BEFORE A COMMISSIONER APPOINTED BY THE OTAGO REGIONAL COUNCIL AND THE CENTRAL OTAGO DISTRICT COUNCIL

IN THE MATTER OF	the Resource Management Act 1991
AND	
IN THE MATTER OF	applications by Cromwell Certified Concrete Limited for resource consents to expand Amisfield Quarry

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STATEMENT OF EVIDENCE OF FRASER COLEGRAVE ON BEHALF OF CROMWELL CERTIFIED CONCRETE LIMITED

(ECONOMIC EFFECTS)

Dated: 30 November 2021

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1 INTRODUCTION

1.1 My name is Fraser Colegrave. I am an economist and the managing director of Insight Economics, an economics consultancy based in Auckland. Prior to that, I was a founding director of another consultancy, Covec Limited, for 12 years.

Qualifications and Experience

1.2 I hold a Bachelor of Commerce (1st Class Honours) in Economics from the University of Auckland. I have over 24 years' commercial experience, the last 21 of which I have worked as an economics consultant. During that time, I have successfully led and completed more than 500 consulting projects across a broad range of sectors.

1.3 My main field of expertise is in undertaking economic assessments (whether for resource consent or plan change applications) in relation to land-use development, including quarries. I have worked extensively in this area for many of the largest companies in New Zealand. In addition, I regularly advise Local and Central Government on a range of associated policy matters.

1.4 I also regularly appear as an expert witness before Councils, Boards of Inquiry, Independent Hearing Panels, the Land Valuation Tribunal, the EPA, the Environment Court, the Family Court, and the High Court of New Zealand.

Involvement in this Proposal

1.5 In June 2021, I was engaged by Cromwell Certificated Concrete Limited to prepare a more detailed assessment of the economic impacts of the expansion of Amisfield Quarry (the Proposal). I produced a report titled *Economic Assessment for Amisfield Quarry Expansion,* 9 November 2021. My assessment and its conclusions are presented in this evidence.

1.6 In preparing this evidence, I have reviewed the following:

(a) The resource consent applications for the Proposal (including the AEE);

(b) The Section 42A reports prepared by Mr Whyte; and

(c) The evidence (in draft) of Mr Sutton (a director of Cromwell Certified Concrete Limited) and Mr Allison (the quarry manager).

Code of Conduct

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

2 SCOPE OF EVIDENCE

2.1 My evidence addresses:

(a) The relevance of economic effects under the Resource Management Act 1991 (RMA);

(b) The essential features of the Proposal in relation to economic effects;

(c) Aggregate demand in Inland Otago;

(d) The economic impacts of the Proposal:

(i) Impacts on GRP, incomes and employment;

(ii) Support for regional construction activity;

(iii) Transport related economic impacts;

(iv) Other economic effects;

(e) Economic type issues raised in submissions on the Proposal; and

(f) The discussion of economic effects in the s42A report for the District Council.

3 SUMMARY

3.1 My assessment found that in terms of section 5(2) and section 7(b) of the RMA, the expansion proposal will have various positive economic effects, while failure to gain consents will have adverse economic effects.

3.2 Consents are sought to extract the remaining resource on the site and to expand the quarry onto the adjoining land at an increased rate of production. This will preserve and gradually expand regional incomes for quarry workers, as well as those employed at related or downstream businesses. It will also enable the quarry's existing customers to continue accessing local, high quality aggregates at competitive prices. According to Mr Sutton's evidence, aggregates of this type and quality are very limited in Inland Otago.

3.3 Expansion will achieve high levels of economic efficiency via economies scale because it will utilise existing infrastructure and not require significant further capital outlays of its own. It will also avoid a range of transport related economic costs.

3.4 The most significant economic effects of the proposal are related to its supply of aggregates (particularly concrete aggregates) in Inland Otago. The scale of this site belies its importance in terms of its role in supplying concrete aggregates, and the contribution that it makes (and can continue to make) to Inland Otago and its economy if consents are granted.

4 ECONOMICS AND THE RMA

4.1 While the RMA is often considered to be environmentally-oriented legislation, economic considerations (community economic wellbeing and the efficient use and development of resources) are also relevant in terms of section 5(2) and section 7(b).

4.2 Section 5(2) refers to enabling people and communities to provide for their social, economic, and cultural wellbeing (and for their health and safety) while:

(a) *Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*

(b) *Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*

(c) *Avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

4.3 Minerals are specifically excluded from section 5(2)(a) to recognise the non-renewable nature of mineral resources.

4.4 Section 7(b) requires that in achieving the purpose of the Act, all persons *"shall have particular regard to ... the efficient use and development of natural and physical resources"* which include the economic concept of efficiency. Economic efficiency can be defined as follows:

> *"Economic efficiency is when all goods and factors of production in an economy are allocated to their most valuable uses and waste is eliminated or minimised."*[1]

4.5 My assessment and evidence addresses the economic effects of granting consents for the proposed quarry expansion. Relevant non-economic effects (e.g. noise, traffic, visual effects, air quality) are covered in the evidence of other witnesses for the applicant. My assessment and evidence does not address the potential economic effects of any environmental effects of the proposal. In my opinion it is not appropriate for me (as an economist) to try to assess such effects and attempt to estimate monetary values for them. Such effects are instead properly addressed by appropriately qualified experts (such as Mr Cudmore). This also avoids the danger of 'double-counting' of effects.

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[1] https://www.investopedia.com/terms/e/economic_efficiency.asp

5 ESSENTIAL FEATURES OF THE PROPOSAL – ECONOMIC EFFECTS

5.1 Amisfield Quarry is an existing aggregate quarry located at 1248 Luggate-Cromwell Road (State Highway 6), approximately 15km north of Cromwell, 70 km from Queenstown and 40 km from Wanaka.

5.2 Aggregates are crushed rocks, stones, and sand. In New Zealand, they are mostly sourced from volcanic rock (known as greywacke), or from rivers (known as alluvial gravel). As described in the evidence of Mr Sutton, aggregates comprise the foundation of virtually every modern building, and are used extensively in the construction of roads, bridges, and other infrastructure. Approximately 14,000 tonnes of aggregate are used to build just one kilometre of a standard two-lane highway, with about 250 tonnes used to construct a masonry home.[2] Accordingly, a reliable ongoing supply of aggregates is critical to economic growth and development.

5.3 The quarry has been in operation since 1994. Expansion of the quarry is now proposed. This will see the annual rate of production increased from a maximum of 70,000m^3/year to 200,000m^3/year. The applicant estimates that the expansion will enable the excavation of up to approximately 4.6 million tonnes of aggregate resource over the life of the quarry.

5.4 As described in the evidence of Mr Sutton, currently, approximately 50% of all quarry output produced by Amisfield Quarry is concrete aggregates which is used to supply 50% of all concrete used in Cromwell, Wanaka and Queenstown.

5.5 The rest of the quarry's output is trucked to customers (mainly general civil contractors and roading contractors) across the region, but primarily in Central Otago and Queenstown Lakes.

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[2] https://cdn.ymaws.com/concretenz.org.nz/resource/resmgr/docs/conf/2019/s3_p4.pdf

6 AGGREGATE DEMAND IN INLAND OTAGO

6.1 Aggregate demand is primarily driven by construction activity, including infrastructure development.

6.2 Using data from a recent GNS Science report[3], I calculated that the 25-year regional aggregate production/demand in Inland Otago is projected to range from 59 million tonnes under the low scenario to 69 million tonnes under the high, with a mid-range forecast of 64 million tonnes of aggregate required. This demand forecast sets the backdrop for my assessment of the proposal's likely economic effects.

7 ECONOMIC IMPACTS OF THE PROPOSAL

Impacts on GDP, Incomes and Employment

7.1 Daily operation of the quarry generates direct regional economic impacts by employing people onsite, paying them wages, and by creating regional GDP though the quarry's ongoing productive processes. In addition, the quarry generates indirect economic impacts via the ongoing purchase of supplies and services from local businesses, such as maintenance and repair organisations.

7.2 I quantified the quarry's ongoing economic impacts (at the current rate of production) using a technique called multiplier analysis, which is based on detailed matrices called input-output (IO) tables . These IO tables describe the different supply chains that comprise the Otago regional economy, and therefore enable the direct impacts of the quarry's operations to be traced through to estimate its overall impacts.[4] These overall impacts comprise both:

(a) **Direct effects** – which capture onsite quarry activities, plus the activities of firms that direct supply goods and services to it; plus

(b) **Flow-on Effects** – which arise when businesses supplying the quarry source good/services from their own suppliers, and so on; and when additional wages and salaries generated by a project

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[3] Aggregate Opportunity Modelling, GNS Science, May 2021, Section 6.0, page 31

[4] This assessment uses our company's own regional IO tables for 2017, which are the latest available, and which are used extensively throughout New Zealand by both public and private sector organisations.

(directly or indirectly) are spent in the local/regional economy and therefore give rise to additional rounds of economic impacts.

7.3 These economic impacts are measured in terms of:

(a) **Contributions to value-added (or GDP)** – GDP measures the difference between a firm's outputs and the value of its inputs (excluding wages and profits). It captures the value that a business adds to its inputs to produce its own outputs.

(b) **The number of people employed** – this is measured in terms of employment counts, which include both part-time and full-time workers, and

(c) **Total wages and salaries** paid to workers, which are often labelled 'household incomes.'

7.4 The table below shows my estimates of annual economic impacts associated with current quarry operations at the current production volume.

Table 1: Annual Economic Impacts of Current Quarry Operations

Impact Measure	Direct	Flow-On	Total
Regional GDP	$2,260,000	$140,000	$2,400,000
Employment Counts	13	2	15
Salaries/Wages Paid	$660,000	$60,000	$720,000

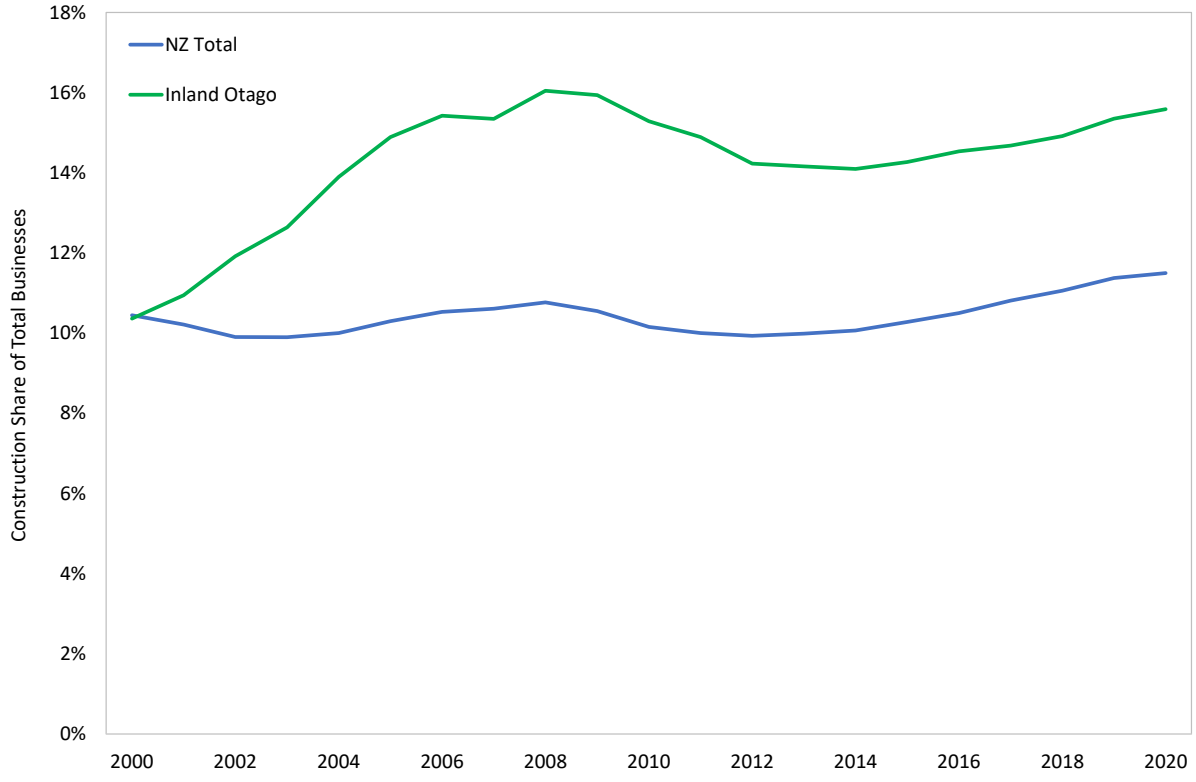
7.5 Table 1 shows that onsite activity, coupled with spending on quarry supplies and services, generates about $2.4 million of regional GDP, including flow on effects, provides full time employment for 15 people, and generates annual wages and salaries of $720,000. Future annual impacts will be higher if planned volume uplifts are achieved via these consent applications. While these regional economic impacts are not particularly significant themselves, the biggest impacts of the quarry are derived from its role in concrete production and supporting and enabling construction activity.

Support for Regional Construction Activity

7.6 The Central Otago and Queenstown Lakes districts, sometimes referred to as "Inland Otago" in the construction industry[5], are amongst the fastest growing in the country. Aggregates are a critical enabler of this growth by providing raw materials needed for building new houses, and for constructing roads and three waters infrastructure.

7.7 Construction – including infrastructure development – is a critical part of the national economy, accounting for more than 10% of New Zealand businesses in 2020. However, it is even more important to Inland Otago, accounting for 16% of all businesses in 2020. Figure 1 provides more detail by comparing construction's share of local and national businesses since 2000.

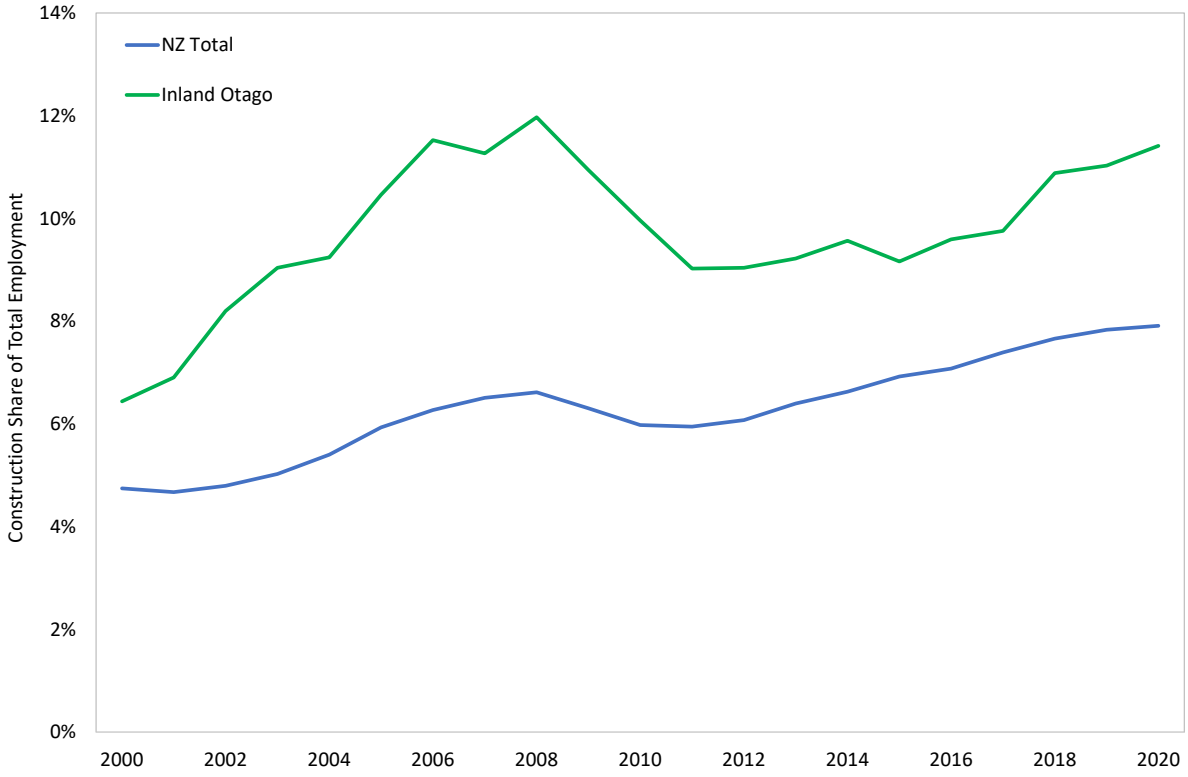
Figure 1: Construction's Share of Local and National Businesses (2000 to 2020)



[5] For example, the Government's construction pipeline reports collectively refer to Central Otago District and the Queenstown Lakes District as Inland Otago. I adopt that label here too for readability.

7.8 As expected, construction also accounts for a significant share of both local and national employment too. This is displayed in the chart below, which compares construction's shares of local employment to the national average over the last 20 years. In short, despite a dip following the GFC, construction has accounted for an increasing share of both local and national employment. In 2020, it accounted for 11% of local employment, and 8% of national.

Figure 2: Construction's Share of Local and National Employment (2000 to 2020)



Planned Infrastructure Projects

7.9 Although aggregates form the foundation of virtually every new building constructed in New Zealand, they are mostly used for roading and other infrastructure projects. For instance, according to an annual survey conducted by MBIE, 80% of aggregate use in Otago is for roading and other infrastructure projects. Given its importance to infrastructure development, I reviewed a range of reports and datasets to identify planned infrastructure projects to which the quarry's outputs could potentially contribute. Such projects are a useful guide to likely future aggregate demand.

7.10 My research led me to the infrastructure pipeline dataset[6], which is maintained by Central Government, but which also includes planned infrastructure investments by Councils. It showed that the various infrastructure projects planned for Inland Otago by Waka Kotahi and QLDC over the next 10 years total between $300 and $800 million, with a midpoint estimate of $550 million. However, these figures exclude planned infrastructure spending by Central Otago District Council (CODC), which also runs into the hundreds of millions over the next 20 to 30 years.[7]

7.11 In short, there are hundreds of millions of dollars of infrastructure projects planned across Inland Otago over the next 10 years, with a strong body of work committed to occur thereafter.

Impacts of the Proposal

7.12 As noted earlier, about 80% of aggregates used in the Otago region are for infrastructure projects, particularly roading. Accordingly, a strong ongoing supply of affordable aggregates is critical to the successful completion of these projects, and to the ongoing economic prosperity of the local area.

7.13 Amisfield Quarry is well-placed to contribute to the supply of aggregates required to complete committed infrastructure works over the next 20 to 30 years, plus contribute to the aggregate needs of local house construction. Without suitable local and reliable sources of aggregate like those found at Amisfield Quarry, the costs of these infrastructure projects would invariably increase because the demand for them is inelastic. This means that the demand for aggregates wouldn't change if its price rose because there are no readily available alternatives, so the same products are instead purchased at a higher price (adding costs to the overall construction budget).

7.14 Further, since Councils and other Government agencies are the main entities funding and undertaking infrastructure projects, any cost increases caused by a shortage of aggregates would be passed on to

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6 https://www.tewaihanga.govt.nz/projects/data-in-open-formats/

7 Page 124 of CODC's LTP shows that it plans to spend $532 million on infrastructure development to 2046.

households and businesses via higher annual rates and tax bills. Enabling Amisfield Quarry to continue operating and gradually expand onto adjacent land is one step towards ensuring that there is enough aggregate to keep pace with strong ongoing demand for infrastructure and other construction projects, thereby securing construction employment and insulating ratepayers from potential rates increased caused by a shortage of aggregate supply.

8 TRANSPORT RELATED ECONOMIC IMPACTS

Economic Impacts - Transport Costs

8.1 Because aggregate is a critical input to construction and infrastructure projects, and since there are no readily available substitutes, decline of these resource consent applications will result in the applicant, Firth and the quarry's other customers all having to source aggregates elsewhere, and probably from further afield, once the current resource is exhausted.

Additional Transport Costs

8.2 Aggregates themselves are cheap, but they are very heavy and hence extremely expensive to move. The cost of trucking aggregates is about 50 cents per tonne-kilometre, so it is vital that a nearby supply remains available to support local construction and infrastructure projects. The greater the travel distance, the higher the overall cost of aggregates used in construction projects.

Fuel and Emissions Impacts

8.3 Not only would sourcing aggregates from further afield incur direct costs for Amisfield Quarry's former customers, but this would also increase the consumption of fossil fuels, with consequent increases in harmful vehicle emissions.

Roading Impacts

8.4 All vehicles cause wear and tear on the roads, but heavy vehicles have a disproportionate impact. This is reflected in the so-called fourth power rule, which states that, holding all other factors constant, doubling the weight of a vehicle increases its "load" on the road by two

to the power of four. i.e. the impact is 2 x 2 x 2 x 2 = 16 times greater. Because of this relationship, heavy trucks have an inordinately high impact on road wear and tear compared to smaller vehicles, such as cars.

8.5 For example, consider the impacts of aggregate-laden trucks travelling further than before because the source quarry is located further from customers than the last supplier. i.e. Amisfield Quarry. With each truck weighing (say) 20 tonnes including payload, each additional kilometre travelled has the same impact as approximately 10,000 cars. This, in turn, accelerates road wear and tear and increases the costs of road maintenance, all of which are funded by taxpayers, ratepayers, and road user charges.

8.6 Further, as noted in a recent report by GeoSolve Pavements Group, the establishment of a hypothetical new quarry elsewhere may also require significant road improvements (including road widening and new control measures) to safely handle the increased pavement loads and traffic.[8]

8.7 Amisfield Quarry, conversely, is located adjacent to the State Highway, which as described in Mr Fernando's evidence, has been designed to carry heavy loads, such as those generated by quarry activities.

9 OTHER ECONOMIC EFFECTS

Impacts of Prior Investments on Future Operating Efficiency

9.1 Granting consents for the expansion will enable the applicant to continue to utilise the significant resources that it has already invested into the site. This, in turn, creates significant economic value by minimising the capital outlays (and hence resources) required to facilitate future expansion onto the adjacent site.

9.2 By comparison, the establishment of a similar facility elsewhere would require expensive and time-consuming processes to establish the necessary infrastructure, which reduces its net economic benefits.

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[8] https://www.geosolve.co.nz/assets/publication-articles/2015-Effects-of-increased-axle-loadings-on-local-roads.pdf

9.3 More generally, there is economic merit in allowing quarries to work through remaining/available resources to the point that they are no longer financially feasible to extract, as this defers the date at which new quarries need to be brought into production, and hence defers the present value cost of developing them. This is particularly important for aggregates, as there are no "complete" alternatives to sourcing them from quarries.

Foregone Rural Production/Other Uses

9.4 In terms of the possible adverse economic effects of other foregone types of rural production on the land proposed to be used for expansion of the existing quarry, I note that:

(a) The opportunity cost of other types of foregone rural production is an internal cost borne by the landowner, not an external cost borne by others or by the community. In other words, the landowner has had the option to use the land for other rural productive purposes, but has explicitly chosen not to. This is a private decision that has no material economic impact on the rest of the community, and hence it is largely a moot point and not relevant when assessing purely economic effects for the purposes of the RMA.

(b) The land proposed to be used for expansion is contiguous with an operating quarry, and can be quarried at low marginal cost compared to a new quarry elsewhere. This is because the expansion area will use the plant and other infrastructure already installed onsite, and will also use existing human resources. This leveraging of existing assets and knowledge means that, for the applicant, quarrying the land will likely lead to greater economic value than any other potential use.

(c) The loss of productive land/soils is a relevant consideration under section 5 of the RMA and is usually addressed through policies in relevant Regional and District Plans. However policies in relation to that issue typically need to be balanced by a decision maker with policies that recognise the functional needs of mineral extraction and processing activities to locate where such resources exist, as well as the wider policy framework which

often acknowledges the benefits of aggregate production and the types of development which requires use of those products.

Competition in the Regional Aggregate Market

9.5 Enabling Amisfield Quarry to continue operating and gradually expand onto adjacent land, as proposed, will help foster and maintain competition in the regional aggregate market and ensure supply of concrete aggregates to the applicant's concrete plant in Cromwell and the Firth plants in Queenstown and Wanaka. This, in turn, will ensure that aggregate and concrete prices remain as competitive as possible and thus help control construction costs related to extensive aggregate and concrete use. Conversely, absent the proposal, the applicant (and Firth) would invariably both face higher concrete aggregate prices, which would likely flow through to concrete prices and thus also inflate the costs of regional projects reliant on its concrete production and supply. I note that in his evidence, Mr Sutton questions whether there would in fact be sufficient supply for the applicant's concrete plants and the Firth plants if concrete aggregates had to be sourced from other quarries.

10 ECONOMIC ISSUES RAISED BY SUBMITTERS

10.1 The submission by Nicola and Bryson Clark to the District Council states (at paragraph 27) that they consider that economic benefits of the proposal (as described in the AEE) have been exaggerated given the locality and small scale of the site in comparison to other existing similar activities operating. I assume that the submitters are referring to the two large quarries currently operating at Parkburn, 2km to the south of the Amisfield Quarry site. The Amisfield Quarry site is much smaller in scale than the Parkburn quarries, however its size belies its importance in terms of its role in the supply of concrete aggregates in Inland Otago. Those benefits are significant.

10.2 Some of the submissions on the Proposal suggest that the expansion land would be better used for other purposes, such as cherry production, and will result in the loss of productive land. Others raise a concern that the proposal will affect uses of land beyond the quarry including through the need for increased cleaning of crop covers or windows or maintenance of machinery. Earlier in this evidence, I have

explained why I have not undertaken an economic assessment of those matters.

11 ECONOMIC ISSUES RAISED IN THE SECTION 42A OFFICERS' REPORTS

11.1 The Section 42A report prepared for the District Council acknowledges the positive economic effects of the proposal (for as long as the quarry continues to operate) and the potential adverse effects if the applications are declined. However the report questions whether my assessment is balanced because it:

(a) does not undertake an assessment of a whole of life comparison of the proposed use of the site compared to other productive rural uses of the site which will not have the same finite lifespan; and

(b) does not compare the economic benefits of the quarry proposal to the economic benefits of other uses of the land.

11.2 Because this is a resource consent application, not a plan change process, there is no need (and it would not be appropriate) to compare potential alternative land use options for the subject site. Rather, my role is to determine the likely economic effects of future activities enabled by the resource consent application itself, which I have done (and summarised herein).

11.3 However, that said, I understand that cherry seasons can be highly variable, whereas quarry operations are relatively constant and also likely have greater flow on economic effects (in terms of supporting other regional activities such as construction).

11.4 The section 42A report states that I have assumed that this model of quarrying (fixed in one location) is the most economic model. My role as an economist is to assess the impacts of this proposal and not to suggest or consider possible other ways or locations in which the quarry could operate. However with my knowledge of quarrying and having reviewed Mr Sutton's evidence, I can confirm that the most economic model for quarrying activities is for these activities to be confined within a single location. The reasons for this are discussed by Mr Sutton in his evidence.

12 CONCLUSION

12.1 In terms of section 5(2) and section 7(b) of the RMA, the expansion proposal will have various positive economic effects (particularly in relation to the role that this quarry has in the supply of concrete aggregates in Inland Otago), while failure to gain consents will have adverse economic effects. In particular, the proposal will enable:

(a) Ongoing production of local, high quality aggregate resources, which are used for a wide range of purposes including production of half of all concrete in Inland Otago);

(b) Contribution to the amount of aggregate resource forecast to be required/consumed in Inland Otago over the next 25 years;

(c) Lower aggregate transport costs, less roading impacts, and less fuel and emissions impacts;

(d) Lower aggregate production costs;

(e) Lower aggregate supply costs which helps to control construction costs;

(f) Efficient utilization of significant investments (of both plant and staff) in the existing quarry;

(g) Competition in the concrete and aggregate market; and

(h) Preservation of employment for quarry workers, at businesses that supply products and services to the quarry and at the concrete plants in Cromwell, Queenstown and Wanaka which make concrete using resource only sourced from Amisfield Quarry.

12.2 The proposal will not result in economic externality costs in relation to loss of the use of the land for rural or other purposes.

Fraser Colegrave

November 2021