25
- *Yaldhurst Quarries Joint Action Group v Christchurch City Council* [2017] NZEnvC 165

[060] Having said that, none of the three commissioners are lawyers, and so the purpose of us examining the above Court decisions was simply to read for ourselves the parts of those decisions referred to by hearing participants, to see if there were any relevant matters that we should have regard to in coming to our findings on the circumstances of the applications before us.

6 Section 104 and 104B matters

[061] We now address the relevant aspects of the application in terms of sections 104 and 104B of the RMA.

6.1 Background environment

[062] The background or existing environment was comprehensively described in the s42A Officer Reports.[36] We adopt those descriptions and refer to specific matters as appropriate in the sections of this Decision that follow.

[063] Section 104(2) of the RMA enables us to disregard a potential adverse effect of allowing an activity if the relevant plan permits an activity with that effect. Mr Kyle advised that in his view none of the activities permitted in the Inner Plains Zone of the SDP would be sufficiently similar in character, scale or effects to the proposed quarry to warrant applying a permitted baseline in this instance.[37] Mr Bligh agreed with Mr Kyle when we asked him about that during the hearing. We also agree.

6.2 Actual and potential effects on the environment

[064] Having reviewed the documentation and the issues of concern to the submitters we find that there are numerous matters that we need to assess. We now address each of these in turn.

6.2.1 Visual impacts effects and landscape values

[065] The key features of the proposed quarry in terms of visual impacts and effects on landscape values arise from the proposed perimeter bunds, associated screen planting and the staged post-quarrying rehabilitation. The earthen perimeter bunds are proposed to be 15-16m wide and 3m high with native and exotic planting on their outer face. Where there are existing shelter belts along the site boundaries these will be retained. Quarrying will not commence until the perimeter bunds are complete and the screen planting established. Implementation and management of visual and landscape mitigation and rehabilitation is proposed to be executed through a Landscape Management Plan (LMP) and a Rehabilitation Plan. Drafts of these plans were provided as part of the application documents.

[066] Fulton Hogan commissioned a Landscape and Visual Impact Assessment (LVIA) from DCM Urban Design. This was revised through the process of further information requests to keep it up to date with changes to the intended design and operation of the quarry. The LVIA includes assessments of effects on landscape character, landscape values and visual amenity.

[36] SDC s42A Officer Report, paragraphs 15 to 18; CRC s42A report, paragraph 158.
[37] Evidence of John Kyle on behalf of Fulton Hogan Limited, Planning, Dated: 23 September 2019, paragraph 16.

[067] The LVIA was reviewed as part of the SDC s42A Officer Report by Wade Robertson[38]. Mr Robertson reported that in his opinion the LVIA was "*generally consistent with accepted industry practice*". In terms of effects on the environment, he concluded that there would be "*no positive landscape effects of note, which is a significant lost end-use opportunity*." He considered the scale of short-term effects to be 'low to moderate' for rural amenity and 'high' for rural character. The latter being largely associated with the perimeter bunds. In contrast, he considered the scale of long-term effects to be 'very low' for rural amenity and 'moderate' for rural character, due to the significant landform modification and change of appearance and use over a long period.

[068] At the hearing, we heard lay evidence from many submitters who live in the area and frequently use the roads surrounding the proposed quarry site for walking, cycling and other activities and who have an appreciation of the amenity of the existing landscape. Many expressed concern that the bunds would reduce the existing visual amenity of the area, block views of the Alps and were out of place in the landscape.

[069] The construction of the bunds will be undertaken ahead of any quarrying activity and will utilise soils stripped from the CPSA. The Applicant expects this to be supplemented with additional topsoil imported to the site. There will be approximately 5,250m of bunds around the perimeter of the entire site, with the exception of the main access road where additional offset bunding is proposed to screen views into the quarry. In addition, the perimeter bund will skirt round the dwelling at 107 Dawsons Road as this dwelling is to be retained.

[070] The bunds will be constructed during winter months and will be grassed. Where there is existing pine hedging this will be retained and an additional row of exotic trees planted on the inside. Where there is no existing shelter belt planting there will be three rows of new planting within a 4m wide strip. The inner row is proposed to be fast growing exotic species, the middle row large native shrubs and the outside row low growing native shrubs and grasses.

[071] We consider the proposed shared path around the perimeter of the site in section 6.2.5 of this Decision Report.

[072] The perimeter bund forms part of the earthworks activity for the site which exceed the permitted cut and fill volume in the SDP. Consent under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health is also triggered by the potential presence of contaminated soil. We discuss this latter matter in section 6.2.9 of this Decision Report.

[073] There are also permitted activity rules in the SDP that apply to the proposed tree planting under the heading of amenity planting and shelter belts. Such planting is subject to a condition that any tree shall not shade any part of the carriageway of any road or any property under different ownership between 10.00am and 2.00pm on the shortest day of any calendar year. The LVIA included modelling to show compliance with that rule, however, this requires the planting on the Jones Road frontage to not exceed a maximum height of 5m. The LVIA was not contested by any other expert and therefore we understand that the perimeter bund planting is classed as a permitted activity under the SDP.

[074] In addition to expert landscape evidence from David Compton-Moen[39] and Mr Robertson for the Applicant, evidence was also presented by Abigail Smith[40] for Christchurch City Council (CCC). These experts conferenced on 4 November 2019 and that resulted in a JWS dated 8 November 2019.

[075] From the above range of information, we consider that the principal issues from a landscape and visual effects perspective are:

[38] Landscape Architect and Manager – Design at Beca Limited.
[39] Landscape Architect/Urban Designer and Director at DCM Urban Design Limited.
[40] Landscape Architect at CCC.

- Perimeter bund design, maintenance and associated planting;
- The proposed recreational walking track and public viewing facility;
- The Landscape Management Plan and consent conditions; and
- Landscape measures post rehabilitation.

[076] The landscape experts were in general agreement that the greatest potential adverse effect will be associated with construction of the 3m high perimeter bund. However, the experts also agreed that the bund should be constructed in its entirety prior to the commencement of Stage 1 quarrying. A consequence of this is that the bund will block open views across the currently rural flat landscape where they now exist. This will not materially change the character of Curraghs Road because this boundary has a row of established pines along the entire boundary which will be retained. The western side of Curraghs Road has no such planting and affords open views which will not be affected by the quarry proposal. In contrast, Dawsons Road has a belt of pine trees on the eastern side for approximately two thirds of the quarry boundary. The effect of the perimeter bund and associated planting will be to increase enclosure along Dawsons Road. Jones Road is more open on both sides, but the general landscape of the area is visible to a greater number of users including the those on the new cycleway, users of SH1 and the elevated overbridge on the CMS2. The railway line to Rolleston also adjoins this boundary which means the landscape and site is currently able to be viewed by passengers on the daily Alpine Express, albeit a fleeting view as part of a much wider experience.

[077] The open Jones Road frontage will have bunds and planting with additional landscape treatment at the main entrance to screen the view into the site. A range of edge treatments are proposed. These were refined during the course of the hearing and we were provided with updated drawings as part of the Applicant's Reply submissions. The landscape experts agreed[41] that the proposed mitigation outlined above was appropriate, and we agree that this will provide effective screening and amenity. As we noted earlier, planting along Jones Road will be maintained at a maximum height of 5m to avoid shading and consequent winter frosting of the road carriageway.

[078] The expert conferencing also proposed a number of consent conditions for the SDC land use consent relating to establishment of grass on the bunds, seasonal timing of bund construction and watering. It was agreed that the temporary irrigation system for planting should remain for a period of 5 years after planting. That requirement, which we support, was not included in Mr Bligh's final recommended SDC land use consent conditions so we have amended them accordingly.

[079] As indicated above, there were two landscape matters that evolved during the course of the hearing, being the shared pathway around the perimeter of the site and the incorporation of a public viewing platform into the site. We discuss this in section 6.2.5 of this Decision Report and, conclude that while we have no concerns with the proposed gravel shared path or the viewing platform, their provision should be required by conditions of consent should the quarry consents be granted. In that regard, we consider that the detailed design and management of this facility should be included within the explicit scope of the Landscape Management Plan and have amended that SDC land use consent condition accordingly.

[080] The Applicant's Landscape Management Plan is an important component of the conditions regime. We note that expert conferencing resulted in agreement that there should be additional conditions to ensure that the Landscape Management Plan is clear about what it is required to achieve. We agree with that approach and have largely adopted the SDC land use consent conditions regime for landscape matters as recommended by Mr Bligh.

[081] One other matter raised by Ms Smith was a suggested revised staging of quarry development so that quarrying commenced in a location where there were established perimeter shelter belt trees. We consider that this would have been a sensible suggestion in the absence of a perimeter bund. However,

[41] Para 7.2 Landscape and Visual Amenity Joint Witness Statement 8 November 2019.

given that the bund will be fully constructed and grassed and all planting implemented ahead of extraction of saleable aggregate we do not consider that any changes to staging are warranted.

[082] We note that post quarry rehabilitation will be ongoing throughout the life of the quarry and issues around rehabilitation are considered in section 6.2.15 of this Decision Report. While the final topography of the site at the end of the consent period remains uncertain (due to uncertainty of cleanfill availability), we agree with the experts that there should be a consent condition requiring removal of the bunds, enabling this material to contribute to rehabilitation of the site and specifically the filling of residual depressions and the enhancement of the post-quarrying soil resource. The JWS proposed a condition to this effect which was not included in Mr Bligh's final recommended SDC land use consent conditions. We have therefore added the following condition *"Prior to the expiry of this consent the perimeter bunds are to be removed as part of the rehabilitation works. The edge treatment plantings shall remain until grass cover has established over any disturbed land."*

[083] In conclusion, we agree with the landscape experts that, with the Applicant's proposed mitigation outlined above and the comprehensive SDC land use consent condition regime recommended, together with the perimeter walkway and viewing platform, on balance the landscape and visual effects will be no more than minor.

6.2.2 Traffic and road safety

[084] The effects of traffic generated by the proposed quarry was a principal issue at the hearing and was the subject of extensive expert evidence, modelling and submitter comment. Expert evidence for the Applicant was presented by Mr Metherell and peer reviewed by Tim Kelly[42]. Evidence for SDC was provided by Andy Carr[43] and Tim Wright[44] gave evidence for the CCC.[45] Expert evidence for the NZTA was provided by David Scarlet[46] and Ian Clark[47]. These witnesses held an expert conference after filing evidence and provided a JWS addressing traffic effects dated 12 November 2019.

[085] Our starting point for assessing these issues is the Integrated Transport Assessment (ITA) prepared for the Applicant by Stantec Ltd. This described the transport context which is of considerable significance to the proposal. The site access is proposed to be from Jones Road. Jones Road is an east west route classed as a 'primary collector road'. Parallel to this is the railway between Christchurch and Rolleston and parallel to that is SH1. Adding to the complexity is CSM2 which is currently under advanced construction. Dawsons Road and Curraghs Road are 'secondary collector roads'. It is acknowledged that a new roundabout on SH1, as part of the CSM2, will likely see increased traffic on Dawsons Road. Maddisons Road is a primary collector road and submitters expressed concern about safety at intersections along Maddisons Road due to increased traffic flows east and west on this route. Some of this traffic has been generated by industrial development at Rolleston, including the inland port, and some has been transferred from SH1 due to road construction delays. The Jones Road - Dawsons Road intersection has a high number of injury crashes.[48]

[086] The ITA assessed traffic effects based on a maximum of 1,500 vehicle movements per day. However, we note that the regime now proposed by the Applicant is specifically a maximum of 1,200 heavy vehicle movements and an average of 800 movements over any consecutive 60 calendar day period.

[087] The principal issues we address in this section include:

- Modelling of traffic generation and routes;

[42] Self employed Traffic Engineer.
[43] Traffic Engineer and Director at Carriageway Consulting Limited.
[44] Transportation Engineer and Director at QTP Limited.
[45] At the expert conferencing Mr Wright was replaced by Mr Falconer who adopted Mr Wright's written statement of evidence.
[46] Senior Traffic and Safety Engineer at NZTA.
[47] Transport Planner and Director at Flow Transportation Specialists Limited.
[48] Evidence of Andrew Alan Metherell on behalf of Fulton Hogan Limited, Traffic Effects, Dated: 23 September 2019, paragraph 27.

- Access to SH1;
- Access to Templeton and use of Jones Road; and
- Effects on other local roads.

[088] The ITA relies heavily on both existing levels of activity and traffic distribution from Fulton Hogan's existing Pound Road Quarry, which Roydon Quarry will replace and provide the same range of aggregate products. In terms of traffic distribution, the ITA relies on six weeks of traffic count data through June and July of 2018. This seemed to us to be a rather limited data set upon which to base future truck destination modelling for the 40 plus year life of the proposed Roydon Quarry. Indeed, we questioned some experts as to whether there would be more reliable methodologies available based on specific development and infrastructure modelling given the proposed use of basecourse from the Roydon Quarry is primarily for roading construction maintenance and urban growth. However, the experts generally agreed that such methodologies would not be a reasonable basis for forecasting quarry material destinations. Having said that, Mr Carr's evidence does refer to the importance of a s128 review condition and its ability to consider future changes in heavy vehicle traffic flows not anticipated by the ITA.

[089] The JWS records that the experts agree that the proposed site access is expected to operate safely and efficiently in conjunction with the proposed widening of the carriageway between the site access and Dawsons Road. In addition, the Jones Road - Dawsons Road intersection is to be upgraded to a roundabout. The Applicant has put two design options forward. Option 1 is a four-arm roundabout which requires some land from the CCC. The CCC stated that it was unlikely to make this land available and therefore there was greater focus during the hearing on Option 2. Option 2 positions the roundabout within the application site and has three arms, with Jones Road connecting with Dawsons Road as a T intersection. The experts all agreed that either option would improve the situation at an intersection which currently has a poor safety record. We accept that either option will be a positive effect of the quarry proposal given there does not seem to be any specific planning for safety improvements at this intersection by the road controlling authorities. However, we also note that the proposed roundabout layout of the Dawsons Road / SH1 intersection[49] extends across the railway lines to the Jones Road - Dawson Road intersection and accommodates the shared use path on the south side. As this design would be subject to a safety audit as part of the detailed design process, we anticipate that appropriate pedestrian and cyclist safety measures will be incorporated.

[090] A significant issue arose from both the evidence of Mr Carr and the NZTA witnesses regarding the potential for heavy vehicle queueing and associated safety effects triggered by the railway level crossing.

[091] The distance between the level crossing and the Jones Road – Dawson Road intersection is increased as a result of the intersection upgrade options referred to above. The JWS records that the experts agree that there is a low probability of southbound vehicles queueing back to the proposed new roundabout[50] and that this will be a matter that the detailed design and safety audit will be able to consider further. However, there is potential for queueing on the southern side of the level crossing to the SH1 / Dawsons Road roundabout. The principal concern is northbound queuing affecting the safety and efficiency of the roundabout. In response to this, Mr Metherell undertook a more detailed level of modelling of this intersection and other relevant intersections using Paramics microsimulation. His resulting evidence was that the queue on the south approach could currently extend to the SH1 intersection on occasion and that this will increase in frequency when the quarry is operational.[51]

[092] Given this situation, the experts all recommended that a Queue Management Plan (QMP) be prepared and agreed by the road controlling authorities and Kiwi Rail Ltd. A draft QMP was prepared by Mr Metherell and was refined during the course of the hearing. The final draft was presented by Mr Bligh with his Supplementary Statement dated 29 January 2020. The QMP essentially sets out a process for

[49] Figure 6.3 Integrated Transport Assessment Stantec Ltd.
[50] Traffic Effects Joint Witness Statement dated 12 November 2019 at paragraph 11.
[51] See Summary Statement of Andrew Metherell, 13 November 2019, paragraph 25.

a Safety Risk Assessment, monitoring before and after the quarry is operational, and a suite of potential mitigation measures.

[093] We note that the recommended SDC land use consent conditions associated with the QMP were agreed between the experts and include a requirement for a workshop with the road controlling authorities and Kiwi Rail on the draft QMP. There are also conditions relating to monitoring and reporting on monitoring, including reporting to the Community Liaison Group.

[094] We are satisfied that the mitigation options available and the robust set of SDC land use consent conditions defining future process and outcomes appropriately addresses this potential roundabout queuing and safety issues.

[095] A further issue of concern to many submitters was the risk of heavy vehicles travelling to and from the quarry using Jones Road from the east instead of using SH1. We were given evidence[52] of this occurring with increasing frequency, possibly to avoid delays associated with level crossings, possibly directed by truck navigation systems, and possibly associated with growth of the inland port at Rolleston and Waterloo Industrial Park (located east of Pound Road and connected to Waterloo Road by a recently upgraded intersection).

[096] The JWS records that the experts did not identify any specific area wide traffic effects other than those addressed above. However, they did all support the discouragement of heavy vehicle routing via Jones Road through Templeton. The Applicant proposes that this is addressed through the SDC land use consent conditions and a Transport Management and Routing Plan (TMRP). An initial version of the TMRP was presented by Kelvyn Jolly[53], in his evidence in chief and a further upgraded version was provided with Mr Jolly's Supplementary Statement in Reply. The draft TMRP details the route restrictions for day and night time hours, a formal induction process for all drivers, codes of practice for all drivers, signage and monitoring.

[097] The principle route restriction proposed by Fulton Hogan is use of Jones Road east of the site as far as Templeton. The proposal is to ban users of the quarry from using this route at all times other than for accessing the Templeton urban area for deliveries. At night time it is proposed that this restriction is extended west on Jones Road (and therefore consequently Curraghs Road) and also Dawsons Road.

[098] We have undertaken our determination of the traffic effects in two stages. The first stage focusses on two matters arising from the proposed mitigation measures that require further consideration. These are, whether the ban on the use of Jones Road east to Templeton should be a complete ban (i.e. no exceptions), and secondly whether the restriction on other local roads should extend to the evening period of 6.00pm to 8.00pm. In light of our determination of these matters, we have then considered as a second stage of whether a more widespread restriction on heavy vehicle routing is warranted on wider amenity and cumulative effects grounds. We consider this below in the sections on Noise and Vibration (6.2.3), Amenity Effects (6.2.6) and Cumulative Effects (6.2.28).

[099] In terms of Jones Road, Mr Metherell's evidence [54] was that once CSM2 is operating the use of Jones Road is forecast to decrease by at least 50 percent as the SH1 route will be more easily accessed and therefore more attractive. We note that the modelling showed only six quarry related heavy vehicles per day using Jones Road to access Templeton for local aggregate deliveries.

[100] We also note that the updated TMRP includes monitoring and compliance measures, including keeping data on trucks needing access to Templeton township, monitoring by CCTV cameras and GPS monitoring of Fulton Hogan's own fleet of trucks.

[52] Including Cathy Dalton, Sean McFarlane, Alison Macklan and Jolene Eagar.
[53] Canterbury Quarries Divisional Manager at Fulton Hogan Limited.
[54] Supplementary Evidence of Andrew Metherell, 9 December 2019, paragraph 3.2.

[101] We consider all these measures to be helpful and appropriate, however, we remain unconvinced about the need for an exception for deliveries to Templeton. As stated by Mr Metherell, the SH1 route to Templeton is an efficient route for heavy goods vehicles unless delayed by the two level crossings. The Kirk Road / SH1 intersection includes a left turn lane, but there is a limitation on the length of truck allowed to turn onto SH1 from Kirk Road of 9m, due to the limited room between the intersection threshold and the railway lines. We consider that a 9m truck size is likely to be large enough to meet local needs and that a removal of the exception for deliveries to Templeton will provide that part of the Templeton community close to Jones Road with greater certainty regarding quarry truck movements and will simplify the monitoring of those movements. We have amended the SDC land use consent conditions accordingly.

[102] The traffic modelling similarly forecasted very little quarry related heavy vehicle movements on Curraghs Road and Dawsons Road, being less than five vehicles per day. A condition recommended by Mr Bligh states that all night time heavy vehicles movements (8.00pm to 6.00am) must access the quarry via Dawsons Road and SH1. Regarding effects from quarry traffic on Curraghs Road, we heard evidence from three witnesses for the New Zealand Motor Caravan Association (NZMCA) about potential effects on the amenity of the campground located at 286 Jones Road. The campground is set back about 250m from both Jones Road and Curraghs Road, but is more open to Curraghs Road than Jones Road. The JWS on noise effects expressed a range of expert opinions on the justification for further route restrictions. While unforeseen traffic effects are specifically identified as a potential matter for the future review of conditions, we consider it is appropriate to provide users of the campground with greater certainty about the use of Curraghs Road during the 6.00pm to 8.00pm evening period. We have therefore added a further SDC land use consent condition to limit the use of the road by quarry traffic during that time period.

[103] An issue of concern to some submitters was the route that heavy vehicles might take in the event that the railway level crossing at Dawsons Road might be closed for some reason such as maintenance. As part of Fulton Hogan's final Reply, Mr Metherell[55] advised that in his opinion railway level crossing closures would be an infrequent event that are only approved by the road controlling authority after following a specified Temporary Traffic Management process. He noted that this process would also require consideration of other methods to manage traffic safely and impacts on the surrounding road network. He considered that standard temporary traffic management planning procedures administered by the road controlling authorities and emergency personnel would dictate the routes available to those accessing the quarry at such times. However, to avoid confusion, Mr Metherell suggested that the conditions of consent and/or the provisions of the TMRP allow for a deviation from TMRP routes if temporary closures or temporary events require other routes to be taken. We agree.

[104] Subject to the SDC conditions of consent agreed by the respective traffic experts, as set out in the condition suite recommended by Mr Bligh, and subject to the amendments we have discussed above, we are satisfied that the effects of heavy vehicle traffic generation associated with the quarry will be managed in a way that results in those effects being no more than minor.

6.2.3 Noise and vibration

[105] The Applicant provided an acoustic assessment[56] with the original application and further information[57] addressing the amendments to the proposal in response to the Councils s92 requests and proposed reduced truck movements. The assessment included noise and vibration effects from site preparation activities and operation of the quarry.

[106] The further information from Marshall Day considered the amendments to the proposal, including the revised hours of operation for quarry activities, reduction in truck movements, reduction in activity between

[55] Supplementary Statement of evidence of Andrew Metherell on behalf of Fulton Hogan Limited, Temporary Traffic Management, 28 February 2020, paragraphs 19 and 20.
[56] "*Fulton Hogan Roydon Quarry Environmental Noise Assessment"* dated 14 November 2018 by Marshall Day Acoustics (Appendix I of the Application).
[57] Response to request for further information by Marshall Day Acoustics dated 16 August 2019.

6.00am – 7.00am, and operation of the mobile processing plant more than 250m from the site boundaries. The revised assessment concludes that noise from the quarry will, on a cumulative basis, comply with the SDP daytime noise limit of 55 dbL_{Aeq}[58]. It notes that operational noise between 6.00am and 7.00am will comply with the SDP night time limit of 45 db L_{Aeq} and operational noise between 6.00pm and 8.00pm will be below 50 db L_{Aeq} (i.e. below the SDP daytime noise limit). It states an analysis of the combined noise of backfilling excavated areas and the mobile processing plant operating close to the north boundary shows a cumulative noise level of 55 db $L_{Aeq,}$ which complies with the SDP daytime noise limit. We note that the acoustic assessment does not reflect the noise reductions expected from Fulton Hogan's concession during the hearing to restrict the operation of any mobile processing plant to within the CPSA which is to be located 500m from the site boundaries.

[107] The acoustic assessment states that all construction activities will comply with NZS6803:1999 "Acoustics – Construction Noise". We note that in this case 'construction activities' constitute 'site preparation activities' which includes topsoil stripping, overburden removal and storage, and the construction and maintenance of bunds and stockpiles.[59]

[108] The further information from Marshall Day stated that traffic volumes have a direct bearing on the resulting noise level (e.g. a 50 percent change in traffic volumes could result in a 3 dB change). It notes traffic noise from SH1 is the prominent noise source affecting the underlying noise environment and that this will be similar from SH1 and CSM2 in the future. It concludes that dramatic changes in traffic volumes on local roads would be required to make an overall change given the existing noise environment.

[109] The acoustic assessment set out the relevant vibration assessment criteria for human response[60] and building damage[61]. It concludes the vibration effects from operational activities will be "minimal". In terms of construction effects, it concludes that an excavator working 20m from a dwelling during construction of the proposed perimeter bund will be noticeable, but will be below the building damage criterion of 5mm/s and the 'intolerable' threshold of BS 5228.[62] It states that vibration effects will be "acceptable" provided the consent holder gives notice of the timing of the construction activities to the closest residents.

[110] Many of the submissions in opposition to the quarry proposal raised concern about noise and vibration effects from onsite quarry operations and truck movements to and from the site. We heard from many submitters who are concerned that noise and vibration from trucks could trigger physical and psychological reactions similar to those experienced during the Canterbury earthquakes. Many submitters considered the community is highly sensitive to loud bangs, low rumbles and vibrations from trucks passing, and that this must be taken into account in terms of people's health and wellbeing.

[111] The TRA raised a number of concerns relating to noise and vibrations. Ms Edgar highlighted the importance of the outdoor environment to the community and concerns that audible noise, all day, every day for years, will significantly impact communities' health and well-being.

[112] The CDHB submission noted that noise and vibration can cause a range of health effects, particularly in vulnerable populations, such as young children and older people and those with intellectual disabilities. The submission recommended a number of mitigation measures including: beginning daytime operations from 7.00am; setback of quarrying activities at night time; access to the site only by SH1; upgrading road surfaces; roundabout design to minimise braking and acceleration; limits on night time truck movements; no use of tonal reversing alarms; and imposition of noise limits.

[58] Measured by A-weighted equivalent continuous sound level in decibels over a stated period of time.
[59] See SDC Conditions 1 and 2.
[60] Human response – British Standard BS 5228-2:2009 "*Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*".
[61] Building damage – German Standard DIN 4150-3:1999 "*Structural Vibration - Effects of Vibration on Structures*"
[62] British Standard BS 5228-2:2009 "*Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*".

[113] The NZMCA submission noted the Weedons campground is 260m from the proposed quarry and will be directly affected by noise and loss of 'quiet' from evening and nighttime quarry operations. Concerns related to loss of amenity and enjoyment, particularly in the early evenings, and potential sleep disturbance.

[114] In relation to the NZMCA site, Marshall Day states that, under the assessed worst-case, noise levels during the night time from 8.00pm are predicted to be 37-39 db L_{Aeq}, which is a similar magnitude to the existing ambient night-time noise levels experienced at the campground. It notes the proposed limited range of quarry activities between 6.00pm and 8.00pm, on up to 150 days per year, will be subject to a noise limit of 50 db $L_{Aeq.}$ which was lower than the SDP daytime limit and therefore represents a "substantial reduction" in potential noise effects.

[115] Expert evidence on potential noise effects was provided by John Farren[63] (for Fulton Hogan), Dr Jeremy Trevathan[64] (SDC) Dr Stephen Chiles[65] (for CHDB), Michael Smith[66] (for the TRA), and Richard Jackett[67] (for the NZMCA). Expert conferencing resulted in a JWS (6 November 2019) which outlines the areas of agreement and disagreement between the noise experts.

[116] The JWS notes there is agreement between all the noise experts that:

a) The noise limits and times proposed in the conditions (as recommended by Fulton Hogan's experts Mr Farren and Mr Bligh) are appropriate to protect health and provided a reasonable standard of amenity;
b) Construction noise and vibration effects will be appropriately managed by conditions;
c) The Applicant's approach to noise modelling is consistent with industry practice;
d) There will be no special audible characteristics at receiver locations;
e) All realistic quarry operating scenarios should comply with the noise limits;
f) The restriction on night time activities between 8.00pm and 6.00am will have acceptable noise effects;
g) All heavy vehicles travelling to and from the quarry between 8.00pm and 6.00am should only access the quarry via SH1; and
h) The Noise Management Plan (NMP) and noise monitoring proposed is appropriate.

[117] There was disagreement regarding the use of tonal alarms, with Dr Chiles, Mr Smith, Mr Jackett and Dr Trevathan considering that they should not be used onsite; and Mr Farren noting that such controls will be impractical, except for Fulton Hogan owned and operated trucks. We note the recommended conditions require that only broadband noise alarms are to be used on quarry-based equipment and trucks[68]; and that between 8.00pm and 6.00am there will be no use of tonal reversing alarms[69]. Furthermore, the Applicant emphasised that the design of the ring road and CPSA minimises any need for vehicle reversing.

[118] Mr Smith and Dr Chiles considered the CLG should be able to comment on drafts of the NMP; whereas Mr Farren, Dr Trevathan and Mr Jackett did not consider this necessary given the CLG will give community input to quarry operations. We prefer the evidence of Smith and Chiles and accordingly we have imposed a condition requiring the consent holder to provide copies of any draft management plans to the CLG, invite written comment, and outline how the CLG's feedback has been incorporated into the final plan.[70]

[63] Acoustic Consultant, Manager and Director at Marshall Day Acoustics.
[64] Acoustic Engineer and Director at Acoustic Engineering Services Limited.
[65] Acoustian at Chiles Limited.
[66] Acoustic Consultant and Principal at Altissimo Consulting Limited.
[67] Principal Engineering Scientist in Acoustics at WSP.
[68] SDC Condition 60.
[69] SDC Condition 61.
[70] SDC Condition 92(g).

[119] Mr Smith considered that the mobile processing plant should only be used within the CPSA. Mr Farren, Dr Chiles and Dr Trevathan considered this was unnecessary given the noise limits and NMP provided adequate controls. However, we note that later in the hearing Fulton Hogan agreed to restrict use of the mobile processing plant to the CPSA in order to provide a minimum separation of 500m[71] to the site boundaries, as requested by the CDHB and the NZMCA. At the hearing adjournment in December 2019, there was agreement between the experts that restricting the operation of any mobile processing plant to within the CPSA would further minimise the noise effects experienced at adjoining properties.

[120] Dr Chiles, Dr Trevathan, Mr Smith and Mr Jackett consider heavy vehicle movements should be restricted between 8.00pm and 7.00am, rather than 8.00pm and 6.00am as proposed. Mr Farren disagreed. We note the hours of operation condition proposed by Fulton Hogan would allow the deposition of cleanfill material, and the loading and transportation of material between 6.00am and 7.00am; and between 8.00pm and 6.00am Monday to Saturday (up to 60 nights per annum), and on Sundays and public holidays (up to 15 days per annum, but no more than five public holidays). In that regard, we discuss appropriate hours of operation in section 6.2.4 of this Decision and remind readers that we have excluded all quarrying operations on public holidays, reduced the number of nights from 60 to 30 and restricted the activities on Sundays to the loading and transportation of material, and movement of vehicles associated with those activities.

[121] There was agreement between the experts that 'a few infrequent' truck movements on local roads between 7.00am and 8.00pm should have acceptable noise effects. However, Mr Farren considered controls on truck numbers and/or routes were not required based on the projected distribution of trucks in the Integrated Traffic Assessment. Dr Chiles, Dr Trevathan, Mr Smith and Mr Jackett considered the traffic evidence only provided indicative values and did not preclude peaks with higher truck movements on local roads. Dr Chiles and Mr Smith recommended restricting all truck movements to the Dawson Road - SH1 access. Dr Trevathan suggested restricting truck movements on Curraghs Road and Jones Road.

[122] Having weighed that evidence, together with that of the relevant traffic experts, we concluded in section 6.2.2 of this Decision Report that heavy vehicle traffic associated with quarrying operations should be precluded from local roads and be confined to Jones Road between the quarry and Dawsons Road.[72] In terms of noise effects, as noted by Dr Chiles, the proximity of the quarry site to SH1 is a positive feature and we agree that all trucks should use this existing high volume road at all times, including for local deliveries. Furthermore, given the Applicant's traffic modelling indicates only 'infrequent use' of local roads, we consider there will be little adverse effect of this restriction on Fulton Hogan's operation of the quarry.

[123] We also find that aggregate extraction should not occur during the hours of 6.00am to 7.00am and heavy vehicle movements during that time should be restricted to the deposition of cleanfill in the quarry and the loading and transportation of material from the quarry. This is now reflected in Condition 27 and Table 1 of the SDC conditions attached to this Decision.

[124] Overall, we find that noise effects on all surrounding residents and the NZMCA campground can be minimised at all times by requiring all heavy vehicles accessing the quarry to use the Jones Road, Dawson Road route to SH1 at all times. We consider this additional restriction addresses the concerns of many submitters regarding noise and vibration effects from truck movements and recognises the community's sensitivity to such effects experienced during the Canterbury earthquakes.

[125] Dr Chiles and Dr Trevathan recommended implementation of road design features to minimise noise effects of heavy vehicles between the site access road and SH1; and Mr Smith recommended the

[71] SDC Condition 33.
[72] SDC Condition 40.

intersection layout should discourage heavy vehicles continuing east on Jones Road. We agree and addressed these matters in section 6.2.2 of this Decision Report.

[126] Dr Chiles, Dr Trevathan, Mr Jackett and Mr Smith considered trucks capable of engine braking should be prohibited from the site. Mr Farren considered this could be managed through a code of practice. We note the conditions proposed require the Applicant to 'take all practicable steps' to ensure heavy vehicles do not use engine brakes. Having weighed the evidence, we have imposed a requirement for the consent holder to take all practicable steps to ensure that heavy vehicles associated with quarrying operations do not use engine brakes within the quarry site, or while travelling on Jones Road, or when approaching or leaving the quarry site (SDC Condition 38).

[127] We note Mr Jackett and Mr Smith's concerns that the noise from extraction activities will be audible outdoors over the ambient sound environment and may result in loss of enjoyment of outdoor spaces. We have considered this within the context of the existing noise environment and find any cumulative impact on ambient noise levels will be minor. We acknowledge noise effects will vary with wind direction.

[128] We have paid particular attention to the potential noise and vibration effects on the two closest dwellings (319 Maddisons Road and 153 Curraghs Road) and the conditions proposed by the Applicant to minimise adverse effects. We accept that construction of the perimeter bunds and topsoil stripping close to the site boundaries poses the highest risk of adverse noise and vibration effects to these closest residents. We also accept that these construction activities will be relatively limited in duration and will comply with the appropriate construction noise standards and vibration criterion. Nevertheless, in terms of operational noise and vibration effects, we have imposed a requirement that no quarry activities other than bund construction can occur within 200m of the dwellings at 319 Maddisons Road and 153 Curraghs Road, unless the prior written approval of the owners and occupiers of these dwellings is obtained (SDC Condition 35).

[129] We are satisfied that this requirement, together with the 500m separation between any mobile processing plant and the site boundaries, will mitigate any potential adverse effects.

[130] We note the Applicant proposes to measure and assess noise emissions once within the first 12 months of commencing extraction activities, and once when excavation advances to within 400m of the dwellings at 319 Maddisons Road and 153 Curraghs Road. We consider this should be amended to measure and assess the noise emissions from activities initially within 400m and thereafter repeated when within 250m of the dwellings to better reflect the noise effects of activities close to the 200m setback distance outlined above.

[131] On the basis of the evidence, we find that with the mitigation proposed, the quarry proposal will meet the relevant daytime and night time noise standards that have been agreed by the respective noise experts to be appropriate in this case.[73] We note that those noise limits are generally more stringent than the SDP permitted activity standards, once the different application point (i.e. notional boundary versus site boundary) and noise metrics (i.e. L_{A10} versus L_{Aeq}), are considered.[74]

[132] We also find on the evidence that site preparation activities, including formation of the perimeter bund, are capable of complying with the appropriate New Zealand Standard NZS 6803:1999 and will be required to do so. Further, that vibration generated by normal quarrying operations will be imperceptible beyond the boundary of the site. Overall, we find the imposition of the proposed noise limits and appropriate controls on quarry activities will result in reasonable sound levels at neighbouring properties that are adequate to protect public health.

[73] The noise limits proposed are set out at paragraph 36 of the EIC of Mr Farren and the noise experts JWS recorded agreement with those limits (paragraph 6 of the JWS).
[74] EIC John Farren, paragraph 37.

6.2.4 Operating hours

[133] The operating hours proposed by Fulton Hogan altered during the course of the hearing in response to submitter concerns. The final operating hours proposed were set out in the recommended SDC land use consent Condition 18 that was attached to the end of hearing evidence of Mr Bligh:

> 18) The hours of operation are 7.00 am to 8.00 pm, Monday to Saturday. Outside of these hours restricted processing operations and load out of trucks may occur as detailed in Table 1 below.

Table 1: Hours of operations/activities.

Hours	Duration	Range of activities
6.00 am to 7.00 am	Monday to Saturday	Load out of trucks and truck movements, site pre-start up including operational warm up of conveyors and machinery. Cleanfill deposition.
7.00 am to 6.00 pm	Monday to Saturday	Full range of quarry activities.
6.00 pm to 8.00 pm	Monday to Saturday on up to 150 days per annum.	Full range of quarry activities except mobile plant processing and working of cleanfill.
8.00 pm to 6.00 am.	Monday to Saturday on up to 60 nights per annum.	Load out of trucks and truck movements, and cleanfill deposition.
Sunday and public holidays	For up to 15 days per year (but on no more than 5 public holidays).	Load out of trucks and truck movements and cleanfill deposition.
At all times, dust suppression, operation of weighbridge office activities, site security and light maintenance as required. NB: 'Cleanfill deposition' above, means the unloading of cleanfill at the site, but not the working of cleanfill.		

[134] The proposed hours of operation were of concern to a number of submitters, particularly with regard to weekday operations between 6.00pm and 6.00am and the operations proposed for Sundays and public holidays. Most of the concerns centered on the potential loss of existing rural amenity that would result from quarry noise (especially that associated with aggregate crushing) and heavy vehicle movements to and from the quarry on local roads. Of particular concern was the proposed night time (8.00pm to 6am) operations which many submitters thought would disrupt their sleep.

[135] We have already found that the effects of noise and heavy vehicle traffic movements will at all times, including during night time hours, be no more than minor provided conditions of consent and the requirements of the Transportation Management and Routing Plan (largely precluding heavy vehicle movements on local roads other than a short stretch of Jones Road) and the Noise Management Plan are complied with. We also note that (as can be seen from Table 1 above) during the 8.00pm to 6.00am time period on Monday to Saturday, and on Sundays and public holidays there will be no extraction or processing (crushing) of aggregate, which submitters considered those activities to be particularly noisy.

[136] In his initial SDC s42A Officers Report Mr Henderson expressed concern about the appropriateness of the proposed night time activities (those between 8.00pm and 6.00am Monday to Saturday) on the amenity of the residential dwellings that were closest to the quarry site. He initially recommended that those activities be precluded. However, by the end of the hearing, in light of the noise experts' JWS, he agreed that the proposed night time activities would comply with the night time noise limits and that the proposed conditions of consent would appropriately manage amenity effects.[75] In other words, he no longer opposed Fulton Hogan's proposed night time activities.

[137] However, in light of the concerns expressed to us by submitters, we remain concerned about the potential for significant cumulative effects arising from night time quarry activities and the justification for quarry activities on public holidays. We consider this further in the sections on Amenity Effects (6.2.6) and Cumulative Effects (6.2.26) of this Decision Report where we conclude that the potential effects of the

[75] Summary Statement of Andrew Henderson, SDC Officer Report, 11 December 2019, paragraphs 46 and 47.

proposed intensity of quarry activities over such a long period of 35 years warrants an hours of operation regime that minimises night time quarry activities and provides certainty of respite for the affected community on public holidays. Consequently, we have amended the SDC consent conditions to prohibit quarry activities, other than dust suppression and site security, on all statutory public holidays and have reduced the number of nights when loading and transportation of material is permitted from 60 nights to 30 nights.

[138] In terms of SDC Condition 18 and Table 1 set out above, we note that Mr Bligh has elsewhere[76] proposed several defined terms for the CRC consents, namely "quarry activities", "site preparation" and "quarry operations". We consider those definitions to be helpful and find that they should also apply to the SDC land use consent if granted. We have therefore amended the wording of the SDC conditions to be consistent with those definitions.

6.2.5 Recreational walking track

[139] Many submitters were concerned that the heavy vehicles associated with the quarry, particularly those using local roads such as Dawsons, Curraghs and Maddisons Roads, would pose a threat to the safety of people walking, running, cycling or horse riding on those roads, as well as detracting from the amenity currently enjoyed by those people. We discussed traffic safety related issues in section 6.2.2 of this Decision Report. In this section we discuss the issue of a walking track around the quarry site.

[140] At the time of the hearing, an off-road cycle and pedestrian path had been partially constructed between the railway line and Jones Road between Dawsons Road and Curraghs Road. Fulton Hogan called this the CSM2 Cycleway. That path will connect to a future cycleway network at either end. Fulton Hogan noted that apart from that path, no dedicated walking infrastructure was provided on any of the roads surrounding the site, although wide berms provided refuge for people choosing to walk on the roadside.[77]

[141] Fulton Hogan have proposed to construct a gravel shared path around the extent of the quarry site, linking through to Templeton, which they call the 'Roydon Quarry Track'. They say this is not required to address landscape or visual effects but is to improve connectivity and recreational opportunities for residents.[78] In response to queries from us, Fulton Hogan have now proposed a public viewing platform on the proposed site perimeter bund facing Dawsons Road that would be accessible from the gravel shared path. Illustrations of the path and the viewing platform were provided by Mr Compton-Moen. Fulton Hogan have also offered to link the gravel shared path into the CSM2 Cycleway at the Dawsons and Jones Road intersection and have provided an illustration showing how pedestrian access could be provided across the proposed new Jones Road / Dawsons Road three-way roundabout (Option 2).

[142] Some submitters were in favour of the proposed gravel shared path while others were opposed to it, mainly because of fears about the safety of users given that, in some places, the path would be sited between the proposed bunds and the proposed landscape planting at the base of the bunds. Importantly, the SDC was of the view that the proposed gravel shared path could not be located in the road reserve, meaning that it would need to be located within the application site. Mr Bligh[79] has advised that Fulton Hogan is prepared to commit to providing the walking track on the basis that even if the SDC does not agree to the use of road reserve, Fulton Hogan land can be used instead.

[143] We have no concerns with the proposed gravel shared path or the viewing platform. We agree they would be a positive enhancement of recreational walking and cycling opportunities in the immediate area and that the viewing platform will no doubt be used by people who are interested in seeing inside a working aggregate quarry. As we understand it, the proposed gravel shared path and viewing platform are offered

[76] CRC192410 Discharge Permit to discharge contaminants into air from an industrial or trade premise or process, Conditions 1 and 2.
[77] Evidence of Andrew Alan Metherell on behalf of Fulton Hogan Limited, Traffic Effects, 23 September 2019, paragraphs 32 and 33.
[78] Evidence of David John Compton-Moen on behalf of Fulton Hogan Limited, Landscape and Visual, 23 September 2019, paragraph 32.
[79] Supplementary Statement of Kevin Michael Bligh on behalf of Fulton Hogan Limited, Project and Consent Conditions, 29 January 2020, paragraph 11.

as a form of mitigation against the impact of quarry trucks on local roads, we therefore find that its provision should be required by conditions of consent should the quarry consents be granted.

6.2.6 Amenity values

[144] Amenity values are defined in s2 of the RMA as "*those natural or physical qualities and characteristics of an area that contribute to people's appreciations of its pleasantness, aesthetic coherence, and cultural and recreational attributes*."

[145] This places emphasis on the existing neighborhood character which was addressed in the submissions and submitter evidence presented at the hearing.[80] In particular, a large number of submitters stressed the importance to them of the open, rural, safe and for many, a relatively peaceful character. While we have addressed the technical issues of air quality, noise, traffic, landscape and a range of other matters that contribute to amenity, we also need to consider the combined effect of the quarry proposal on the overall amenity of the area.

[146] Many submitters feared significant adverse effects on the local amenity values would result from the proposed quarry. In many cases, this view was founded in the personal knowledge of the effects associated with other large areas of quarrying in Greater Christchurch, particularly at Yaldhurst and McLeans Island. However, the expert evidence was that in the vicinity of the proposed Roydon quarry, the background environment included occasional high levels of ambient PM_{10} dust from existing rural land use activities and elevated noise levels from nearby road and rail corridors, aircraft and the Ruapuna raceway.

[147] Notwithstanding the above, on the evidence as reinforced by our site visits, we are for the most part satisfied that the Roydon Quarry proposal is designed to a significantly higher standard than many other existing quarries. It also includes a regime of consent conditions that will require active management throughout the life of the quarry. On this basis, we find that the effects on amenity values will be managed to acceptable levels.

[148] However, we acknowledge the concerns expressed to us by many submitters regarding potential effects on local amenity values. We consider that there are two related aspects that bear on amenity effects that warrant further consideration. These relate to the effects on amenity from the extent of heavy vehicle movements at night time and the routes used to access the quarry.

[149] Heavy vehicles movements at nighttime, Sundays and public holidays are proposed to be limited to 30 vehicles per hour. That has the potential to involve 300 vehicle movements on 60 nights and 15 Sundays or public holidays. We accept that there will be some occasions when nighttime and Sunday transportation of material will be necessary in the wider interests of efficient development of infrastructure and urban assets. However, these are the times with the greatest potential to adversely affect wider amenity values for the local community. We have carefully weighed the relevant evidence and have determined that a cautious approach to managing the risks of such effects arising is warranted. We consider that the community should have the certainty that they will not experience adverse amenity effects on public holidays and we consider that quarry customers should be capable of managing their activities such that access to the quarry on public holidays can be avoided. We have therefore determined that the hours of operation should exclude public holidays for all activities except dust suppression, operation of weighbridge office activities, site security and light maintenance.

[150] Based on the evidence of the Applicant's witnesses, we also consider that the night time transportation of quarry material will in all likelihood be project specific and occur under exceptional circumstances, rather than representing business as usual. These circumstances may require the level of heavy vehicle movements proposed at 30 per hour, but we consider that allowing that to occur for up to 60 nights a year

[80] Including Tina and Sophie Moore, Anne Thompson, Carole Greenfield, Mike Mora, Chris Fox and Stephen Bain/Simon Moore.

has the potential to create material adverse effects on amenity values and we have therefore reduced this to 30 nights with the allowance to operate on up to 15 Sundays per year, as sought by the Applicant.

[151] The second and related matter is the proposed restriction on routes taken by heavy vehicles travelling to and from the quarry. We determined in section 6.2.2 of this Decision that additional mitigation measures are required to provide greater certainty to existing community interests and related activities by ensuring that any heavy vehicle traffic to or from Templeton is routed via SH1 and not Jones Road and that heavy vehicle traffic should not use Curraghs Road during the evening hours of 6.00pm to 8.00pm.

[152] The Applicant has proposed that all night time heavy vehicle traffic will use the Dawsons Road rail crossing to access SH1 irrespective of their destination and this route would also be used for that traffic travelling to the quarry. The implementation, management and enforcement of the routing restrictions is to be documented in the Transportation Management and Routing Plan.

[153] Mr Mertherell's modelling illustrated on Figure 11-1 of the Integrated Transport Assessment was that very few heavy vehicles would need to use both Curraghs Road and Dawsons Road northbound, being a maximum of 0 to 5 vehicles per day. However, higher volumes are forecast to use Jones Road west bound at a maximum of 80 vehicles per day. This is nearly double the number forecast in Figure 11-1 to use the alternative route of SH1 westbound being a maximum of 47 vehicles per day. This was supplemented by the Project Transport Model Technical Assessment Report which was Appendix B to Mr Metherell's evidence in chief dated 23 September 2019. This showed the am peak, interpeak and pm peak hourly quarry traffic using Jones Road west and SH1 west to be evenly divided between the two.[81]

[154] We remain concerned about the uncertainty of heavy traffic routing given that it is based on only two months of winter traffic generation data from the Pound Road quarry without regard to the location of likely future demand for the type of aggregate to be produced by the Roydon quarry. We consider that further attention could helpfully have been given to expected demand patterns over the next ten years, but we accept that aggregate demand predictions beyond that would be highly speculative. Having regard to this and the levels of traffic forecasted by the modelling, we consider that a full prohibition on using Curraghs Road and Dawsons Road is unlikely to cause unreasonable inefficiencies for quarry customers, but would have significant benefits by providing greater certainty for the surrounding community, easier heavy vehicle management for the Applicant and easier monitoring and enforcement of traffic restriction conditions of consent for the SDC.

[155] We also consider that heavy vehicle arrivals and departures from the west should be required to use the SH1 route in preference to Jones Road. We understand that the SH1 route will be equally efficient and is a part of the roading network designed for traffic of this nature. Our understanding of the Applicant's traffic modeling is that the additional traffic through the rail level crossing and SH1 roundabout intersection resulting from this requirement is not expected to make a material difference to the traffic management challenges at that intersection. Even if we are wrong about that then we understand that any issues arising can be addressed through the Roydon Quarry, SH1 / Dawsons Road Queue Management Plan.

[156] We acknowledge that these additional measures reflect a cautious approach that goes beyond that considered necessary by the relevant experts. However, we consider that they are appropriate in the circumstances and will ensure that potential amenity effects are avoided to the extent that they do not weigh against a grant of consent. In saying that, we are cognisant of the concerns expressed to us by many submitters about potential adverse effects of quarry activities, and heavy vehicle traffic in particular, on the levels of 'peaceful rural' amenity that they currently enjoy.

[157] These measures have been incorporated into the SDC conditions.

[81] Figures 2-1, 2-2 and 2-3 pages 6 and 7 Roydon Quarry Project Transport Model Technical Assessment Report, Stantec Ltd.

6.2.7 Ngai Tahu values and interests

[158] We understand that there are no known heritage structures, archaeological sites, wahi tapu sites or other sites of significance to Ngai Tāhu that have been identified on the proposed quarry site.[82] We also note that following the Applicant's consultation with Mahaanui Kurataiao Limited and feedback from the Kaitiaki (Environmental) Portfolio Committees of Te Ngāi Tūāhuriri Rūnunga and Te Taumutu Rūnunga, it was agreed that a cultural impact assessment was not required, but concerns were expressed about the health impacts of dust, heavy metals from truck brake pads, groundwater separation and the need for an accidental discovery protocol.[83] We deal with those three substantive matters in this Decision Report and note that the Applicant has accepted the need for an accidental discovery protocol.

[159] Ngai Tahu did not lodge a submission or appear at the hearing in support of any other submitter. We find that Ngai Tahu values and interests do not weigh against a grant of consent.

6.2.8 Hazardous substances

[160] The SDC s42A author noted that the storage of hazardous substances is governed by the HSNO Act.[84] Nevertheless, we address it here for completeness.

[161] The Applicant intends to store fuel and lubricants required for quarry plant and machinery on the site. Up to 15,000 litres of diesel will be stored in fixed a double skinned tank which will be covered to shelter it from the rain and the tank will be sited on an impervious surface with secondary containment (or self-bunding) serviced by an oil interceptor. Refueling will occur on an adjacent covered concrete refueling pad, which could double as an area for vehicle servicing. Until the diesel tank is installed,[85] portable tankers may be used, with any refueling taking place well above the bottom of the pit floor.

[162] Lubricants, such as engine oil, will be stored within a workshop in small quantities, totaling approximately 250 kilograms. We note that the Applicant proposes a Spill Management Plan for the site which will deal with matters such as the management and inspection of the fuel tank.

[163] The SDC s42A author concluded that the measures proposed in relation to the storage of hazardous substances were consistent with standard industry practice and as a consequence any potential adverse effects would be appropriately managed. We heard no expert evidence to the contrary.

[164] The CRC s42A author also addressed this matter, noting that under Rule 5.179 of the CLWRP the use of land for the storage and use of a hazardous substance listed in CLWRP Part A of Schedule 4[86] is a permitted activity. The Applicant considers they are able to meet all conditions of Rule 5.179. Ms Goslin agreed with the Applicant that the conditions of Rule 5.179 will be met by the Applicant's proposal. That being the case, we do not need to consider this matter further.

[165] Finally, should the quarry consents be granted, we record that we see no need to duplicate in the CRC conditions of consent any hazardous substances management conditions that are included in the SDC land use consent. Doing so would result in undesirable regulatory and enforcement uncertainty.

6.2.9 Contaminated land

[166] As we noted earlier, land use consent is required under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS). While this is a SDC responsibility, we note SDC have understandably deferred to the expertise of the CRC.

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[82] Evidence of Kevin Michael Bligh on behalf of Fulton Hogan Limited, Project and Consent Conditions, Dated: 23 September 2019, paragraph 26.
[83] Evidence of Donald Gordon Chittock on behalf of Fulton Hogan Limited, Dated: 23 September 2019, paragraph 47.
[84] Hazardous Substance and New Organisms Act 1996.
[85] Within two years of the commencement of quarrying activities.
[86] Schedule 4 defers to substances defined in the Hazardous Substances (Minimum Degrees of Hazard) Regulations 2001, including substances that are flammable. That would obviously include diesel and lubricants.

[167] The quarry site preparation activities have the potential to mobilise existing soil contamination at 107 Dawsons Road and 220 Jones Road, which were both identified on CRC's Listed Land Use Register (LLUR)[87] as potentially contaminated sites due to use as a 'livestock dip or spray race operation'. The Applicant provided Preliminary and Detailed Site Investigations[88] which were audited for CRC by Rowan Freeman[89] and reported on in the CRC s42A Officer Report. On the basis of this review, Ms Goslin advised that 220 Jones Road is no longer an area of interest as the likelihood that common livestock dipping chemicals being used there in the past was low.

[168] Mr Freeman had some concerns about the adequacy of the PSI and DSI report for 107 Dawsons Road.[90] However, he was satisfied that the Applicant's intention to develop and implement a Remedial Action Plan (RAP) would address those issues. Mr Freeman noted this requirement was reflected in the proposed SDC land use consent conditions, but that there needed to be a timeframe specified for providing the RAP and that CRC should also be provided with a copy of it.[91] We agree as does the Applicant.

[169] On 6 November 2019, we were advised that Mr Freeman had left the employ of the CRC and that Guy Knoyle[92] had been engaged to confirm Mr Freeman's assessment and identify any areas of disagreement or new areas which required investigation. Mr Knoyle provided a 10 page "Addendum to Section 42A Officer's Report". Mr Knoyle stated that he agreed with Mr Freeman's assessment and that he was not aware of any contaminated land matters within the site or external to the site that would impact on or be impacted by the development of the proposed quarry.[93] Unfortunately, Mr Knoyle's s42A Addendum did not appear to refer to the latest (at that time) suite of consent conditions recommended by Ms Goslin[94] or Mr Bligh. Nevertheless, we have taken his conclusions into account in considering consent conditions should the quarry consents be granted.

[170] In that regard, Ms Goslin provided an Addendum to her September 2019 s42 Officer Report.[95] She advised that the investigation of additional possible HAIL sites identified by Mr Knoyle could be addressed through recommended consent conditions. She also advised that Mr Knoyle's conclusions had no impact on her earlier conclusions regarding the actual and potential adverse effects on groundwater quality and users or effects arising from contaminated soils.

[171] We are satisfied that subject to compliance with appropriate conditions of consent, the actual and potential adverse effects arising from the remediation of contaminated land will be less than minor.

6.2.10 Bird strike and Christchurch International Airport

[172] Submitters Air New Zealand and Christchurch International Airport Ltd (CIAL) raised concerns regarding potential adverse effects on aircraft arising from bird strike, as well as effects on aircraft arising from lighting and dust.

[173] The August 2018 s92 response from the Applicant advised that an assessment of environment effects for lighting and glare, the scope of which was agreed with CIAL, concluded that the proposed quarry lighting would have negligible effects on aircraft operations. That response also advised that while the potential for bird strike could be increased should large water bodies be established within the quarry, the Applicant

[87] Referred to as HAIL sites.
[88] Preliminary and Detailed Site Investigation (Golder Associates, November 2018) – AEE Report - Appendix H.
[89] Principal Science Advisor – Contaminated Land, CRC.
[90] Relating to an area of land covering approximately 0.8 hectares may have been used for market gardening, a waste dumping area situated on the southeast corner adjacent to Dawson Road, and a stockpile of old battery cases under mature trees between Shed#2 and Shed#3.
[91] So as to ensure proper storage and management of any contaminated or potentially contaminated stockpiles; material sorting piles and remediation excavations.
[92] Technical Director – Contaminated Land at Pattle Delamore Partners Limited.
[93] Addendum to CRC s42A Officer Report dated 14 August 2019, Report of Guy Anthony Knoyle, Technical Director – Contaminated Land, CRC, Executive Summary.
[94] Appendix 7 of the CRC s42A Officer Report.
[95] Addendum to s42A Officer Report dated 2 September 2019, Report of Hannah Louise Goslin, paragraph 6.

had determined that the nature of the quarry (being primarily basecourse materials) did not warrant the need for sediment wash water ponds.

[174] Regarding dust, the Applicant's August s92 response advised that any visible dust plumes from the quarry would generally be contained within the site boundaries through a range of dust mitigation and quarry design features (e.g. use of sealed haul and access roads) and any extension of visible dust plumes beyond the site boundary would be infrequent and not likely to extend laterally more than 100m and be contained within 50m above ground level. On that basis, the Applicant considered that there would be no impairment of pilot visibility due to the proposed quarry.

[175] The Applicant volunteered a number of conditions aimed at deterring birds frequenting the quarry. The SDC s42A author supported those conditions.

[176] CIAL[96] and Air New Zealand did not attend the hearing. Mr Boswell for CIAL provided a written statement of evidence advising that their concerns had been largely resolved. He supported the Applicant's intended avoidance of wash water ponds and ponds for truck wash water; and stated that provided there were no open water storage ponds of any kind on the site, CIAL was satisfied that the risk of bird strike would be appropriately managed.[97] Mr Boswell recommended a minor amendment to the SDC consent conditions to reflect current CIAL practice and to the contents of the Quarry Rehabilitation Plan, which we find to be reasonable.[98]

[177] Importantly, later in this Decision Report, we discuss the requirement to avoid any ponding of water anywhere within the base of quarry site, including in areas where cleanfill has been placed and in areas that have been rehabilitated. We find that provides additional certainty that the outcome sought by CIAL will be achieved for the duration of the consent.

[178] Regarding dust, Mr Boswell was satisfied that the dust suppression measures proposed by the Applicant would address CIAL's core concerns and avoid adverse effects on airport operations.[99] Regarding lighting, Mr Boswell was satisfied that as long as the Rexel Lighting Solutions lighting plan that accompanied the Applicant's first s92 response was implemented the risk to airport operations would be 'low'.

[179] Mr Bligh advised that Fulton Hogan accepted almost all of the conditions sought by CIAL[100], with the exception of the use of low seed producing grass which was not considered necessary to deter birds given the distance from the airport.

[180] We are satisfied that subject to compliance with appropriate conditions of consent, potential adverse effects on aircraft arising from lighting, bird strike and dust plumes will be suitably avoided or mitigated to the extent that they are no more than minor.

6.2.11 Air Quality Effects

[181] The potential adverse effects of the proposed quarry on air quality were of concern to most if not all of the submitters in opposition. The primary issues raised were:

- The risk of nuisance effects from dust settling on houses, washing and other property;
- The risk to human health for people living, working or staying in the vicinity of the quarry from dust particulates and respirable crystalline silica (RCS) and from the contamination of water supplies;

[96] Evidence of Rhys Boswell, CIAL General Manager of Strategy and Sustainability.
[97] EIC Boswell, paragraph 34.
[98] EIC Boswell, paragraphs 36 and 37.
[99] EIC Boswell, paragraph 43.
[100] Rebuttal Evidence, Bligh, paragraphs 77 to 85.

- The effects of dust emissions from heavy vehicles transporting aggregate from the quarry and from heavy vehicles transporting cleanfill to the quarry; and
- Risks to the health of animals, particularly horses being trained in the area.

[182] We discussed offsite heavy vehicle related effects in section 6.2.2, the potential impacts of the quarry on horse training in section 6.2.13, and the effects on water supplies in section 6.2.17 of this Decision Report. Accordingly, we do not traverse those three matters here.

[183] The Resource Management (National Environmental Standard for Air Quality) Regulations 2004 (NESAQ) include ambient air quality standards that apply to the Christchurch Airshed.[101] Importantly, under regulations 17(1) and 17(3) we are directed to decline Fulton Hogan's air discharge consent application if we find that the discharge of PM_{10} from quarry activities would be likely, at any time, to increase the concentration[102] of PM_{10} by more than 2.5 micrograms per cubic metre ($\mu g/m^3$) in any part of the Christchurch Airshed unless Fulton Hogan can reduce the amount of PM_{10} discharged from another source by the same or greater amount than the amount likely to be discharged into the Airshed by quarry activities. The PM_{10} reduction from another source is colloquially referred to as an 'offset'.

[184] In terms of addressing air quality matters, we are grateful for the carefully researched material presented to us by a number of submitters. We were also extensively assisted by air quality experts engaged by hearing participants and in particular we appreciated the two JWS that they prepared.[103] The air quality experts were Roger Cudmore[104] and Audrey Wagenaar[105] (for Fulton Hogan), Louise Wickham[106] (for the CDHB), Deborah Ryan[107] (for the CRC) and Charles Kirkby[108] (for the TRA).

[185] In the interests of brevity, where the air quality experts are in agreement, we do not traverse their individual evidence in any detail, deferring instead to agreements recorded in the JWS. However, where there is disagreement, we traverse the individual evidence in more detail.

6.2.11.1 Quarry design and mitigation measures

[186] Prior to addressing the issues that were of concern to submitters and the s42A authors, we briefly outline the key design features of the proposed quarry and the dust mitigation operational measures that were described in the Applicant's evidence, particularly that of Mr Cudmore and Mr Jolly.

[187] The design features include the layout of the CPSA (see section 3 of this Decision Report), the sealed entrance and ring roads, the use of reject pea gravel on internal unsealed roads, and not driving trucks over active cleanfill areas. These measures are largely targeted at avoiding and minimising dust emissions from heavy vehicle movements.

[188] By the conclusion of the hearing Fulton Hogan had proposed a number of dust mitigation operational measures, to be documented in a Dust Management Plan (DMP) that is to be certified by the CRC; including:

- vacuuming sealed roads within the CPSA and entrance way;
- watering internal pea gravel roads but otherwise limiting the use of water carts;

[101] Regulation 13
[102] Calculated as a 24-hour mean under Schedule 1 of the NESAQ.
[103] Joint Witness Statement of: (1) Deborah Ryan; (2) Roger Cudmore; (3) Audrey Wagenaar; (4) Charles Kirkby; and (5) Louise Wickham. Air Quality, dated: 14 November 2019; Second Joint Witness Statement of: (1) Deborah Ryan; (2) Roger Cudmore; (3) Charles Kirkby; and (4) Louise Wickham. Air Quality – Particularly PM_{10}, dated: 9 December 2019.
[104] Principal and National Technical Leader at Golder Associates (NZ) Limited.
[105] Associate and Senior Environmental Scientist at Golder Associates Limited.
[106] Director and Senior Air Quality Specialist at Emission Impossible Limited.
[107] Technical Director for Air Quality Pattle at Delamore Partners Limited.
[108] Independent air quality practitioner at The Air We Breath Limited.

- covering loads of incoming cleanfill material (or pre-wetting it);
- using fog canons or solid set fine mist spray systems at the cleanfill unloading area and clean fill working face;
- not allowing trucks to traverse the operational cleanfill area;
- a shaker bar (rumble strip) and wheel wash system (located near the site exit);
- locating all mobile crushers within the CPSA;
- using fine mist sprayers on the processing plant, including the crusher plant, screening plant, conveyors and drop points (and potentially aggregate stockpiles);
- application of polymer sprays to stabilise stockpiles, if necessary;
- limiting perimeter bund construction to the months of May to October;
- hydroseeding the perimeter bund within 14 days of its construction;
- wetting topsoil and overburden stockpiles and irrigating the perimeter bunds and associated screening vegetation;
- not extracting aggregate within 200m of any existing dwelling without the prior written consent of the dwelling's owner;
- monitoring PM_{10} levels at the site boundary and when they reach or exceed 150 µg/m^3 (1-hour average) initiating additional dust control measures and ceasing dust generating activities upwind and within 250 m of sensitive receptor locations; and
- if visible dust is blowing beyond the site boundary at any time dust generating activities will cease and additional dust suppression measures implemented.

[189] In their 30 January 2020 Reply submissions Fulton Hogan stated that they considered the proposed quarry to be 'an exemplar' in the way it has been designed and proposed to be managed and rehabilitated. In that regard we acknowledge that the design features and dust control measures listed above appear to be consistent with best practice and recognised industry standards.

[190] We understand that the efficacy of dust suppression measures relates directly to the extent of exposed soil or the open area of a quarry. Mr Cudmore advised that for the Roydon quarry active dust suppression on only 6ha of open area would be required on any dry day (where there has been no rainfall in the last 12 hours) irrespective of the wind speed. As we discuss in section 6.2.18 of this Decision Report, the evidence of Eric van Nieuwkerk[109] demonstrated that an adequate water supply will be available for dust suppression purposes on that area of open quarry. We note that in the event of an inadequate water supply Fulton Hogan must either use chemical dust suppressants[110] or must cease quarrying activities.[111]

[191] The DMP will contain standard operating procedures (SOP) for dust suppression measures and for the location and calibration of ambient PM_{10} monitoring equipment. The monitoring will enable real time triggers for dust mitigation measures to be imposed, including ceasing operations in some wind conditions. The monitoring proposed by Fulton Hogan includes:

- Installation of a meteorological station at the site to measure wind speed and direction, rainfall, temperature and humidity;
- A permanent real time PM_{10} monitor on the eastern site boundary;
- At least two real time mobile PM_{10} monitors to be located on the quarry site boundary between the area of active quarrying / filling and the nearest off-site sensitive receptors.

[192] We discuss the adequacy of the proposed monitoring later in this Decision Report. However, we record here that we consider there is a need to locate a permanent real-time PM_{10} monitor (US EPA or National Environmental Standards for Air Quality 2004 (NES)) compliant equipment) on each boundary of the quarry given that public roads surround the site and there are existing dwellings in close proximity to at

[109] Senior Hydrogeologist at Golder Associates (NZ) Limited.
[110] CRC192410 Condition 26.
[111] CRC192410 Condition 27.

least three of the boundaries. That will ensure that PM_{10} trigger levels can be monitored regardless of wind direction or shifts in wind direction.

6.2.11.2 Nuisance dust effects

[193] The November 2019 JWS[112] addressed the potential for dust related nuisance effects to arise for people beyond the quarry site boundary. Mr Cudmore, Mr Kirkby and Ms Ryan all considered that the operation of the quarry could be readily managed such that dust nuisance effects would not be objectionable or offensive at sensitive receptors. For the benefit of readers, we understand that the term 'sensitive receptors' means residential dwellings, places of worship and commercial properties within 500 m of the site.

[194] In terms of the expert's individual opinions, Mr Cudmore emphasised that the design of the quarry allowed for controls on dust to be employed far more effectively than in other conventional quarries around Canterbury and accordingly a loss of control of dust emissions would be "very rare". Ms Ryan was satisfied that submitter concerns about soiling of washing, windows, solar panels and general dust deposition would be mitigated to the extent that more than minor adverse effects could be avoided. Similarly, she concluded any more than minor adverse effects on roof water supplies could be avoided and posed more of a nuisance risk than a health risk, given that aggregate dust is relatively inert.

[195] The November JWS recorded that Ms Wickham considered that some residents might experience dust nuisance effects on occasion, even if best practice dust mitigation measures were implemented, given their close proximity to the quarry site. She considered that nuisance effects could be expected at some locations within 200 to 300m of the site during dry and windy conditions unless the mobile plant was operated at least 500m from sensitive receptors. As we recorded in section 3 of this Decision Report, Fulton Hogan now intends to operate the mobile plant solely within the CPSA which means it will satisfy Ms Wickham's concerns.

[196] Mr Kirkby and Ms Wickham considered there would be a heightened risk of dust nuisance occurring during construction of the perimeter bunds. Mr Kirkby recommended that where there are adjacent dwellings the bunds should be set back further into the site. We understand he was referring to the dwellings at 319 Maddisons Road and 153 Curraghs Road and the dwellings to the south west of the site. Mr Cudmore[113] disagreed, on the basis that construction of the bund near those dwellings would only take several days to a week, and that dust control with water could readily be employed during that time and thereafter vegetation would be rapidly established on the bunds. While we accept Mr Cudmore's expert opinion on that matter, having considered the evidence of Mr Kirkby we find that, in addition to permanent PM_{10} monitors on each boundary, mobile dust monitors should be located on the quarry's southern and western boundaries between the site preparation activities and the nearest dwelling in order to ensure that dust emissions can be monitored and mitigation measures triggered when required.

[197] Some submitters were concerned about dust on gardens, crops and physical property.

[198] Southern Woods Nursery was worried about dust landing on their nursery plants and trees adversely affecting growth rates and plant health. The nursery is situated around 300m to south west of the quarry. In response Mr Cudmore advised that given the nursery's distance downwind, the quarry design and operational measures, and the proposed real time dust monitoring, there would be "low potential" for plants to receive significant deposits of dust (which he advised would be a level exceeding 4 grams per square metre per month[114] above background levels). We accept his uncontested expert opinion on that matter.

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[112] Page 5.

[113] Supplementary evidence dated 21 October 2019.

[114] Recommended trigger level for deposited solids in the Ministry for the Environments; "*Good Practice for Assessing and Managing Dust*" November 2016

[199] The NZMCA has operated the Weedons campground to the west of the proposed quarry since 2007. The NZMCA was concerned about the potential effects of dust on members relaxing outside during a prevalent north easterly wind.[115] While acknowledging their concern, we accept the expert evidence of Mr Cudmore and Ms Ryan that the NZMCA site is unlikely to experience any nuisance dust given its minimum 290m separation distance from the quarry face and the dust mitigation controls now proposed.

[200] The issue of separation distances from dwellings was raised by numerous submitters, reflecting the many rural properties in the general vicinity of the proposed quarry and the general public awareness of dust problems in the Yaldhurst area. Referring to the EPA Victoria Guidelines[116], some submitters (including the CDHB) sought a minimum 500m separation distance between the quarry and sensitive receptors. The EPA Victoria Guidelines recommend a 500m separation distance for quarrying, crushing, screening, stockpiling and conveying of rock with respirable crystalline silica. We note from the uncontested evidence of Bruce Dawson[117] for Fulton Hogan that the recommended separation distances are default minimums in the absence of a site-specific assessment. We agree with Mr Cudmore that a site-specific assessment has been undertaken here. Importantly, in response to the submitters' concerns, Fulton Hogan proposes to locate the mobile crushing plant within the CPSA, which we find largely addresses the submitter concerns relayed to us given this will be operated at least 500m from the site boundaries.

[201] Having considered concerns raised and the expert evidence, we find that the operation of the quarry can be managed so that dust nuisance dust effects are unlikely to be objectionable or offensive beyond the site boundary. We are satisfied that conditions of consent can be imposed to ensure that outcome is achieved. We agree that the certified DMP will be fundamental to the effective implementation of dust mitigation measures and its preparation will enable Hogan to identify and implement the best practicable options for minimising dust emissions beyond the site boundary.[118]

[202] In terms of real time dust monitoring being used to initiate mitigation measures, we find that the applicant's proposed PM_{10} value of 150 µg/m^3 (as a 1-hour average)[119] and 'visible dust blowing beyond the site boundary"[120] criteria are appropriate triggers for the cessation of quarry activities. We note that the PM_{10} trigger value is more conservative than the alert limits of 155 and 170 µg/m^3 (as a 1-hour average) recommended by Ms Wickham on behalf of the CDHB.

[203] During the hearing we queried how "out of hours" dust suppression measures would be activated and in response Fulton Hogan has proposed consent conditions requiring them to be automated and activated remotely outside of working hours. We consider this to be an important mitigation measure.[121]

6.2.11.3 Human health standards

[204] Before we discuss the potential adverse effects of quarry dust on human health, we firstly traverse the applicable health standards that should be applied. We received a substantial amount of evidence and submissions on this matter, including from the air quality experts and submitters Dr Seddon- Smith, Dr Laurence Greenfield, Dr Kelvin Duncan and Davina Penny.

[205] The CDHB recommended the following standards:

- PM_{10} – No more than one exceedance in a 12-month period of 50 µg/m^3 expressed as a 24-hour mean (50 µg/m^3 as a 24-hour average);[122]

[115] Evidence of Alexander James Imlach of the New Zealand Motor Caravan Association Inc, dated 14 October 2019, paragraph 23.
[116] EPA Victoria publication number 1518, dated March 2013 (EPA Victoria Guidelines).
[117] Evidence of Bruce Edgar Dawson on behalf of Fulton Hogan Limited, Victoria Guidelines for Separation Distances, Dated: 23 September 2019, paragraph 35. Mr Dawson is Principal Environmental Consultant at Golder Associates Pty Ltd (Australia).
[118] CRC192410 Condition 7.
[119] CRC192410 Condition 22.
[120] CRC192410 Condition 24.
[121] CRC192410 Condition 26.
[122] NESAQ.

- PM_{10} - Any exceedance of 150 µg/m^3 as a 1-hour mean set as a trigger level to prompt action to control dust (150 µg/m^3 as a 1-hour average);[123]
- $PM_{2.5}$ – Ambient concentration of $PM_{2.5}$ is not to exceed µg/m^3 as a 24-hour mean (25 µg/m^3 as a 24-hour average);[124] and
- RCS – Ambient concentrations of RCS not to exceed 3 µg/m^3 as an annual average (3 µg/m^3 - annual average).[125]

[206] The air quality experts agreed on the annual average RCS standard which we understand is based on protecting against silicosis and carcinogenic effects derived from chronic exposure. For Fulton Hogan, Audrey Wagenaar (Associate and Senior Environmental Scientist at Golder Associates Ltd) supported the additional use of the acute Texas RCS 1-hour average standard of 47 µg/m^3 which has regard to higher risk health groups. We find that to be appropriate and as we discuss further in section 6.2.11.6 of this Decision Report, we have incorporated these standards into the consent condition specifying the requirement for Fulton Hogan to undertake a RCS monitoring programme.[126] We have also required that programme to assess compliance with the $PM_{2.5}$ standard.

[207] We discuss ambient air quality standards in section 6.2.11.8 of this Decision Report, but note here that we have not imposed the 50 µg/m^3 of PM_{10} as a 24-hour average as consent condition given the many other land use activities that can affect ambient air quality in the wider area.

[208] Both Ms Wagenaar and Dr Seddon-Smith stressed dose determines whether a substance has a toxic effect on a person. Ms Wagenaar confirmed that she considered the RCS annual average standard to be a "safe level" that is protective of silicosis and carcinogenic effects and is more conservative than the "no-observed adverse effect level". Ms Wagenaar also agreed with Dr Greenfield that there is no negligible risk level (e.g. zero risk level) associated with particulate matter. However, she noted that the WHO air quality criterion is based on "tolerable" or "acceptable risk".

[209] We find that the air quality standards discussed above are based on robust scientific studies and research and that they will address both acute and chronic exposure.

6.2.11.4 Human health effects from dust and RCS

[210] The human health consequences of dust were outlined by Dr Humphrey, the Medial Officer of Health at the CDHB, and also in more detail by Dr Seddon Smith. This included the effects of RCS which are generated by the extraction and processing of certain types of aggregates. A number of submitters referred to adverse health effects from Yaldhurst quarry dust including nosebleeds, persistent coughs, sore throats and chest infections.

[211] We deal with the unique human health issues raised by the submitter Brackenridge Estate in section 6.2.12 of this Decision Report.

[212] As with nuisance dust, the potential effects on people's health arising from dust and RCS was addressed in the air quality experts' JWS. It was common ground that potential effects on human health are generally associated with particulate matter smaller than 10 microns in diameter (PM_{10}), which can have effects on people's cardiovascular and pulmonary systems. It was also agreed that there was emerging information on the health effects of particulate matter smaller than 2.5 microns ($PM_{2.5}$).

[213] All of the air quality experts agreed that there would be negligible health effects due to PM_{10} in the Templeton township located 700m from the quarry site boundary.[127] Mr Cudmore, Ms Ryan and

[123] Ministry for the Environment – Good Practice Guide for Assessing and Managing Dust 2016.
[124] World Health Organisation – Ambient Outdoor Air Quality and Health.
[125] California Office of Environmental Health Hazard Assessment – Chronic Reference Exposure Levels.
[126] CRC192410 Condition 20.
[127] November 2019 JWS, paragraph 9.

Mr Kirkby all considered that the potential for health effects from PM_{10} discharges on the sensitive receptors were likely to be acceptable or low. Ms Wickham considered that there may be occasions where PM_{10} levels might exceed health-based criteria and on that basis, she recommended additional PM_{10} monitoring to assist with proactive emissions management.[128] We concur with the need for rigorous monitoring.

[214] All of the air quality experts agreed that offsite levels of RCS were not expected to exceed the annual criterion and were likely to be well below that criterion.[129] Nevertheless, Ms Wickham remained concerned about the potential for elevated short-term levels of RCS and recommended additional monitoring. In that regard all of the experts agreed that a short-term monitoring study for RCS was appropriate.[130] We addressed that matter above where we found that a RCS monitoring study is necessary if consent is granted.

[215] We accept the agreed positions of the air quality experts regarding the unlikely occurrence of adverse health effects. We consider that the monitoring regime imposed will provide sufficient data to confirm or otherwise the expert opinions. Should these opinions be proven wrong, then conditions of consent will enable the air discharge permit, and the quarrying operations it enables, to be reviewed.

6.2.11.5 The Mote Study

[216] The next matters we need to assess are RCS monitoring and compliance with the NESAQ. Relevant to those assessments is what was referred to by many hearing participants as the 'Mote study. We briefly discuss that here as the predicted level of particulate emissions from the proposed quarry was not based on dispersion modelling, but on the use of comparative monitoring data from the Yaldhurst quarries.

[217] We note that Ms Wickham and Mr Kirkby considered that dispersion modelling could have added value to the comparative analysis with the existing Yaldhurst quarries. Mr Cudmore and Ms Ryan considered that the calculation of emissions from Yaldhurst quarries and the Roydon quarry using USEPA emission factors was helpful to understand the relative PM_{10} emissions from Yaldhurst compared to Roydon; and that dispersion modeling would be unlikely to provide any greater certainty as to the quantum of Roydon dust emissions.[131] However, we consider this issue is moot as dispersion modelling was not undertaken and we must assess the proposal on the basis of the evidence before us.

[218] Returning to the Mote study, in 2018 a four-month air quality monitoring programme was undertaken at the Yaldhurst quarries by Mote Limited. The CRC s42A Officer Report stated that the Mote study was commissioned by CRC, in collaboration with the CDHB and CCC, with the objective of investigating the impacts of dust and RCS from existing quarry operations at Yaldhurst in response to community concerns and to characterise short term concentrations of PM_{10} and $PM_{2.5}$.

[219] There was considerable debate during the hearing about the merits of the Mote study, including amongst the experts. Ms Wickham was directly involved in the study and considered there was insufficient data to make robust conclusions about long term PM_{10} concentrations. There was also debate about unusually wet weather conditions during the study reducing both ambient emissions and quarry dust. Mr Cudmore disagreed with that as elevated soil moisture levels tend to occur only for a short time in summer and this was not likely to have affected the number of days when the quarry floor would be dry and prone to dust emissions. He considered the study period was representative of other years.

[220] On the weight of evidence before us we accept that the Mote study is the best available information to inform the Applicant's assessment of particulate emissions from the proposed quarry. While we

[128] Ibid, paragraph 10.
[129] Ibid, paragraph 13.
[130] Ibid, paragraph 15.
[131] Ibid, paragraph 22.

acknowledge the limitations of the study, in terms of its short duration and limited number of data points, we accept that it is reasonably representative of dust emissions from the Yaldhurst quarries under various wind conditions.

[221] Consequently, we accept the opinions of Mr Cudmore, Ms Ryan and Mr Kirkby that Applicant's air quality assessment was completed using appropriate methods and in accordance with recognised good practice.

6.2.11.6 RCS Monitoring

[222] Ms Wickham reported that Yaldhurst personal exposure monitoring found elevated short-term levels of RCS in the PM_4 fraction, which was not readily explainable. She therefore recommended additional monitoring. Mr Cudmore[132] considered that the results of the RCS monitoring in the Mote study and related RCS exposure studies did not warrant RCS monitoring at the quarry site given the significantly lower levels of dust that would be generated from it. However, to provide further confidence to the local community he considered it would be reasonable to undertake a one-off programme of RCS monitoring for three months.

[223] We agree that exposure to short term levels of RCS poses a "minor or less" health risk to people offsite. We also agree with Ms Ryan and Mr Cudmore that it is not appropriate to use the personal exposure monitoring data used by Ms Wickham (in her Appendix C) to infer acute exposure of people to RCS from the quarry proposal. Overall, we accept the conclusions of Ms Ryan and Mr Cudmore (on the basis of the Mote study) that the RCS levels in the vicinity of the existing Yaldhurst quarries were mostly below detection limits, and that where measured, were well below the 3 $\mu g/m^3$ - annual average standard we discussed above.

[224] Nevertheless, during the hearing the Applicant agreed to the development of a short-term study for RCS and proffered a condition to reflect this. We note the condition proposed requires the RCS monitoring programme to be designed in consultation with the CDHB and CRC. We agree that there should be such a study but consider that the condition lacks sufficient detail on its specific requirements.

[225] We have therefore imposed an expanded Condition 20 which requires the monitoring programme to assess compliance with the 1-hour and annual levels of RCS being received by Templeton residents and other residents located within 500m of Stage 1 of quarrying operations.[133] The monitoring is to occur for a continuous 12-month period following commencement of quarrying activities.

[226] We consider this will give confidence to the surrounding community that any offsite RCS levels associated with the quarry operation will be measured and reported to ensure concentrations are within the predicted levels. As we discussed above, if the applicable RCS standards are shown to be exceeded then a review of consent conditions can follow.

6.2.11.7 The 'Scaling Factor'

[227] The NESAQ raises several issues. In order to determine compliance or otherwise with Regulation 17, it is first necessary to predict the increase in Airshed PM_{10} concentrations that are likely to be caused by quarrying activities. As we noted previously, in the absence of dispersion modelling this has involved translating the measured PM_{10} concentrations from the Yaldhurst quarries (the Mote study) to the Roydon site. This necessitates determining the quantum of 'down scaling' (reduction factor) of the measured Yaldhurst levels that should be adopted to accurately reflect the Roydon proposal before us, inclusive of its full range of dust mitigation measures.

[132] Supplementary Statement dated 6 November 2019.
[133] CRC192410 Condition 20.

[228] This 'down scaling' is based on assessing the annual PM_{10} load from the Yaldhurst quarries that contributed to the Mote study data and then assessing the annual PM_{10} load likely to emanate from the Roydon quarry. The ratio of the former to the latter allows a 'scaling factor' to be determined. Both assessments entail applying USEPA emission factors to the various on-site quarrying activities. We note here that only Mr Cudmore undertook an assessment of the annual PM_{10} load from the Yaldhurst quarries.

[229] We address this issue at some length given the importance of assessing compliance with the NESAQ.

[230] The air quality experts generally agreed that the use of a scaling factor was appropriate but there was a range of views on what the factor should be. We requested the experts to conference on this matter and the December 2019 JWS set out individual points of agreement and disagreement from each expert with Mr Cudmore's assessment (Appendices A – D of the JWS) and the estimated annual PM_{10} emissions calculated by each expert in (Table 1 and Table 2 of the JWS). The estimated annual emissions of PM_{10} based on a Roydon quarry design throughput of 625,000 tonnes per year range from 2.9 tonnes per year for Ms Wickham, to 1.6 tonnes per year for Mr Cudmore. Ms Wickham also estimates a higher level of emissions for the first year associated with bund formation of 3.3 tonnes per year.

[231] Having considered these assessments in detail we agree with Mr Cudmore and Ms Ryan that Ms Wickham's PM_{10} emission factors for bund formation and her assumed travel distances for heavy vehicles within the site are unrealistically high. We also note Ms Wickham used a very low soil moisture content of 1 percent (Appendix D of the JWS), despite agreement between the experts that the moisture content levels would be 8 percent during bund formation due to restrictions on the time of year works can occur.

[232] Mr Cudmore adopted a 0.1 scaling factor (i.e. a 10-fold reduction) in his assessment. He subsequently clarified that he considered the actual reduction would be significantly greater than 10 given the key design differences between the Yaldhurst quarries and the Roydon quarry, the significantly larger area exposed at Yaldhurst (10 times larger), higher Yaldhurst aggregate production (3 times higher), finer aggregate products produced at Yaldhurst, and a greater use of haul trucks there compared to the intended use of conveyors at Roydon. His further analysis in Attachment B to his rebuttal evidence[134] assessed relative PM_{10} emissions per year for different sources at the proposed quarry and the Yaldhurst, Roberts Road and Pound Road quarries. This showed that the Yaldhurst quarries would produce in the order of 30 times more PM_{10} emissions than the Roydon quarry and demonstrated that his initially assumed 10-fold reduction was conservative.

[233] Mr Kirkby[135] considered a 10-fold scaling factor was "*somewhat arbitrary and maybe insufficiently conservative"* and that caution needed to be applied due to the difference in the layout of the sites and the distance between the monitoring sites and the boundary of the Yaldhurst quarries. He considered a 10-fold scaling factor was the maximum factor that could be applied.

[234] Ms Ryan noted that the experts' estimated scaling factors in the December JWS ranged from 12 to 22. On that basis she considered the use of a 10-fold reduction was supportable.[136]

[235] Ms Wickham[137] considered the scaling factor approach had limitations because the emission estimates for the proposal did not include all sources, Mr Cudmore's emission estimates for Yaldhurst could not be verified, and the highly variable nature of key dust sources. She suggested a scaling factor of between five and seven would be appropriate. Ms Wickham subsequently updated her original estimate of Roydon PM_{10} emissions to reflect a maximum throughput of 750,000 t/yr, a maximum of 26 ha of land exposed at

[134] Rebuttal Statement dated 6 November 2019.
[135] EIC of Charles Kirkby on behalf of the Templeton Residents' Association (14 October 2019), para 20.
[136] Summary Statement, Section 42A Reporting Officer, Canterbury Regional Council, Air Quality – Deborah Ryan, Dated: 11 December 2019, paragraph 5.4.
[137] 14 November 2019 JWS

one time and a separation distance of 500m between the mobile processing plant and the eastern site boundary.[138] Her revised estimate suggested a 7-fold reduction and she considered a 5-fold reduction was therefore more appropriate.

[236] An important difference between Mr Cudmore's assessment and the other experts is his application of an 80 percent reduction to the USEPA emission factor for tertiary crushing with water control (for producing fine chip). His assessment was that because the quarry will only produce coarse aggregate products (AP50, AP40 and AP 20) and less than 50 percent of the total annual production would pass through the crusher, there would be a 50 percent reduction in crushing and screening emissions per tonne from Roydon compared to Yaldhurst.

[237] Appendices A-D of the second JWS outlined the key differences between each experts' estimate. This has assisted us greatly in understanding the factors and assumptions used. We note that the key difference in Ms Wickham's estimates arises from the assumed emissions from onsite truck movements, as she considers use of reject pea gravel on road surfaces has no emission reduction and she assumed longer travel distances. Conversely, we consider it is reasonable to include a reduction for use of reject gravel (which was agreed by Mr Cudmore, Ms Ryan and Mr Kirkby) and we agree with Mr Cudmore and Ms Ryan that Ms Wickham's assumed travel distances are too high.

[238] We note that the experts' emission calculations for the processing plant are more closely aligned, with the key difference being the 80 percent reduction Mr Cudmore had assumed for producing coarser product. We agree with Ms Ryan that Mr Cudmore's assumption is not supported by the USEPA emission factors and that it is not appropriate to adjust the emission factors for crushing and screening (tertiary cone crushers controlled with water sprays). We note Ms Ryan's and Ms Wickham's estimates for the processing plant were the same, except that Ms Ryan correctly accounted for only 50 percent of product being crushed and screened. We agree with Mr Kirkby, Ms Ryan and Ms Wickham that no further reductions should be applied due to the Yaldhurst quarries processing finer products.

[239] Having weighed the evidence, we find that the use of a 0.1 scaling factor (10-fold reduction) is reasonable and supportable (based on the evidence of Mr Kirkby, Ms Ryan and Mr Cudmore) given the significantly different design features at the proposed quarry, the limited exposed area (26 ha at Roydon versus 230 ha at Yaldhurst), proposed limitations on the production of fine products, and the lower number of processing plants operating.

[240] Nevertheless, we prefer Ms Ryan's estimate of annual PM_{10}, as set out in the December JWS, because the estimates of Mr Kirkby and Ms Wickham are not as realistic as Mr Cudmore's and Ms Ryan's in relation to emissions from loading and unloading aggregate and cleanfill and truck movements; but Ms Ryan's estimates for the processing plant are more realistic than Mr Cudmore's due to his assumed emission reduction associated with the processing of coarser product.

6.2.11.8 Ambient Air Quality

[241] Schedule 1 to the NESAQ sets an ambient PM_{10} air quality standard within an Airshed of 50 $\mu g/m^3$ expressed as a 24-hour mean. One exceedance over a 12-month period is allowed. Ms Ryan considered that the monitoring data for the Roydon site[139] indicated an "acceptable" ambient air quality at the site of around 30 $\mu g/m^3$ as a 24-hour average, or lower. She considered that given the range of incremental PM_{10} concentrations estimated as likely to arise from the Roydon quarry, air quality in the vicinity of the site would remain at levels below the NESAQ standard. In her opinion, in times of high ambient background concentrations of PM_{10}, the quarry itself will not be responsible for any exceedance.

[138] Supplementary Statement of Louise Fleur Wickham (Air Quality) Called by Canterbury District Health Board, 21 November 2019, Attachment A.
[139] Table 1.

[242] Ms Wickham highlighted that PM_{10} background levels at the proposed site were relatively high compared with some rural areas in New Zealand and can be elevated on occasion when compared with the NESAQ standard. She considered that there was "little room" for new discharges in the rural environment, irrespective of the adjacent polluted Christchurch Airshed, given existing high background levels of PM_{10} which peak at 45 $\mu g/m^3$.

[243] Mr Cudmore's assessment was that the air quality in Canterbury was not substantially degraded and there was plenty of assimilative capacity for discharges dominated by coarse PM_{10} (i.e. low in $PM_{2.5}$), which cause localised and low impacts on existing ambient levels. Based on an assessment of daily PM_{10} levels around the Yaldhurst quarries and the Roydon site, and winter statistics for Christchurch and Kaiapoi, he considered that measured elevated PM_{10} levels at Roydon were isolated events resulting in much lower levels than those occurring in the winter in the urban Airshed.

[244] We acknowledge there may be occasions when the ambient concentrations of PM_{10} in the adjacent Christchurch Airshed may be close to or will exceed the NESAQ standard of 50 $\mu g/m^3$ (as a 24-hour average). However, we agree with Ms Ryan and Mr Cudmore that these exceedances relate predominantly to domestic fires and vehicle emissions during winter conditions. We accept that elevated ambient PM_{10} levels at the proposed quarry site are not related to those activities and are more likely to be as a result of dry and windy conditions stirring up dust from areas of exposed soil and surrounding rural land use activities. We find that during such dry and windy conditions (which typically occur outside the winter months), the Roydon quarry would be unlikely to contribute to any exceedance of the NESAQ ambient standard in the adjoining Christchurch Airshed.

6.2.11.9 National Environmental Standard Air Quality Regulation 17

[245] We now turn to the key issue of NESAQ Regulation 17, namely whether the proposed quarry will be likely, at any time, to increase the concentration of PM_{10} (calculated as a 24-hour mean) by more than 2.5 $\mu g/m^3$ in any part of the Christchurch "polluted Airshed". We note that the Christchurch Airshed boundary runs along the east side of Dawsons Road, adjacent to the quarry's eastern site boundary.

[246] Of course, not all dust produced by the Roydon quarry will find its way into the Christchurch Airshed, as that depends on which way the wind is blowing. Mr Cudmore considered that north west and north east winds associated with fine, dry conditions would have the greatest potential to cause dust emissions to enter the Airshed. We agree and note that, as explained by Mr Cudmore, each stage of quarrying operations will have a different location with respect to the Airshed boundary. Therefore, for each stage, there is a particular range (or in other words "arc") of key wind directions which direct emissions towards the Airshed. This results in different percentages of time that quarry dust emissions will impact the Airshed throughout the year. The average is 38 percent of the time (40 percent as assessed by Ms Ryan) for all stages within 500m of the Airshed boundary, and an average of 34 percent for all stages within the whole proposed quarry site.[140]

[247] On the basis of Table 4 in his Evidence in Chief, Mr Cudmore was of the opinion that the largest likely increase in PM_{10} concentration in the Airshed would be 2.4 $\mu g/m^3$ (as a 24-hour average) and so the NESAQ would be complied with.

[248] Ms Ryan initially considered there was uncertainty whether compliance with the NESAQ would be achieved and thought that a PM_{10} 'offset' may need to be imposed.[141] However, towards the conclusion of the hearing Ms Ryan helpfully produced a table showing the range of incremental concentration increases ($\mu g/m^3$ as a 24-hour average) predicted to occur in the Christchurch Airshed given the range of

[140] Reply Evidence of Roger Steven Cudmore on Behalf of Fulton Hogan Limited, PM_{10} Emissions and PM_{10} Offsetting, Dated: 3 March 2020, paragraph 9.
[141] CRC s42A Officer Report – Report of Deborah Ryan, paragraph 3.

scaling factors set out in the December JWS.[142] The increases ranged from 0.9 to 3.0 µg/m^3. On this basis, Ms Ryan considered that the incremental increase would be less than 3 µg/m^3 (as a 24-hour average), even at the conservative end.[143] On balance, she concluded the NESAQ could be met at all times, including during construction of the bunds on the boundary of the site, with the imposition of conditions to ensure a high level of dust control.

[249] As noted above, Ms Wickham applied only a 5-fold reduction (or scaling factor) to the emissions from the Yaldhurst quarries. On this basis, she concluded that the Roydon quarry would contribute to daily PM_{10} concentrations close to, or just above, the allowable NESAQ Regulation 17 PM_{10} increase. However, as discussed above we find Ms Wickham's scaling factor to be unrealistically low.

[250] Having weighed the expert evidence, we are unable to conclusively determine that the discharge to be expressly allowed by the Roydon quarry consent would be likely, at any time, to increase the concentration of PM_{10} (calculated as a 24-hour mean) by more than 2.5 µg/m^3 in any part of the polluted Christchurch Airshed. On that basis, we are not directed by the NESAQ to decline the consent application nor are we required to require a reduction of PM_{10} emissions from another source.

[251] However, we acknowledge and accept Ms Ryan's advice that the Roydon quarry air quality assessments are not absolute given the uncertainty associated with determining an appropriate 'scaling factor'. We also note the relatively small quantum of increase allowed under the NESAQ and the accuracy of dust monitoring equipment, and consider a precautionary approach is required to ensure any incremental increase that does occur is within the levels predicted. We therefore consider it is appropriate to impose consent conditions requiring the applicant to monitor the contribution of PM_{10} to the Christchurch Airshed; and to require an 'offset' in the event Regulation 17 is shown by that monitoring to be breached. To be clear, we do not consider on the available evidence that it is likely there will be a breach, but consider it is important that the actual potential for a breach is monitored and responded to should it arise.

[252] These requirements are detailed in Conditions 29 – 31 of Discharge Permit CRC192410. They require reporting by a suitably qualified experienced practitioner on compliance with Regulation 17(1) one month after completion of the perimeter bund formation, and both 12 months and 5 years after commencement of Stage 1 aggregate extraction. The reports are to be publicly available and provided to the CLG. In the event that a breach is identified, then all quarry activities (except dust suppression and security) must cease until such time as a compliant PM_{10} offset is certified as appropriate by the CRC and it has been fully implemented.

[253] During the course of the hearing we requested a specific offset proposal from the Applicant and provided opportunity for comment from other parties on it. The purpose of doing so was for us to be able to address whether a valid offset is available that meets the legal requirements and to impose it if we found that the Regulation 17 requirement was not met.

[254] Mr Cudmore considered that, if required, Fulton Hogan's Roberts Road and Barters Road sites offered a range of offset options within the Christchurch Airshed and that these could take effect within 12 months of the grant of consent and remain effective for the duration of the consent.

[255] In terms of the quantum of PM_{10} emission reductions that would be required, the estimates provided by the experts ranged from 1.6 to 2.9 tonnes per year. We do not need to decide which figure is correct because in the event that the requirement for an 'offset' is triggered the monitoring record will provide reliable data that will enable the quantum of necessary PM_{10} reductions to be determined.

[142] Summary Statement, Section 42A Reporting Officer, Canterbury Regional Council, Air Quality – Deborah Ryan, Dated: 11 December 2019, Table 1, Range of incremental concentrations based on scaling factors derived from 2nd JWS.
[143] Ibid, paragraph 6.3.

[256] We do however wish to record that we do not consider the offsets detailed in Mr Cudmore's Supplementary Statement of 5 February 2020 relating to Roberts Road extraction and Pound Road consented activities to be valid offsets. This is quite simply because extraction at Roberts Road will cease in 2022 when consents for that site expire, some consented activities are not being carried out at Pound Road at the present time and are therefore not emitting, and in any case the consents associated with the Pound Road activities expire in 2031. We consider that any offset required needs to be real in that it can be implemented now and will continue to occur for the 35-year life of the Roydon consents. In any event this is not a matter for us to determine now.

6.2.11.10 Other Consent Conditions

[257] We have addressed a number of key changes to the air quality consent conditions recommended by Mr Bligh in the preceding parts of this Decision Report. These include:

- permanent PM_{10} monitors on all four site boundaries;
- additional requirements for the RCS monitoring programme which must occur for 12 months; and
- reporting on Regulation 17(1) compliance and offset implementation if required.

[258] In section 6.2.2 of this Decision Report we determined that to achieve appropriate mitigation of amenity effects, including the risk of dust from heavy vehicles and noise and vibration effects, the vehicles entering and leaving the site must at all times use Dawson Road - SH1 for access. This is addressed in Condition 40 of the SDC land use consent.

[259] Finally, the Applicant has proposed that all heavy vehicles leaving the site will pass under a water spray bar which will moisten the load and minimise dust emissions while in transit. We consider that this will work effectively in conjunction with covering of loads and this is addressed in Condition 41(e) of the SDC consent. However, we consider that there remains a risk of dust emissions from cleanfill loads travelling to the site. As a result, we have included a requirement in Condition 43 to the SDC consent that all loaded heavy vehicles arriving at the site must have their load covered.

6.2.12 Brackenridge

[260] Brackenridge Estate was established at 150 Maddisons Road in 1999, following the closure of the Templeton Centre. Today 62 people live in 11 homes (leased from Housing NZ) and eight people live at homes located at Globe Bay Drive and Iraklis Close, Templeton (leased from private landlords). Additionally, 50 people access respite support at three homes at Brackenridge Estate, and 60 people access vocational support from that support base. The Brackenridge living environment meets the specific needs of the residents, particularly those people with autism and other complex health needs. People with autism have a high predisposition to noise hyper sensitivity, and those who are also medically fragile are particularly susceptible to the adverse impacts of poor air quality.[144]

[261] The Brackenridge Services Limited (Brackenridge) representatives that we heard from were concerned that their residents, many of whom have respiratory conditions, will be adversely affected by the noise, traffic and dust generated by the quarry proposal. Brackenridge was represented by counsel and also Brian Reddington who advocated on their behalf. Expert evidence was presented by Dr Brian Porter[145] on noise hypersensitivity of the Brackenridge residents who suffered from Autism Spectrum Disorder. The principal concern being that if there is increased noise as a result of the quarry that would result in increased distress and distressed behaviour for some of those living at Brackenridge. [146]

[262] Witnesses for Brackenridge told us noise can have negative sensory impacts on people with autism, resulting in detrimental outcomes for their health and behaviour. There is concern that the close proximity of the proposed quarry is likely to cause noise (from the crushing plant and from heavy vehicle traffic)

[144] Statement of evidence of Jane Cartwright, Chair of the Brackenridge Services Limited (Brackenridge) Board, 14 October 2019.
[145] Medical Practitioner and Consultant Psychiatrist at CDHB.
[146] Apart from that of Dr Porter who expanded on the nature of the residents.

which may also be heightened should the wind be blowing towards the homes of the people. In terms of traffic, there was concern about the potential for increased traffic intensity resulting from the other traffic associated with the quarry's activities. We were told that vibration and noise associated with heavy truck movements along Kirk and Maddisons Road would have adverse impacts on people with intellectual disabilities housed at Brackenridge. Regarding dust, there was concern that at times the wind could blow dust in the direction of the homes at Maddisons Road, Globe Bay Drive and Iraklis Close, and expose the people living in these homes to dust which was likely to impact negatively on their health.[147]

[263] We acknowledge the concerns of the Brackenridge representatives, together with those of the families of some residents that we heard from.[148] Brackenridge residents are indisputably part of the local community and form part of the existing environment against which effects are to be assessed. Nevertheless, we must be satisfied on the evidence before us that there will be actual or potential adverse effects on those residents should we find that their presence in the community weighs against a grant of consent.

[264] In relation to noise the expert evidence that we have before us is that the noise limits to be imposed on the quarry operation are appropriate to protect people's health and provide a reasonable standard of amenity, and are actually more stringent than the permitted activity limits in the operative SDP. The evidence shows that the realistic operating scenarios for the quarry will be able to comply with those noise limits.[149]

[265] We understand that there will be limited if any quarry generated heavy vehicle traffic passing the Brackenridge site on the corner of Maddisons and Kirk Roads. In that regard, we heard that the calibrated traffic model developed by Stantec does not show any material change in use on Maddisons Road due to the quarry. That model also predicts that no quarry traffic will use Kirk Road, due to the fact that Kirk Road is not an efficient route for traffic between northwest Christchurch and the quarry.[150] However, we record that the concerns raised by Brackenridge have contributed to our determination to impose a condition requiring all quarry vehicles to access the site via Dawsons Road – SH1, therefore avoiding any increase in heavy traffic along Maddisons Road.

[266] Regarding dust, the air quality experts agreed that there would be negligible health effects due to $PM_{2.5}$ at all locations beyond the boundary of the quarry site; that offsite levels of RCS are not expected to exceed the annual average OEHHA value of 3 $\mu g/m^3$ for chronic effects of exposure to RCS (where the annual average criterion is based on protection against silicosis derived from chronic exposure) and are likely to be well below this criterion; and that there will be negligible health effects due to PM_{10} at the Templeton township.

[267] We appreciate the point made by counsel for the submitter and Dr Porter that Brackenridge residents are likely to be more susceptible to the effects of noise and dust than other people in the area. However, we note that Templeton is not currently a dust or noise free environment. In response to our questions, Dr Porter said that it was impossible to tell if existing noise from aircraft, the Ruapuna raceway or existing heavy vehicles leads to a deterioration in the Brackenridge residents' mental state. In terms of dust, he said it was also very hard to say if the resident's respiratory problems resulted from the current dust environment as most of the residents had pre-existing and significant respiratory problems before arriving there.

[268] Turning to the Brackenridge residents housed closer to the proposed quarry site in Globe Bay Drive and Iraklis Close, we take the view that if residents are housed amongst the wider community then they should be willing to accept the levels of amenity (in terms of traffic, noise and dust) that are acceptable to other

[147] Ibid. Also Statement of evidence of Dr Richard Porter, 21 October 2019.
[148] Including Brian Reddington and Roy and Denise Gearry (parents of resident Andrew Gearry).
[149] JWS Noise
[150] Supplementary Statement of Evidence of Andrew Metherell, Transport and Local Roads, 9 December 2019, paragraphs 3.5 and 3.8.

members of the community. In that regard we note the Applicant's Reply[151] submissions, referring to Environment Court[152] decisions, that "*an assessment of effects is to be based on normal physiological responses and cannot seek to protect those whose sensitivities might be at the higher end of the scal*e." The Globe Bay Drive and Iraklis Close dwellings are already subject to an elevated ambient noise environment dominated by traffic noise and aircraft overflights, and elevated levels of dust at various times and the relevant experts have confirmed there will be no noticeable change to those existing environmental conditions. [153]

[269] In light of the weight of expert evidence before us, and in the absence of expert evidence demonstrating that the Brackenridge residents will be adversely affected by the quarry proposal, we find that the proximity of the Brackenridge Estate facilities to the proposed quarry site does not weigh against a grant of consent.

6.2.13 Impacts on horse training

[270] Several submitters were concerned about the potential adverse effects of quarry dust on the health of horses being trained in the area. Dr Gareth Fitch[154] provided evidence for submitters Nigel and Alex McGrath. Dr Fitch postulated that dust from the quarry containing silica could deposit on grazed pasture, increasing the severity and incidence of inflammatory airway disease (IAD) in horses. He considered that would be detrimental to the horses' health and consequently have a negative impact on racing performance. This will consequently have an adverse effect on trainers' reputations and ultimately their business success.

[271] In response Fulton Hogan provided rebuttal evidence from Dr Alec Jorgensen, a director of the Waikato Equine Veterinary Centre in Cambridge. Dr Jorgensen noted that the dust generated from using training tracks and arenas appears to create significant nuisance dust with visible dust clouds produced by horses working in dry conditions and visible coating of dust downwind on neighbouring pasture. He stated that dust from the tracks is blown onto the neighbouring pasture presenting the same risks while grazing as outlined by Dr Fitch. Countering that to some extent, we heard evidence from horse trainers in the area indicating that training tracks were watered up to four times a day to during dry conditions to supress that dust.

[272] Mr Cudmore agreed with Dr Jorgensen and noted that horses will always ingest some sediment material with or without the presence of a nearby quarry because of wind-blown dust from agricultural land, gravel roads and river beds. He considered this effectively ensures that grass is always likely to have some residual level of silicon-based sediment regardless of the proposed quarry. He considered that inhalation of sediment while grazing would not be a material issue unless the grass was heavily laden with a visible coating of deposited dust during dry conditions and such levels of dust deposition were highly unlikely to result from the quarry proposal. [155]

[273] Dr Jorgensen stated that he had not knowingly seen a case of silicate pneumoconiosis in 20 years of working as an equine veterinarian and was not aware of any case relating to a quarry adversely affecting the health of horses kept in the vicinity of a site. He noted that the paper referred to by Dr Fitch, stating the inhaled silica can cause severe pulmonary lesions in horses, dated from 1981 and related to a specific geographical area in California. We agree with Dr Jorgensen that the paper is not particularly relevant to the case before us.

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[151] Ibid, paragraph 39.
[152] *Motorimu Wind Farm Ltd v Palmerston North City Council* W067/08 26 September 2008 at [327]; *Re Meridian Energy Limited* [2013] NZEnvC 59 at [299].
[153] Reply Submissions, paragraphs 65 and 68.
[154] A vetinarian with Canterbury Equine Clinic Ltd.
[155] Supplementary Rebuttal Evidence of Roger Cudmore on behalf of Fulton Hogan Limited, Air Quality – Dr Fitch Evidence, 30 October 2019, paragraph 6.

[274] Dr Jorgensen further advised that the primary risk factors for stress fractures in racehorses (a matter raised by Dr Fitch) are training methods, training surfaces and the immature equine skeleton. In his opinion that risk would not be influenced by the concerns raised by the submitters.

[275] Dr Jorgensen concluded that the causative agents of IAD are many and varied in the environment and that there may be individual genetic predispositions. If exposure to silicates plays any role in the development of IAD, it is likely to be minor and dose dependent. He considered that the proposed quarry would not fundamentally change the exposure of horses to silicates in the neighbouring area beyond the normal fluctuations and variations encountered in the natural environment.

[276] Ms Wagenaar advised that in her view the human health air quality criteria are sufficiently robust to also protect equine health.[156] In that regard, we have already found that the risk to human health from silica in the quarry dust is less than minor.

[277] We note that the JWS on equine health effects records that the relevant experts (including Dr Jorgensen and Dr Fitch) agreed that the risk of pulmonary silicosis occurring in horses is so small as to not be relevant.[157]

[278] Having weighed the evidence on potential health effects of quarry dust on horses, we prefer the opinion of Dr Jorgensen because he has critically examined the reference material cited by Dr Fitch and commented on its applicability here. We find that the potential adverse effects of quarry dust on the health of horses being trained in the vicinity of the quarry will be no more than minor.

[279] Regarding the issue of quarry generated heavy vehicle traffic disturbing horse training activities, we note and agree with the Applicant's Reply submissions[158] where they stated "*Further, the number of quarry vehicles predicted to use the roads where a pre-ponderance of horse-training submitters live, is very small …. Mr Metherell's transport modelling shows no forecast use of Kirk Road and only very small increases for Maddisons, Dawsons and Curraghs Road*." We accept those submissions and on that basis we find that the potential adverse effects of quarry generated heavy traffic on horses being trained in the vicinity of the quarry will be no more than minor. Notwithstanding this our decision to impose conditions that limit the vehicle access route to the Jones Road - Dawsons Road - SH1 route, avoids any increase in heavy vehicle traffic on the surrounding local roads from the proposed quarry.

[280] Finally, we acknowledge the fear of some horse trainers[159] that the mere perception of a nearby quarry could lead some clients to relocate their horses to another site where no quarry is present. However, we received no evidence of that having occurred elsewhere in response to other established quarries. Nor did we receive any evidence from existing clients of horse trainers in the Templeton area stating that the mere presence of a quarry would lead them to relocate their horses. In the absence of such evidence we find we are unable to assign much weight to that potential adverse effect which may or may not eventuate.

6.2.14 Cleanfill

[281] As we noted earlier, as aggregate extraction is completed Fulton Hogan intends to progressively rehabilitate the site by placing trucked in cleanfill, overburden and topsoil in the extracted areas. It is anticipated that approximately 30 percent of the total truck movements to the quarry will bring in cleanfill.[160] That equates to up to 180 incoming trucks a day.[161] The deposition of cleanfill requires land use[162] and discharge[163] consents from CRC under the provisions of the CLWRP. The Applicant proposes

[156] Rebuttal Evidence of Audrey Wagenaar on behalf of Fulton Hogan Limited, Dr Fitch Evidence, 30 October, paragraph 7.
[157] JWS, Equine Health, 13 November, paragraph 13(a).
[158] Ibid, paragraphs 14 and 15.
[159] In particular Mr and Mrs McGrath.
[160] JWS, Air Quality, page 3.
[161] 1200 maximum movements (600 in and 600 out). 30% of 600 is 180.
[162] Application CRC192409 – a controlled activity under CLWRP Rule 5.177
[163] Application CRC192413 – a discretionary activity under CLWRP Rule 5.100.

that cleanfill material deposited at the site will meet the definition of 'cleanfill' in the CLWRP and the deposition will be undertaken in accordance with a Cleanfill Management Plan (CMP).

[282] All trucks that bring cleanfill to the site will go through an automated wheel wash as they re-enter the CPSA after tipping off the cleanfill.

[283] Relevantly, CLWRP Policy 4.19 states:

> *The discharge of contaminants to groundwater from earthworks, excavation, waste collection or disposal sites and contaminated land is avoided or minimised by ensuring that:*
> *a. activities are sited, designed and managed to avoid the contamination of groundwater…*

[284] The proposed deposition of cleanfill was of concern to a number of submitters,[164] particularly in terms of potential adverse effects on groundwater quality. Concerns were also expressed about cleanfill dust, but we addressed dust generally in section 6.2.14 of this Decision Report.

[285] The Applicant does not intend to use cleanfill to backfill the excavated quarry back to the original ground level. Indeed, we heard evidence from several participants that it was very unlikely that there would be enough cleanfill available from the Greater Christchurch area over the life of the quarry to restore the excavated pit back to anything close to the original ground level.

[286] Once cleanfilling is completed in a 'worked out' area, then within six months that area will have topsoil and stored overburden materials spread over it and contoured to a depth of 300 millimetres. The area will then be grassed. A rehabilitated quarry floor level of at least 1.3m above the highest recorded groundwater level is proposed.

[287] The proposed cleanfilling activity was addressed by CRC s42A authors Dr Lisa Scott[165], Mr Freeman and Ms Goslin. Dr Scott referred to a groundwater investigation of quarries in Yaldhurst, noting that discharges (or leaching) from fill materials there had been shown to have a measurable impact on groundwater quality. The most notable changes were in alkalinity, hardness (calcium and magnesium), chloride, sulphate and silica concentrations arising from the leaching of soils, untreated wood and hard materials including bricks, tiles, paving materials and concrete.

[288] Dr Scott concluded:[166]

> *"… even with strict cleanfill management, contaminants released from the proposed Roydon Quarry and cleanfill may cause some degradation in the aesthetic properties (e.g. hardness, taste, potential discoloration) of high-quality groundwater below the deposition site. However, this contamination would likely be low impact, localised and dissipate within a few hundred metres of the fill areas. I am not aware of any sites where truly 'clean' fill deposition has had a significant adverse effect on groundwater quality or caused exceedances of health-based drinking-water limits."*

[289] On the basis of Dr Scott's evidence, we are satisfied that the proposed deposition of cleanfill can be undertaken in a manner that results in no more than minor adverse effects on groundwater quality in accordance with the relevant provisions of the CLWRP. However, this requires the cleanfilling to be strictly managed and monitored. In particular, potentially problematic materials such as roading materials containing coal tar, road-derived sediments (road sweepings and catchpit sediments), medium density fiberboard (MDF), uncured concrete, wet cement or any other liquid containing waste or slurries, such as hydro-excavated soils should be precluded from being placed as 'cleanfill'. We also agree, as suggested by Dr Scott, that the cleanfill should not include any visible vegetation or wood[167] and, as suggested

[164] Including Stephen Bain and Simon Moore.
[165] Senior Groundwater Scientist, CRC.
[166] Evidence of Dr Scott, paragraph 78.
[167] At the hearing Mr Jolly for Fulton Hogan advised he could not see any operational reason why Dr Scott's suggestion would not work.

initially by Mr Freeman,[168] that that material going to cleanfill must meet "at or below background" soil contaminant levels for the Roydon Quarry site and not the site of origin. We note from the JWS on Water Quality that rehabilitation expert Victor Mthamo[169] (for the Applicant) did not appear opposed to this.

[290] For the Applicant, Mr Jolly explained how incoming cleanfill would be inspected, initially at the weighbridge by CCTV and again at the cleanfill deposition area.[170] We are satisfied with the rigor of that process.

[291] CRC Discharge Permits CRC192408 and CRC 192409 contain an Advice Note below Condition 21 which defines cleanfill. We note that Plan Change 7 to the CLWRP amends Rule 5.177 (earthworks over aquifers) to specify that concrete slurry, coal tar and hydro-excavated waste must not be deposited in cleanfill sites. We have therefore amended the Condition 21 Advice Note to be consistent with that approach.

[292] To conclude, subject to the imposition of conditions of consent and adherence to a Cleanfill Management Plan, we are satisfied that the potential adverse effects of the proposed use of cleanfill for rehabilitation purposes will be no more than minor.

6.2.15 Site rehabilitation

[293] The Applicant prepared a draft Quarry Rehabilitation Management Plan (attached as Appendix G to the AEE) in line with the requirements of the Christchurch District Plan and the CCC Rehabilitation Plan Guidance document.

[294] Rehabilitation will primarily involve re-spreading and contouring of cleanfill and stored overburden materials, stabilisation of quarry faces, and vegetation of completed and restored extraction areas to create a free draining and stable landform, with batter slopes no steeper than one vertical metre to three horizontal metres. The placement of 300mm of uncompacted topsoil across the new surface will allow for rural pastoral activities to be undertaken.[171] The restored vegetative cover (initially grass) will be regularly monitored, fertilised, re-sowed and weeded as necessary.[172]

[295] From the Supplementary Rebuttal evidence of Mr Mthamo, we are satisfied that a 300mm cover of uncompacted topsoil is sufficient sustain plant growth. We also note Mr Compton-Moen's advice that that 300mm of topsoil over and above 1m of existing material above the water table will provide a sufficient growing medium for grass and plants. He advised that in many projects, including subdivisions, a depth of 300mm of topsoil is typically specified to provide a healthy growing medium for plants.[173]

[296] In response to submitter concerns, the Applicant amended the proposal so that the site will be rehabilitated progressively, limiting the amount of active open working area (inclusive of extraction and rehabilitation areas) to no more than 40ha at any one time.[174] Mr Jolly further advised that Fulton Hogan is proposing to only have 5ha of extraction area open at any one time, along with 5ha being actively cleanfilled and progressively rehabilitated. In practical terms he said, that would involve around 1-2ha being cleanfilled at any one time, with the remaining (3 to 4ha) area being progressively rehabilitated.[175]

[297] Timeframes for rehabilitation will be driven largely by the rate of aggregate extraction. The Applicant anticipates that rehabilitation of each worked-out stage will be completed within 12 months of the stage

[168] Endorsed by the CRC's replacement expert Mr Knoyle.
[169] Principal Consultant at Reeftide Environmental and Projects Limited.
[170] Ibid Jolly, paragraphs 71 to 75.
[171] Ibid Compton-Moen, paragraph 34.
[172] Evidence of Victor Mkurutsi Mthamo on behalf of Fulton Hogan Limited, Rehabilitation, Dated: 23 September 2019, paragraph 34.
[173] Supplementary Rebuttal Evidence of David John Compton-Moen on behalf of Fulton Hogan Limited, Landscape and Visual; Davina Penny Evidence, 30 October 2019, paragraph 7.
[174] Ibid Chittock, paragraphs 86 and 87.
[175] Ibid Jolly, paragraph 84.

being finished[176] and within six months of the completion of cleanfilling.[177] We note that the JWS addressing landscape and visual amenity reported agreement that the perimeter bunds should be removed at the end of quarrying and we presume used for rehabilitation.

[298] Regarding the eventual 'look' of the site, we note the evidence of Mr Compton-Moen who advised that the proposed Rehabilitation Management Plan will result in a pastoral landscape, albeit with a modified topography, that is in keeping with rural character and has a high level of visual amenity with or without the perimeter bunds being retained. He considered a complete grass cover would will be possible along with the planting of trees. He noted that the existing character of the Templeton rural area has a geometric patterning of the landscape which is reinforced by cadastral boundaries, shelterbelts, pylons and roads. Mr Compton-Moen concluded that the rehabilitation of the site would allow for this patterning to be re-established and a high proportion of open space to buildings would be retained.[178]

[299] Some submitters queried the intended rehabilitation of the CPSA. Mr Mthamo confirmed that after decommissioning the permanent (fixed) processing equipment and machinery, a portable (mobile crusher) processing plant will be used to extract material from the area beneath where the access road, buildings and fixed processing plants are to be located. Final rehabilitation of that area would then be undertaken.[179] We find that to be acceptable.

[300] The Applicant considers that based on current trends (e.g. urban growth, land use preferences), the most likely land uses post rehabilitation will be rural residential lifestyle blocks (as per the current SDP zoning) with some light pastoral farming.[180] We agree with the Applicant that there is no need to covenant the site to preclude future intensive land uses (such as dairying) given the existing controls on intensification in the CLWRP, SDP and pending national regulations.[181]

[301] We are satisfied that the proposed site rehabilitation is generally appropriate.

[302] However, an issue arose during the hearing as to whether or not site remediation should be completed within whatever fixed duration is imposed on the consents, if granted. There is of course no certainty that a resource consent will be renewed upon its expiry. That is particularly the case for long duration consents, given changing community attitudes and environmental conditions that can occur over a period of several decades.

[303] Legal advice obtained by the CRC (in response to a query from us) concluded that in some cases it may be appropriate for activities to endure beyond the expiry date of a consent provided that the conditions are clearly framed and are intended to be complied with and those conditions do not necessitate work that would otherwise require consent. In this case the remediation activities (including discharges of cleanfill to land and discharges of dust to air) will require consent from the CRC. Similarly, land use to rehabilitate the site will be required from the SDC.

[304] For his part Mr Henderson[182] considered that it was more appropriate and consistent with standard practice that all activities should be completed before the consent expires. We agree. Accordingly, we find that should consents be granted, full site remediation should be completed prior to the quarry consents expiring.

[176] Ibid Mthamo, paragraph 27.
[177] Ibid Bligh, paragraph 110.
[178] Ibid, Supplementary Rebuttal Evidence of David John Compton-Moen, paragraphs 8 and 9.
[179] Rebuttal Evidence Mthamo, paragraph 17.
[180] Ibid Mthamo, paragraphs 54.3(f) and 105.
[181] Ibid Mthamo, paragraphs 112.3 and 133 and Bligh paragraphs 129 to 134; JWS Water Quality, paragraphs 21 and 24.
[182] End of hearing Summary Statement, page 7.

[305] We acknowledge that in his final Reply legal submissions counsel for Fulton Hogan agreed with that position, stating *"In any event, Fulton Hogan is willing to have conditions requiring all physical rehabilitation works to be completed within the life of the consent*." [183]

6.2.16 Stormwater

[306] Policy 4.13 of the CLWRP is that the effects of stormwater discharges should be minimised. Policy 4.14 is that a discharge should not exceed the natural capacity of the soil to treat or remove the contaminant.

[307] The quarry operation will generate stormwater from impermeable surfaces which the Applicant intends to discharge to land, an activity requiring consent under the CLWRP. [184] The Applicant's first s92 response stated that they intended to separate 'clean' stormwater[185] and divert it to onsite stormwater infiltration ponds for reuse as dust suppression, bund watering and plant processing (aggregate wash water). Runoff from roads would infiltrate into the ground along the road edges. The stormwater ponds will be lined with soils to ensure the removal of contaminants. The contaminant removal efficiencies of the ponds would be in accordance with MfE On-Site Stormwater Management Guidelines (NZWERF, 2004) and the ponds would provide for the removal of 90 percent of total suspended solids, 75 percent of any hydrocarbons and 85 percent of heavy metals.

[308] Consistent with the s92 response, the evidence of Mr van Nieuwkerk[186] recommended that runoff from roofs and hardstand areas be treated in stormwater infiltration ponds and Mr Bligh[187] advised that stormwater run-off from roofs and hardstand areas would be conveyed to 'dry' stormwater detention basins.

[309] The above matters will all be set out in a Stormwater Management Plan (SMP). The draft SMP attached to the Summary Statement of Mr Bligh stated that the CPSA will be excavated to 6m below ground level and be contoured such that there is a natural fall towards its south west corner, which will naturally direct stormwater towards a vegetated stormwater infiltration basin.[188]

[310] Stormwater was addressed by CRC s42A authors Dr Scott and Ms Goslin. Dr Scott[189] noted that stormwater from roads and parking areas can contain low levels of metals, hydrocarbons and pathogens. That accords with our own understanding of stormwater. Ms Goslin advised[190] that the Applicant proposed to discharge stormwater to land via dry ponds where stormwater would pond for no longer than 48 hours. The base of any dry pond would be 1m above the highest recorded groundwater level. However, the Applicant has not proposed a location for the stormwater ponds as they were are intended to be moved as the quarry progresses.

[311] Dr Scott advised[191] that the removal of contaminants (sediment, metals, hydrocarbons, and particularly pathogens) to background levels before reaching any offsite wells would be more likely if the discharge points for stormwater and wash water were located on the upgradient side of the site and above a thick unsaturated zone (i.e. at the original ground level). In that regard the draft SMP attached to the Summary Statement of Mr Bligh indicated (Figure 2 on page 10) that the 'vegetated infiltration basin' would be located on the southern edge of the CPSA, outside the sealed ring road. We understand the basin will have a floor level at least 4m above the highest recorded groundwater level. We find that to be adequate.

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[183] Addendum to Synopsis of Closing Legal Submissions for Fulton Hogan Limited, Response to Panel Questions and Minute 14, 3 March 2020, paragraph 10.
[184] Application CRC192412 – a discretionary activity under CLWRP Rule 5.97.
[185] The Applicant's first s92 response suggested that runoff from roofs, roads and hardstand areas would be clean.
[186] Evidence of Eric Roland van Nieuwkerk on behalf of Fulton Hogan Limited, Water Quality and Water Use, Dated: 23 September 2019, paragraph 94.2.
[187] EIC Bligh, paragraph 99.
[188] Draft SMP, page 10.
[189] EIC Bligh, paragraph 55.
[190] CRC s42A report, paragraph 285.
[191] Dr Scott, paragraphs 60 and 61.

[312] Dr Scott noted that stormwater contaminants can build up to high concentrations in the soils at the base of stormwater ponds and that those soils require periodic replacement. She suggested that contaminated soil material with high levels of leachable contaminants from the ponds should not be used as fill in the base of the quarry excavations. We agree and consider conditions of consent can address those matters.

[313] To conclude, subject to appropriate the conditions of consent, we are satisfied that the management of stormwater can be undertaken in a manner that is consistent with the provisions of the CLWRP, particularly Policy 4.14, resulting in adverse effects that are no more than minor.

6.2.17 Groundwater quality

[314] Relevantly, Objective 3.13 of the CLWRP states:

> *Groundwater resources remain a sustainable source of high quality water which is available for abstraction while supporting base flows or levels in surface water bodies, springs and wetlands and avoiding salt-water intrusion.*

[315] CLWRP Strategic Policy 4.4(e) is that groundwater is managed so that overall water quality in aquifers does not decline. Strategic Policy 4.7 is that that resource consents for new or existing activities will not be granted if the granting of the resource consents would cause water quality limits set out in Table 11(m) of the CLWRP to be breached. Policy 4.19(c) is that the discharge of contaminants from disposal sites (which we take to include cleanfill) are minimised by ensuring that there is sufficient thickness of undisturbed sediment in the confining layer over the Coastal Confined Aquifer System to prevent the entry of contaminants into the aquifer. Policy 4.23 includes that a 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.

[316] Groundwater quality under the proposed quarry site, and further afield, can be affected by the storage of hazardous substances (should leaks or spills occur), the excavation of contaminated land, the placement of cleanfill (if not properly screened and managed) and the management and discharge of stormwater. We addressed those matters in preceding sections of this Decision Report. In light of the provisions of the CLWRP and the issues raised by the Applicant's experts and submitters, we now address:

- the potential groundwater quality effects of the principal activity of aggregate extraction;
- effects on nearby privately-owned groundwater domestic supply bores; and
- effects on SDC's groundwater public water supply well (M36/7575) supplying the Devine Drive area (Source G01673, Claremont Bore).

[317] Regarding the first matter we agree with the CRC s42A author that the greatest risk to groundwater quality is exposure of groundwater at the base of the quarry pit and infiltration of contaminants through a reduced depth of unsaturated material separating groundwater from the quarry surface. Fulton Hogan intends to avoid that by keeping aggregate extraction activities at least 1m above the highest recorded groundwater level across the quarry pit floor.

[318] Some submitters were concerned that the proposed excavation 'buffer' of 1m above the highest recorded groundwater level was insufficient and sought greater buffer depths in the range of 2m to 5m.

[319] Dr Scott agreed with the Applicant's assessment of historical groundwater level information which she described as "*relatively conservative*".[192] Regarding the 1m buffer Dr Scott[193] considered:

> *"The reasons for restricting the maximum depth of quarrying to one metre above highest groundwater level in Canterbury are not widely documented, but I understand they were introduced as a measure to*

[192] Ibid Dr Scott, paragraph 36.
[193] Ibid Dr Scott, paragraph 44.

> *prevent future flooding hazards for post-quarry land use. Managing the quarry to this depth is important because it helps to minimise the risk of excavators working directly in groundwater during periods when the water table is high. It also minimises the chance of fill materials being periodically saturated with groundwater after the excavations are filled, which decreases the leaching risk."*

[320] However, Dr Scott went on to advise:[194]

> *"The activity of digging, crushing and screening of aggregate poses a low risk to groundwater because it involves chemically unreactive (mostly silicate mineral) materials. The major contaminant generated is fine sediment, which can cause dust issues in air, but is generally not a problem for water where there is no surface water receiving environment. There may be some very fine suspended sediment from crushing that could be flushed into groundwater when it rains and transported short distances through highly permeable gravels. But small amounts of suspended sediment should be filtered out before reaching any nearby wells."*

[321] Regarding the proposed 1m buffer depth Dr Scott stated (our emphasis):

> *"It is important to bear in mind that the level of the groundwater table in this area can rise and fall by five metres or more in response to the amount of recharge and abstraction occurring. The highest water level for quarry management is a level that has only been reached less than 5% of the time over the past 10 years. All the rest of the time the water level has been lower. Average piezometric contour levels plotted across the site are at least 2 metres lower than the maximum levels. Within the limits of uncertainty of our projections, most of the time there should be more than 3 metres of undisturbed material above the groundwater."*

[322] In a similar vein, in response to submitter evidence the Applicant emphasised that the proposed quarry floor level will be at least 5m above the groundwater table most of the time and that the groundwater level at the site would have risen close to 1m below the proposed quarry floor depth for a maximum of only one month in the past 30 years.[195] Mr van Nieuwkerk also noted that climate change induced sea level rise will not change groundwater levels beneath the quarry site which is located around 25km from the coast.[196]

[323] Some submitters were concerned about a potential rise in groundwater levels caused by the Central Plains Water (CPW) irrigation scheme and uncertainty regarding future climate change effects. The rebuttal evidence of Nicholas Eldred[197] for the Applicant addressed the specific concerns raised by the TRA relating to the practicality of mitigation measures for addressing possible future groundwater rises. He agreed with Mr van Nieuwkerk that this could be addressed by five yearly reviews of the highest recorded groundwater level and a requirement to remediate with virgin materials if required[198].

[324] Dr Scott verbally advised that although the CPW started operating in 2015, it was only in September 2019 that irrigation commenced in the area that might affect the quarry site. The Applicant noted that any modest groundwater response to CPW in the quarry area may be offset by other factors such as climate change impacting recharge, increased drainage to spring fed streams and drains, and changes in groundwater abstraction by wells. An adaptive approach based on groundwater level monitoring was therefore proposed and we agree that is appropriate. However, given the importance of retaining an appropriate buffer between the quarry floor and the underlying groundwater, we consider that groundwater level monitoring should occur throughout the term of consent and not just for the first five years, as was originally proposed by the Applicant. This need for this long-term monitoring appeared to be agreed by the respective water quality experts.[199]

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[194] Ibid Dr Scott, paragraph 42.
[195] Rebuttal Evidence van Nieuwkerk, paragraph 11.
[196] Ibid van Nieuwkerk, paragraph 13.
[197] Geotechnical Business Group Manager at GHD.
[198] Rebuttal Evidence Charles Eldred, paragraph 13(d).
[199] JWS, Water Quality, paragraph 27.

[325] Given the restrictions to be imposed on the storage of hazardous substances, the excavation and removal of contaminated land, the placement of cleanfill, the management and discharge of stormwater, Dr Scott's advice that with the intended restrictions on excavation depth "*most of the time there should be more than 3 metres of undisturbed material above the groundwater*", and Mr van Nieuwkerk's view that the separation distance to groundwater will be at least 5m most of the time, we are satisfied that the Applicant's proposed excavation depths and the consent conditions specifying a minimum 1m buffer to groundwater are adequate.

[326] Having said that, we acknowledge the importance of accurately determining and monitoring groundwater levels and accept the s42A authors' detailed recommendations in that regard.[200] We understand that Hogan also accepts those recommendations.[201] Having said that we note that based on a revised assessment of highest recorded (historical) groundwater levels Mr van Nieuwkerk has determined that the maximum quarry pit depths should be 42.99mRL[202] in the northwest corner and 33.22mRL in the southeast corner.[203] Mr van Nieuwkerk also suggested that referencing a generalised depth below ground level would be ambiguous as the ground elevation at the quarry site is highly variable and can have localised differences of more than 1m. Accordingly, he recommended[204] the use of a map (or aerial photograph) in consent conditions showing the proposed quarry floor surface as contours in m RL. We accept the utility of such a map should consents be granted, but also consider there is merit in recording the northwest and southeast quarry pit depth limits that he determined. We agree that the maximum quarry pit floor depth should be reviewed every five years as recommended by Mr van Nieuwkerk.

[327] Some submitters[205] queried why the records from the on-site bore M36/0257 had not been used to determine the highest recorded groundwater level. In her end of hearing Summary Statement, Ms Goslin advised that, based on discussions with Dr Scott, she understood that those records could not have been relied on because the record for well M35/0257 was not continuous (ceasing in 1989 and not recommencing until 2017), the well reference level was not accurately surveyed, and the well is deep at 63m and so its water levels may not be a true reflection of shallow groundwater at the site. We are satisfied with that explanation.

[328] In relation to bore M35/0257, we were also informed by Dr Scott that the measuring point of the bore is actually below ground level.[206] We were provided with photographs showing that the well cover is flush with the ground and the measuring point is down a manhole below ground. Unfortunately, prior to the conclusion of the hearing, the CRC database incorrectly recorded the measuring point as being above ground[207] and that error was not noticed until Dr Scott examined the issue in response to a submitter's concern. Dr Scott advised that it is 'an easy error' for someone to have made in the wells database because the records simply have a "-" for above ground and no sign for below ground, and so these can be switched if the person entering data does not pay attention to the sign. We are satisfied with that explanation.

[329] We note that the Reply evidence of Mr van Nieuwkerk confirmed the evidence of Dr Scott on the above matters. In particular, he considered that bore M35/0257 does not represent the shallow Springston / Riccarton Gravel aquifer, which holds the shallow groundwater table beneath the proposed quarry site.[208]

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[200] Paragraph 259 of CRC s42A Officer Report and paragraph 102 of Dr Scott's evidence.
[201] Ibid Chittock, paragraph 76.
[202] Reduced Level.
[203] Ibid van Nieuwkerk, paragraph 48.
[204] Supplementary Evidence of Eric Roland Van Nieuwkerk on behalf of Fulton Hogan Limited, Response to Submission by Ms Davina Penny, 29 January 2019, paragraph 15.
[205] Including Stephen Bain, Simon Moore and Davina Penny.
[206] Email to the commissioners dated 13 December 2019.
[207] See for example the well card for bore M36/0257 included in Appendix A to the evidence of Mr van Nieuwkerk.
[208] Supplementary Evidence of Eric Roland Van Nieuwkerk on behalf of Fulton Hogan Limited, Response to Submission by Ms Davina Penny, 29 January 2019, paragraph 10.

[330] We note that groundwater levels in and around the quarry site will be monitored for the duration of consent. Dr Scott considered that water levels should be recorded daily and we agree that is appropriate and note that Hogan intends using automatic water level recorders that collect data every 15 minutes.[209] We also consider that, as was also agreed by the water quality experts, that a five-yearly review of the maximum depth of allowable extraction should be required, based on the groundwater level monitoring data. We note that such a review could result in the maximum allowable depth of abstraction decreasing.[210] We find that should be reflected in consents CRC192408 and CRC192409 should the applications be granted.

[331] We agree that any part of the quarry pit floor that is shown to be over-excavated over the term of the consent, such that groundwater rises above the excavated ground level or rehabilitated areas (acknowledging the uncertainties likely to be caused by factors such as climate change or the effect of recharge arising from the CPW), should be immediately back filled with 'virgin material' to avoid ponding.

[332] We now address potential effects on nearby privately-owned domestic supply bores, which some submitters were understandably concerned about. In that regard Policy 4.23[211] of the CLWRP states:

> *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.*

[333] We understand that Policy 4.23 applies to the aesthetic quality of groundwater.[212] We note and accept Dr Scott's advice[213] that:

- based on groundwater monitoring data downgradient of existing quarries in the Yaldhurst area, only wells located up to 1km downgradient of the Roydon Quarry site need to be considered;
- there are 30 such wells in the CRC database, five of which are registered for "domestic" and eight for "domestic and stock water" supplies;
- shallow domestic bores in the area are already at risk from microbial contamination (indicated by bacteria species *E.coli*) as result of general rural land use activities; and
- some domestic wells very close to the downgradient side of the site (along Jones Road/Main South Road) might be able to notice a small change in the aesthetic quality of the bore water (e.g. increased alkalinity and hardness) but that is unlikely to pose a risk to public health.

[334] In her verbal presentation to us, Dr Scott advised that any water quality impacts in shallow downgradient wells resulting from quarry operations would potentially manifest for a distance of "*a few hundred metres at most*". She thought that a 500m downgradient monitoring zone was conservative and noted that in Yaldhurst at a distance 1km downgradient of existing quarries she "*was struggling to see any change from background water quality*".

[335] Notwithstanding Dr Scott's views, Mr van Nieuwkerk recommended that if turbidity effects did occur in wells downgradient of the site, then the Applicant should commission sampling and testing of any affected well's water quality. If test results showed non-compliance with New Zealand drinking standards, and that could be attributed to the quarry operations, then the Applicant should provide an alternative water supply, or install a deeper well for affected parties.[214] In that regard we agree with Mr Kyle who opined that would be an appropriate means of 'protecting' those domestic wells.[215] We consider those matters should also be specified in conditions and note that was agreed by the respective water quality experts.[216]

[209] JWS Water Quality, paragraph 30(a)(ii)
[210] JWS, Water Quality, paragraphs 27 and 28.
[211] We note CLWRP Objectives 3.8A, 3.13 and 3.24 also address water quality and Policy 4.7 requires any breach of the water quality standards in Table 11(m) of the CLWRP to be effectively avoided. Policies 4.13, 4.14 and 4.19 are also relevant.
[212] Joint Witness Statement, Water Quality, 6 November 2019, paragraph 7.
[213] Ibid Dr Scott, paragraphs 80 to 83.
[214] Ibid van Nieuwkerk, paragraphs 84 and 97.3.
[215] Ibid Kyle, paragraph 63.
[216] JWS, Water Quality, paragraph 30(a)(iv).

[336] In that regard, we note that Hogan has now committed to undertaking baseline water quality monitoring, prior to commencement of aggregate excavation activities, for all downgradient domestic water supply wells within 500 metres of the site; and to providing contingency measures, including alternative water supply measures, should those wells become contaminated by quarrying activities.[217]

[337] The SDC public water supply bore is 600m directly downgradient from the quarry site. The well is 108m deep and is screened from 105m. The abstracted water is untreated but is regularly tested for the presence of bacteria. Relevantly, Objective 3.8A of the CLWRP states:

> *High quality fresh water is available to meet actual and reasonably foreseeable needs for community drinking water supplies.*

[338] We note that none of the proposed quarry excavation, deposition or discharge activities will occur within the well's Community Drinking Water Supply Protection Zone delineated in the CLWRP. Dr Scott considered that typical contaminants from the quarry operation, such as metals or hydrocarbons, are highly unlikely to persist or migrate over the time and distance it takes for groundwater to reach the deep SDC well. She considered that the potential for contamination of the SDC well was "very low". We agree.

[339] On 14 October 2019, the SDC (as a submitter) advised that they no longer wished to appear at the hearing. They reiterated their support for groundwater monitoring and mitigation actions, the additional two monitoring wells proposed by the Applicant and sought that water quality monitoring undertaken from well M36/7575 be included within Fulton Hogan's monitoring report with and any trends identified in relation to the quarry operation being noted and mitigated if the effects are adverse. We find those requests to be reasonable. We also note that the Applicant agreed to include SDC monitoring results in their annual reporting.[218]

[340] In overall terms, we find that the potential adverse effects of the proposed quarry operation on domestic bores and the SDC water supply bore are no more than minor and that the quarry proposal is therefore not inconsistent with the relevant policy provisions of the CLWRP. In saying that we also note Ms Goslin's conclusion that, based on Dr Scott's evidence and careful adherence to the conditions she recommended, the risk of breaching water quality limits in Table 11(m) of the CLWRP was expected to be "low".[219]

[341] Notwithstanding our above finding, we agree that a comprehensive groundwater quality monitoring programme, linked to remedial actions should groundwater quality be demonstrably degraded by the quarry operations, is prudent. There was general agreement that downgradient groundwater quality monitoring should occur for the duration of the consents (or the lifetime of the quarry).[220] This was also sought by the SDC (with regard to well M36/7575) and was thoroughly addressed by Dr Scott's evidence.[221] We understand her recommendations were largely accepted by the Applicant. We note that there will now be six groundwater monitoring wells for the quarry, as the Applicant has proposed two additional downgradient monitoring wells on the site boundary at the same depth as the existing four wells. We are satisfied with the overall recommended monitoring approach.

6.2.18 On-site water demand and Water Permit CRC182422

[342] There is an existing irrigation take consent associated with the site (Water Permit CRC182422) that commenced in November 2017 and presently authorises water to be taken and used at a rate not exceeding 9.5 litres per second (L/s) for the purposes of irrigation. The consent is due to expire on 1 July 2032.

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[217] Supplementary Statement of Kevin Michael Bligh on behalf of Fulton Hogan Limited, Project and Consent Conditions, 29 January 2020, paragraph 30.
[218] Rebuttal Evidence van Nieuwkerk, paragraph 9.
[219] CRC s42A Officer Report, paragraph 455.
[220] JWS, Water Quality, paragraph 12.
[221] Ibid Dr Scott, paragraphs 112 to 127.

[343] We understand that it has been agreed between Fulton Hogan and CRC that the use of this water for dust suppression and other ancillary activities within the proposed quarry is better authorised by a new use consent, rather than a change to the conditions of Water Permit CRC182422.[222] Accordingly, we understand the Applicant applied for a new resource consent to use water.[223] Legal advice provided to the CRC stated that if the Council decided to grant a new use permit, that permit would be able to sit alongside existing Water Permit CRC182442 (provided that the new "use" permit clarified that it only authorised additional uses under Water Permit CRC182442 and did not amend the "take" rate or volume of abstraction authorised by Water Permit CRC182442).[224]

[344] The recommended expiry date for the new permit sought to "use" water is 1 July 2032, which is the same as the expiry date for existing Water Permit CRC182442. Ms Goslin considered that conditions can be placed on the new "use" permit regarding a maximum annual volume of abstraction and compliance with the Resource Management (Measuring and Reporting of Water Takes) Regulations 2010. We agree.

[345] Existing Water Permit CRC182442 does not include a maximum annual volume to be abstracted. However, the CLWRP requires the amount of water taken to be reasonable for the intended use.[225] Policy 4.63 of the CLWRP requires that any abstraction of groundwater is to be subject to a maximum seasonal volume, which we understand to be the same as an annual volume. On that basis the s42A authors contended that an annual allowable volume of abstraction needed to be determined for the continued use of Water Permit CRC182422 and that it should be based on Schedule 10 of the CLWRP given that the existing consent is for irrigation purposes. Mr Kyle disagreed[226] but we prefer the evidence of the s42A authors on this matter.

[346] For CRC, David Just[227] initially considered that the application of Method 3 in Schedule 10 of the CLWRP yielded an annual volume of 96,489m^3 and that limit should be imposed on the water permit. However, the JWS for Water Quantity stated that Mr Just had revisited the annual volume issue using Method 2 of Schedule 10, which in Mr Just's view was equally valid to determine the annual volume for irrigation. On that basis, Mr Just considered that that an annual volume of 119,920m^3 could reasonably be taken for irrigation under existing Water Permit CRC182422.[228] We note that the updated consent conditions attached to Mr Bligh's evidence restrict annual water use to 119,920m^3 and Mr Kyle considered that granting consent to use water in accordance with those conditions was therefore consistent with the CLWRP reasonable use provisions.[229] We agree.

[347] Noting that water needs to be sourced by the Applicant to ensure sufficient availability for dust suppression and irrigation of rehabilitation areas in addition to processing plant requirements, Mr van Nieuwkerk determined the likely quarry water demand using the model GoldSim.[230] He assumed a 'dust-prone' area within the quarry of 6ha. This resulted in an estimated annual volume of 112,375m^3, although in most years the actual demand would be approximately half that. As part of the Reply submissions, Mr van Nieuwkerk's supplementary evidence [231] clarified that most of the time the quarry's median daily water demand was expected to be 188m^3 and median annual water demand would be 83,635m^3.

[222] The original application sought to change the conditions of the existing water permit to include a new use, being aggregate washing and dust suppression. CRC s42A Summary Statement, 11 December 2019.
[223] Ibid Kyle, paragraph 16.
[224] CRC s42A Officer Report, Appendix 4, paragraph 16.
[225] CLWRP Objectives 3.9 and 3.10, Policies 4.65, 4.69 and 11.4.26.
[226] Ibid Kyle, paragraphs 51 and 52.
[227] Team Leader, Consents Planning, CRC.
[228] JWS Water Quantity, 13 November 2019, paragraph 12.
[229] Ibid Kyle, paragraph 50.
[230] A model in which a 30 year time series of rainfall, evaporation, evapotranspiration and groundwater levels in trigger level well M36/0217 (which governs the water restrictions) as well as the effects of climate change (up to 30% more evapotranspiration and seasonal changes in rainfall with a net increase of 6%), have been taken into account. See paragraphs 27 to 36 and Appendix D of van Nieuwkerk EIC.
[231] Ibid, paragraph 15.

[348] Mr van Nieuwkerk considered that peak demand could be met under the existing consent conditions of Water Permit CRC182422, even at times when groundwater abstraction restrictions[232] applied, if at least 2,500m^3 of storage (using a water tank or water bladders) was provided onsite.[233] In his supplementary evidence, he clarified that a storage volume of 2,500m^3 would only be required three times in a 30 year period fully affected by the predicted increase in evapotranspiration due to climate change.

[349] We accept Mr van Nieuwkerk's expert technical evidence on these water demand and supply matters. Accordingly, we find that a consideration of on-site water demand and availability does not weigh against a grant of consent.

[350] For completeness, we note the concern of some submitters[234] that Fulton Hogan's water demand estimates were too low and that much more water may be required in practice. In our view that is a risk that falls on Fulton Hogan and the submitters' concerns can be easily satisfied by imposing a condition requiring quarry operations to cease if the annual volume restriction on the new 'use' permit is reached and no alternative source of on-site water is available for dust suppression and other quarry activities.[235]

6.2.19 SDC water race

[351] A small, local lateral line of the SDC administered Paparua Water Race stock water race system terminates in north eastern corner of the proposed quarry site. Some submitters[236] were concerned that if Fulton Hogan used water from the race for quarry operations then surrounding landowners use of the race for stockwater could be adversely affected.

[352] In his end of hearing Summary Statement, Mr Henderson advised that many lateral branches of the water race system had already been closed. Furthermore, the SDC did not guarantee flow in the water race and that consent is required from SDC to use the water for irrigation (and we presume for any other non-stock water uses including dust suppression). He noted there is a process to follow should Fulton Hogan wish to close that part of the water race, although there is also an option to redirect a water race around a proposed work area.

[353] We conclude that the presence of a local lateral line of the SDC administered Paparua Water Race within the proposed quarry site does not weigh against a grant of consent, albeit that there will be a further SDC administered regulatory process for Fulton Hogan to follow (to either close the water race lateral or use the water for non-stock water purposes) should the quarry applications before us be granted.

[354] Some submitters, including Davina Penny, raised the issue of endangered aquatic species (such as the Canterbury mudfish) possibly being resident in the water race within the quarry site and the potential adverse effects that quarry activities could have on those species. We received no qualified evidence on that matter. However, we note that the recently notified Plan Change 7 to the CLWRP introduces additional provisions relating to specific protection of discrete habitats of some threatened aquatic species along with more general amendments to better provide for fish passage and strengthen the management of activities which can result in damage to or loss of habitats of indigenous freshwater species. We note that this includes mapping areas of known 'Indigenous Freshwater Species Habitat'. To the best of our knowledge, none of those Plan Change 7 provisions refer to the SDC water race within the Roydon quarry site.

[355] On that basis and in the absence of actual evidence derived from an ecological survey of the water race, we find that the issue of potential endangered aquatic species within the water race does not weigh against a grant of consent.

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[232] Water Permit CRC182422 contains abstraction restrictions linked to groundwater levels.
[233] Ibid van Nieuwkerk, paragraphs 31 to 36 and Bligh paragraph 97.
[234] Including Carole Greenfield, Davina Penny and Anne Thompson.
[235] Consent CRC192410 Condition 28.
[236] Including Davina Penny.

6.2.20 Downgradient groundwater levels and flows

[356] In this section of this Decision Report we discuss potential effects of abstracting groundwater under existing Water Permit CRC182422 on groundwater levels and flows. Firstly, regarding groundwater levels generally, we note that the proposed quarry sits within the CLWRP's Selwyn-Waimakariri Groundwater Allocation Zone, which is currently deemed to be 'over allocated', and so 'new' water takes are a prohibited activity. Importantly in that regard, the Applicant has not proposed an increase in rate of "take" authorised by Water Permit CRC182422.[237] Based on the discussion in section 6.2.18 of this Decision Report, we also accept that there will be no increase in the annual volume of abstraction that might otherwise have occurred for irrigation purposes.

[357] Consequently, we agree with Ms Goslin that potential adverse effects on groundwater levels will be no greater than what is currently authorised (in fact they could well be less given the lower annual volume recommended by Mr van Nieuwkerk compared to Water Permit CRC182422's CLWRP Schedule 10 compliant seasonal volume) and so there will also be no additional adverse effects on the availability of water in neighbouring wells.

[358] Regarding the SDC's Paparua Water Race lateral that currently terminates within the site, we note Ms Goslin's advice (based on technical advice from Dr Scott) that there will not be a significant change in the amount of recharge to groundwater from the closure of that lateral and so potential adverse effects on groundwater from such a closure will be less than minor. Similarly, we accept that there will not be any change to groundwater flow patterns around the proposed quarry site, as the Applicant will not excavate below the groundwater table at any time.

[359] In conclusion, subject to an annual maximum volume of 112,375m^3 (as was recommended by Mr van Nieuwkerk) being applied to the new 'use' permit that will sit alongside existing Water Permit CRC182422, we are satisfied that potential adverse effects on groundwater levels and the efficacy of neighbouring wells will be no more than minor.

6.2.21 Soil resource and versatile soils

[360] We dealt with the issue of contaminated land and the storage and use of hazardous substances earlier in this Decision Report. In terms of the soil resource more generally, we note that Objective B1.1.1 of the SDP is to avoid, remedy or mitigate adverse effects on the District's land and soil resources.

[361] In addition, Objective 3.23 of the CLWRP states:

> *Soils are healthy and productive, and human-induced erosion and contamination are minimised.*

[362] We note that while the site's topsoil will be stripped and stockpiled, it will not be removed from the site and it will be used either in perimeter bund formation or site rehabilitation. The CRC s42A report author noted that while using the site for quarrying will temporarily remove the site from productive uses, the proposed rehabilitation will also return the site to a pastoral state following its completion. We consider that to be appropriate and find that actual and potential adverse effects on the site's soil resource generally are likely to be minor.

[363] During the course of the hearing, we became interested in the issue of the preservation of versatile soils, which we understand are generally accepted in the Selwyn District as being LUC Class 1 and 2 soils.[238] We also understand that the proposed quarry site contains predominantly LUC Class 2 and 3 soils with a small area of Class 4 soil in its south western corner.[239] Using the LRIS Portal, in response to a query from us, Mr Mthamo estimated that approximately 58 percent of the site contains LUC Class 2 soil and

[237] Ibid van Nieuwkerk, paragraph 24.
[238] Baseline Assessment, Versatile Soils (DW015), SDC, section 2.0, page 3.
[239] https://lris.scinfo.org.nz/layer/48076-nzlri-land-use-capability/ and Supplementary Evidence of Victor Mthamo on behalf of Fulton Hogan Limited, Versatile Soils, 29 January 2020, paragraph 24.

40 percent of the site contains LUC Class 3 soil.[240] Consequently, a significant portion of the quarry site could not be considered to have 'versatile soils'.

[364] Ms Goslin noted that, notwithstanding the general objective above, there are no provisions addressing versatile soils in the CLWRP.[241] In his end of hearing Summary Statement, Mr Henderson advised that the policy direction in the SDP[242] relating to versatile soils was limited to largely encouraging residential growth around existing townships. He noted that the Canterbury Regional Policy Statement (RPS)[243] contains some limited provisions relating to avoiding, remedying or mitigating adverse effects where they would compromise or foreclose the productivity of the region's soil resources. Mr Henderson remained of the view that the quarry proposal was consistent with those limited provisions.

[365] As part of the Applicant's Reply, Mr Mthamo[244] stated that the quarry would achieve RPS Objective 3.23 because "…*the versatility of the soils will be maintained post-rehabilitation and the soil's productive potential will be maintained such that the range of available land uses post-rehabilitation are similar to the range currently available. The soils post-rehabilitation will be healthy and productive just as well as they are pre-quarrying*."

[366] While a number of submitters with local knowledge helpfully informed us of the nature of past cropping activities on parts of the site, we received no expert evidence that contradicted that provided by Mr Henderson and Mr Mthamo. Consequently, we find that the presence of some LUC Class 2 soil within the proposed quarry site does not weigh against a grant of consent.

6.2.22 Husky dogs

[367] Some submitters[245] raised the issue of the Husky Rescue NZ Charitable Trust[246] now occupying buildings that were previously part of Roydon Lodge. Issues were raised regarding whether that operation required consent, what the effects of the quarry would be on the volunteers running the site and the dogs themselves, and what effect the dogs might have on neighbouring properties.

[368] Regarding the first issue, in his end of hearing Summary Statement, Mr Henderson advised that the Trust's operation is a permitted activity under the SDP. In terms of the second issue, we understand from the Applicant that the Trust has moved onto the site in full knowledge of the potential quarry development. Regarding the effect of the Trust's operation on neighbours, Dr Trevathan (SDC's noise expert) advised us that neighbouring residents would not be able to hear the dogs barking regardless of whether they were housed indoors or outdoors.

[369] We find that the presence of the Husky Rescue NZ Charitable Trust facility on the quarry site does not weigh against a grant of consent.

6.2.23 CCC cemetery

[370] Several submitters raised the issue of an intended CCC cemetery on land owned by that Council to the immediate east of Dawsons Road.[247] Indeed, we understand that land has been earmarked in the CCC's Long Term Plan for that purpose and that a cemetery might take up 2/3 of the total CCC owned block. Mike Mora, representing the Waipuna/Halswell-Hornby-Riccarton Community Board, advised that CCC was currently undertaking consultation with ethnic groups and church representatives and he thought the new cemetery could be operational within two years.

[240] Second Statement of Supplementary Evidence of Victor Mthamo on behalf of Fulton Hogan Limited, Versatile Soils – Response to Panel questions, 28 February 2020, paragraph 9.
[241] End of Hearing Summary Statement, section 9.9.
[242] Policy B1.1.8.
[243] Policy 5.3.2 and Objective 15.2.1.
[244] Ibid, paragraph 55.
[245] Including Davina Penny.
[246] A charitable Trust involved in the rescue, rehabilitation and re-homing of Husky dogs.
[247] The physical address of that land being 173 Maddisons Road.

[371] In his end of hearing Summary Statement, Mr Henderson advised that the land in question is zoned 'Rural Urban Fringe' in the Christchurch District Plan. He noted that there are no provisions for cemeteries in that zone and unless it is enabled by a designation or plan change, a new cemetery will require resource consent as a non-complying activity. He concluded, as did Susan Ruston for the CCC,[248] that any effects of the proposed quarry on a CCC future cemetery on that land should not form part of our considerations.

[372] Given the agreed planning advice of Mr Henderson and Ms Ruston on this matter, and in the absence of expert evidence to the contrary, we accept that we should not have regard to any potential adverse effects on a possible new cemetery and we find that it's possible future development does not weigh against a grant of consent.

6.2.24 Compliance monitoring

[373] Many submitters were concerned at what they perceived as a lack of compliance monitoring of existing quarry consents in the Greater Christchurch area, or a tardy CRC response to complaints about quarry dust. On that note Ms Goslin[249] advised "*It is acknowledged that CRC Compliance and Monitoring staff are unable to be at the quarry site at all times and due to the distance between CRC's offices and the proposed quarry site, are unable to respond to complaints immediately*."

[374] In response, while acknowledging the genuinely held submitter concerns, we record that case law has established we are obliged to assume that any conditions imposed on resource consents that we may grant will be complied with by the consent holder. It is beyond our scope to question the Councils' past or future compliance monitoring and enforcement actions or the level of resource they apply to those tasks.

[375] We note however the evidence of Mr Bligh, who correctly in our view stated that it is the day-to-day operation of the quarry which has the greatest risk to result in non-compliance. For that reason, Fulton Hogan have proposed a number of continuous or periodic monitoring measures which include trigger levels, alerts and reporting requirements by the consent holder.[250]

[376] Nevertheless, we agree that it is unfair to expect residents to 'police' or monitor compliance with consent conditions (a matter raised by several submitters[251]) and our expectation is that the Councils will diligently monitor compliance with conditions of the consents should they be granted.

6.2.25 Positive effects

[377] Policy 4.93 of the CLWRP is:

> *Recognise the value of gravel extraction for construction and maintenance of infrastructure, for economic activity, for flood management purposes and for the re-build of Christchurch.*

[378] The Applicant's AEE[252] noted that aggregate is an important component in the construction and maintenance of housing, commercial and industrial buildings and community infrastructure. The Applicant estimates that new sources of aggregate supply will be required for the Greater Christchurch area within 20 to 25 years as existing quarries become progressively exhausted.[253] Should the Roydon Quarry be consented, the Applicant considers it would extend Greater Christchurch's consented aggregate supply from 2044 to around 2050, assuming a predicted 'business as usual' (namely as unaffected by earthquake

[248] Environmental Planner and Director at Enspire Planning Limited.
[249] Section 42A Officer Report, paragraph 366.
[250] Ibid Bligh, paragraph 159.
[251] Including the Yaldhurst Environment Association, TRA, Davina Penny and Annell McDonagh.
[252] Ibid, section 6.11.
[253] Evidence of Michael Campbell Copeland on behalf of Fulton Hogan Limited, Economics, Dated: 23 September 2019, paragraph 18.

generated activity and based on expected Greater Christchurch population growth) aggregate consumption rate of 9.6 tonnes per person per annum.[254]

[379] Roydon Quarry is expected to have a lifespan in excess of 40 years with the production of 30 million tonnes of high-quality aggregate averaging around 425,000 to 575,000 tonnes per annum.[255] Its aggregate will be suitable for good quality top course, basecourse and sub-base products that meet NZTA and CCC product specifications.[256] The quarry could also accept on average around 100,000 to 200,000 tonnes per annum of cleanfill. It would provide 5 or 6 full time jobs on-site[257] and indirect employment for other workers within the construction and roading industries including truck drivers, administrative staff and contractors. Quarry related expenditure with local businesses was expected to average $9.5 million per annum.[258]

[380] We acknowledge those positive effects, but note some or all of them would equally accrue to a quarry sited elsewhere.

[381] The Applicant also suggested that if Roydon Quarry was not approved then greater costs would be incurred from having to transport aggregate from more distant sources of supply and that in turn could increase the market cost of aggregate. We do not assign much weight to those somewhat speculative suggestions, given the acknowledged existing 20 to 25 years of aggregate supply from existing quarries.

[382] A number of submitters[259] queried the need for the quarry and the ongoing level of demand for aggregate given the 'wind down' in post-earthquake reconstruction and imminent completion of major roading projects. While alluvial aggregate is a natural resource that is required to be sustainably managed, policies to achieve this are to be addressed in the appropriate policy statements and plans. We are primarily concerned with understanding the potential adverse effects of the proposed quarry and the relevant policy requirements in existing policy statements and plans as required by s104 of the RMA. If demand for aggregate decreases in the future, then presumably less aggregate will be extracted potentially extending the life of the quarry. This may result in both fewer potential day to day adverse effects (such as dust generation and traffic movements), while also possibly resulting in those effects occurring for a greater number of years.

[383] We note that the Applicant has proposed to form a Roydon Quarry Community Liaison Group (CLG).[260] We consider that to be a positive initiative that is commonly undertaken for major infrastructural projects. We anticipate that the CLG will helpfully provide a forum for discussing matters associated with the operation of the quarry, promoting the free flow of information including monitoring data. We note that Fulton Hogan agrees that the CLG should be independently chaired and that they should meet the reasonable operating costs of the CLG.[261] We consider this is appropriate and that those matters should be recorded in conditions of consent if consent is granted.

6.2.26 Cumulative effects

[384] Section 2 of the RMA defines a cumulative effect to mean "*any cumulative effect which arises over time or in combination with other effects regardless of scale, intensity, duration or frequency of the effect*."

[385] In previous sections of this Decision Report we have discussed potential adverse effects that might arise over time from the proposed quarry under a number of topic headings. We have also considered wider effects on amenity values which, in itself, is an important aspect of cumulative effects. As a result, we

[254] Evidence of Michael Oliver Chilton on behalf of Fulton Hogan Limited, Aggregate Demand and Supply, Dated: 23 September 2019, paragraphs 46 and 47. Chilton, Summary Statement, paragraphs 32 and 37. Also Rebuttal Evidence Copeland, paragraph 10.
[255] Ibid Copeland, paragraph 13.
[256] Ibid Jolly, paragraph 21.
[257] Ibid Copeland, paragraph 23.6.
[258] AEE, Appendix J, Economic Assessment, paragraph 45.
[259] Including Carole & Laurence Greenfield, John & Anne Cunningham and Bill Woods.
[260] Ibid Chilton, paragraphs 126 to 130.
[261] Rebuttal Evidence of Donald Chittock, paragraph 6.

have determined the need for both a tighter regime on night time and public holiday operating hours and days, and heavy vehicle routing. While in individual areas we found that potential adverse effects were either no more than minor, or would be so subject to compliance with conditions of consent, we found that the cumulative effect on amenity values and the sensitivity of the surrounding community justified further restriction on quarry activities.

[386] For completeness, we now need to consider whether there are other matters that contribute to cumulative effects that combine to have a more than minor effect overall on the environment, given the conditions regime that we are likely to impose. We also need to consider whether there are cumulative effects over the life of the quarry and also whether the existence of the quarry makes other land use changes more likely which could result in additional cumulative effects.

[387] Notwithstanding our findings on the individual categories of potential adverse effects addressed to date in this Decision Report, having considered the submitter and expert evidence before us, we consider that the effects arising from quarry activities that could conceivably contribute to the occurrence of cumulative adverse effects on the environment, and on people in particular, are changes to visual outlooks and landscape character, heavy vehicle traffic, quarry noise, dust and their consequential effect on amenity values. We evaluated the amenity value matters in section 6.2.6 of this Decision Report.

[388] Notwithstanding the cautious mitigation measures we intend to impose, we accept that in some limited locations and on some infrequent occasions the adverse effects of quarry activities on certain people, in a cumulative sense, might still arguably be more than minor. An example of this might be a residential property owner on Jones, Dawsons or Curraghs Road who no longer enjoys an open vista across the quarry site (due to the perimeter bunds and shelter belt planting) and on a particular day in certain weather conditions might be subjected to passing heavy vehicle traffic, quarry noise and windblown dust. From a cumulative effects perspective, such a person might consider their amenity values to be adversely affected to a more than minor extent. While such an example is not fanciful, it would be rare for all of those adverse effects to coincide and even if they did, the evidence is that they would individually be of a very low scale and would not occur continuously for extended periods of time.

[389] Consequently, we do not find that the possibility of cumulative adverse effects on people's existing level of amenity to be of such significance, scale or frequency as to weigh against a grant of consent, given the additional conditions that we consider should be imposed, over and above those finally recommended by the Applicant and the section 42A authors.

[390] A second aspect to cumulative effects is whether the granting of consent materially increases the likelihood that expansion of the Roydon quarry, or the establishment of additional nearby quarries, could occur, notwithstanding that in any case that would require additional or quite separate resource consents. The Roydon site is largely bounded by roads. However, two properties on Maddisons Road directly abut the quarry site. Fulton Hogan's proposal is that quarrying activities will not occur within 200 metres of these properties without the written approval of the owners and this has been written into consent conditions. The possibility that this land, itself, could, at some point, in the future seek to be included within the quarry site is an obvious prospect. One of those properties has already been the subject of a purchase offer by Fulton Hogan which was declined.[262] However, it is not our role to speculate on whether or not the Roydon quarry consent holders might in the future seek to expand the footprint of the quarry, or if other operators might seek to establish quarries in the nearby vicinity. Even if that did occur, then the appropriate avenue to consider the effects of any such proposals would be the necessary future consent processes. Those future consent processes would necessarily, and appropriately, be required to consider the effects of any quarry expansion (or any new quarry) cumulatively with the existing effects emanating from the Roydon quarry at that time.

[262] Submission by Anne Thompson, page 2.

[391] A further concern raised by some submitters was that if the Roydon quarry proceeds and, despite the Applicant's expert evidence to the contrary, its operation resulted in material adverse effects on the environment of nearby properties then that could affect their ability to sell their property and relocate elsewhere. In the submitters' opinion that might then increase the likelihood of Fulton Hogan or other quarry operators buying those properties with a view to further quarry operations. We heard only anecdotal evidence [263] of this occurring in the vicinity of other established quarry areas in Christchurch. Again, while acknowledging the fears of the submitters who raised this concern, we cannot speculate that such an effect might occur. As noted by counsel for Fulton Hogan in their closing submissions, case law has established that "*….decisions in cases like this should not be made based on peoples' fears that might never be realised.*"

[392] In turning our minds to cumulative adverse effects, we were cognisant of the Environment Court[264] and High Court[265] decisions which addressed the cumulative effects of multiple quarries at McLeans Island in Christchurch. The main findings of the Courts in those cases that are potentially relevant here are that cumulative effects can be grounds for declining a quarry consent where there are multiple existing quarries in the locality. That is undoubtedly so, however, in this case there are no other quarries in the vicinity that could reasonably be said to contribute cumulatively to the range of effects that we have assessed in this Decision Report. In saying that, we acknowledge the existing small Council stockpile area on the corner of Curraghs Road and Jones Road that we understand to be a former gravel pit, but the evidence before us was that the site is no longer used for aggregate extraction.

[393] In light of the above discussion, our overall conclusion on potential cumulative adverse effects is that, based on the evidence before us, they are unlikely to be of such a scale or to have such a frequency of occurrence that would lead us to find that the applications should be declined, given the consent regime that we intend to impose.

6.2.27 Alternative locations

[394] A number of submitters not surprisingly suggested alternative locations for the proposed quarry that in their view would have less effects on the environment. Some, including Amy Adams MP for Selwyn, went further stating that our task was to determine the most appropriate use of the proposed Roydon quarry site. We do not share that view. Our evaluation of the applications is governed by s104 of the RMA which in our view does not require a consideration of alternative uses for the site. Such matters are instead the purview of the SDP, and in some cases, regional policy statements and plans.

[395] In that regard, we note that the SDP does not contain any quarry zones.

[396] However, an assessment of alternative locations is required in an AEE if it is likely that the proposed activity will result in any significant adverse effect on the environment.[266] Arguably, this application does not cross that threshold. Nevertheless, the application documents include a map showing a large number of potential quarry sites, illustrating the extent of the alluvial aggregate resource that is potentially available in this part of the Canterbury Plains. Other alternative sites raised by submitters included additional extraction from the Waimakariri River and from land not yet quarried within the Christchurch District Plan quarry zone at Yaldhurst.

[397] In enquiring about the latter, we were advised by Mr Bligh that all the land within the quarry zone is consented for quarrying, but there is approximately 93ha where quarrying has yet to occur. The Applicant's final Reply legal submissions included maps which show that Fulton Hogan own 105.54ha of land in three locations that is consented for quarrying but is not yet quarried. This consists of 70.31ha at

[263] Verbal responses from Anne Thompson, Davina Penny.
[264] *Yaldhurst Quarries Joint Acton Group v Christchurch City Council* [2017] NZEnvC 165.
[265] *Harewood Gravels v Christchurch City Council and Yaldhurst Quarries Joint Acton Group* [2018] NZHC 3118.
[266] RMA Schedule 4, clause 6(1)(a).

Miners Road, 27.88ha at McLeans Island[267] and 7.35ha at Roberts Road. It should also be noted that Mr Chittock, in answering questions from Commissioners, advised that Fulton Hogan had been pursuing a land swap with the Templeton Golf Club, but that this was currently on hold.

[398] The matter of river extraction was addressed in the Applicant's final legal submissions. These referred to the decisions of the Christchurch Independent Hearing Panel and evidence to those hearings which referred to the 2006 Environment Court decision of *Road Metals Company Limited v Christchurch City Council NZ* EnvC 419. We were not supplied with a full copy of that decision, but we understand that it confirms that river extraction can only play a small part in the overall gravel supply for the Greater Christchurch Area. This was also addressed in the evidence of Mr Chilton for the Applicant which rather alarmingly pointed to a need for an additional 1000ha of alluvial aggregate quarry to meet anticipated Greater Christchurch demand for the next 40 years.

[399] Our need to consider alternative quarry sites is limited and we are not to substitute our own judgement for that of the Applicant. Case law has further established that we need only be satisfied that Fulton Hogan has investigated alternative sites. We do not need to conclude that they have selected the most suitable or the only suitable site. Nor is Fulton Hogan required to show that that their proposal is the best use of resources out of available alternatives. In overall terms, provided the application is consistent with the sustainable management purpose of the Act, little weight should be given to the question of alternatives.

[400] We find that to be the case here. We are satisfied that the Applicant's evidence and our questioning of hearing participants has provided us with a sufficient understanding of the context of alternative locations to the extent that is relevant. We find that the issue of alternative locations does not weigh against a grant of consent.

6.2.28 Overall conclusion on effects

[401] In the preceding sections 6.2.1 to 6.2.27 of this Decision Report we have considered and discussed a wide range of potential adverse effects that might arise from the proposed Roydon quarry, including effects of concern to submitters. In most cases we have determined that the potential adverse effects have been appropriately quantified by the experts (including the s42A authors and the experts acting for Fulton Hogan and those acting for submitters) and suitable mitigation measures have been proposed that will result in those potential effects either being no more than minor or not weighing against a grant of consent.

[402] Where some uncertainty exists, we find that conditions can be imposed to ensure that rigorous monitoring, reporting and review will either result in quarry operations being required to cease (should adverse effects be demonstrated) or additional mitigation or offsetting being required such that those adverse effects are suitable addressed.

[403] We acknowledge than many submitters will be unhappy with our findings in that regard. However, as submitted by counsel for Fulton Hogan, a general allegation, perception or fear that there will be adverse effects does not constitute evidence of the same. There is a body of case law confirming that decision-makers should not be influenced by mere perceptions of harm which are not shown to be well founded. If it is found on the basis of probative evidence that there is unlikely to be any actual or potential adverse effect on the environment of allowing the activity, then the fact that some people remain fearful is not a relevant matter for us to take into account.[268] While for some submitters the expert evidence presented and Joint Witness Statements may ease their concerns, for others this may not occur until the quarry is developed and confidence about the extent of actual adverse effects arising develops.

[267] The McLeans Island Rural Quarry zone is extracted already or consented for future extraction. Allowable quarrying can be very shallow in this area – as little as 2 metres deep in parts. There are some areas that cannot be quarried due to separation distances or dwellings present.

[268] Synopsis of Opening Legal Submissions for Fulton Hogan Limited, 14 November 2019, paragraph 54.

6.2 National environment standards and other regulations

[404] The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 are relevant and we dealt with that in section 6.2.9 of this Decision Report.

[405] The Resource Management (National Environmental Standards for Air Quality) Regulations 2004 are relevant and we dealt with that in section 6.2.11 of this Decision Report.

[406] The NES for Sources of Human Drinking Water is potentially relevant insofar as it relates to the SDC's public water supply well (M36/7575) supplying the Devine Drive area. We addressed that in section 6.1.17 of this Decision Report.

[407] The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 apply to the proposed groundwater take. We note that Applicant has recently installed a water meter on bore M36/0257 to measure the existing water take at the site. Ms Goslin recommended conditions requiring records to be provided to the CRC in a form consistent with the regulations.

[408] No other relevant national environmental standards or regulations were brought to our attention and we are not aware of any.

6.3 National policy statements

[409] The NPS for Freshwater Management 2014 (NPSFM) is applicable. However, the CLWRP is a contemporary regional plan that was made operative on 1 February 2017. Plan Change 1[269] to the CLWRP, which is relevant to the Selwyn Te Waihora zone where the proposed quarry is located, was made operative on 1 February 2016. We have therefore assumed that the CLWRP gave effect to the NPSFM, prior to it being amended in 2017.

[410] Notwithstanding that, we note that the application's consistency with the NPSFM was assessed by Ms Goslin.[270] She identified Objectives A1, A2, A4 and B1 and Policies A3, A4 and B5. We agree those are the relevant provisions and we do not repeat them here. In order to ensure the application was consistent with those provisions Ms Goslin recommended:

- a bond to cover rehabilitation;
- a covenant to restrict high-intensity (in terms of nutrient leaching) on the rehabilitated land; and
- groundwater monitoring conditions and associated remedial action trigger levels.

[411] We agree that monitoring conditions are required but have found that there is no need to covenant the site to restrict pots-rehabilitation land use. We discuss the need for a bond later in this Decision Report.

6.4 New Zealand Coastal Policy Statement

[412] The New Zealand Coastal Policy Statement 2010 is not relevant.

6.5 Regional Policy Statement

[413] The Canterbury Regional Policy Statement (RPS) became operative on 15 January 2013. Ms Goslin assessed relevant provisions in Chapters 6 (Recovery and Rebuilding of Greater Christchurch), 7 (Freshwater), 14 (Air quality) and 15 (Soils) of the RPS. We have read the provisions that were brought to our attention.

[414] Mr Kyle noted that RPS Chapter 6 does not contemplate new urban development at the quarry site, no provision is made for Templeton to expand beyond its current boundary, and more intensive rural

[269] Introducing policies, rules and limits to Section 11 of the CLWRP to manage water quality and water quanity in the Te Waihora/Lake Ellesmere catchment.
[270] CRC s42A Officers Report, paragraphs 376 to 391.

residential development of the area is also not contemplated due to the CIAL noise contours.[271] On that basis, Mr Kyle concluded that establishing Roydon quarry would not conflict with the RPS direction for urban development in Greater Christchurch. We agree.

[415] Regarding traffic matters, Mr Kyle identified Policy 5.3.3, Objective 6.2.1(10) and Policy 6.3.5(4) as relevant to Main Road South and that part of Jones Road west of the quarry as these qualify as "Strategic Infrastructure". The provisions focus on the protection of safe efficient and effective functioning of these parts of the network, including the avoidance of activities that would limit these aspects.

[416] The principle issue arising from this is the queuing issues at the new SH1 roundabout in conjunction with the rail level crossing. This has been addressed earlier and was resolved in a manner that was agreed by all expert traffic witnesses through the combined measures of consent conditions and the process of finalising the Queuing Management Plan.

[417] We note that many of the RPS provisions dealing with water quality mirror provisions in the superior instruments. In general terms, and relevant to this proposal, the RPS provisions that provide additional guidance on water quality require us to manage activities which may affect water quality (including by controlling land uses), singularly or cumulatively, to maintain water quality at or above the minimum standard set for that water body.[272] We addressed water quality matters in sections 6.2.14 to 6.2.20 of this Decision Report and we are satisfied that the proposed activity, subject to the imposition of appropriate conditions, is consistent with the relevant RPS provisions.

[418] Regarding air quality, the RPS provisions require that ambient air quality is maintained or improved so that it is not a danger to people's health and safety and the nuisance effects of low ambient air quality are reduced. [273] On the other hand, the provisions also direct us to enable the discharges of contaminants into air provided there are no significant localised adverse effects on social, cultural and amenity values, flora and fauna, and other natural and physical resources.[274] Importantly, in relation to the proximity of discharges to air and sensitive land-uses Policy 14.3.5(3) requires that "*New activities which require resource consents to discharge contaminants into air are to locate away from sensitive land uses and receiving environments unless adverse effects of the discharge can be avoided or mitigated."*

[419] We addressed the issue of dust in section 6.2.11 of this Decision Report. Relating that assessment to the RPS provisions we conclude that the proposal is consistent with them.

[420] Ms Goslin considered that the application was inconsistent with Policy 14.3.5(3), as there were likely to be localised adverse amenity or nuisance dust effects to a minor level for dwellings within 250m of the quarry site. However, we note the conclusions of Ms Ryan, for the CRC, that discharges of particulate matter of a size and nature that are linked to health effects were not likely to be significant and consequently, adverse health effects associated with the quarry would be no more than minor. However, given the rural setting of the application site and ambient air quality we do not consider that a minor inconsistency with RPS Policy 14.3.5(3) weighs against a grant of consent.

[421] Ms Goslin considered that the application was consistent with the RPS provisions[275] relating to soils, primarily we understand because the site's soils will be stockpiled and used for either bund formation or rehabilitation. Mr Mthamo provided us with further evidence on this aspect as part of Fulton Hogan's final Reply and directed us specifically to Policy 5.3.12(1) of the RPS.[276] This policy includes avoiding development and/or fragmentation of land which forecloses the ability to make appropriate use of that land for primary production. While we consider that he misquoted this policy, his overall evidence is that

[271] Ibid Kyle, paragraph 40.
[272] Policies 7.3.6 and 7.3.7.
[273] Objective 14.2.1
[274] Objective 14.2.2
[275] Objectives 15.2.1 and 15.2.2 and Policies 15.3.1 and 15.3.2.
[276] Second Statement of Supplementary Evidence of Victor Mthamo on behalf of Fulton Hogan Limited, Versatile Soils – Response to Panel questions, 28 February 2020, paragraphs 16 to 18.

after rehabilitation, the productive potential of the site's soils would be materially the same as existed before the quarry commenced operation. However, he noted that the level of management and inputs (such as fertiliser and irrigation) to achieve that result would be higher than that required currently. We were not presented with any evidence that challenged Mr Mthamo's conclusion and therefore we accept that RPS Policy 5.3.12 is not a barrier to granting consent.

[422] In overall terms we are satisfied that the proposal is consistent with the RPS provisions.

6.6 Regional plans

[423] As we have noted earlier, the relevant plans are the Canterbury Land and Water Regional Plan (CLWRP) and the Canterbury Air Regional Plan (CARP).

6.6.1 Canterbury Land and Water Regional Plan

[424] The CLWRP was comprehensively assessed by Ms Goslin in the CRC s42A Officer Report and we have had regard to her assessment when identifying the relevant CLWRP provisions that we outlined in section 6.2 of this Decision Report.[277] We do not repeat our earlier assessments here, but record that in each case we found the proposal to be in accord with the provisions cited.

[425] The CLWRP also addresses quarries more generally with Policy 4.94 stating:

> *Enable the extraction of gravel from land, provided adverse effects on groundwater quality are minimised and remediation is undertaken to minimise any ongoing risk of groundwater contamination.*

[426] Based on our assessments in section 6.2 of this Decision Report, we are satisfied that the Roydon quarry proposal is consistent with CLWRP Policy 4.94.

6.6.2 Canterbury Air Regional Plan

[427] The Canterbury Air Regional Plan (CARP) does not set quantitative air quality thresholds. The CARP objectives seek that:

- Ambient air quality provides for the health and wellbeing of the people of Canterbury (Objective 5.2);
- Degraded air quality is improved over time and where ambient air quality is acceptable it is maintained (Objective 5.4);
- Amenity values of the receiving environment are maintained (Objective 5.6);
- Offensive and objectionable effects and noxious or dangerous effects on the environment are generally avoided (Objective 5.9); and
- Discharges from new activities are appropriately located to take account of adjacent land uses and sensitive activities (Objective 5.7).

[428] Policy 6.1 of the CARP sets a narrative threshold that discharges of contaminants into air do not cause:

a. Adverse effects on human health and wellbeing; or

b. Adverse effects on mauri and life supporting capacity of ecosystems, plants or animals; or

c. Significant diminished visibility; or

d. Significant soiling or corrosion of structures or property.

[429] On the basis of our earlier findings in relation to the nuisance and human health effects likely to arise from the dust generated by quarrying activities, we find the application is consistent with this policy.

[430] CARP Policy 6.8 states:

> *Offensive and objectionable effects are unacceptable and actively managed by plan provisions and the implementation of management plans.*

[277] CRC s42A report, paragraphs 440 to 484.

[431] We consider implementation of the DMP and the imposition of consent conditions limiting quarry operations in certain wind conditions will ensure that any offensive and objectionable effects beyond the site boundary can be avoided.

[432] CARP Policy 6.9 states:

> *Discharges from new activities are appropriately located and separated from sensitive activities, taking into account land use anticipated by a proposed or operative plan and the sensitivity of the receiving environment."*

[433] We find that the proposed quarry is appropriately located and separated from sensitive activities such as residences and businesses. We consider a minimum separation distance of 500m from aggregate processing and 200m from extraction activities (in the absence of approval to do otherwise from the affected parties) takes into account the sensitivity of the receiving environment.

[434] CARP Policy 6.11 states:

> *When evaluating resource consent applications recognise locational constraints on activities, when imposing terms and conditions.*

[435] We have had regard to locational constraints on activities in determining the conditions to be imposed.

[436] CARP Policy 12 states:

> *Where activities locate appropriately to mitigate adverse effects on air quality a longer consent duration may be available to provide on-going operational certainty."*

[437] We consider the applicant has appropriately located the activities with the highest potential for discharges to air to the CPSA and has increased the minimum distance between aggregate extraction and sensitive receptors to 200m. We have taken this into account in determining the consent duration.

[438] CARP Policy 22 states:

> *Applications for resource consent for discharges of contaminants into air from large scale fuel burning devices and industrial or trade activities shall identify the best practicable option to be adopted to minimise effects*.

[439] On the basis of the evidence of the air quality experts, we find that the design of the quarry and the dust mitigation measures proposed represent the best practicable option for minimising effects. We are satisfied that the ongoing review and implementation of a DMP will ensure the Applicant is required to assess the best practicable option for the duration of the consent.

[440] CARP Policy 6.25 states:

> *Applications for resource consent for discharges into air from industrial or trade activities or large scale fuel burning devices classified as discretionary shall address:*
>
> *a. where the discharge includes PM10, the mass emission rate of the proposed discharge relative to the total emission rate of all discharges within the Clean Air Zone; and the degree to which the proposed discharge exacerbates cumulative effects within the Clean Air Zone; and*
>
> *b. localised effects of the proposed discharge and the location of sensitive receptors; and*

c. available mitigation and emission control options; and

d. the duration of consent being sought and the practicability for the effects of the discharge to be reduced over time.

[441] We find that the Applicant's air quality assessment indicates that they have the ability to control fugitive emissions and that the proposal is unlikely to exacerbate cumulative PM_{10} concentrations within the polluted Christchurch Airshed to any measurable extent.

[442] We note that the CARP sets a very low threshold of "no adverse effects" on human health and wellbeing or the mauri and life supporting capacity of ecosystems, plants or animals. We note the NESAQ provides a somewhat higher threshold, which provides a guaranteed level of protection for New Zealanders. Overall, in determining adverse effects on human health, we have relied on the ambient air quality standard in the NESAQ for PM_{10} and $PM_{2.5}$ and the criterion in the CREL[278] for RCS.

[443] Overall, we concluded that the application is consistent with the relevant objectives and policies of the CARP.

6.7 Selwyn District Plan (SDP)

[444] The relevant objectives and policies of the operative SDP were considered in the SDC s42A Officer Report by Mr Henderson, the evidence of Mr Kyle and in Appendix K (Statutory Assessment) of the notified application. We note that the review of the operative SDP has now commenced, however at this point there are no notified provisions that we can give any weight to.

[445] Mr Kyle and Mr Henderson agreed that the relevant SDP provisions are contained within the following sections:

- Chapter B.1 Land and Soil and B 1.3 Water;
- Chapter B2 Transport Networks;
- Chapter B2.4 Waste Disposal;
- Chapter B 3.2 Hazardous Substances; and
- Chapter B 3.4 Quality of the Environment.

[260] Both Mr Henderson and Mr Kyle agree that given the mitigation approach to potential effects on the SH1 roundabout has been agreed by the traffic experts, the proposal sits comfortably with the SDP policies and can therefore be consented. This conclusion was reached in a context where there is little SDP policy guidance specifically on the activity of aggregate quarrying. The forthcoming SDP review process may provide an opportunity to address this.

[261] We sought some clarification from Mr Henderson on SDP policies relating to versatile soils and he advised in his end of hearing Summary Statement[279] that the SDP has one policy that is directly relevant to versatile soils, being *Policy B1.1.8 Encourage residential development to occur in and around existing townships*. This policy clearly is clearly focused on urban development and is of little relevance here.

[262] In overall terms, having considered the SDP provisions brought to our attention by the various counsel, witnesses and submitters, and taking into account the mitigation measures outlined in previous sections of this Decision Report and recommended regime of consent conditions, we find there is no policy barrier in the SDP to the granting of consent.

[278] California Office of Environmental Health Hazard Assessment – Chronic Reference Exposure Levels.
[279] Paragraph 22.

6.8 Iwi management plans

[446] A number of relevant iwi management plans and other documents were brought to our attention and assessed by the Applicant and the reporting officers. We consider those documents to be relevant under s104(1)(c) of the RMA. To the extent that those matters are specifically provided for in the statutory instruments, we have already addressed them in preceding sections of this Decision Report.

6.9 Sections 105 and 107

[447] Section 105 of the RMA lists additional matters that we must have regard to. Ms Goslin considered s105 matters related to discharges to air, discharges of stormwater to land, and the discharge of cleanfill to land. She concluded that in overall terms there were very few alternatives to the methods of discharge or receiving environments proposed by the Applicant.[280] We agree. We also record that we have had regard to the sensitivity of the various receiving environments for those discharges in section 6.2 of this Decision Report.

[448] Section 107 of the RMA requires that no discharge permit shall be granted that allows certain listed effects in the receiving waters, which in this case is the groundwater below the proposed quarry site. Ms Goslin considered that provided the Applicant undertook their proposal in accordance with the conditions she recommended, the effects listed in s107 were unlikely to occur.[281] We heard no qualified evidence to the contrary. For the Applicant, Mr Kyle agreed with Ms Goslin that there was no impediment under either ss105 or 107 of the RMA to granting the consents sought.[282]

[449] We are satisfied that the requirements of s107 of the RMA can be met.

6.10 Other matters

[450] No other relevant matters were brought to our attention and we are not aware of any.

6.11 Permitted baseline

[451] When forming an opinion for the purposes of subsection 104(1)(a) of the RMA we may disregard an adverse effect of the activity on the environment if a national environmental standard or a plan permits an activity with that effect.[283] As noted earlier in this Decision Report, we have not disregarded any effects associated with the applications.

7 Part 2 matters

[452] Following the High Court decision[284] in *Davidson*, we have not separately referred to Part 2 matters as the statutory instruments appropriately address those matters in our view and we do not find those instruments to be invalid, nor do they have incomplete coverage or uncertain meaning in terms of the issues relevant here.

8 Overall Consideration

[453] In the preceding sections of this Decision Report we have discussed the potential effects of the proposal and the requirements of the various statutory instruments. In overall terms, we find that the purpose of the RMA will be better served by granting the applications than declining them.

9 Consent conditions

[454] The SDC s42A author recommended consent conditions for our consideration. For the CRC, Ms Goslin commented on the Applicant's suggested conditions and recommended wording for conditions that she considered appropriate but had not been offered by the Applicant. Conditions were also recommended to us in the evidence of the Applicant's planning witness Mr Bligh. We note Mr Bligh's extensive

[280] CRC s42A report, paragraph 545.
[281] CRC s42A Officer Report, paragraph 547.
[282] Ibid Kyle, paragraph 117.
[283] Section 104(2) of the RMA.
[284] *RJ Davidson Family Trust v Marlborough District Council* [2017] NZHC 52.

experience with quarry consents in the Greater Christchurch area.[285] We are grateful for the assistance of the s42A authors and Mr Bligh.

9.1 SDC consents

[455] As is normal in a hearing of this scale, the conditions proposed by the Applicant and SDC witnesses evolved during the course of the hearing. This included conferencing of planning witnesses specifically on the conditions.[286] We also gave directions as to form of conditions relating to the preparation and certification of Management Plans and minimising overlap and inconsistency between consents.

[456] We were provided with a final copy of the Applicant's proposed conditions in their Reply submissions through Mr Bligh's Supplementary Statement dated 29 January 2020. We have used that condition set as the starting point for further changes as part of this Decision Report. We note that Mr Bligh's final set included new or amended conditions relating to the following:

- A requirement to construct of the walking track and viewing platform within five years;
- No aggregate processing to occur until road improvements are complete;
- A reduction in operating hours on public holidays to 15 days per year;
- All processing with mobile crushers to be within the CPSA;
- No extraction within 200m of any existing dwelling;
- Amendment to the truck route restriction condition referring to a map showing the areas to be avoided; and
- Amendment to limit access to one vehicle access on Jones Road.

[457] Mr Bligh also revised the management plan conditions and made further changes to remove duplication between consents. The final conditions we have imposed are set out in Appendix 1 of this report.

[458] In terms of those final conditions there remained only one substantive area of disagreement between Mr Henderson and Mr Bligh. This related to the issue of rehabilitation extending beyond the term of consent. We have considered this earlier in this Decision Report and agreed with Mr Henderson in our finding that all activities contemplated by the consent should occur within the life of the consent.

[459] The substantive changes to the SDC conditions arising from this Decision Report include the following:

- A specified consent term of 35 years;
- A new condition listing the various figures and plans that attached to and form part of the consents;
- The recreational walking track and viewing platform to be completed within 12 months of completion of the perimeter bund and details addressed in the Landscape Management Plan;
- Amendments to Table 1 (hours of operation) to clarify that quarrying operations on Sundays are limited to between 7.00 am to 6.00 pm, for a maximum of 30 days per year;
- Restricting heavy vehicle traffic routing to and from the site to the use of Jones Road - Dawsons Road - SH 1.
- An additional condition prohibiting quarry traffic on Curraghs Road between 6.00 pm and 8.00 pm;
- Amending the route restriction condition to remove the exemption for Templeton and to increase the clarity of wording;
- An addition to the condition addressing the management of material being dropped from heavy vehicles onto Jones Road with a requirement that all loads are to be covered; and
- An additional Condition 85 requiring that the perimeter bunds be removed prior to consent expiry as part of the site's rehabilitation.

[285] Evidence of Kevin Michael Bligh on behalf of Fulton Hogan Limited, Project and Consent Conditions, Dated: 23 September 2019, paragraph 7.
[286] Refer Joint Witness Statement - Planning Consent Conditions dated 28 November.

[460] We have also made further changes to significantly increase the consistency between the SDC conditions and the CRC conditions and to avoid duplication of conditions. This includes:

- Standardising the scope of authorised activities and inserting definitions of 'quarry activities', 'quarrying operations' and 'site preparation' and using those definitions throughout the conditions that follow;
- Addition of a condition requiring a pre-construction meeting in parallel with the CRC General Conditions, Condition 6;
- Amending the quarry management plan conditions to be consistent with the amended the CRC consents;
- Re ordering of some conditions so that the conditions to be achieved through the management plans precede the management plan conditions;
- Amendment to Table 1 (hours of operation) to be consistent with the definitions outlined above;
- Removal of the column in Table 2 specifying the area of open areas requiring dust suppression. That is a matter more appropriately dealt with in the CRC discharge to air consent CRC192410; and
- Certain excavation conditions are deleted as they are covered in the CRC consents.

[461] A range of other editorial improvements have also been made to improve clarity, certainty and consistency.

9.2 CRC consents

[462] As we noted above, Ms Goslin commented on the conditions recommended by the Applicant. In his pre-circulated evidence, Mr Bligh then commented on Ms Goslin's comments and provided a revised suite of conditions. As part of the Applicant's Reply submissions, Mr Bligh provided a further revised suite of conditions that reflected questions we posed to various experts, submitter concerns, the outcome of expert conferencing (including both air quality and planning expert conferencing), discussions that have occurred between experts, including matters raised in the s42A authors' presentations, and additional concessions and commitments offered by the Applicant.[287]

[463] The final conditions we have imposed on the CRC consents are set out in Appendix 2 of this Decision Report. They are based on the conditions provided by Mr Bligh in Reply, but we have substantially revised them. Our revisions include compiling a suite of General Conditions that apply to all of the CRC consents so as to avoid repetition between the separate consents. We have introduced conditions setting out a process for the CRC certification of management plans which we consider to be necessary in terms of regulatory certainty.

[464] As discussed in section 6.2.11 of this Decision Report, we enhanced the PM_{10} monitoring conditions (requiring permanent monitors on all site boundaries) and clarified the necessary extent of the RCS monitoring and reporting programme. We have required periodic reviews (based on monitoring data) of compliance with the NESAQ airshed PM_{10} regulations. A breach of those regulations will require quarrying activities to cease and a PM_{10} offset to be implemented before quarrying activities can recommence.

[465] We have also reordered, clarified and simplified many of the remaining conditions in each separate consent document. We have consistently used the word "must" instead of "shall' or "should" to provide certainty. Other revisions include improvements to grammar and the use of Mr Bligh's defined terms for "quarry activities", "site preparation" and "quarry operations" throughout the conditions.

9.3 Bond

[466] Several submitters, including the Yaldhurst Residents Association, suggested the imposition of bond to ensure post quarry land use occurred in an appropriate manners and imposed conditions were adhered

[287] Supplementary Statement of Kevin Michael Bligh on behalf of Fulton Hogan Limited, Project and Consent Conditions, Dated: 29 January 2020, paragraph 5.

to. The CRC s42A report author advised that s108(2)(b) of the RMA allows a consent condition to require a bond to be entered into with the consent authority. Section 108A specifies that a bond may be required to ensure the performance of one or more conditions of a resource consent and it may continue to be in force after the expiry of the consent to ensure the ongoing performance of conditions relating to long-term effects. Ms Goslin recommended that Fulton Hogan should enter into a bond with the CRC and provided comprehensive wording for a bond condition, with the intent being to provide the CRC with necessary funds to fully remediate the site in the event the consent holder defaults or abandons the site. [288] However, Ms Goslin did not recommend a monetary quantum.

[467] For the Applicant, Mr Bligh[289] stated that "*the applicant does not have a poor compliance history which would warrant a bond condition. The applicant is open to discussing a bond further with CRC but it would be useful to understand what CRC consider an appropriate quantum*." Nevertheless, we understand that Fulton Hogan now agrees to and has offered the imposition of a bond condition. [290]The bond conditions require a bond to be paid to CRC and attach to all the CRC consents as part of the General Conditions. We are satisfied with the form of the conditions proposed.

9.4 Consent duration

[468] Fulton Hogan sought an unlimited duration for all land use consents and a duration of 35 years for all discharge permits and the new water 'use' permit.

9.4.1 CRC consents

[469] For the CRC, Ms Goslin initially recommended a duration of 13 years for each of the CRC consents, primarily because the site's existing water permit expires in 13 years. She noted that Policy 4.11 of the CLWRP seeks that the attainment of catchment specific water quality and quantity outcomes is enabled through limiting the duration of resource consents to a period of no more than five years past the expected notification date of a sub-regional plan process. The Selwyn Te-Waihora sub regional plan process is operative (Plan Change 1 to the CLWRP) but the CRC's Long Term Plan states that the follow up Selwyn-Te Waihora process is targeted for 2025/2026. Ms Goslin advised that a duration of 13 years is just beyond the five-year timeframe set out in Policy 4.11, but provides a consistent expiry across all resource consents.

[470] We understand that Policy 4.11 is primarily designed to address nutrient losses from rural land use activities, particularly land uses associated with irrigation, and in its part (a) it explicitly refers to *"… any plan change that will introduce water quality or water quantity provisions into Sections 6 – 15 of this Pla*n". As noted by Ms Goslin, that has already occurred for the Selwyn-Te Waihora zone within which the quarry falls. In our view Policy 4.11 does not weigh in favour of a short duration for the quarry.

[471] In her end of hearing presentation to us, Ms Goslin recommended a duration for the CRC consents of 20 years. She considered that was a fair amount of time for Fulton Hogan to undertake quarrying activities and to gather data on the effects of those activities. She considered that a 20 year duration would also enable changes to technology or monitoring techniques to be incorporated into any replacement consents.

[472] As we noted in section 5.7 of this Decision Report, to assist us on this and other matters, and in response to a request from us, the s42A authors helpfully compiled a table of existing quarry consents and their durations and key conditions. Ms Goslin noted that there was no common theme on consent durations, although more recent consents had shorter durations due to their small size. Indeed, the consent durations imposed on quarries ranged from 5 to 35 years with numerous intermediate periods.

[288] CRC s42A Officer Report, paragraphs 300 and 301.
[289] Ibid Bligh, page 13 of his Appendix 7.
[290] Supplementary Statement of Kevin Michael Bligh on behalf of Fulton Hogan Limited, Project and Consent Conditions, 29 January 2020, paragraph 32.

[473] The Roydon quarry will be a major infrastructural operation with an expected life in excess of 35 years. It will require significant investment to establish. We have already concluded that subject to the imposition of appropriate conditions of consent the potential adverse effects on the environment resulting from its operation will be no more than minor. Further to that, we have imposed consent conditions requiring rigorous monitoring of PM_{10} and RCS emissions that might arise from quarry activities. We have set PM_{10} thresholds that if breached will require quarry activities to either cease or additional dust mitigation measures to be deployed. We have also required reviews of PM_{10} monitoring data to periodically check (during the first decade or so of quarry activities) whether or not the NESAQ regulation relating to the Christchurch airshed will be breached.

[474] We accept that the 'new use' permit to be associated with existing Water Permit CRC182422 should logically be granted for the same duration as that existing permit. However, in terms of s113(1)(b) of the RMA, we see no effects-based reasons for reducing the duration for the remaining CRC consents from the 35 year term sought by Fulton Hogan. If consent Water Permit CRC182422 is not renewed in 13 years' time then Fulton Hogan will simply need to either utilise an alternative source of water for dust suppression and other quarry activities or transfer another water take consent(s) to that site.

[475] In that regard we note and accept the Applicant's Reply submissions[291] that "*…the unavailability of water under CRC182422 is provided for in the conditions of consent (Condition 27 of CRC192410) and requires Fulton Hogan to assess the need to temporarily cease some or all parts of site operations requiring water usage to manage dust, including any mobile processing and acceptance of cleanfill, until such time when water can be taken again. Any risk of water being unavailable, either now or after expiry of CRC182422, is addressed in conditions and it is a commercial risk assumed by Fulton Hogan*."

[476] In making our decision on duration for the CRC consents we have had regard to the fact that the Applicant offered conditions of consent providing for annual s128 review opportunities. We have further enhanced the s128 review condition (imposed by us as a General Condition applying across all of the CRC consents) so that it specifically deals with the issue of PM_{10} and RCS emissions from the quarry site. We are satisfied that will enable any unforeseen adverse effects to be addressed, including effects on human health. It will also enable changes to technology or monitoring techniques to be incorporated into revised conditions.

9.4.2 SDC consents

[477] An issue arises as to whether the SDC land use consent should have a consent duration commensurate with the 35 year duration imposed on the CRC consents (other than the new 'use' water permit). Fulton Hogan specifically sought an unlimited term for the SDC land use consent. In considering this matter we have had regard to the nature of quarrying being a temporary but, albeit in this case, lengthy activity as well as the need to achieve integration of the management of the quarry activity with the CRC consents. While the life of the quarry may exceed the 35 year term proposed for the CRC consents, we consider at this point that it is important that all aspects of the activity should be able to be reassessed in an integrated and holistic manner when the CRC consents expire. Therefore, we have imposed a specific term on the SDC land use consent of 35 years.

10 Determination

[478] Pursuant to the powers delegated to us by the Selwyn District Council and the Canterbury Regional Council under s34A of the Resource Management Act 1991, we record that:

- having read the Applicant's application documents, reports, further and supplementary information, evidence and legal submissions;
- having read the submissions and submitters' written evidence and having considered the submitters' verbal evidence provided at the hearing;

[291] Ibid, paragraph 84.

- having read the various s42A reports provided by the SDC and the CRC;
- having considered all of the written and verbal answers provided to our questions; and
- having considered the various requirements of ss104, 105 and 107 of the RMA;

as set out in detail in sections 6, 7 and 8 of this Decision Report and by way of brief summary we find that:

a) based on the qualified expert evidence before us, the actual and potential adverse effects of the applications are either demonstrably minor or can be suitably avoided, remedied or mitigated by the imposition of consent conditions;

b) the applications if granted will have positive effects;

c) subject to the imposition of appropriate conditions of consent the applications are generally consistent with the provisions of the relevant statutory instruments, and where uncertainty exists (such as with regard to compliance with the NESAQ PM_{10} airshed regulations) we conclude that rigorous monitoring can demonstrate whether or not compliance is achieved and if it is not, conditions can be imposed to require quarry activities to cease until such time as compliance occurs;

d) other unforeseen effects can be dealt with by way of s128 reviews; and

e) the purpose of the RMA would be best achieved by granting the applications sought.

[479] We therefore grant the applications listed in section 4 of this Decision Report, subject to conditions.

[480] As noted above the conditions of consent we have settled on are set out in Appendices 1 and 2. Given the length and complexity of the consent documents it is quite conceivable that those conditions may contain errors of a grammatical or cross-referencing nature.

[481] Accordingly, should the Applicant or the SDC or CRC reporting officers identify any minor mistakes or defects in the attached conditions, then we are prepared to issue an amended suite of conditions under s133A of the RMA correcting any such matters. Consequently, any minor mistakes or defects in the conditions should be brought to our attention prior to the end of the 20-working day period specified in s133A.

Signed by the commissioners:

Sharon McGarry

Paul Thomas

Rob van Voorthuysen (Chair)

Dated: 22 April 2020

Appendix 1 SDC consent conditions

Appendix 2 – CRC consent conditions

LAND USE CONSENT RC185627

Authorised Activities

1. This consent authorises the following list of activities undertaken at 107 Dawsons Road and 220 Jones Road, Templeton, legally described as Rural Section 6475 and Rural Section 6324, Lot 1 Deposited Plan 4031, Rural Section 6342, Section 7 Survey Office Plan 510345, Rural Section 5381 and Section 6 Survey Office Plan 510345, at or about map reference NZTM2000 1555356mE, 5177132mN as shown on Plan CRC192408A, attached to and forming part of this resource consent:
   a) Site preparation, topsoil stripping, overburden removal and storage;
   b) Construction and maintenance of bunds and stockpiles;
   c) Extraction, loading and transportation of material;
   d) Processing of aggregates (including crushing and screening of aggregates);
   e) Combustion products from the operation of 1.04 megawatt of diesel fired generation (up to four generators);
   f) Stockpiling of aggregates;
   g) Deposition of cleanfill;
   h) Site rehabilitation; and
   i) Movement of vehicles associated with the above activities

2. For the purposes of these consents:
   a) *Quarry activities* means the activities listed in condition 1(a) to (i).
   b) *Site preparation* means the activities listed in condition 1(a) and (b).
   c) *Quarrying operations* means the activities listed in condition 1(c) to (i).

3. Except as required by consent conditions, the authorised activities must be undertaken in accordance with the information and plans submitted with the application submitted on 20 November 2018 and subsequent further information submitted on 12 March 2019 and 16 August 2019 and additional information presented to the Hearings Panel. Where there is any conflict between the application and the conditions, the conditions of consent prevail.

4. The authorised activities; and in particular *site preparation* activities including the perimeter bunding, landscape planting, perimeter walking track, public viewing platform, and establishment of the Central Processing and Stockpiling Area (CPSA); must be undertaken in accordance with the following figures and plans that are attached to and form part of this consent:
   a) ”Appendix A – Entrance Site diagram” and “Appendix B – Quarry Site diagram” attached to the Supplementary Statement of Donald Gordon Chittock on Behalf of Fulton Hogan Limited, Plans and Diagrams, dated 29 January 2020;
   b) DCM Urban Design Limited figures all dated 5 December 2019 and referenced as follows:
      i) Project no / drawing no: 2017_031 / 0100 Revision: A titled “Edge Treatments”;
      ii) Project no / drawing no: 2017_031 / 0101 Revision: A titled “Edge Treatments and Walking Track Route”;
      iii) Project no / drawing no: 2017_031 / 0102 Revision: A titled “Edge Treatment A – Curraghs Road”;
      iv) Project no / drawing no: 2017_031 / 0103 Revision: A titled “Edge Treatment B – Maddisons Road (Western Section)”;
      v) Project no / drawing no: 2017_031 / 0104 Revision: A titled “Edge Treatment C – 319 Maddisons Road (Eastern Edge)”;

vi) Project no / drawing no: 2017_031 / 0105 Revision: A titled "Edge Treatment D – Dawsons Road";

vii) Project no / drawing no: 2017_031 / 0106 Revision: A titled "Edge Treatment E – Jones Road";

viii) Project no / drawing no: 2017_031 / 0107 Revision: A titled "Dawsons Road / Jones Road 3 Way Roundabout";

ix) Project no / drawing no: 2017_031 / 0108 Revision: A titled "Viewing Platform";

x) Project no / drawing no: 2017_031 / 0109 Revision: A titled "Mitigation Measures During Operation"; and

c) Lighting Plan prepared by Ideal Supplies Ltd. Lighting Design reference 3242 dated 5 August 2019.

***Advice Note**: The Approved Consent Documentation has been entered into Council records as RC185627.*

Lapse and Expiry

5. Pursuant to section 125 of the Resource Management Act 1991 this consent will lapse five years after the date of this consent unless either the consent is given effect to, or the Council has granted an extension pursuant to section125(1)(b) of the Act.

6. The term of consent is 35 years.

Supervision and Notification

7. The consent holder must appoint a representative(s) prior to the exercise of this resource consent, who will be the Council's principal contact person(s) in regard to matters relating to this consent.

8. All quarrying works must be overseen by a suitably qualified and experienced quarrying practitioner.

   ***Advice Note:** Should any persons change during the term of this resource consent, the consent holder must inform the Team Leader – Compliance Environmental Services, Selwyn District Council (SDC Manager) and must also give written notice to the SDC Manager of the new person's name and how they can be contacted as soon as practicable.*

9. At least one month prior to commencement of *quarry activities* authorised by this consent, the consent holder or their agent must arrange and conduct a pre-construction site meeting with the SDC Manager. This must be arranged in conjunction with the parallel requirement of General Condition 6 of the regional consents. At a minimum, the following must be covered at the meeting:
   a) Scheduling and staging of the works, including the proposed start date;
   b) Responsibilities of all relevant parties;
   c) Contact details for all relevant parties;
   d) Expectations regarding communication between all relevant parties;
   e) Site inspections; and
   f) Confirmation that all relevant parties have copies of the contents of these consent documents and all associated management plans.

Quarry Management Plans

10. The following Quarry Management Plans must be submitted to the SDC Manager in electronic and hard copy form for certification at least 40 working days prior to the commencement of *quarry activities:*
    a) Landscape Management Plan;
    b) Transportation and Routing Management Plan;

c) Roydon Quarry SH1/Dawsons Road Queue Management Plan;
d) Noise Management Plan; and
e) Quarry Rehabilitation Plan.

11. Subject to conditions 12 and 14, works to which a Management Plan relates must not commence until the consent holder has received written certification from the SDC Manager that the Management Plan adequately gives effect to the relevant Condition(s).

12. If the consent holder has not received a response from the SDC Manager, within 20 working days of the date of submission under condition 10, the Management Plan will be deemed to be certified.

13. If the SDC Manager's response is that that they are not able to certify the Management Plan they must provide the consent holder with reasons and recommendations for changes to the Management Plan in writing. The consent holder must consider any reasons and recommendations of the SDC Manager and resubmit an amended Management Plan for certification.

14. If the consent holder has not received a response from the SDC Manager within five working days of the date of resubmission under condition 13 above, the Management Plan will be deemed to be certified.

15. Once certified a Management Plan may be varied by the consent holder. The certification process for any variation to the plan must follow the process outlined in conditions 11 to 14. The *quarry activities* subject to the variation must not commence until the variation has been certified by the Council. Any amendment must be consistent with the conditions of the resource consent and the original objectives or purpose stated within the Management Plan and any changes must be reported at the following Community Liaison Group meeting.

16. This resource consent and a copy of the Council certified versions of all the management plans required by this consent must be kept on site at all times, and the consent holder must ensure all personnel are made aware of each plan's contents, where the plan relates to *quarry activities* that those personnel are responsible for. All certified management plans must also be publicly available on the consent holder's web site.

Works to be Completed Prior to Commencement of Quarry Operations

Site Preparation and Landscaping

17. Prior to extraction and processing of saleable aggregate commencing on the site, and for the duration of *quarrying operations*, site perimeter bunding, landscape planting and a perimeter walking track and viewing platform must be established in accordance with Visual Impact Assessment by DCM Urban, referenced as Appendix E of the Resource Consent Application report by Golder Associates dated November 2018, together with subsequent updates to this documentation in the 12 March 2019 and 16 August 2019 further information responses, and figures listed in conditions 4(b)(i) to (x).

18. The site bunding must include:
    a) Establishment of 3 metres (m) high earth bunds around the site perimeter, with the exception of site accessways, with a 1m wide flat top. The bunds must have a profile with an outside slope no steeper than 1V:3H (one metre vertical to three metres horizontal) and must have a minimum base width of 15m;
    b) Bunding at the heavy vehicle accessway entrance adjacent to Jones Road in general accordance with the figure listed in condition 4(b)(x), inclusive of any minor amendments to the design shown in the listed figure that are approved in writing by the SDC Manager;

c) As soon as practicable following construction of the bunds, the bunds are to be sown with grass or hydro-seeded and thereafter watered regularly to ensure grass cover is established and maintained;

d) Construction of the bunds must occur during the months of May to October inclusive;

e) The grassed bunds must be mown regularly or grazed to give a tidy appearance;

f) The bunds must be watered when required to suppress potential dust, until a grass cover has been established. An 80 percent grass cover is to be maintained on earth bunds at all times during *quarrying operations;* and

g) To ensure the survival of the existing shelter belts listed in condition 19(a), bunds should not be constructed within 1m of the base of existing trees. Where no shelterbelt currently exists, bunding must be setback at least 4m from the site boundary in general accordance with the figures listed in conditions 4(b)(i), (iv) and (vi) to (x).

19. The landscape planting must include:

a) The existing shelterbelts identified on the figure listed in condition 4(b)(i) along the site's road boundary with Curraghs Road, the common boundary with 319 Maddisons Road, and the road boundary adjacent to the dwelling at 107 Dawson's Road must be retained. Where there are gaps or where the vegetation is dying or in poor condition these gaps must be filled with similar tree species to achieve closures of these gaps;

b) An additional row of plantings must be established behind these existing shelter belts in accordance with the figures listed in conditions 4(b)(i), (iii) and (v). These rows of plantings must be established within the first planting season following the commencement of consent;

c) Along the site boundaries where there are no existing shelter belts, four rows of plantings must be established in accordance with the figures listed in conditions 4(b)(i), (iv) and (vi) to (x). The plantings must be established within the first planting season following the commencement of consent;

d) All plantings must be established on the outer side of the bunds;

e) Any plantings along the Jones Road boundary must be maintained at a height of 5m or less to limit shading of the road carriageway; and

f) All plantings required for this consent under this condition (conditions 19(a) to (e)) must be maintained for the duration of this consent. Any dead, diseased, or damaged plants must to be replaced with plants of a similar species and as soon as practicable, having regard to planting seasons. Irrigation of the plantings must be provided for a minimum of 5 years.

20. The perimeter walking track and viewing platform must be provided within 12 months of completion of the bund and must include:

a) A walking track in general accordance with the figures listed in conditions 4(b)(ii) to (vi) and (viii). The walking track must be established on the application site unless the Selwyn District Council agrees in writing that road reserve may be used for this purpose; and

b) A viewing platform in general accordance with the figure listed in condition 4(b)(ix). The consent holder may vary the location of this platform as the quarry develops provided that any varied location enables an unimpeded view of *quarrying operations*.

Landscape Management Plan

21. The consent holder must prepare a Landscape Management Plan for certification by the Selwyn District Council. The purpose of the Landscape Management Plan is to provide detail on how conditions 17 to 20 will be achieved for the duration of this consent. The Landscape Management Plan must, as a minimum, include:

a) Details of all bunding and landscape planting to be established prior to *quarrying operations* commencing;

b) Details of any bunding and landscape planting to be established after *quarrying operations* commence;
c) The methodology for establishing landscape planting required by (a) and (b);
d) Details of the Walking Track and Viewing Platform;
e) The maintenance requirements for all landscape features for the duration of this consent; and
f) The process for reviewing the Landscape Management Plan.

22. The consent holder must ensure that all *quarry activities* are undertaken in a general accordance with the certified Landscape Management Plan.

Site Access

23. Vehicle access must be provided from Jones Road, between Curraghs and Dawsons Road, for all quarry vehicles. This access point must be designed and constructed in general accordance with the recommendations of the Stantec ITA (Appendix C of the AEE) and the figure listed in condition 4(b)(x). The heavy vehicle access must be located at least 250m from the dwelling at 1090 Main South Road.

24. Roading upgrades must be undertaken in general accordance with the Stantec ITA (Appendix C of the AEE). This must include provision of a roundabout to replace the existing Dawsons Road / Jones Road intersection and roading upgrades on Jones Road.

25. The roading improvements specified in conditions 23 and 24 must be constructed and be fully operational prior to the commencement of *quarrying operations*.

26. Prior to the commencement of the roading improvements specified in conditions 23 and 24, the consent holder must provide detailed designs of those improvements to Selwyn District Council's Transportation Asset Manager for technical review and certification.

27. The consent holder must arrange for a detailed design road safety audit to be carried out of the Jones Road / Dawsons Road roundabout required under condition 24. The audit must be carried out by a suitably qualified and experienced, independent traffic engineer with a copy provided to the SDC Manager. All safety improvements identified or recommended by the audit must be implemented by the consent holder.

Operational Conditions - General

28. The hours of operation and the only *quarry activities* that may be undertaken during those hours on specified days are limited to those set out in Table 1 below.

Table 1: Hours of quarry activities and other associated activities.

When			Allowable activities
At all times			Dust suppression, operation of weighbridge office activities, site security and light maintenance.
Daytime	Monday to Saturday, excluding Public Holidays.	7.00 am to 6.00 pm	Full range of *quarry activities* except processing of aggregates with mobile plant is limited to a maximum of 120 days per annum.
Early Morning		6.00 am to 7.00 am	Deposition of cleanfill, loading and transportation of material, and movement of vehicles associated with these activities. Site pre-start up including operational warm up of conveyors and machinery.
Evening	Monday to Saturday on up to 150 days per annum, excluding Public Holidays.	6.00 pm to 8.00 pm	Full range of *quarry activities* excluding processing of aggregates with mobile plant and deposition of cleanfill.
Night-time	Monday to Saturday on up to 30 nights per annum, excluding Public Holidays.	8.00 pm to 6.00 am.	Loading and transportation of material, and movement of vehicles associated with these activities.
Sunday	On up to 15 Sundays per annum, excluding Public Holidays.	7.00 am to 6.00 pm	

29. No processing of aggregates or transportation of material to or from the site can take place prior to the opening of the Christchurch Southern Motorway Stage 2 (CSM2) and the establishment of the bunds required by condition 17. Night time activities must not be undertaken during the first five years of *quarry activities*.

30. In addition to the limits imposed by condition 28 Table 1, heavy vehicle movements outside the hours of 6.00 am to 8.00 pm Monday to Saturday and all day on Sundays must not exceed 30 heavy vehicle movements per hour.

Excavation

31. All stockpile volumes must not exceed a maximum total volume of 200,000 cubic metres (m^3) at any one time and must not be higher than the top height of the perimeter bunds.

32. *Quarrying operation* areas must be limited at any one time to the maximum area of open ground set out in Table 2 below. These areas exclude the sealed access road(s) and any site buildings.

Table 2: Open area limits for *quarrying operations*.

Purpose	Area (ha)
CPSA and mobile processing plant	7
Excavation in process	5
Fill and rehabilitation in process	5
Site roads – unsealed	5
Field conveyor and service lanes	4
Total active area	26

33. All roads within the CPSA and the access road into the site must be sealed in accordance with the figures listed in condition 4(a).

Advice Note: *Also refer to conditions of CRC192408 and CRC192409.*

Setbacks

34. All fixed and mobile processing plant and associated stockpiling must be set back at least 500m from the site boundaries and be located within the CPSA, as shown on Figure RC185627A and in general accordance with the figures listed in condition 4(a).

35. No *quarry activities* other than bund construction must occur within 200m of the dwellings at 319 Maddisons Road and 153 Curraghs Road, unless the prior written approval of the owners and occupiers of these dwellings is obtained. The consent holder must provide a copy of any written approvals to the SDC Manager and the Community Liaison Group prior to *quarry activities* in these areas commencing.

Keeping of Records

36. On an annual basis and at the conclusion of each stage of aggregate extraction, the consent holder must forward a progress report to the SDC Manager. The report must include:
    a) the volume of material extracted,
    b) the amount and type of clean fill placed,
    c) the area of extraction that remains open,
    d) the number of daily heavy vehicle movements associated with *quarrying operations* during that stage, and
    e) a plan showing the area which has been worked during the applicable period.

Traffic Management

37. Heavy vehicle movements must not exceed a maximum of 1,200 movements per day. For the avoidance of doubt this means 600 trucks entering the site each day and 600 trucks exiting each day. Heavy vehicle movements must not exceed more than 800 movements per day, as an average, over any consecutive 60 calendar day period. For the avoidance of doubt, this means 400 trucks entering the site each day and 400 trucks exiting each day.

38. The consent holder must take all practicable steps to ensure that heavy vehicles associated with *quarrying operations* do not use engine brakes within the quarry site, or while on Jones Road, or when approaching or leaving the quarry site.

39. Only heavy vehicles owned or contracted by the consent holder can access the site between the hours of 8.00 pm and 6.00 am. These vehicles shall not use engine brakes.

40. Heavy vehicle movements leaving or accessing the Roydon Quarry must use the direct route comprising Jones Road, Dawsons Road and State Highway 1 and must not travel on the following roads:
    a) Jones Road west of the quarry access (between the access and Curraghs Road);
    b) Dawsons Road north of Jones Road (between Jones Road and Maddisons Road); and
    c) Jones Road east of Dawsons Road (between Dawsons Road and Railway Terrace).

Transportation Management and Routing Plan

41. The consent holder must prepare a Transportation Management and Routing Plan (TMRP) for certification by the SDC Manager. The purpose of TMRP is to provide detail on how all conditions relating to heavy vehicle movements will be achieved, and to ensure all heavy vehicle drivers are aware of the potential safety hazards present on roads in the vicinity of the quarry, including safe travel procedures across the Dawsons Road railway level crossing. *Quarrying operations* must not occur until Selwyn District Council has certified the TMRP in accordance with conditions 10 to 16.

    The TMRP must include, as a minimum:
    a) Formal codes of practice for all drivers;
    b) Formal induction processes for all drivers;
    c) A requirement for non-consent holder-controlled heavy vehicle drivers accessing the quarry site to sign on to codes of practice;
    d) Appropriate onsite signage; and
    e) The process for review of the TMRP.

    The consent holder must ensure that all *quarry activities* are undertaken in a general accordance with the certified TMRP.

Site Access

42. The internal site access road design must include a rumble strip and wheel wash to assist in removing muddy material from vehicle wheels before vehicles exit the site and must be in general accordance with the figures listed in conditions 4(a) and 4(b)(x).

43. To avoid material being deposited, dropped or tracked onto public roads from the quarry site, the following measures must be put in place for the heavy vehicle access road:
    a) At least the first 100m of the access road inside the site boundary is to be inspected daily and sediment and debris vacuumed as required;
    b) The edges of the sealed access road must be inspected and maintained, particularly where pot holes emerge. Before they are filled, pot holes must be coned off to avoid further damage and likelihood of transferring material to Jones Road;
    c) Heavy vehicles must be inspected (which may be by camera) at the weighbridge with the purpose of identifying and minimising the risk of materials being deposited on nearby roads;
    d) Loaded heavy vehicles arriving at the site must have their load covered; and
    e) Heavy vehicles with aggregate or other quarry material leaving the site must either cover their load or have the load dampened with water spray before leaving the site.

44. The length of Jones Road from Dawsons Road to the quarry site's heavy vehicle entrance must be inspected daily by the consent holder to assess if sediment has been deposited on the road from

vehicles travelling to or from the quarry site. Any sediment deposited on the road must be removed that same day. A record of when road sediment removal has taken place must be retained and made available to the SDC Manager on request and otherwise provided to the SDC Manager annually.

Roydon Quarry, SH1 / Dawsons Road Queue Management Plan

45. Within three months of the date of commencement of this consent the consent holder must submit a Roydon Quarry, SH1 / Dawsons Road Queue Management Plan ('the QMP') to the SDC Manager for certification.

46. The QMP required by condition 45 must be prepared by a suitably qualified, independent and experienced traffic engineer and must be in general accordance with the draft Roydon Quarry, SH1 / Dawsons Road Queue Management Plan attached as Appendix X prepared by Stantec: Version E January 2020.

47. The purpose of the QMP is to ensure that *quarrying operations* do not result in an increase in the safety risk at the SH1 / Dawsons Road roundabout.

48. Safety at the SH1 / Dawsons Road roundabout must be assessed in accordance with a fit for purpose Safety Risk Assessment carried out in accordance with the approach set out in Section 2 of the draft Roydon Quarry, SH1 / Dawsons Road Queue Management Plan dated 28 January 2020 or any subsequent amendment made to the QMP. The QMP must include details relating to:
    a) The monitoring required to identify any changes in the operation and safety risk at the SH1 / Dawsons Road roundabout arising from the impact of *quarrying operations* on northbound traffic queuing back from the railway level crossing into the roundabout, and southbound traffic on Dawsons Road queuing back from SH1 towards the railway, including:
        i) baseline traffic monitoring (required to be undertaken prior to the *quarrying operations* commencing);
        ii) monitoring after the *quarrying operations* commence; and
        iii) where required, repeating monitoring of (i) and (ii) above;
    b) How it will be determined whether mitigation is required and the methods required to address the assessed safety risk arising from the *quarrying operations*;
    c) The procedures and timeframes for the installation of the mitigation measures (if any);
    d) How any required mitigation will be monitored for effectiveness and any ongoing review requirements for the QMP; and
    e) Reporting requirements.

49. Prior to submitting the Final QMP to the SDC Manager for certification, the consent holder must provide the New Zealand Transport Agency, KiwiRail, Selwyn District Council and Christchurch City Council with an opportunity to participate in a collaborative workshop with the consent holder to discuss a draft of the QMP ('Draft QMP).

50. If New Zealand Transport Agency, KiwiRail, Christchurch City Council and/or Selwyn District Council agree to participate in a workshop:
    a) The consent holder must provide a copy of the Draft QMP to the participating organisations at least 10 days before the workshop;
    b) The consent holder must circulate a record of the workshop discussions to the participating organisations within 5 working days of the completion of the workshop; and
    c) The participating organisations must be given an opportunity to provide written feedback to the consent holder on the Draft QMP within 15 working days of the completion of the workshop.

51. If New Zealand Transport Agency, Kiwi Rail, Christchurch City Council and/or Selwyn District Council decline the opportunity to participate in a collaborative workshop, the consent colder must provide a copy of the Draft QMP to the declining organisation and they must be given 15 working days to provide written feedback to the consent holder on its content.

52. The consent holder must ensure that all written feedback received from the New Zealand Transport Agency, Kiwi Rail, Christchurch City Council and/or Selwyn District Council on the Draft QMP is provided to the SDC Manager when the QMP is submitted for certification, along with a clear explanation of where any comment made on the Draft QMP has or has not been incorporated into the QMP and the reasons why.

53. The consent holder must ensure that a copy of the certified QMP is provided to the Community Liaison Group at the next scheduled meeting.

54. Once the QMP is certified, the consent holder must implement the QMP.

55. Once the QMP is certified, the consent holder must report to the New Zealand Transport Agency, Kiwi Rail, Christchurch City Council, Selwyn District Council, and the Community Liaison Group at the following times:
    a) At the completion of baseline monitoring and prior to the *quarrying operations* commencing;
    b) Six months after *quarrying operations* commence; and
    c) Annually thereafter for a period of three years, or until the New Zealand Transport Agency and KiwiRail agree no further monitoring and mitigation is needed to achieve the purpose set out in condition 47, whichever is earlier.

    Each report must contain the following details:
    a) A description of the monitoring undertaken during the reporting period and analysis of the results;
    b) A description of any mitigation measures implemented during the reporting period, or planned for the following reporting period; and
    c) Any amendments identified as being necessary to the QMP for the following reporting period.

56. The QMP is to be an adaptive document. It may be updated by the consent holder at any time provided that prior to doing so further consultation and collaboration occurs with the New Zealand Transport Agency and KiwiRail. Any changes made to the QMP must be consistent with achieving the purpose set out within condition 47. Any updated provisions must not be implemented until the updated QMP has been re-certified by the SDC Manager.

Noise

57. All *quarrying operations* on the site, measured in accordance with the provisions of NZS 6801:2008 "Acoustics – Measurement of environmental sound" and assessed in accordance with NZS 6802:2008 "Acoustics – Environmental Noise", must not exceed the following noise limits at any point within any other property, during the following times:
    a) Daytime 7.00 am to 6.00 pm 55 dB LAeq;
    b) Evening 6.00 pm to 8.00 pm 50 dB LAeq; and
    c) Night 8.00 pm to 7.00 am 45 dB LAeq and 70 dB LAmax.

58. The noise limits in condition 57 do not apply to vehicle movements on the internal site accessway within 250m of Jones Road.

59. *Site preparation* activities must be conducted in accordance with NZS 6803: 1999 "Acoustics -

Construction Noise" and must comply with the "typical duration" noise limits contained within Table 2 of that Standard.

60. Should audible vehicle reversing alarms be required on quarry-based equipment or trucks owned by the consent holder, only broadband noise alarms must be used.

61. Between the hours of 8.00pm and 6.00am, the consent holder must not allow heavy vehicles or quarry-based equipment to be used on the site which use tonal reversing alarms. (i.e. machinery and trucks must use broadband or hiss beepers or similar, or alternatively flashing lights, which meet workplace safety requirements).

Noise Management Plan

62. The consent holder must prepare a Noise Management Plan (NMP) for certification by the SDC Manager. The purpose of the NMP is to detail the methods that will be used to comply with conditions 57 to 61 and to manage noise effects to an acceptable level.

    As a minimum the NMP must include:

    a) The proposed measures to be used to control noise generated by *quarry activities*;
    b) The role of the consent holder's staff in the management of noise and the nomination of specific staff member(s) responsible for overseeing the implementation and upkeep of the NMP;
    c) The procedures that will be followed by the consent holder should any complaint in relation to noise be received; and
    d) A procedure for advising nearby properties of any proposed Sunday or night time activities (8.00 pm to 6.00 am); and
    e) The process for review of the NMP.

63. Noise emissions from *quarry activities* must be measured and assessed in accordance with condition 57 by a suitably qualified and experienced acoustic consultant at the following times:

    a) Once within the first 12 months following the commencement of *quarrying operations*;
    b) When excavation initially advances to within 400m of either of the dwellings at 319 Maddisons or 151 Curraghs Road and thereafter when excavation initially advances to within 250 m of either of those dwellings; and
    c) Once when rehabilitation activities are initially undertaken within 400m of the dwellings at 319 Maddisons or 151 Curraghs Road and thereafter when excavation initially advances to within 250m of either of those dwellings.

    On each occasion, a report describing the measurement results and compliance or otherwise with the limits in condition 57 must be submitted to the SDC Manager within 20 working days of completion of the noise measurements.

Lighting and Glare

64. Lighting from the quarry site must be directed downwards and must have a maximum light spill not exceeding 3-lux spill on to any part of any other adjoining property, in accordance with Rule 9.18.1.2 contained in Part C of the Rural Volume of the Selwyn District Plan.

65. All lighting for the site must be designed and installed by an appropriate and recognised lighting specialist, in general accordance with the plan listed in condition 4(c).

Airport Operations and Bird Strike

66. Q*uarry activities* must not involve feeding or attracting birds to site. The quarry must be managed to

ensure that any surface ponding drains freely and rehabilitated areas must be designed and finished to be free draining surfaces, as provided for in the Draft Quarry Rehabilitation Plan (Appendix G of the AEE).

67. The contact details for the consent holder representative required under condition 7 of this consent must be provided to Christchurch International Airport Limited (CIAL) prior to *quarrying operations* commencing. If the consent holder representative should change during the duration of this consent, the consent holder must advise CIAL of the contact details for the new consent holder representative.

    ***Advice Note**. The purpose of condition 67 is to enable prompt contact with the consent holder to be made by CIAL for any issues that may arise on-site that need urgent action to prevent conflict with airport operations, including but not limited to dust generation and glare from quarrying operations and bird management.*

68. The consent holder must allow CIAL's planning staff and/or Wildlife Management Officer to arrange visits to the quarry site by Ornithological or Pest Management Consultants and their staff for the purposes of pest bird monitoring or management and to assess and make recommendations that relate to the mitigation of bird strike risk.

69. Solid waste resulting from *quarrying operations* must be disposed of to an approved solid waste facility by an appropriately licenced operator. Solid waste must be held in wheelie bins or similar appropriate containers designed to avoid attracting birds or rodents, to shelter the contents from rainfall, and to secure the waste in the event of windy conditions.

70. The consent holder must provide CIAL with an opportunity to participate in the development and review of management plans relevant to bird strike and dust. The consent holder must also consult CIAL about the final land use to be implemented after site rehabilitation is completed to enable CIAL to provide input on possible risks to airport operations.

Hazardous Substances

71. The only hazardous substances that can be stored on site are fuel and lubricants for quarry plant and machinery.

72. The total maximum volume of diesel stored on site must not exceed 15,000 litres (L). Diesel storage must have a Stationary Container Certificate and the storage of all hazardous substances on site must be in accordance with the requirements of the Hazardous Substances and New Organisms Act 1996.

Demolition

73. Prior to any demolition of buildings on the site, asbestos surveys must be undertaken, and any identified or suspected asbestos containing material (ACM) must be removed. All asbestos work must be undertaken by a suitably licenced person(s) in accordance with the Health and Safety at Work (Asbestos) Regulations 2016 and the WorkSafe New Zealand Approved Code of Practice: Management and Removal of Asbestos 2016. The results of the asbestos survey must be used to determine if asbestos investigation of soil is required around the periphery of the dwellings.

74. When any buildings on the site have been vacated, prior to their demolition, the investigation of lead-based paint in soils around the periphery of the buildings must be undertaken and reported to SDC Manager.

Remediation of Contaminated Material

75. The handling and reuse of contaminated material identified in the "Preliminary and Detailed Site Investigation", prepared by Golder Associates (NZ) Limited dated November 2018 and submitted with

the application (Appendix H of the AEE) must be undertaken in accordance with a Remediation Action Plan (RAP). The RAP must be prepared and submitted to the SDC Manager and the Canterbury Regional Council (CRC) prior to the remediation works commencing.

76. The material identified in condition 75 may be reused in the construction of earth bunds on the site or for rehabilitation of the base of the quarry excavation only if it is identified as being suitable for that purpose in accordance with the RAP prepared under condition 75.

77. The excavation of the material identified in conditions 75 and 76 must be supervised and validated by a Suitably Qualified and Experienced Practitioner (SQEP) as defined in the NES Contaminated Land Users' Guide (MfE 2012). On completion of the works, the consent holder must submit a site validation report to the SDC Manager.

78. Prior to undertaking *quarrying activities* in identified HAIL locations, the consent holder must remove any contaminated soils. Validation sampling of the underlying soils must be completed, to determine the land can be suitably reinstated for rural residential land use, upon the completion of *quarrying activities*.

79. An unexpected discovery protocol must be prepared to address the potential for uncovering of contaminated soil/materials during earthworks and extraction, and must be applicable to all *quarry activities*.

80. If soils are found that have visible staining, odours and/or other conditions that indicate potential soil contamination, then work must cease and all workers must vacate the immediate area, notify the site manager and ensure that the local authorities are informed (via Selwyn District Council and the Environment Canterbury pollution hotline on 0800 76 55 88). No excavation of such soil must occur without advice from a SQEP on land contamination and the agreement of the SDC and CRC.

Rehabilitation

81. Each stage of aggregate extraction, with the exception of any active haul roads, must be rehabilitated within six months of the completion of clean filling. Rehabilitation must include, but is not limited to:
    a) Reshaping the clean filled areas;
    b) Spreading topsoil over the reshaped clean fill to a minimum depth of 300 millimetres (mm);
    c) Sowing the top soiled areas with a suitable grass species or another suitable vegetative cover; or
    d) If rehabilitation occurs outside of spring or autumn, covering the top soiled area with mulch or another form of material to suppress dust from the area until it is appropriate to sow grass or another suitable vegetative cover; and
    e) Undertaking all reasonably practicable measures to prevent dust emissions from the rehabilitated area, including but not limited to watering of exposed soil.

82. All rehabilitated surfaces must be designed and constructed to be free draining and the final rehabilitated ground level must not be above the ground level that existed prior to *quarrying operations* commencing.

83. Rehabilitated areas must be monitored and maintained to ensure they are free draining and have a suitable grass or other vegetative cover for a period of 24 months following the completion of rehabilitation.

84. The final internal slopes of the quarry must vary between 1V:3H and 1V:6H with an irregular form to avoid a linear, uniform appearance of the slopes and to create a more natural appearance.

85. Prior to the expiry of this consent the perimeter bunds are to be removed as part of the rehabilitation works. The edge treatment plantings must remain until grass cover has established over any disturbed

land.

86. At least one month prior to the commencement of any *quarry activities*, the consent holder must submit a Quarry Rehabilitation Plan (QRP) to the SDC Manager for certification. The purpose of the QRP is to detail:
    a) The progressive rehabilitation of the site through the stages of extraction; and
    b) The methods that will be used to comply with conditions 81 to 85.

87. The QRP must be in general accordance with the draft QRP submitted to the Selwyn District Council in November 2018 and, as a minimum, must include the following:
    a) A description of the proposed rehabilitation works including:
        i) The proposed final landform;
        ii) Whether cleanfill or other material will be used in the rehabilitation;
        iii) The type of land uses that the rehabilitated quarry could support following rehabilitation;
        iv) The patterns of surface drainage and any subsoil drains; and
        v) Any landscaping and planting;
    b) A program and timescales for progressive rehabilitation;
    c) Measures proposed to mitigate any potential adverse effects arising from undertaking rehabilitation;
    d) Measures to mitigate potential ongoing adverse effects on the stability of adjoining land and its susceptibility to subsidence and erosion; and
    e) A process for review of the QRP.

88. Rehabilitation of the site must be undertaken in accordance with the certified QRP and implemented at the completion of each stage of quarry activities.

89. Hours of operation for rehabilitation work must comply with condition 28 Table 1.

90. The QRP must be reviewed by the consent holder annually to assess the need for it to be updated. If the QRP is to be updated the consent holder must consider the following matters:
    a) The rehabilitation activities undertaken during the previous 12 months;
    b) Areas of the site to be quarried (aggregate extraction) over the next 12 months;
    c) Plans for earthworks, including overburden stripping and disposal, over the next 12 months; and
    d) Areas of vegetation removed and areas planted during the previous 12 months.

91. In addition to QRP updates undertaken under condition 90, an update must also be undertaken if:
    a) There is a fundamental shift in *quarrying operations* relative to those contemplated at the time the QRP was last reviewed (e.g. an unscheduled move to a new area); or
    b) A significant environmental incident occurs (e.g. flooding on the site causing damage to assets).

Consultation

92. The consent holder must establish a Community Liaison Group (CLG) in accordance with the following requirements:
    a) The purpose of the CLG must include, but not be limited to, the following:
        i) To engage on an on-going and regular basis about matters associated with the *quarrying operations;*
        ii) To promote the flow of information between the local community and the consent holder so as to, wherever possible, address any issues that may arise; and

iii) To discuss the results of monitoring and any matters that may arise as a result of the monitoring.

b) The CLG must initially comprise up to two representatives of the consent holder and the consent holder must invite one representative of the Selwyn District Council, one representative of the Canterbury Regional Council, one representative of the Templeton Residents Association (TRA), one representative of the Weedon's Residents Association (WRA), one representative of the New Zealand Motor Caravan Association Incorporated, one representative of Southern Woods Nursery, and representatives of the relevant Kaitiaki Rūnanga.

Advice Note: *This condition only governs initial membership for the purposes of convening the first meeting of the CLG. On-going membership will be determined by the CLG.*

c) The consent holder must ensure that members of the CLG are provided with the opportunity and facilities to meet:

i) At least 30 working days prior to the start of any *site preparation* activities; and

ii) Not less frequently than quarterly during the first year of *quarrying operations* and biannually thereafter, unless all members of the CLG agree there is no need for a meeting;

d) If the consent holder, in progressing any element of the quarry, wishes to call a meeting of the CLG to obtain community input, the meeting regime may be shifted to accommodate such a request;

e) The time, date and venue of proposed meetings must be notified to members of the CLG;

f) Minutes of the CLG meetings must be kept by the consent holder and be made publicly available; and

g) Members of the CLG must be provided with copies of any draft management plan and be invited to provide written comments on the contents of the plan within 10 working days. In conjunction with submitting a management plan for certification to SDC or CRC, the consent holder must report on how any feedback provided by CLG members has been incorporated or not into each management plan.

93. The consent holder must engage an independent chairperson to facilitate CLG meetings.

94. The consent holder must meet the reasonable administrative costs of the CLG meetings (e.g. meeting invitations; meeting venue; preparation of meeting minutes) and facilitation of meetings by an independent chair.

Advice Note: *In the event that it is not possible to establish a CLG or convene meetings through lack of interest or participation from the local community, then such failure to do so will not be deemed a breach of these conditions. Should the local community wish to re-establish meetings after a period of inactivity then the conditions above shall continue to apply.*

Accidental Discovery Protocol

95. Immediately following the discovery of material suspected to be a taonga, kōiwi or Māori archaeological site, the following steps must be taken:

a) All work in the vicinity of the discovery must cease and the SDC Manager advised;

b) Immediate steps must be taken to secure the site to ensure the archaeological material is not further disturbed;

i) The consent holder must notify the Kaitiaki Rūnanga and the Area Archaeologist Heritage New Zealand Pouhere Taonga (in the case of kōiwi (human remains) the New Zealand Police must also be notified).

Advice Note: *The Kaitiaki Rūnanga and HNZPT will jointly appoint a qualified archaeologist who will confirm the nature of the accidentally discovered material*.

ii) If the material is confirmed as being archaeological, the consent holder must ensure that an archaeological assessment is carried out by a qualified archaeologist, and if appropriate, an archaeological authority is obtained from HNZPT before work resumes (as per the Heritage New Zealand Pouhere Taonga Act 2014).

iii) The consent holder must consult the Kaitiaki Rūnanga on any matters of tikanga (protocol) that are required in relation to the discovery and prior to the commencement of any investigation.

iv) If kōiwi (human remains) are uncovered, in addition to the steps above, the area must be treated with utmost discretion and respect, and the kōiwi dealt with according to both law and tikanga, as guided by the Kaitiaki Rūnanga.

v) Works in the site area must not recommence until authorised by the Kaitiaki Rūnanga, the Heritage New Zealand Pouhere Taonga (and the NZ Police in the case of kōiwi) to ensure that all statutory and cultural requirements have been met.

vi) The consent holder must notify SDC prior to the recommencement of work, and copies of all relevant authorisations must be provided to the SDC Manager.

Advice Notes: *It is expected that all parties will work towards work recommencing in the shortest possible time frame while ensuring that any archaeological sites discovered are protected until as much information as practicable is gained and a decision regarding their appropriate management is made, including obtaining an archaeological authority under the Heritage New Zealand Pouhere Taonga Act 2014 if necessary. Appropriate management may include recording or removal of archaeological material.*

Although bound to uphold the requirements of the Protected Objects Act 1975, the consent holder recognises the relationship between Ngāi Tahu whānui, including its Kaitiaki Rūnanga, and any taonga (Māori artefacts) that may be discovered.

Reporting and Review

96. The consent holder must maintain a Complaints Register. The Complaints Register must include details of when a complaint was received, the steps taken by the consent holder to investigate the complaint, and any steps taken to address the issue(s) raised. The complaints register must be provided to the SDC Manager annually, and otherwise must be available to the SDC Manager on request.

97. Records of all staff training relevant to compliance with conditions of this consent must be retained on site and provided to the SDC Manager upon request.

98. The Selwyn District Council may, during the month of May or November each year, review any or all of the conditions of the consent pursuant to section 128 of the Resource Management Act 1991 for all or any of the following purposes:
    a) To deal with any adverse effect on the environment which may arise from the exercise of the consent that was not foreseen at the time of granting of the consent, and which is therefore more appropriate to deal with at a later stage; and/or
    b) To require the consent holder to adopt the best practical option to remove, remediate or reduce any adverse effects on the environment resulting from the activity; and/or
    c) To review the noise limits and any adverse effects resulting from heavy vehicle traffic associated with *quarry activities*, including measures to manage heavy vehicle traffic flows not foreseen at the time of granting of the consent; and/or
    d) To review the methodology of *quarry activities* should adverse noise, dust or nuisance effects become an issue; and/or
    e) To require consistency with any relevant Regional Plan, District Plan, National Environmental Standard, Water Conservation Order or Act of Parliament.

Additional Advice Notes

Monitoring

a) In accordance with section 36 of the Resource Management Act 1991, the Council's specialised monitoring fee will be charged.

b) If the conditions of this consent require any reports or information to be submitted to the Council, additional monitoring fees for the review and certification of reports or information will be charged on a time and cost basis. This may include consultant fees if the Council does not employ staff with the expertise to review the reports or information.

c) Where the conditions of this consent require any reports or information to be submitted to the SDC Manager please forward to the Council's Compliance and Monitoring Team compliance@selwyn.govt.nz

d) Any additional monitoring due to non-compliance with the conditions of the resource consent will be charged to the consent holder as an additional monitoring fees on a time and cost basis.

Realignment of Roads and Road Stopping

f) The physical formation of public roads will need to be approved by the relevant territorial local authority depending on which option is to be constructed. Railway crossing changes will also require the approval of KiwiRail Ltd. Road stopping approvals under Section 342 and Schedule 10 of the Local Government Act 1974 or section 116 and 117 of the Public Works Act may also be necessary

Vehicle Crossings

g) Any new or upgraded vehicle crossing requires a vehicle crossing application from Council's Assets Department prior to installation. For any questions regarding this process please contact transportation@selwyn.govt.nz. You can use the following link for a vehicle crossing information pack and to apply online: http://www.selwyn.govt.nz/services/roading/application-to-form-a-vehicle-crossing-entranceway

Building Act

h) This consent is not an authority to build or to change the use of a building under the Building Act. Building consent will be required before construction begins or the use of the building changes.

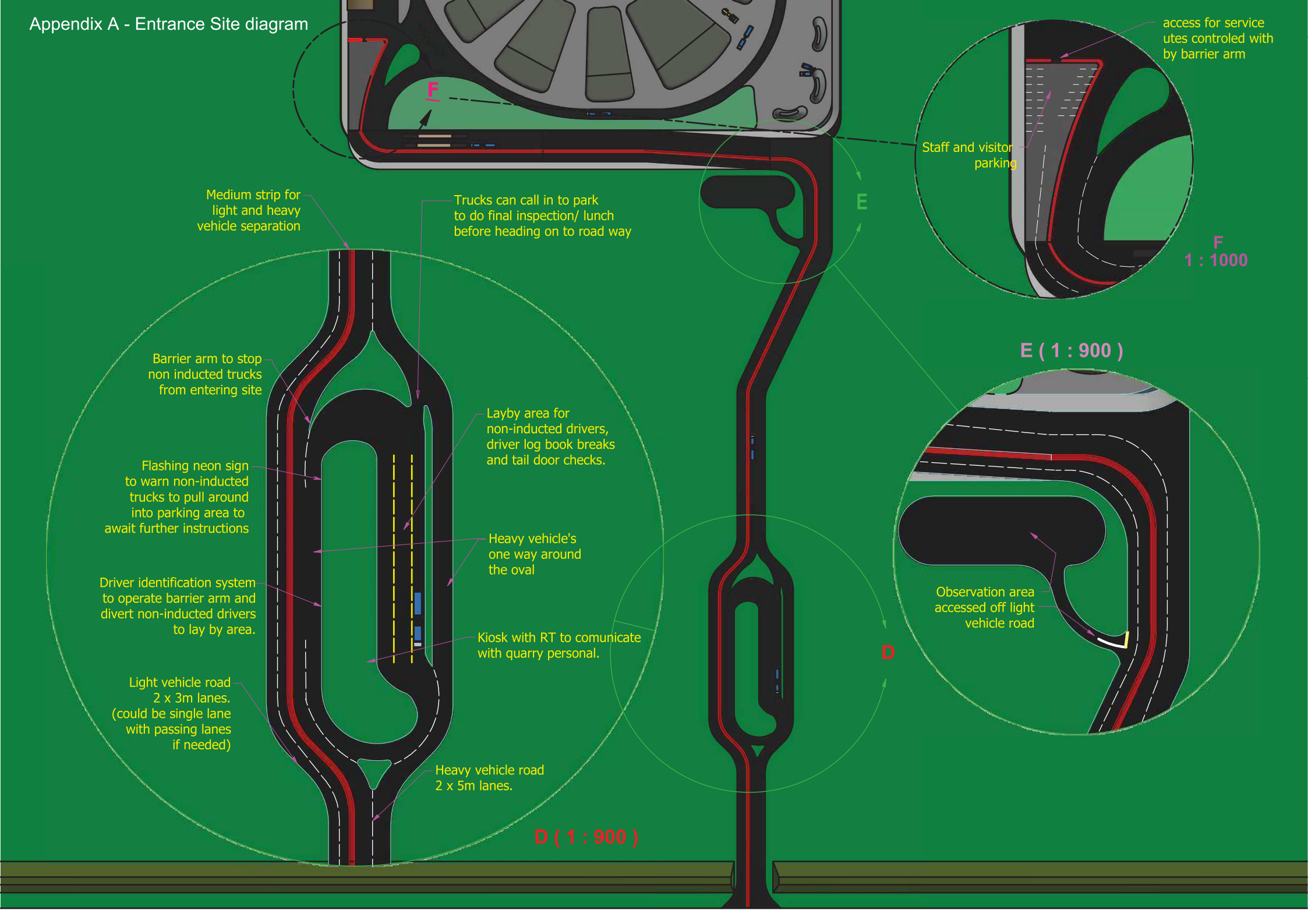
Impact on Council Assets

i) Any damage to fixtures or features within the Council road reserve that is caused as a result of construction or demolition on the site must be repaired or reinstated and the expense of the consent holder.

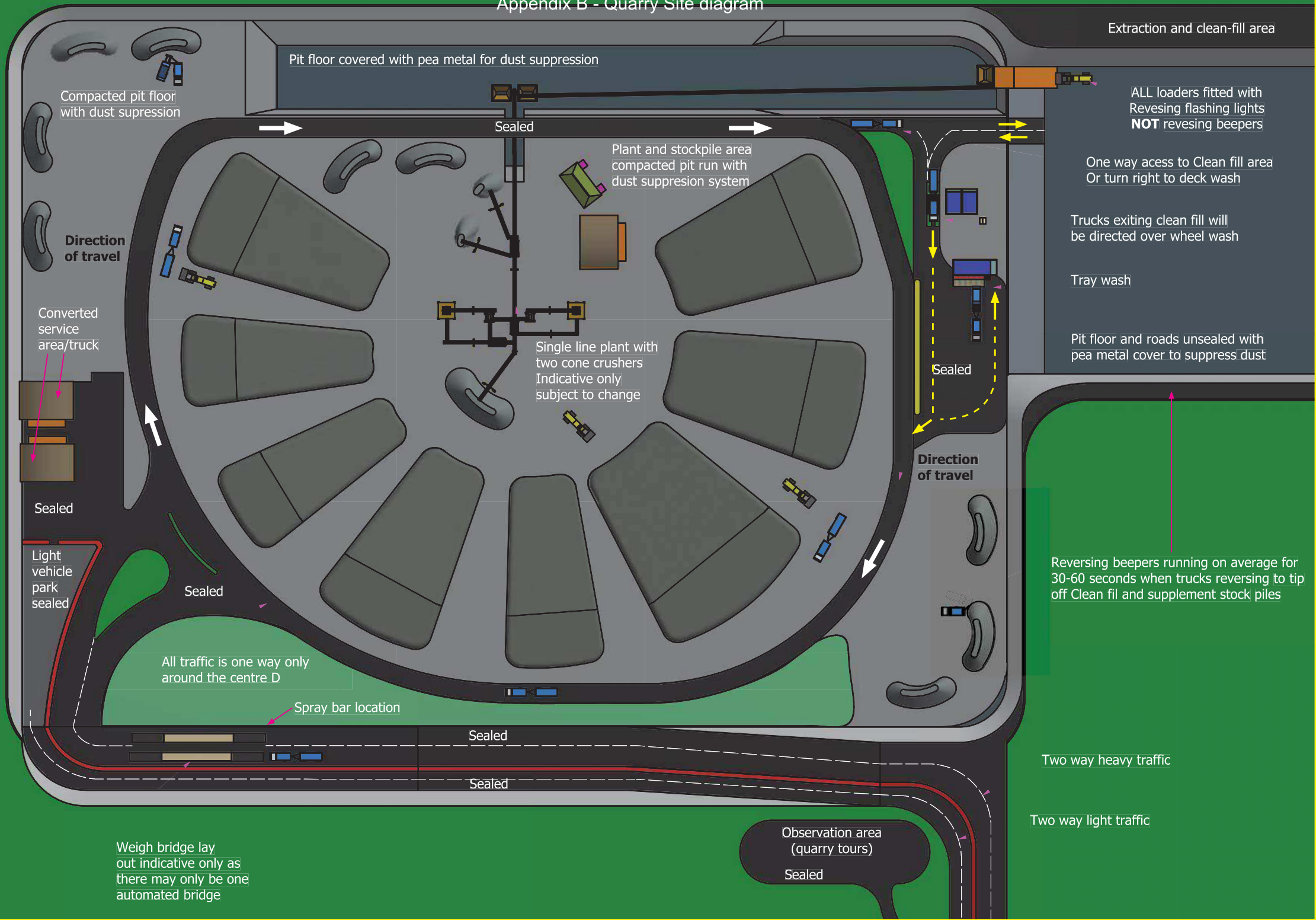
Property Access

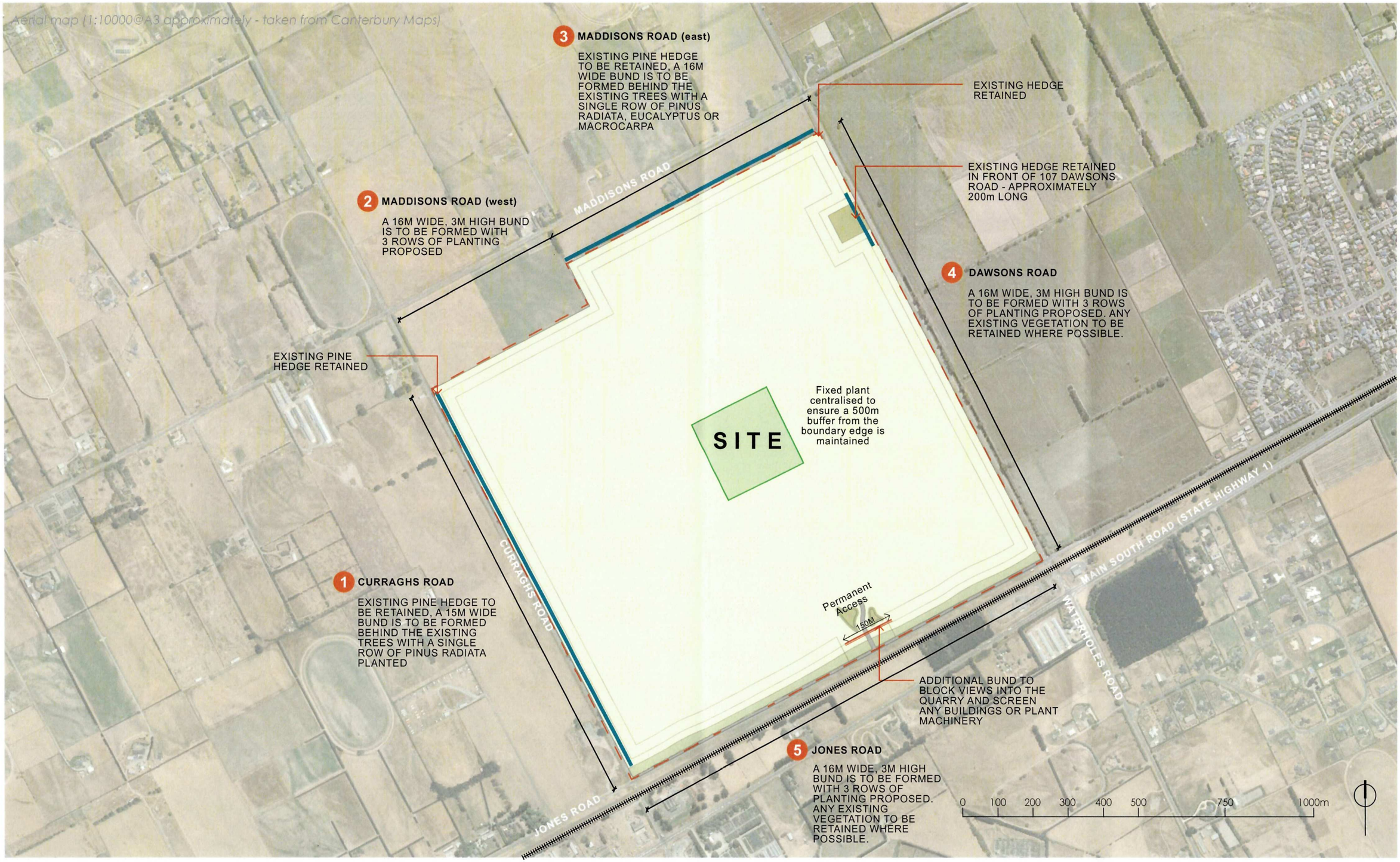
j) Access by the Council's Officers or its agents to the property is reserved pursuant to Section 332 of the Resource Management Act 1991.

Appendix A - Entrance Site diagram



Appendix B - Quarry Site diagram





Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	**Revision no:**	**Amendment**	**Approved**	**Date**
Drawing name:	**EDGE TREATMENTS**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	1:10000				

DCM URBAN DESIGN LIMITED
3/329 DURHAM STREET NORTH
CHRISTCHURCH 8013
WWW.DCMURBAN.COM
021 114 0337

Project no / drawing no: **2017_031 / 0100**

Revision: **A**

A. EDGE TREATMENTS AND WALKING TRACK ROUTE

Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	Revision no:	Amendment	Approved	Date
Drawing name:	**EDGE TREATMENTS AND WALKING TRACK ROUTE**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	1:10000				

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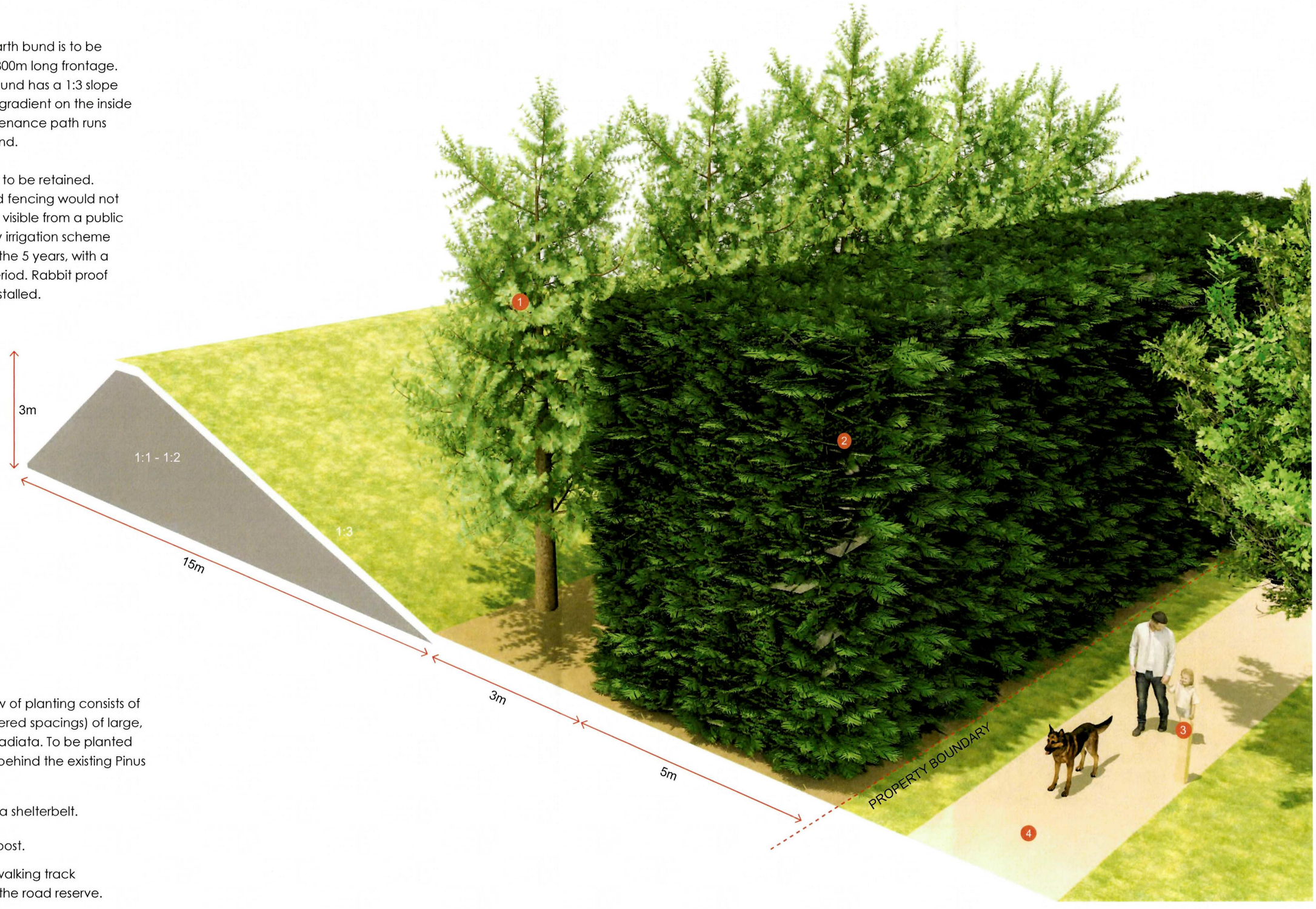
Project no / drawing no: **2017_031 / 0101**

Revision: **A**

A 3m high, 15m wide earth bund is to be constructed along this 800m long frontage. The outer edge of the bund has a 1:3 slope with a variable 1:2 - 1:1 gradient on the inside slope. A 1m wide maintenance path runs along the top of the bund.

Existing farm fences are to be retained. Security or closed board fencing would not be permitted where it is visible from a public viewpoint. A temporary irrigation scheme would be operated for the 5 years, with a 2 year establishment period. Rabbit proof shields would also be installed.



1. Row 1: the inner row of planting consists of a single row (staggered spacings) of large, fast growing Pinus radiata. To be planted approximately 3m behind the existing Pinus radiata shelterbelt.
2. Existing Pinus radiata shelterbelt.
3. Kilometre marking post.
4. Unsealed running/walking track constructed within the road reserve.

Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	Revision no:	Amendment	Approved	Date
Drawing name:	**EDGE TREATMENT A - CURRAGHS ROAD**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	NTS				

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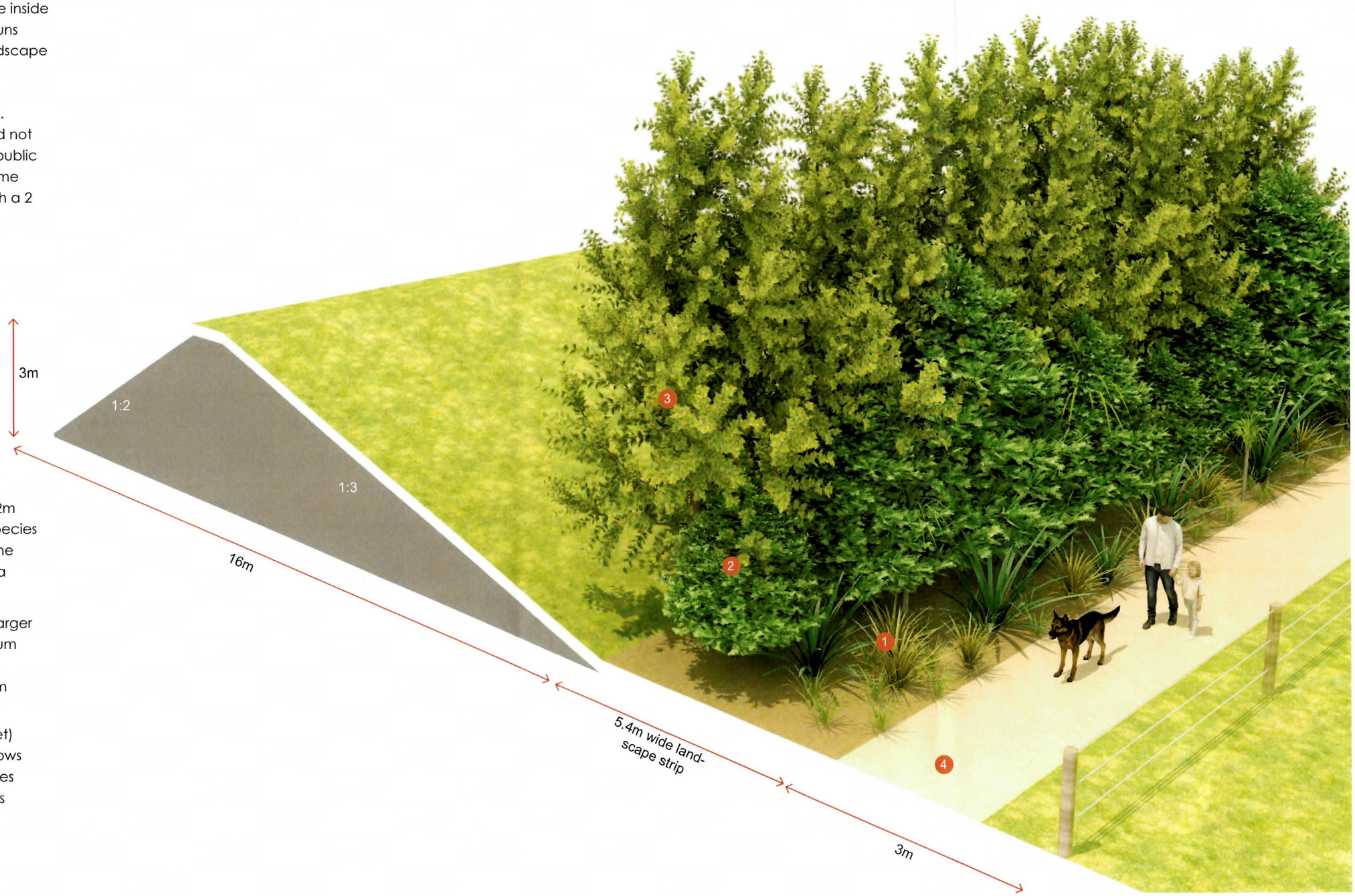
Project no / drawing no: **2017_031 / 0102**

Revision: **A**

A 3m high, 16m wide earth bund is to be constructed along this 660m long boundary. The outer edge of the bund has a 1:3 slope (18.4°) with a 1:2 (26.6°) gradient on the inside slope. A 1m wide maintenance path runs along the top of the bund. A 5.4m landscape strip is to be planted next to the bund.

Existing farm fences are to be retained. Security or closed board fencing would not be permitted where it is visible from a public viewpoint. A temporary irrigation scheme would be operated for the 5 years, with a 2 year establishment period.



1. Row 1: the outer row of planting, 2m wide, consists of a mix of native species at 1.0m centres including, Cordyline australis, Phormium tenax, Poa cita amongst others.
2. Row 2: consists of a single row of larger native species including Pittosporum tenuifolium, Hoheria sextylosa, Plagianthus regius and Pittosporum eugenioides.
3. Rows 3 and 4: the inner rows (offset) of planting consists of two single rows of large, fast growing exotic species including Pinus radiata, Eucalyptus cordata, Hoheria augustifolia, Plagianthus regius and Cupressus Macrocarpa at 2m centres.
4. Unsealed running/walking track.

Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	Revision no:	Amendment:	Approved:	Date:
Drawing name:	**EDGE TREATMENT B - MADDISONS ROAD (WESTERN SECTION)**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	NTS				

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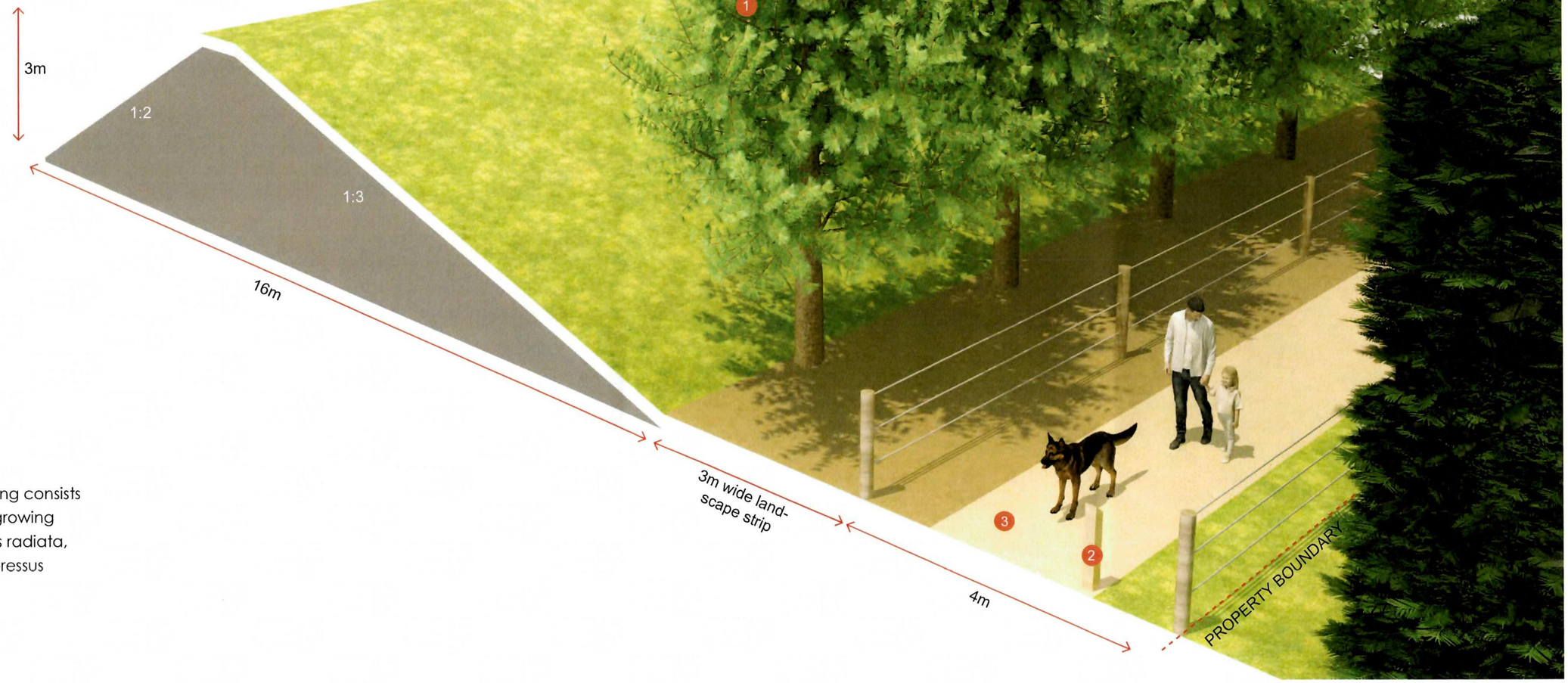
Project no / drawing no: **2017_031 / 0103**

Revision: **A**

A 3m high, 16m wide earth bund is to be constructed along this 800m long boundary. The outer edge of the bund has a 1:3 slope (18.4°) with a 1:2 (26.6°) gradient on the inside slope. A 1m wide maintenance path runs along the top of the bund.

Existing farm fences are to be retained. Security or closed board fencing would not be permitted where it is visible from a public viewpoint. A temporary irrigation scheme would be operated for the 5 years, with a 2 year establishment period. Rabbit proof shields would also be installed.



1. Row 1: the inner row of planting consists of a single row of large, fast growing exotic species including Pinus radiata, Eucalyptus cordata and Cupressus Macrocarpa.
2. Kilometre marking post.
3. Unsealed running/walking track.

Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	Revision no:	Amendment:	Approved:	Date:
Drawing name:	**EDGE TREATMENT C - 319 MADDISONS ROAD (EASTERN EDGE)**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	NTS				

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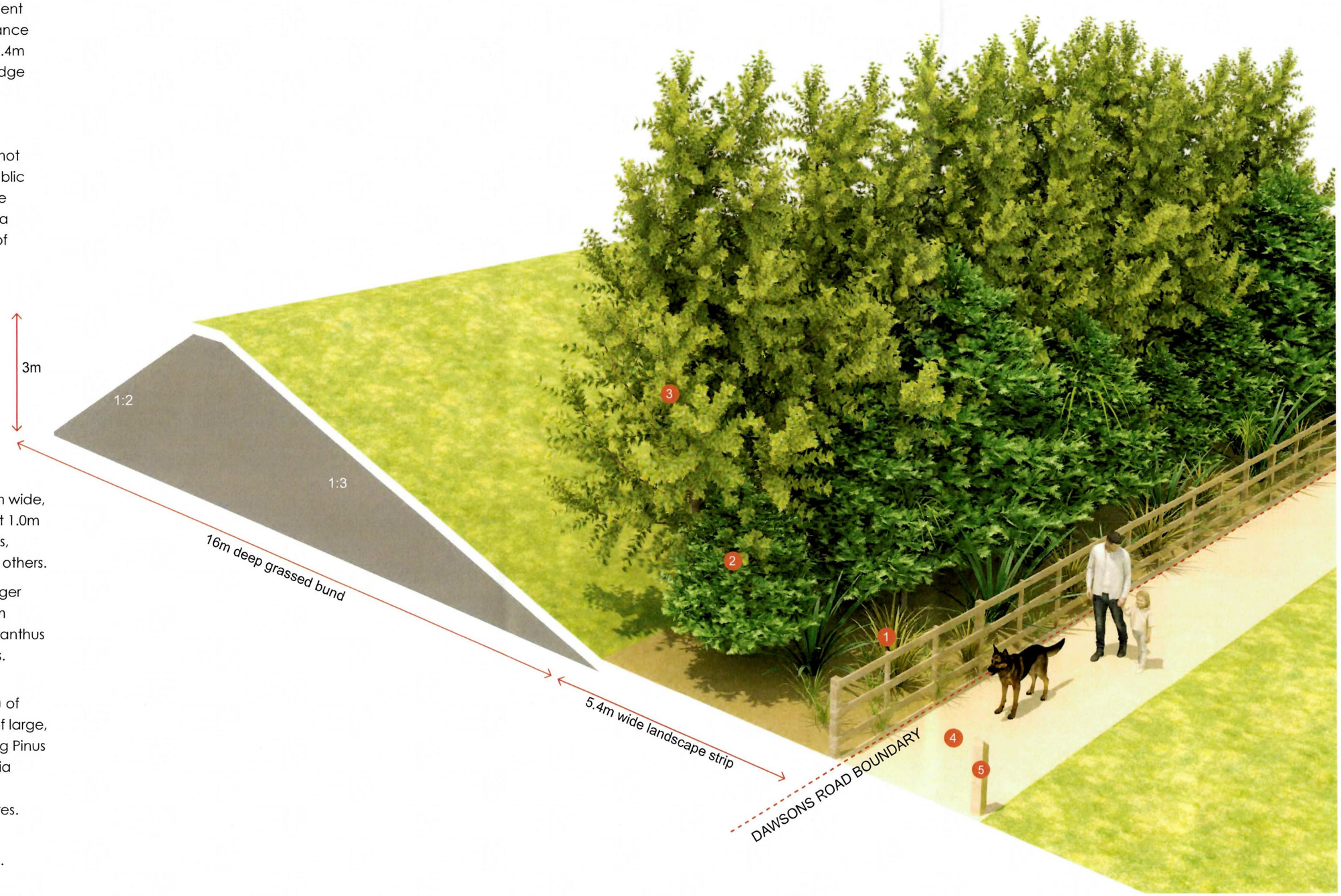
Project no / drawing no: **2017_031 / 0104**

Revision: **A**

A 3m high, 16m wide earth bund is to be constructed along the Dawsons Road frontage . The outer edge of the bund has a 1:3 slope (18.4°) with a 1:2 (26.6°) gradient on the inside slope. A 1m wide maintenance path runs along the top of the bund. A 5.4m landscape strip runs along the outside edge of the bund.

Existing farm fences are to be retained. Security or closed board fencing would not be permitted where it is visible from a public viewpoint. A temporary irrigation scheme would be operated for the 5 years, with a 2 year establishment period. Rabbit proof shields would also be installed.



1. Row 1: the outer row of planting, 2m wide, consists of a mix of native species at 1.0m centres including, Cordyline australis, Phormium tenax, Poa cita amongst others.
2. Row 2: consists of a single row of larger native species including Pittosporum tenuifolium, Hoheria sextylosa, Plagianthus regius and Pittosporum eugenioides.
3. Rows 3 and 4: the inner rows (offset) of planting consist of two single rows of large, fast growing exotic species including Pinus radiata, Eucalyptus cordata, Hoheria augustifolia, Plagianthus regius and Cupressus Macrocarpa at 2m centres.
4. Unsealed running/walking track constructed within the road reserve.
5. Kilometre marking post.

Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	**Revision no:**	**Amendment:**	**Approved:**	**Date:**
Drawing name:	**EDGE TREATMENT D - DAWSONS ROAD**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	NTS				

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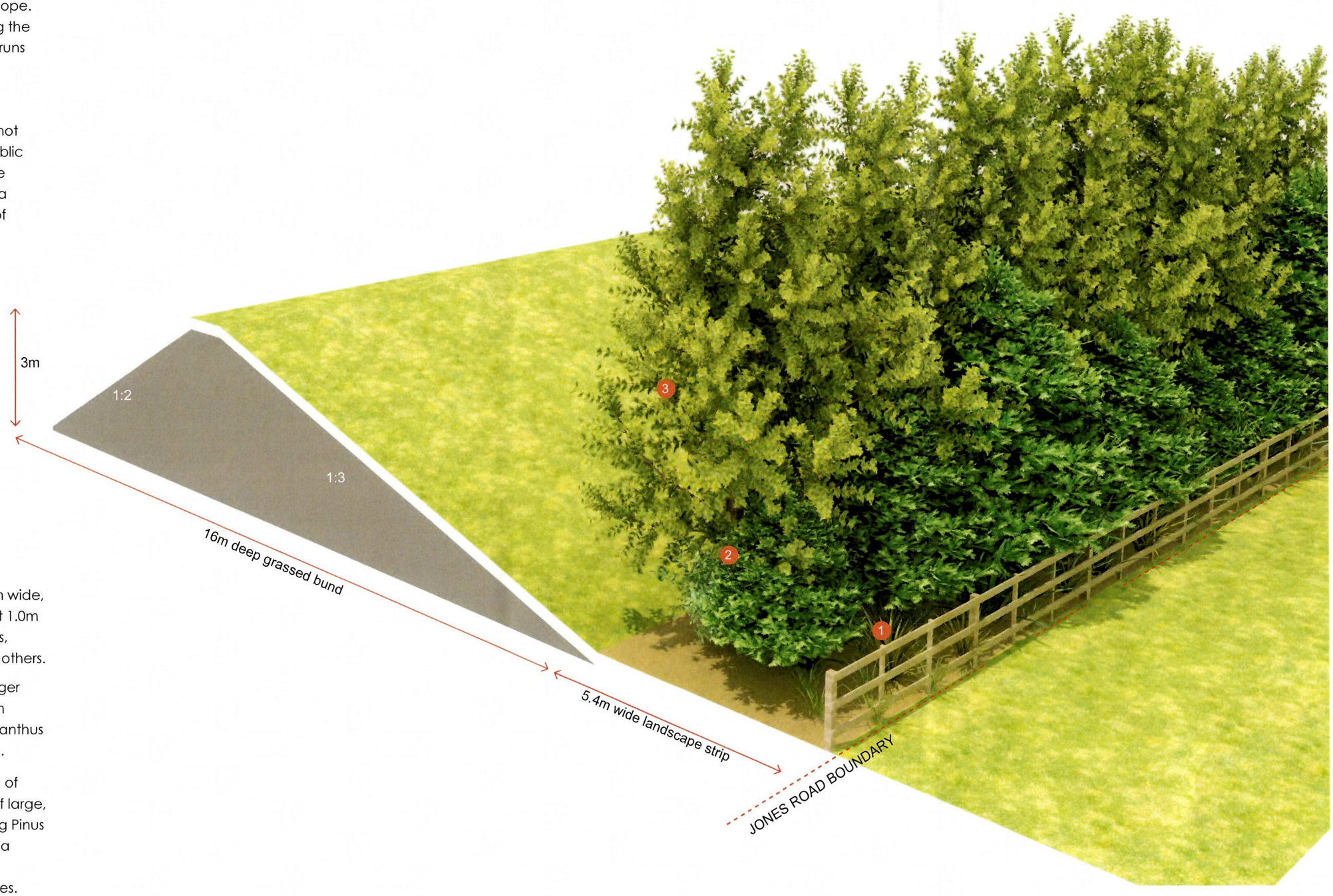
Project no / drawing no: **2017_031 / 0105**

Revision: **A**

A 3m high, 16m wide earth bund is to be constructed along Jones Road frontages . The outer edge of the bund has a 1:3 slope (18.4°) with a 1:2 (26.6°) gradient on the inside slope. A 1m wide maintenance path runs along the top of the bund. A 5.4m landscape strip runs along the outside edge of the bund.

Existing farm fences are to be retained. Security or closed board fencing would not be permitted where it is visible from a public viewpoint. A temporary irrigation scheme would be operated for the 5 years, with a 2 year establishment period. Rabbit proof shields would also be installed.



1. Row 1: the outer row of planting, 2m wide, consists of a mix of native species at 1.0m centres including, Cordyline australis, Phormium tenax, Poa cita amongst others.
2. Row 2: consists of a single row of larger native species including Pittosporum tenuifolium, Hoheria sextylosa, Plagianthus regius and Pittosporum eugenioides.
3. Rows 3 and 4: the inner rows (offset) of planting consist of two single rows of large, fast growing exotic species including Pinus radiata, Eucalyptus cordata, Hoheria augustifolia, Plagianthus regius and Cupressus Macrocarpa at 2m centres.

Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	**Revision no:**	**Amendment:**	**Approved:**	**Date:**
Drawing name:	**EDGE TREATMENT E - JONES ROAD**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	NTS				

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Project no / drawing no: **2017_031 / 0106**

Revision: **A**

A. CONCEPT PERSPECTIVE

Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	Revision no:	Amendment:	Approved:	Date:
Drawing name:	**DAWSONS/JONES ROAD 3 WAY ROUNDABOUT**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	NTS				

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Project no / drawing no: **2017_031 / 0107**

Revision: **A**

A. CONCEPT PERSPECTIVE

Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	**Revision no:**	**Amendment:**	**Approved:**	**Date:**
Drawing name:	**VIEWING PLATFORM**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	NTS				

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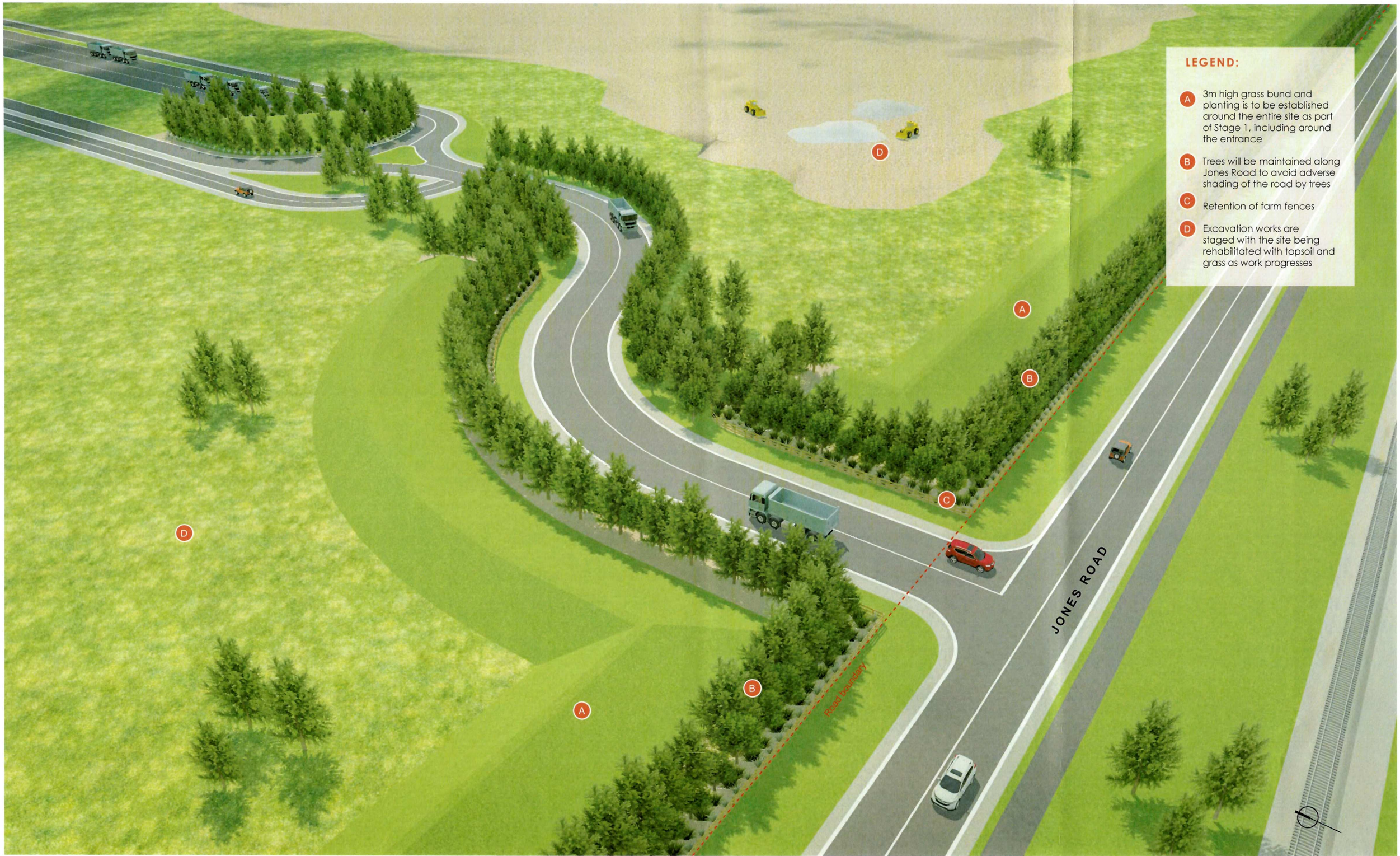
Project no / drawing no: **2017_031 / 0108**

Revision: **A**



Client / project name:	FULTON HOGAN / ROYDON QUARRY TRACK	**Revision no:**	**Amendment:**	**Approved:**	**Date:**
Drawing name:	**MITIGATION MEASURES DURING OPERATION**				
Designed by:	Dave Compton-Moen / Tom Morrison				
Drawn by:	TOM MORRISON				
Original issue date:	5 DECEMBER 2019				
Scales:	NTS				

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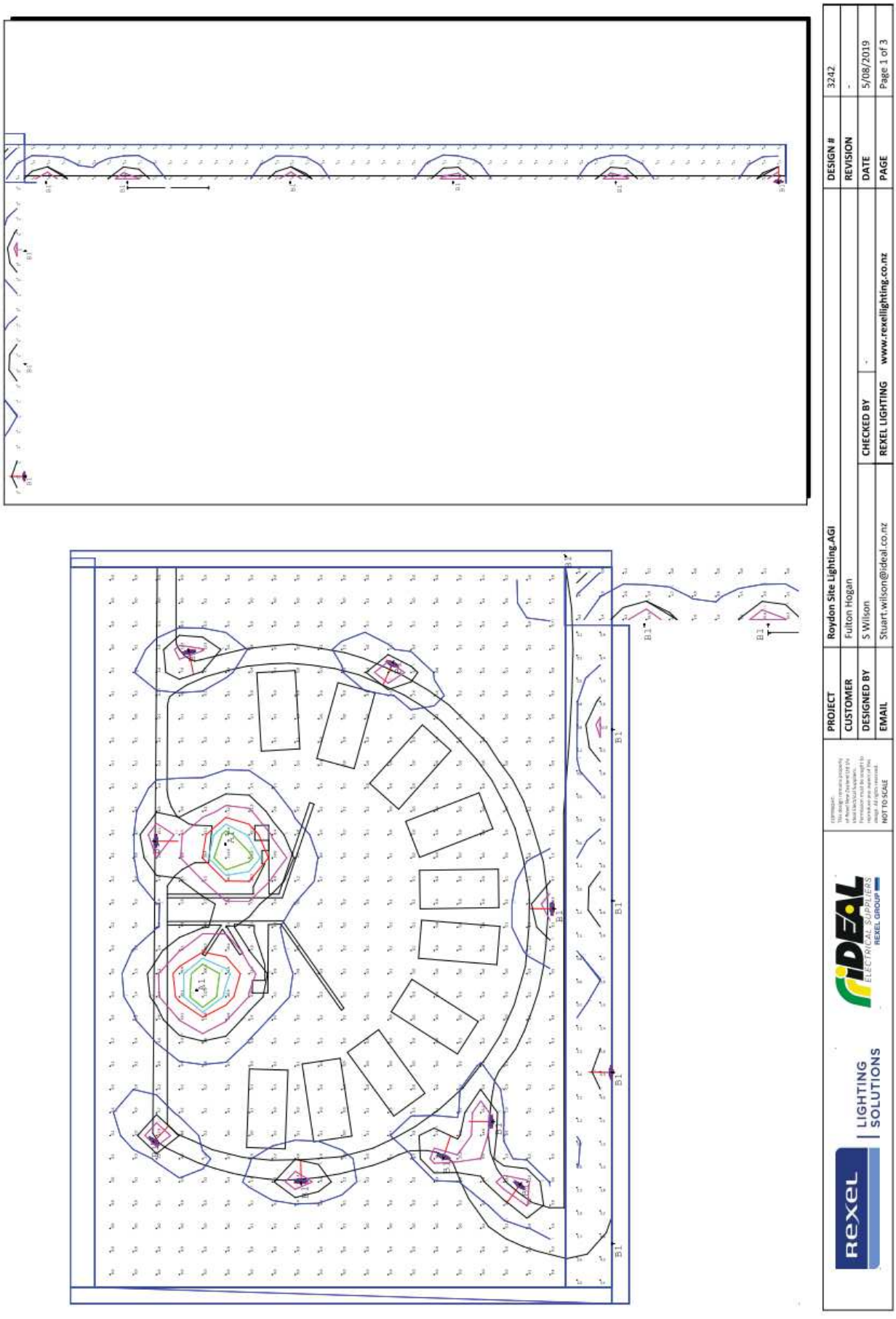
Project no / drawing no: **2017_031 / 0109**

Revision: **A**

10.3 Appendix C – Ideal Supplies Ltd. Lighting Design



Render Image - View Name : RenderViewpoint_3

Render Image - View Name : RenderViewpoint_5

Render Image - View Name : RenderViewpoint_4

PROJECT	Roydon Site Lighting.AGI	DESIGN #	3242
CUSTOMER	Fulton Hogan	REVISION	-
DESIGNED BY	S Wilson	CHECKED BY	-	DATE	5/08/2019
EMAIL	Stuart.wilson@ideal.co.nz	REXEL LIGHTING	www.rexellighting.co.nz	PAGE	Page 2 of 3

REXEL | LIGHTING SOLUTIONS

IDEAL ELECTRICAL SUPPLIERS REXEL GROUP

NOT TO SCALE

Luminaire Schedule				
Symbol	Qty	Label	LLF	Description
	20	B1	0.800	Rexel Streetlight 53w - 46050-PRLED539C
	2	A1	0.800	Rexel Floodlight 600w - FL06-600 5000K Ra70 F01602_IE

AS/NZS1680 Compliance Schedule							
Label	CalcType	Units	Avg	Max	Min	Min/Avg	Calc Height (Z)
Object_13_Top_1	Illuminance	Lux	1.66	16.7	0.0	0.00	9
Object_14_Top_1	Illuminance	Lux	2.39	12.0	0.1	0.04	0.195
Pit Calcs	Illuminance	Lux	2.56	112.9	0.0	0.00	0.02

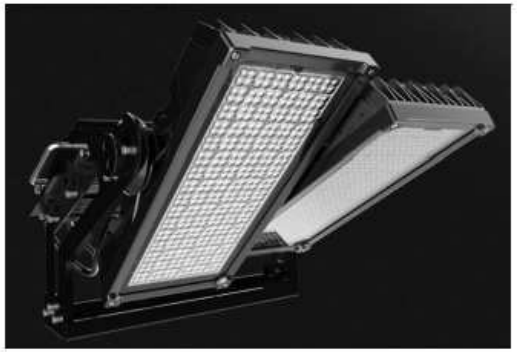
NOTE:

***Type A1 Floodlights to be mounted on 12m floodlight poles.**

***Type B1 to be mounted on 9m streetlight columns with a 1m outreach arm.**

Luminaire Location Summary					
LumNo	Label	X	Y	Orient	Tilt
13	B1	1026736.036	2852945.514	0	0
15	B1	1026736.036	2853052.442	0	0
16	B1	1026736.036	2853159.37	0	0
17	B1	1026736.036	2853266.298	0	0
18	B1	1026736.036	2853373.226	0	0
19	B1	1026736.036	2853426.69	0	0
27	B1	1026767.233	2853461.113	217.736	0
28	B1	1026691.732	2853439.509	89.646	0
29	B1	1026617.723	2853439.509	89.646	0
30	B1	1026543.714	2853439.509	89.646	0
31	B1	1026469.705	2853439.509	89.646	0
33	B1	1026522.433	2853491.256	89.646	0
34	B1	1026505.862	2853513.753	342.075	0
35	B1	1026726.711	2853623.494	190.98	0
36	B1	1026512.742	2853639.392	317.317	0
37	A1	1026642.493	2853607.793	224.453	0
38	A1	1026578.82	2853620.262	308.605	0
41	B1	1026496.119	2853479.721	144.113	0
42	B1	1026614.353	2853464.942	89.646	0
43	B1	1026721.441	2853534.794	155.593	0
44	B1	1026495.067	2853574.806	1.38	0
45	B1	1026643.58	2853638.97	270.003	0

TYPE: B1



TYPE: A1

Design Time: 5hrs

REXEL LIGHTING SOLUTIONS | IDEAL ELECTRICAL SUPPLIERS REXEL GROUP

NOT TO SCALE

PROJECT	Roydon Site Lighting.AGI			DESIGN #	3242
CUSTOMER	Fulton Hogan			REVISION	-
DESIGNED BY	S Wilson	CHECKED BY	-	DATE	5/08/2019
EMAIL	Stuart.wilson@ideal.co.nz	REXEL LIGHTING	www.rexellighting.co.nz	PAGE	Page 3 of 3

pedersen read consulting electrical engineers

GENERAL CONDITIONS applying to resource consents:

- *CRC192408*
- *CRC192409*
- *CRC192410*
- *CRC192411*
- *CRC192412*
- *CRC192413*
- *CRC192414*

Authorised Activities

1. These consents authorise the following list of activities undertaken at 107 Dawsons Road and 220 Jones Road, Templeton, legally described as Rural Section 6475 and Rural Section 6324, Lot 1 Deposited Plan 4031, Rural Section 6342, Section 7 Survey Office Plan 510345, Rural Section 5381 and Section 6 Survey Office Plan 510345, at or about map reference NZTM2000 1555356mE, 5177132mN as shown on Plan CRC192408A, attached to and forming part of these resource consents.
   a) Site preparation, topsoil stripping, overburden removal and storage;
   b) Construction and maintenance of bunds and stockpiles;
   c) Extraction, loading and transportation of material;
   d) Processing of aggregates (including crushing and screening of aggregates);
   e) Combustion products from the operation of 1.04 megawatt of diesel fired generation (up to 4 generators));
   f) Stockpiling of aggregates;
   g) Deposition of cleanfill;
   h) Site rehabilitation; and
   i) Movement of vehicles associated with the above activities.

2. For the purposes of these consents:
   a) *Quarry activities* means the activities listed in condition 1(a) to (i).
   b) *Site preparation* means the activities listed in condition 1(a) and (b).
   c) *Quarrying operations* means the activities listed in condition 1(c) to (i).

3. No *quarry activities* can occur within 200 metres of any dwelling existing as at 30 April 2020 as shown on CRC192408A without the prior written consent of both the owners and occupiers of the dwelling.

4. Aggregate extracted from the site must:
   a) not exceed 625,000 tonnes in any 12-month period; and
   b) must not be processed to produce a product type smaller than AP20.

Prior Notice

5. The consent holder must inform the Canterbury Regional Council, Attention RMA Monitoring and Compliance Manager (the CRC Manager) of the date on which these resource consents are first exercised.

6. At least one month prior to commencement of *quarry activities* authorised by these consents, the consent holder or their agent must arrange and conduct a pre-construction site meeting with the CRC Manager. At a minimum, the following must be covered at the meeting:
   a) Scheduling and staging of the works, including the proposed start date;
   b) Responsibilities of all relevant parties;
   c) Contact details for all relevant parties;
   d) Expectations regarding communication between all relevant parties;

e) Site inspections; and

f) Confirmation that all relevant parties have copies of the contents of these consent documents and all associated management plans.

Preliminary Works

7. The following site management works must be undertaken prior to *quarry activities* commencing:
   a) The perimeter of the quarry site must be surrounded by secure fencing, with lockable access gates;
   b) Warning notices able to be read from a distance of five metres are erected and maintained at all entrances to the site stating as a minimum:
      i) Name of the site;
      ii) Name of the owner of the site and a contact telephone number;
      iii) Groundwater is vulnerable to contamination; and
      iv) Only clean fill may be deposited at this site; general refuse and hazardous waste must not be dumped at this site.

Bund Formation

8. Prior to commencing *quarrying operations,* the consent holder must establish vegetated earth bunds around the site perimeter, with the exception of site accessways, which must remain in place for the duration of *quarrying operations* (excluding final site rehabilitation). The bunds must be compacted to minimise top soil loss and be at least three metres high, with a one metre wide flat top, a base width of 15 metres and an outside slope of no more than 1:3 (one metre vertical to three metres horizontal).

9. As soon as practicable, but within 14 days following their construction, the bunds must be sown or hydro-seeded with grass (or another suitable vegetative cover). Prior to grass (or another vegetative cover) being established on them the bunds must be watered when required to suppress windblown dust. The bunds must thereafter be regularly watered for at least five years to ensure grass (or another vegetative cover) is maintained for the duration of consent with at least 80 percent coverage.

10. To assist in achieving swift grass or vegetative cover, construction of the bunds must take place during the months of May to November inclusive.

Site Rehabilitation

11. Rehabilitation of the site must be undertaken in accordance with the Quarry Rehabilitation Plan (QRP) certified by the Selwyn District Council.

Management Plan Certification Process

12. The following Quarry Management Plans must be submitted to the CRC Manager in electronic and hard copy form for certification at least 40 working days prior to the commencement of *quarry activities*:
   a) Dust Management Plan;
   b) Cleanfill Management Plan;
   c) Spill Management Plan; and
   d) Stormwater Management Plan.

   Advice Note*: The certification process is confined to confirming that a Management Plan adequately gives effect to the relevant Condition(s).*

13. Subject to Conditions 14 and 16 below, works to which a Management Plan relates must not commence until the consent holder has received written certification from the CRC Manager.

14. If the consent holder has not received a response from the CRC Manager within 20 working days of the date of submission under Condition 12, the Management Plan must be deemed to be certified.

15. If the CRC Manager's response is that that they are not able to certify the Management Plan they must provide the consent holder with reasons and recommendations for changes to the Management Plan in writing. The consent holder must consider any reasons and recommendations of the CRC Manager and resubmit an amended Management Plan for certification.

16. If the consent holder has not received a response from the CRC Manager within five working days of the date of resubmission under Condition 15 above, the Management Plan must be deemed to be certified.

Complaints Register

17. The consent holder must maintain a Complaints Register. The Complaints Register must include details of when a complaint was received, the steps taken by the consent holder to investigate the compliant, and any steps taken to address the issue raised. The complaints register must be provided to the CRC Manager annually, and must otherwise be available to the CRC Manager on request.

    For dust complaints the register must must include:

    a) The location where dust was detected by the complainant;
    b) The date and time when dust was detected;
    c) A description of the wind speed and wind direction when the dust was detected by the complainant;
    d) The most likely cause of the dust detected; and
    e) Any corrective action undertaken by the consent holder to avoid, remedy or mitigate the dust detected by the complainant.

Consent Condition Reviews

18. The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of these consents for the purposes of:
    a) Dealing with any adverse effect on the environment which may arise from the exercise of these consents and which it is appropriate to deal with at a later stage;
    b) Amending dust suppression requirements;
    c) Amending suspended particulate (dust) and groundwater monitoring requirements;
    d) Ensuring compliance with any relevant National Environmental Standards; and
    e) Avoiding, remedying, mitigating, off-setting or compensating for any adverse effects on human health arising from suspended particulate matter (including dust and Respirable Crystalline Silica) generated by *quarry activities*.

Consent Lapsing

19. The lapsing date for the purposes of section 125 of the Resource Management Act 1991 is five years from the date of issue of these consents.

Bond

20. Prior to the first exercise of these consents, the consent holder must enter into an enforceable written agreement acceptable to the Canterbury Regional Council, that provides for a bond in favour of Canterbury Regional Council pursuant to sections 108(2)(b) and 108A of the Resource Management Act 1991. The purpose of the bond is to secure the rehabilitation of the site, undertake groundwater monitoring, and undertake remediation of any groundwater contamination resulting from *quarry activities*, in the event of any default by the consent holder.

21. The bond must be a cash bond or bank bond provided by a registered trading bank of New Zealand; acceptable to the Canterbury Regional Council.

22. The bond amount must be sufficient to cover the activities listed in Condition 20.

23. The consent holder must engage suitably qualified and experienced persons to assess the maximum costs of the activities listed in Condition 20 and to subsequently peer review that assessment.

24. The bond amount may be adjusted by the Canterbury Regional Council giving notice on the fifth anniversary of the commencement of these consents and every five years thereafter. The consent holder must provide a report to the Canterbury Regional Council which addresses whether the bond quantum should be revised. The purpose of the adjustment is to reflect changes in the risk profile of the quarry or to the Consumer Price Index. The Canterbury Regional Council must engage a suitably qualified and experienced person to peer review the report and respond within two months of receipt of the report on the appropriateness of any proposed revised bond quantum.

25. If the consent holder and the Canterbury Regional Council cannot agree on the terms of the bond, the dispute must be resolved through an agreed disputes resolution process or referred to arbitration.

26. The costs of, and incidental to, the preparation of all bond documentation, including the Canterbury Regional Council's costs, must be met by the consent holder.

27. If these consents are transferred in part or whole to another party or person, the bond lodged by the transferor must be retained until a replacement bond is entered into by the transferee to ensure compliance with conditions of these consents.

28. For the avoidance of doubt, the enforceable written agreement may provide for the bond to be held after the expiry of these consents.

DISCHARGE PERMIT CRC192410 - TO DISCHARGE CONTAMINANTS INTO AIR FROM AN INDUSTRIAL OR TRADE PREMISE OR PROCESS

General

1. The discharge of contaminants into air beyond the boundary of the site described in General Condition 1 must not be offensive, objectionable, noxious or dangerous.

2. The Quarry Manager, or another nominated person, must be available at all times (including outside quarry operation hours) to respond to dust emission complaints and issues.

Dust Management Plan

3. Prior to the commencement of *quarry activities,* the consent holder must prepare and implement a Dust Management Plan (DMP) for the certification of the CRC Manager. The certified DMP must be retained on site at all times.

4. The exercise of this consent must be undertaken in accordance with the certified DMP. In the event of any inconsistency between the conditions of this consent and the provisions of the DMP, then the conditions of this consent must prevail.

5. The purpose of the DMP is to identify and implement the best practicable option (BPO) for avoiding and minimising the release of particulate matter beyond the boundary of the site, and to provide detail on how the conditions of this consent will be complied with.

6. Prior to submitting the DMP to the CRC Manager the consent holder must have the DMP reviewed by a Suitably Qualified and Experienced Practitioner (SQEP) in air quality to confirm that the measures proposed in the DMP are appropriate to achieve compliance with conditions of this consent and enable the management of discharge of dust beyond the boundary to a level that is not offensive, objectionable, noxious or dangerous.

7. The DMP must include, but not be limited to:
   a) A description of the content and purpose of the DMP;
   b) A description of the dust sources on site;
   c) A description of the receiving environment and identification of sensitive receptors within 250 metres of site boundaries;
   d) The methods (including dust reduction through design methodologies) to be used for controlling dust at each source during *quarry activities*;
   e) A description of site rehabilitation methodology;
   f) A description of dust discharge monitoring requirements and methodology;
   g) A description of procedures for responding to dust and wind condition-based trigger levels specified in Conditions 22 and 23 and associated follow up investigations and recording of findings;
   h) A system for training employees and contractors to make them aware of the requirements of the DMP;
   i) Identifying staff responsible for implementing and reviewing the DMP;
   j) Procedures, processes and methods for managing dust when staff are not on site;
   k) Methods for determining the weather conditions that will trigger a restriction on potentially dusty activities;
   l) A method for recording and responding to complaints from the public;
   m) A maintenance schedule for meteorological and particulate (including PM_{10}) monitoring instruments;
   n) Separate Standard Operating Procedures (SOPs) dedicated to the management of potential dust discharges from specific sources, including but not limited to:
      i) The Central Processing and Stockpiling Area (CPSA) and associated aggregate stockpiles;
      ii) Site roads – sealed and unsealed;

iii) Aggregate excavation and cleanfilling areas;
iv) Top soil and overburden stripping and stockpiling;
v) Bund construction and the recontouring of slopes during rehabilitation;
vi) The automated dust suppression for dust prone areas that can be activated outside of working hours;
vii) Location and calibration of PM_{10}, Respirable Crystalline Silica (RCS) and meteorological monitoring equipment;
viii) Environmental information management for recording, quality assurance, archiving and reporting the quantity and types of data including all ambient environmental data for wind, rainfall-evaporation, PM_{10} concentrations, RCS concentrations, community feedback, and all data required for dust management of the site; and

o) A copy of the SQEP's peer review report required under Condition 6.

8. The DMP (including the SOPs) must be reviewed by a SQEP, at least every two years, to ensure it remains fit for purpose. Any amendments to the DMP must be subject to certification by the CRC Manager in accordance with General Conditions 13 to 16.

Diesel Generator Operation

9. Diesel generators associated with mobile plant must only be used between 7am and 8pm, excluding any warm up and cool down period. The generators must be serviced at least once every year by a person competent in the servicing of such appliances. The servicing must include internal cleaning and replacement or repair of damaged equipment and services as necessary.

Planning of Activities

10. The consent holder must assess weather and ground conditions (wind and likely rainfall) at the start of each day and ensure that applicable dust mitigation measures and methods are ready for use prior to commencing *quarry activities* for the day.

11. The consent holder must take wind direction and speed into account in planning and carrying out work so as to minimise dust dispersion towards any residential dwellings that are within 250 metres of the area where *quarry activities* are planned.

Monitoring

12. Prior to the commencement of *site preparation* activities, a meteorological station must be installed at the site with instruments capable of continuously monitoring, logging in real time and reporting representative metrological data for the site and surrounding area.

13. The instruments specified in Condition 12 must be installed and maintained in accordance with the manufacturer's specifications. The consent holder must keep a record of when maintenance is undertaken, and the type of maintenance undertaken. This record must be provided to the CRC Manager upon request.

14. The instruments must be installed on a mast such that their height is at least four metres above pre-quarrying ground level and in accordance with Australian Standard 2923 – 1987 Ambient Air Guide for Measurement of Horizontal Wind for Air Quality Applications.

15. An alarm to site staff (for example via mobile phone) must be provided if the rolling average wind speed trigger level in Condition 23 is exceeded.

16. Meteorological monitoring must include:
a) Wind speed as 1-minute vector averages with maximum resolution of 0.1 metres per second (m/s), accuracy of at least within +/-0.2 m/s, and a stall speed no greater than 0.5 m/s;
b) Wind direction as 1-minute vector averages with maximum resolution of 1.0 degree and accuracy of at least within +/- 1.0 degree, and a stall speed no greater than 0.5 m/s;

c) Rainfall and evaporation as hourly averages with maximum resolution of 1 mm/day and accuracy that meets standard good industry practice as specified by the National Environmental Monitoring Standards (NEMS) for Rainfall Recording (Version 1.0 June 2013);

d) Screened temperature with accuracy of +/- 0.5 degree; and

e) Humidity (%RH) with accuracy of +/- 5 percent.

17. All meteorological monitoring data must be recorded using an electronic data logging system and be retained for the duration of this consent and provided to the CRC Manager upon request.

18. Prior to the commencement of *quarry activities*, a permanent real-time PM_{10} monitor (US EPA or Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (NESAQ) compliant equipment) must be installed and operated on each of the quarry's northern, eastern, southern and western site boundaries:

a) The eastern site boundary PM_{10} monitor must be located directly adjacent to the centre of the proposed Stage 1 *quarrying operations* area;

b) Each of the site boundary PM_{10} monitors must record hourly and 24-hourly average PM_{10} concentrations; and

c) The consent holder must consult with the CRC Manager regarding the location of each PM_{10} monitor on each of the four site boundaries.

***Advice Note**: The intent of locating a permanent PM_{10} monitor on each site boundary is to provide up-wind and down-wind PM_{10} measurements regardless of wind direction. This intent should be taken into account when locating the monitors on each site boundary.*

19. Prior to the commencement of *site preparation* activities, the consent holder must locate real-time PM_{10} monitors (referred to as the "mobile monitors") on each of the quarry's southern and western site boundaries. On each day that *quarry activities* are undertaken, the mobile monitors must be located directly between the centre of that day's *quarry activities* activities and the nearest downwind off-site sensitive location that is less than 500 metres away from the *site preparation* activities. The two mobile monitors must be of a type that are suitable for dust management but need not meet the standard for NESAQ compliance monitoring. The mobile monitors must be calibrated against one or more of the permanent real-time PM_{10} monitors required under Condition 18.

20. Prior to the commencement of *quarrying operations,* the consent holder must design and implement a Respirable Crystalline Silica (RCS) monitoring programme in consultation with the Canterbury District Health Board (CDHB) and the CRC Manager. The RCS monitoring programme must be:

a) designed to assess compliance with the following standards:

(i) 47 micrograms per cubic metre ($\mu g/m^3$) 1-hour level of RCS;

(ii) 3 $\mu g/m^3$ annual average level of RCS; and

(iii) 25 $\mu g/m^3$ 24-hour average level of $PM_{2.5}$;

at the western edge of the Templeton urban area and at any residential dwelling located within 500 metres of Stage 1 *quarrying operations*;

b) undertaken for at least 12 continuous months;

c) include reporting requirements to the CDHB and the CRC Manager;

d) peer reviewed by a Suitably Qualified and Experienced Practitioner (SQEP), with any recommendations of that practitioner regarding the design or implementation of the programme being adopted; and

e) provided to the CRC Manager for certification prior to being commenced.

21. Within one month of the completion of the RCS monitoring programme, the consent holder must prepare a report outlining the results of the programme and any implications of RCS generated by *quarrying operations* for human health, particular for that of the residents of Templeton and the occupants of any residential dwellings located with 500 metres of Stage 1 *quarrying operations*. The report must be provided to the CRC Manager, the CDHB and members of the Community Liaison Group. The report must also be made publicly

available on the consent holder's webpage (fultonhogan.com or any replacement consent holder's web address).

Dust Mitigation

22. If *quarry activities* cause real time particulate concentrations at the site boundaries to reach or exceed a PM_{10} concentration of 150 micrograms per cubic metre, as a 1-hour average updated every ten minutes, then *quarry activities* must cease and must not resume until additional dust control measures have been implemented.

23. *Quarry activities* (except dust suppression measures) within 250 metres of a sensitive receptor location must not be undertaken when the wind direction (10-minute average) places *quarry activities* directly upwind of the sensitive receptor location and the wind speed reaches or exceeds 7 m/s.

24. If at any time, including outside normal operating hours, visible dust is blowing beyond the site boundary or if the Condition 22 PM_{10} monitoring trigger is breached the consent holder must:
    a) Cease all *quarry activities*;
    b) Continue all dust suppression activities including but not limited to the immediate watering of both active and inactive exposed surfaces;
    c) Investigate possible sources of the dust;
    d) Only resume *quarry activities* (other than dust suppression) once there is no longer visible dust blowing beyond the site boundaries and when the monitoring trigger in Condition 22 is no longer being breached; and
    e) Notify the CRC Manager within one working day of the dust event, including its cause and the dust suppression actions undertaken.

25. The consent holder must take all reasonably practicable measures to minimise the discharge of dust from *quarry activities*, including but not limited to:
    a) Assessing weather and ground conditions (wind and dryness) at the start of each day and ensure that applicable dust mitigation measures and methods are ready for use prior to commencing *quarry activities;*
    b) Taking wind direction and speed into account in planning *quarry activities* to minimise the risk of dust dispersion towards any residential dwellings that are within 250 metres of the site boundary;
    c) During *site preparation*, limiting the height of topsoil, overburden and aggregate stockpiles to no more than three metres above natural ground level;
    d) During *quarrying operations*, locating stockpiles of processed aggregate within the quarry floor area below natural ground level;
    e) Stockpiling processed aggregate products by grade within the quarry floor area;
    f) Not exceeding a maximum aggregate stockpile volume of 200,000 cubic metres at any one time;
    g) Setting back all stockpiles associated with fixed and mobile processing plant in the CPSA at least 500 metres from site boundaries;
    h) Vegetating any long-term stockpiles of topsoil, overburden or unprocessed aggregate;
    i) Spraying stockpiles with water;
    j) Sealing the site access road from Jones Road to the CPSA and sealing the ring road around the CPSA;
    k) Placing a rumble strip and/or wheel wash on the site access road to assist in removing muddy material from vehicle wheels before they exit the site;
    l) Regularly vacuum sweeping sealed roads and yard areas;
    m) Constructing and maintaining unsealed internal roads so that they are comprised of an aggregate base, with surfaces that are graded and free of pot holes;
    n) Using field conveyors as the primary form of transporting aggregate from the active quarry face to the CPSA;
    o) Minimising drop heights when loading trucks, conveyor hoppers and when moving material;

p) Pre-dampening top soil and overburden with a water cart or sprinklers prior to its extraction and removal;

q) Carrying out land stripping and land rehabilitation during favorable weather conditions when winds are below 7 m/s;

r) Locating fixed and mobile processing plant in the CPSA, below natural ground level, and least 500 metres from site boundaries;

s) Operating fixed and mobile processing plant in conjunction with water dust suppression (either sprays or high-pressure fogging system) fixed to the plant or located beside the plant;

t) Establishing and maintaining shelter belt plants around the site boundaries and maintaining existing shelter belts;

u) Ensuring trucks leaving the site with loads of sand or similar fine material have their loads covered and all trucks leaving the site pass under an operational water spray boom;

v) Ensuring all trucks entering the site with loads of cleanfill are covered;

w) Regularly applying dust suppression measures such as reject 'pea gravel' material or water to unsealed haul and access roads during any dry or windy conditions when dust is likely to be discharged from them;

x) Undertaking routine site inspections of visible dust emissions throughout each day of *quarry activities* and electronically logging findings and any dust suppression actions;

y) Using pea gravel, reject gravel, pit run gravel, water or dust suppressants on exposed surfaces (including aggregate extraction areas, stockpiles, internal unsealed roads and loader working areas) as necessary to avoid visible dust plumes extending beyond the site boundary;

z) Maintaining an adequate supply of water and equipment on site for the purposes of dust suppression at all times;

aa) Imposing a speed restriction on all internal roads of 15 kilometers per hour at all times and clearly signposting this limit on all internal roads;

bb) Using water carts as a back-up measure for dust suppression during dry weather; and

cc) Using water from bore M36/0257 on the site together with water stored in tanks or similar vessels for dust suppression purposes.

26. The consent holder must install, operate and maintain an automated dust suppression system for dust prone areas that can be activated remotely outside of working hours when:

a) the PM_{10} trigger level specified within Condition 22 has been exceeded; or

b) when the wind speed reaches or exceeds 7 m/s.

27. Where the take of groundwater from the existing bore (M36/0257) is reduced in accordance with Condition 2(a) or (b) of Water Permit CRC182422, the consent holder must undertake dust suppression measures using the reduced bore take, water storage capacity on site (i.e. water tanks or similar vessels), and if necessary, chemical dust suppressants.

28. Should the ability to take water authorised under Water Permit CRC182422 cease at any time in accordance with Condition 2(c) of CRC182422, the consent holder must cease *quarry activities* until such time when water can be taken again.

PM_{10} Offset

29. Utilising the PM_{10} monitoring data collected under conditions of this consent, together with any other relevant and publicly available air quality monitoring data, the consent holder must obtain reports from a SQEP in air quality assessing compliance with Regulation 17(1) of the Resource Management (National Environmental Standards for Air Quality) Regulations 2004, on at least three occasions, being no later than:

a) One month after the completion of perimeter bund formation;

b) Twelve months after the commencement of Stage 1 aggregate extraction; and

c) Five years after the commencement of Stage 1 aggregate extraction.

30. The reports required under Condition 29 (whether they be draft or final reports) must be provided to the CRC Manager within five working days of their receipt by the consent holder and the reports must at that same time be made publicly available on the consent holder's webpage (fultonhogan.com or any replacement consent holder's web address) and also be provided directly to Community Liaison Group members.

31. Should any of the reports required under Condition 29 conclude that Regulation 17(1) of the Resource Management (National Environmental Standards for Air Quality) Regulations 2004 has been breached by the consent holder's *quarry activities,* then all *quarry activities* (with the exception of dust suppression activities) must cease upon receipt of the reports by the consent holder and must not resume until a Regulation 17(3) compliant PM_{10} offset developed by the consent holder and certified as appropriate by the CRC Manager has been fully implemented.

LAND USE CONSENT CRC192408 and CRC192409 - TO EXCAVATE MATERIAL and TO DEPOSIT CLEANFILL MATERIAL OVER AN UNCONFINED/SEMI-CONFINED AQUIFER

Extraction Depth

1. Prior to undertaking *quarry activities,* the consent holder must establish a surveyed datum point at natural ground level in an area that will not be excavated. This point must thereafter be used to determine the depth of excavation at any point within the site.

2. Prior to the excavation of overburden, the consent holder must survey the site to determine elevations of the natural ground level of the site relative to Mean Sea Level. The survey must be undertaken by a registered surveyor to an accuracy of +/- 50 millimeters vertically and be provided to the CRC Manager.

3. Once aggregate extraction has commenced the consent holder must undertake, at three monthly intervals or otherwise on request from the CRC Manager, a laser level survey of all depths of excavated and filled areas on the site. The survey must be provided to the CRC Manager. The survey is not required if there has been no excavation in the preceding three-month period. Alternative methods for achieving this condition, such as GPS depth technology on excavation machinery may be used subject to approval in writing from the CRC Manager.

4. In February of each year, utilising the survey data obtained under Condition 3, the consent holder must produce a contour map showing the surveyed maximum quarry depth relative to the highest recorded groundwater level for the site derived from the groundwater level data obtained from Condition 6 and provide that map to the CRC Manager.

5. Excavation of aggregate and deposition of cleanfill must only occur where the quarry floor maintains at least one metre separation depth to the highest groundwater level[1]. This must be achieved by ensuring the base of the quarry is no deeper than (unless shallower depths are determined pursuant to Condition 7):
   a) 9.9 metres below natural ground level in the northwest area of the site (42.99 m RL); and
   b) 8.1 metres below natural ground level in the southeast area of the site (33.22 m RL);

   in accordance with the contour plan included as Plan CRC192408B, attached to and forming part of this consent.

Groundwater Level Monitoring

6. For the duration of this consent, the consent holder must monitor and record the groundwater levels daily in the six bores specified below:

   Upgradient

   BX23/0833 (Bore ID DRBH1) - Located at or about map reference: NZTM X and Y 1554612 – 5177022

   BX23/0836 (Bore ID DRBH2) - Located at or about map reference: NZTM X and Y 1554914 – 5177686

   Downgradient

   BX23/0835 (Bore ID DRBH4) - Located at or about map reference: NZTM X and Y 1556077 – 5177047

   BX23/0834 (Bore ID DRBH3) - Located at or about map reference: NZTM X and Y 1555397 – 5176416

   Two additional downgradient monitoring bores to be installed on either the eastern or southern site boundaries at the same depth as the existing four monitoring bores with the location of the additional two bores being subject to the prior written approval of the CRC Manager.

7. Five years after the commencement of aggregate extraction and at five yearly intervals thereafter, based on monitoring data obtained under Condition 6, the consent holder must submit a report to the CRC Manager by a SQEP in groundwater monitoring recommending whether the maximum depth of quarrying specified in Condition 5 should be decreased. Thereafter the depth of quarrying must not exceed any decreased maximum depth of quarrying determined in accordance with the report recommendations.

[1] As defined in the Canterbury Land and Water Regional Plan.

8. Notwithstanding Condition 7, at all times and in all circumstances, the consent holder must limit excavation to one metre above both the highest groundwater level[2] for the site and the highest recorded groundwater level[3] for the site, referenced to the datum point in Condition 1.

9. Should the groundwater water level increase (at times of high-water table) so that the separation is less than one metre between the measured groundwater levels and the current (at that time) ground level within the quarry site (be it the base of the active quarry floor or the ground level of any rehabilitated area), then:
   a) then any machinery (other than that used for applying virgin materials under (b) below) must be moved away from these areas;
   b) the consent holder must apply virgin materials to that area, so as to re-establish a one metre separation distance throughout the quarry site; and
   c) the consent holder must decrease the maximum allowable depth of extraction in conformance with Conditions 7 and 8. The decreased maximum allowable depth of extraction must be reported to the CRC Manager.

   Advice Note: For the purpose of this consent, 'virgin materials' is aggregate that is of comparable quality and composition to aggregate which was excavated.

10. Should groundwater levels rise into the quarry floor during excavation of aggregate or deposition of cleanfill, the consent holder must notify the CRC Manager within 24 hours.

Excavation of Aggregate

11. Following development of the CPSA, excavation of aggregate must commence with extraction in the centre of the site (adjacent to the CPSA) and must occur in a progressive sequence (moving southward and then anticlockwise) generally in accordance with the Plan CRC192408C, attached to and forming part of this consent.

12. *Quarrying operation* areas must be limited at any one time to the maximum area limitations set out in Table 1 below:

Table 1: Open area limits for *quarrying operations*.

Purpose	Area (ha)	Open area requiring dust suppression (ha)
Central processing area, its fixed and mobile processing plant and stockpiles.	7	2
Excavation in process	5	1
Fill and rehabilitation in process	5	2
Site roads – unsealed	5	0
Field conveyor, service lanes	4	0
Total active area	26	5
The above areas exclude the sealed access road(s) and any site buildings.		

[2] As defined in the Canterbury Land and Water Regional Plan.
[3] Derived from the groundwater level data obtained from Condition 6.

Cleanfill Management Plan

13. At least east one month prior to the commencement of any cleanfilling activity, the consent holder must prepare a Cleanfill Management Plan (CMP) prepared in accordance with Section 8.1 and Appendix B of "A Guide to the Management of Cleanfills", Ministry for the Environment, January 2002 and submit it to the CRC Manager for certification.

14. The exercise of this consent must be undertaken in accordance with the certified CMP. In the event of any inconsistency between the conditions of this consent and the provisions of the CMP, then the conditions of this consent must prevail.

15. The CMP must include but not be limited to:
    a) A description of the content and purpose of the CMP;
    b) Details of *quarrying operations* relevant to the deposition of cleanfill material;
    c) The actions to be undertaken to ensure compliance with the conditions of this consent and actions to be undertaken in response to any incident that may adversely affect the environment;
    d) Identifying and providing contact details of the staff member responsible for each action;
    e) The steps to be undertaken to correct incidences of non-compliance with the conditions of this consent;
    f) The specific location of cleanfill placement areas;
    g) A description of operational procedures and monitoring that will be implemented to prevent unauthorised cleanfill material from entering the site;
    h) A list of acceptable and unacceptable cleanfill material;
    i) How rejected cleanfill material will be stored pending its removal to an authorised landfill;
    j) The maximum length of time that rejected material can be stored on site pending its removal;
    k) Construction procedures to ensure the long-term stability of cleanfill areas;
    l) Timetable of works and re-vegetation measures;
    m) Procedures for improving and/or reviewing the CMP; and
    n) Procedures for responding to complaints.

16. The consent holder must ensure that a copy of the certified CMP is held on site at all times and all personnel working on the site are made aware of and have access to it.

17. The certified CMP must be reviewed and updated at least once every two years for the duration of this consent.

18. Any updated version of the CMP must be forwarded to the CRC Manager for certification within 30 days of its review and updating.

Staff Training

19. Specific staff training specified in the CMP must be provided in accordance with Section 8.2.2 of "A Guide to the Management of Cleanfills" (MfE Guide), Ministry for the Environment, January 2002. All records of staff training must be retained on site and provided to the CRC Manager upon request.

20. Annual refresher training must be provided by a SQEP in cleanfill management, as part of the training specified in the CMP.

Cleanfilling

21. Where additional fill is required to be brought to the site for rehabilitation purposes the consent holder must ensure that all material deposited in the excavated area is:
    a) Only material defined as 'cleanfill' as set out in the Advice Note following this condition;
    b) Only material which meets the Canterbury Regional background levels which are described in Canterbury Regional Council, 2007 *Background concentrations of selected trace elements in*

Canterbury soils. Addendum 1: Additional samples and Timaru specific background levels. Environment Canterbury Report R07/1/2, Trace Elements Level 2: Regional – Recent for Heavy Metals;

c) Not deposited into groundwater and is at least one metre above the highest groundwater level as determined under conditions of this consent;

d) Assessed against the cleanfill acceptance criteria and inspected and deposited in accordance with the procedures contained in the certified CMP required under Condition 13;

e) Rejected from the site if the load description is contrary to the actual content in the truck;

f) Checked by the site manager or nominated person prior to deposition in the excavated area. If the material is not classified as cleanfill, the consent holder must immediately remove the material and arrange for its disposal;

g) Recorded in a digital database, with the database record being provided to the CRC Manager upon request, and including as a minimum the following information:

i) The name of the company delivering the material;

ii) The date of delivery;

iii) The physical address of the land the material was sourced from;

iv) A description of the material;

v) Any laboratory reports pertaining to the composition of the material;

vi) Any authorisation under which the material was removed from the source site (e.g. resource consent); and

vii) The weight or volume of the delivered material.

***Advice note**: 'Cleanfill' is defined as material that when buried will have no adverse effect on people or the environment. Cleanfill material includes virgin natural materials such as clay, soil and rock, and other inert materials such as concrete or brick that are free of:*

a) combustible, putrescible, degradable or leachable components;

b) hazardous substances;

c) products or materials derived from hazardous waste treatment, hazardous waste stabilisation or hazardous waste disposal practices;

d) materials that may present a risk to human or animal health such as medical and veterinary waste, asbestos or radioactive substances and liquid waste; and

e) concrete slurry, coal tar and hydro-excavated waste.

22. Any material rejected in accordance with Condition 21(e) must be disposed of at an appropriate facility, and the consent holder must provide the CRC Manager with written confirmation of such disposal within ten working days of the disposal taking place.

23. No cleanfill material must be deposited at the site which has been sourced from a site defined as 'potentially contaminated'.

***Advice Note:** For the purpose of this consent, 'potentially contaminated' means a part of a site where an activity or industry described in the list in Schedule 3 of the Canterbury Land and Water Regional Plan, which is attached as Attachment 1 and forms part of this resource consent, has or is being undertaken on it or where it is more likely than not an activity or industry described in the list in Schedule 3, is being or has been undertaken on it, but excludes any site where a detailed site investigation has been completed and reported and which demonstrates that any contaminants in or on the site are at, or below, background concentrations.*

24. All cleanfill stockpiles must be inspected and spread over the working area on a regular basis.

25. Any mixed material arriving at the site must be thoroughly inspected to ensure it contains no material that does not meet the definition of cleanfill. This inspection must include a review of the cleanfill disposal application form and information (including any laboratory reports pertaining to the composition of the

material) related to the material's source followed by a visual inspection to identify any unacceptable material.

26. The consent holder must ensure that any contractor depositing material at the site has a written contract with the consent holder and is provided with a copy of this consent prior to entering the site.

27. Site inductions must be held on a quarterly basis for all contractors using the site, and records of these inductions must be kept and made available to the CRC Manager upon request.

Groundwater Quality Monitoring and Reporting

28. Prior to the commencement of *quarry activities*, representative samples of groundwater must be taken (subject to landowner approval and if practically possible) from all domestic water supply wells within 500 metres downgradient of the site, as indicated in attached Plan CRC192408D and listed on CRC's wells database, to establish baseline water quality conditions in those wells. Each bore sample must be analysed for the contaminants in Table 2 of Condition 29. A copy of the results of the groundwater samples must be provided to the CRC Manager and the bore owner.

29. The consent holder must undertake the following groundwater sampling regime for the bores listed in Condition 6 of this Consent and bore M36/2743:
    a) Representative samples of groundwater must be taken at three-monthly intervals for a period of five years after *quarry activities* commence and thereafter at six-monthly intervals for the duration of this consent;
    b) Samples must be taken after adequate purging to remove all stagnant water from the bores or by using an alternative method, such as a low-flow sampling technique, to ensure that fresh groundwater is drawn through the bore screens;
    c) All samples must be taken by a suitably qualified practitioner and analysed for the contaminants listed in Table 2 by an accredited laboratory; and
    d) The water quality monitoring results must be supplied to the CRC Manager within one month of them being received in an electronic format, suitable for automatic upload to a water quality database (preferably directly from the analytical laboratory immediately after quality checking).

Table 2: Contaminants and trigger concentrations.

Contaminant	Property or trigger value
Acidity	No testing
Alkalinity	100 g/m^3 as CaCO3
Ammoniacal N	1.2 g/m^3 as N
Chloride	250 g/m^3
Electrical Conductivity	50 mS/m at 25°C
E.coli bacteria	1 MPN/100 ml median of samples
Total Hardness (calcium + magnesium)	100 g/m^3 as CaCO3
Dissolved Iron	0.2 g/cm^3
pH	8.5
Dissolved Zinc	1.5 g/cm^3
Total Petroleum Hydrocarbons	Any detection >0.1 g/m^3
Dissolved Aluminium	0.1 g/m^3
Dissolved Arsenic	0.005 g/m^3

Contaminant	Property or trigger value
Dissolved Boron	0.7 g/m^3
Dissolved Cadmium	0.002 g/m^3
Dissolved Chromium	0.025 g/m3
Dissolved Copper	1 g/m3
Dissolved Lead	0.005 g/m3
Dissolved Manganese	0.04 g/m3
Dissolved Nickel	0.04 g/m3
Nitrate-Nitrogen	No testing
Dissolved Sodium	200 g/m3
Sulphate	250 g/m3

Responses to Monitoring

30. The results of the analyses of groundwater samples tested must be compared with the contaminant trigger values in Table 2. Any contaminant concentration in the downgradient bores will be deemed an exceedance if:
    a) The tested result is in excess of the trigger values for a contaminant given in Table 2 and the median concentration of the same contaminant in the upgradient wells for that sampling event is less than the Table 2 trigger levels; or
    b) The median concentration of a contaminant in the downgradient wells exceeds the upgradient median concentration of the same contaminant by more than 10 percent of the respective Table 2 contaminant trigger value, where any median concentration in the upgradient wells for a sampling event exceeds the Table 2 trigger.

    Advice Notes: *The trigger levels are intended to establish if there has been an increase in concentration of any contaminant across the consent-holder's site. Upgradient wells are to monitor if any contamination is coming from other upgradient properties. Condition 30(b) makes allowance for Table 2 trigger values being exceeded because of an upgradient contamination source, by requiring a further increase of more than 10 percent of the trigger level across the site before a consent exceedance is triggered.*

    Median concentrations are intended to combine results spatially from different wells, to account for the potential for narrow plumes of contaminants in groundwater being detected at only one well. Where Conditions 30(a) and 30(b) refer to a median concentration, it is to be calculated from the test results from a set of monitoring wells, (either upgradient or downgradient wells), for one sampling event, not averaged over different events.

31. If there is an exceedance in a downgradient bore as determined by Condition 30, the consent holder must within one month of receiving the results:
    a) Obtain a second sample of groundwater from the bore sampled in accordance with Condition 29;
    b) Obtain a sample of groundwater from the upgradient bores specified in Condition 29; and
    c) Analyse these samples in accordance with Condition 30.

32. If the results of analysis of the second groundwater samples carried out in accordance with Condition 31 show that none of the concentrations of contaminants analysed exceed the trigger concentrations in Table 2 as determined by Condition 30, the consent holder must continue to sample groundwater in accordance with Condition 29.

33. If the results of analysis of the second groundwater samples carried out in accordance with Condition 31

show an exceedance of the trigger concentrations in Table 2 as determined by Condition 30, the consent holder must:

a) Notify the CRC Manager;

b) Notify the residential occupiers with water supply bores for all adjoining properties 500 metres downgradient of the affected monitoring bore;

c) Sample all domestic wells within 500 metres downgradient of the affected monitoring bore (subject to well owner approval);

d) Conduct an investigation into the potential cause(s) of the exceedance, which may include undertaking additional monitoring beyond the routine sampling;

e) If any domestic bore sample reveals an adverse effect on drinking-water quality which was not present at the time of baseline sampling prior to *quarrying operations* commencing, including on its taste, clarity or smell, then the consent holder must either provide the well user with an alternative supply of potable water, provide an appropriate water treatment system, or install a deeper well for the user (subject to the land owner's approval); and

f) Implement necessary measures to reduce the concentration of the contaminant in groundwater. Such measures may include:

   i) cessation of activities that may have caused the exceedance;

   ii) removal of the contaminant source(s);

   iii) stabilisation or capping of the contaminant source(s); and

   iv) revision of cleanfill management procedures.

Annual Report

34. The consent holder must prepare an annual report containing the groundwater level and quality monitoring data and assessments required to be collected under the conditions of this consent. The report must also include groundwater quality data from the Selwyn District Council public supply well M36/7575 if that data is available from the Selwyn District Council. The report must discuss groundwater quality trends in the monitoring data, any exceedances of the Table 2 contaminant trigger concentrations and any mitigation actions taken in response to those exceedances. The annual report must be provided to the CRC Manager by 31 August each year.

Spills

35. The consent holder must prepare a Spill Management Plan (SMP) for the site and provide the SMP to the CRC Manager for certification.

36. The exercise of this consent must be in accordance with the certified SMP. In the event of any inconsistency between the conditions of this consent and the provisions of the SMP, then the conditions of this consent must prevail.

37. The purpose of the SMP is to demonstrate how Conditions 39 and 40 will be achieved.

38. The SMP must as a minimum:

a) Contain a description of the content and purpose of the SMP;

b) Document measures to prevent leaks and avoid spills of fuel or any other hazardous substance (including fuel reconciliations);

c) Set out procedures to be undertaken in the event of a spill of fuel of any hazardous substance, in accordance with Condition 39; and

d) Set out staff training requirements for responding to spills.

39. The consent holder must take all practicable measures to prevent leaks and avoid spills of fuel or any other hazardous substances in accordance with the SMP including but not limited to:

a) No refueling or maintenance of vehicles or machinery can occur on the quarry pit floor, with the exception of generators for mobile plant;

b) Appropriate servicing and maintenance of vehicles and machinery such that they do not result in leaks or spills;

c) Only undertaking refueling or maintenance on vehicles or machinery on hardstand surfaces that are roofed;

d) Keeping a spill kit capable of absorbing all fuel and oil products on site and available at all times; and

e) Training all staff involved in the refueling or maintenance activities in the use of spill kits.

40. When any mobile tankers are used on site, refueling with such tankers must take place well above the bottom of the quarry pit floor, and in roofed facilities with spill management provisions. Mobile tankers must not be present on site outside of refueling areas.

***Advice Note**: Condition 40 does not apply to the refueling of generators associated with mobile plant.*

41. In the event of a spill of fuel or any other hazardous substance, the consent holder must ensure that:

a) The spill is cleaned up as soon as practicable and measures taken to prevent a reoccurrence;

b) The CRC Manager is informed within 24 hours of a spill event exceeding four litres and the following information provided:

i) The date, time, location and estimated volume of the spill;

ii) The cause of the spill;

iii) The type of hazardous substance(s) spilled;

iv) Clean up actions undertaken;

v) Details of the steps taken to control and remediate the effects of the spill on the receiving environment;

vi) An assessment of any potential effects on the environment of the spill; and

vii) Measures to be undertaken to prevent a reoccurrence of the spill.

WATER PERMIT CRC192414 – TO USE GROUNDWATER (NEW USE PERMIT)

1) The volume of water taken in terms of this permit from bore M36/0257 must be in accordance with Water Permit CRC182422 and at a rate not exceeding 9.5 litres per second, with a volume not exceeding 752 cubic metres in any one day and 5,267 cubic metres in any period of seven consecutive days and 112,375 cubic metres between 1 July and the following 30 June.

2) Water may only be used for the *quarry activities.*

3) Prior to the exercise of this consent the consent holder must:
   a) install a water meter(s) that has an international accreditation or equivalent New Zealand calibration endorsement, and has pulse output, suitable for use with an electronic recording device, which will measure the rate and the volume of water used to within an accuracy of plus or minus five percent as part of the pump outlet plumbing, or within the mainline distribution system, at a location(s) that will ensure the total volume of water used is measured; and
   b) install a tamper-proof electronic recording device such as a data logger(s) that time stamps a pulse from the flow meter at least once every 60 minutes, and have the capacity to hold at least one season's data of water taken as specified in Condition 4.

4) The recording device(s) must:
   a) be set to wrap the data from the measuring device(s) such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording); and
   b) store the entire season's data in each 12 month period from 1 July to 30 June in the following year, which the consent holder must then download and store in a commonly used format and provide to the Canterbury Regional Council upon request in a form and to a standard specified in writing by the Canterbury Regional Council; and
   c) be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder. The recording device(s) must be designed and installed so that no data is able to be deliberately changed or deleted.

5) The water meter and recording device(s) must be accessible to the Canterbury Regional Council at all times for inspection and/or data retrieval.

6) The water meter and recording device(s) must be installed and maintained throughout the duration of the consent in accordance with the manufacturer's instructions.

7) All practicable measures must be taken to ensure that the water meter and recording device(s) are fully functional at all times.

8) Within one month of the installation of the measuring or recording device(s), or any subsequent replacement measuring or recording device(s), and at five-yearly intervals thereafter, and at any time when requested by the Canterbury Regional Council, the consent holder must provide a certificate to the CRC Manager, signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:
   a) The measuring and recording device(s) have been installed in accordance with the manufacturer's specifications; and
   b) Data from the recording device(s) can be readily accessed and/or retrieved in accordance with Condition 4 and 5.

DISCHARGE PERMITS CRC192411 and CRC192412 - TO DISCHARGE STORMWATER ONTO AND INTO LAND WHERE CONTAMINANTS MAY ENTER WATER and DISCHARGE CONTAMINANTS ONTO AND INTO LAND WHICH MAY ENTER WATER FROM AN INDUSTRIAL OR TRADE PROCESS

Stormwater

1. Stormwater that falls on unsealed surfaces and infiltrates to ground is authorised by this consent.

2. Stormwater runoff from road surfaces that infiltrates to ground along road edges is authorised by this consent.

3. Stormwater runoff from roofs and hardstand surfaces other than roads must be collected and conveyed to a stormwater infiltration pond(s).

4. Any stormwater infiltration pond(s) must:
   a) provide no less than one metre of separation between the highest groundwater level[4] at the site and the pond invert;
   b) be 'dry ponds' in which stormwater will infiltrate into the ground and within which no ponding occurs for more than 48 hours; and
   c) be lined with soils to facilitate the removal of contaminants. The soil must not be sourced from contaminated land (as defined in the Canterbury Land and Water Regional Plan).

5. The contaminant removal efficiencies of the infiltration ponds must be in accordance with the Ministry for the Environment On-Site Stormwater Management Guidelines (NZWERF 2004) including:
   a) 90 percent removal of Total Suspended Solids;
   b) 90 percent removal of Biochemical Oxygen Demand (BOD);
   c) 75 percent removal of hydrocarbons; and
   d) 85 percent removal of heavy metals (zinc, copper, lead).

6. Any soil, trade waste or other detritus removed from the base of a stormwater infiltration pond must not be used for fill in the quarry site and must be taken to an appropriate landfill for disposal.

7. All stormwater diversion and treatment systems must be maintained in accordance with appropriate stormwater treatment and discharge guidelines from Selwyn District Council or Christchurch City Council, as specified in the Stormwater Management Plan.

Stormwater Management Plan

8. Prior to the commencement of *quarry activities,* the consent holder must prepare and implement a Stormwater Management Plan (SWMP) prepared by a SQEP in stormwater management for the certification of the CRC Manager.

9. The purpose of the SWMP is the provide detail on how the conditions of this consent will be achieved and to implement the stormwater management and treatment systems for the site.

10. The exercise of this consent must be in accordance with the certified SWMP. In the event of any inconsistency between the conditions of this consent and the provisions of the SWMP, the conditions of this consent must prevail.

11. The SWMP must include, but not be limited to:
    a) A description of the content and purpose of the SWMP;
    b) Relevant stormwater treatment and discharge guidelines from Selwyn District Council or Christchurch City Council;

[4] As defined in the Canterbury Land and Water Regional Plan.

c) Quarry site location and proposed *quarry activities* likely to generate stormwater;
d) Site management responsibilities relating to stormwater;
e) Stormwater sources including all impervious surfaces;
f) Stormwater management and design criteria for the CPSA, extraction sites, cleanfill sites, and vehicle washing areas;
g) Stormwater infiltration basin contaminant removal efficiencies;
h) Inspections, maintenance, and auditing;
i) Complaints response;
j) Staff and contractor training with regard to the contents of the SWMP; and
k) SWMP review procedure.

12. All stormwater diversion and treatment systems used on the site must be designed and installed in conformance with the certified SWMP.

Hazardous Activities

13. Truck washing must be undertaken on a roofed and bunded wash pad formed of impermeable material. Truck wash water not being collected and recycled in the wash process must be collected in a holding tank or sump and transported offsite to be discharged as trade waste into an approved wastewater system.

14. All sediment collected from the truck wash sump or holding tank must be periodically excavated and disposed of to an approved offsite waste facility.

15. Concrete mixing trucks must not be washed out on site.

DISCHARGE PERMIT CRC192413 – TO DISCHARGE CONTAMINANTS ONTO AND INTO LAND WHERE CONTAMINANTS MAY ENTER GROUNDWATER ASSOCIATED WITH THE DEPOSITION OF CLEANFILL

1. The deposition of cleanfill material onto and into land must be undertaken in accordance with Land Use Consents **CRC192408** and **CRC192409.**

2. Soils from HAIL areas identified within the site in the application documents, which are validated as being below applicable standards/guidelines for rural residential land use but are above background soil levels for the local soil type, must not be deposited more than five metres below original ground level, unless otherwise approved in writing by the CRC Manager.

Plan CRC192408A

Plan CRC192408B

Plan CRC192408C

Plan CRC 192408D

LEGEND

Site boundary

Plan CRC192408A

NOTES

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3. Schematic only, not to be interpreted as an engineering design or construction drawing.

0 200 400 METRES

REFERENCE SCALE: 1:10,000 (at A3)

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

CLIENT
FULTON HOGAN LIMITED

PROJECT
ROYDON QUARRY

TITLE
SITE LOCATION PLAN

CONSULTANT
GOLDER

YYYY-MM-DD	NOVEMBER 2018
PREPARED	RK
REVIEW	KB
APPROVED	KB

PROJECT NO.	REPORT	REV.	FIGURE
1781870	001	0	01

LEGEND

- Canterbury Regional Council (CRC) Observation Wells
- Fulton Hogan Observation Wells and Site Well
- Site boundary
- Maximum quarry depth (m RL)
- Parcel boundary

Plan CRC192408B

NOTES

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0 250 500 METRES

REFERENCE SCALE: 1:10,000 (at A3)

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

CLIENT
FULTON HOGAN

PROJECT
RESOURCE CONSENT APPLICATION, 'ROYDON QUARRY', TEMPLETON

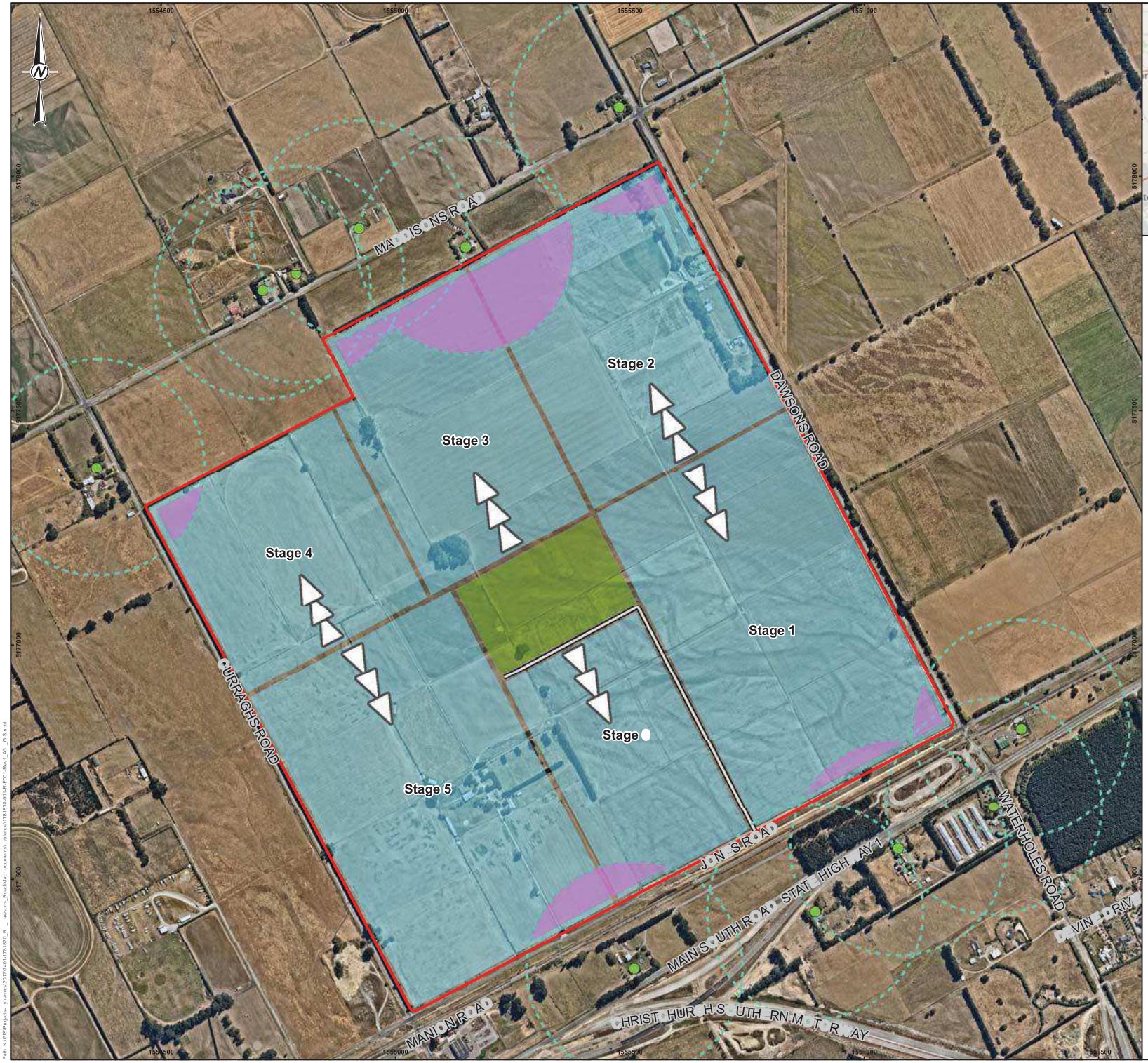
TITLE
192408B

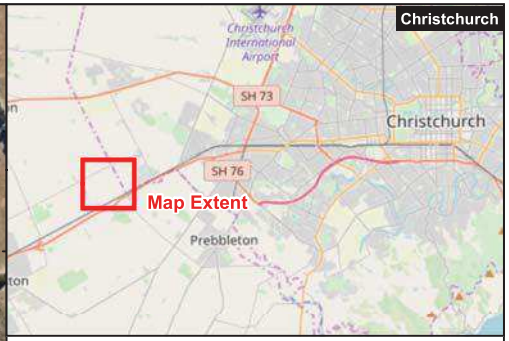
CONSULTANT

GOLDER

YYYY-MM-DD	2019-12-11
PREPARED	ZM
REVIEW	EVN
APPROVED	KB

PROJECT NO. 1781870 | REPORT | REV. | FIGURE **05**





LEGEND

- Site boundary
- Areas not to be quarried without written approval of the respective property owner
- Nearby houses
- Buffer 200m from houses
- entral Processing and Stockpiling Area
- Indicative staging direction
- Access road
- Proposed staging

Plan CRC192408C

NOTES

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3. Schematic only, not to be interpreted as an engineering design or construction drawing.

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PR J TI N: NZG 2000 New Zealand Transverse Mercator

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RC185 27A / CRC192408A / CRC192410A / CRC192413A

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GOLDER

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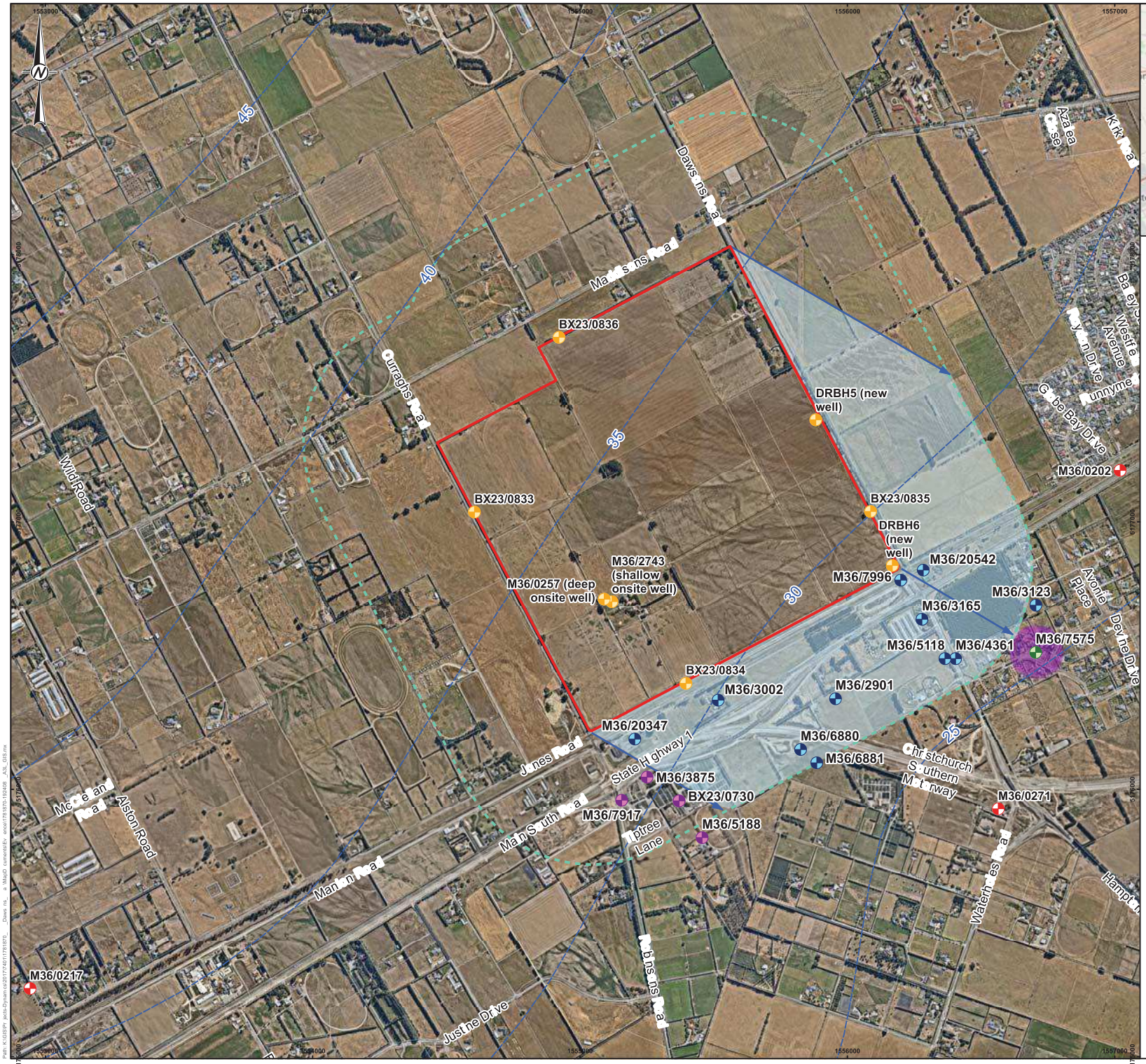

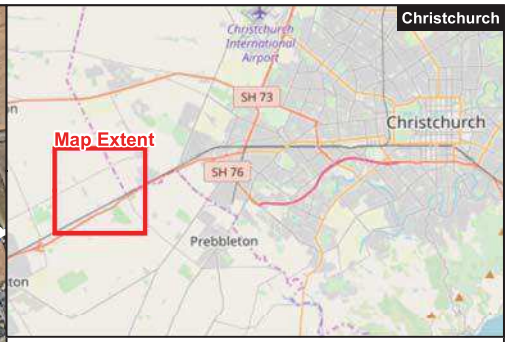

LEGEND

- Site boundary
- Future Groundwater observation well
- Canterbury regional council (ECan) observation well
- Domestic supply well
- Irrigation well
- Community drinking water supply well
- Piezometric contours m (1983-2003 average)
- Groundwater flow line
- Site boundary buffer - 500 m
- Downgradient Zone - 500 m
- Community Well Protection Zone
- Parcel boundaries

NOTES

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0 500 1,000 METRES

REFERENCE SCALE: 1:14,000 (at A3)

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

CLIENT
FULTON HOGAN

PROJECT
RESOURCE CONSENT APPLICATION, 'WOODSTOCK QUARRY', EMPLACEMENT

TITLE
192408C **Plan CRC192408D**

CONSULTANT
GOLDER

YYYY-MM-DD	2020-01-22
PREPARED	AE
REVIEW	EVN
APPROVED	KB

PROJECT NO. 1781870

REV. 02