milward finlay lobb

Supporting Information for a Rezone Request (Hearing G)	
Client	**T A and W L Johnston**
Address	**340 King Street, Temuka**
File Number	**182378/02**
Date	**February 2025**

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Supporting Information for a Rezone Request

In response to the request for additional information from the section 42A Report writer we now provide the following information on behalf of TA & WL Johnston to Timaru District Council for their consideration as part of the District Plan Review Hearing G process.

1.0 Overview

This package is prepared on behalf of the submitter to address the matters raised by the section 42A Preliminary Report (**s42A Prelim Report**).

1.1 Submitter

Tristram Alexander Johnston & Wendy Louise Johnston

340 King Street

Temuka 7920

1.2 Location

Lot 1 DP 439638

340 King Street, Temuka

RT 545286 9,613 square metres more or less.

Valuation Reference: 24680/348.00

2.0 Environmental Values

2.1 Existing Environment

The subject site is located on King Street (State Highway 1) to the north of the Temuka township. The site is currently zoned Rural 1, with a small strip on the north west boundary zoned Rural 2 and a small section of the south-west corner zoned Residential 1.

There is an existing dwelling and garage on site with vehicle access off King Street (State Highway 1). The remainder of the site is comprised of some small paddocks. Existing gate access to these paddocks is established from the end of Neal Street, with gates visible from Google Street View when viewing the site. The site is not able to support commercial farming due to its size, and the development of the surrounding sites would make it difficult to establish farming activities without causing nuisance.

The topography of the site is flat in nature, and there is well established landscaping that largely screens the property from King Street (State Highway 1). There is established landscaping along the internal property boundaries that also screens the site from neighbouring properties.

The site has existing connections to Council services, with infrastructure available to the site from King Street (State Highway 1) and Neal Street.

An aerial photograph of the site is provided below at Figure 1.

Figure 1: Aerial photograph. The subject site is outlined above on the aerial photograph by a red line.

Within the Proposed District Plan the following zones apply to the site: General Rural Zone, General Residential Zone. The following overlays also apply to the site:

- Flood Hazard Assessment Area
- Wahi Tupuna – SASM-4
- Versatile Soils
- Urban Area – Temuka

A screenshot of the overlays as shown in the e-plan is provided on the following page in Figure 2:

Figure 2: Overlays across the site as shown on the e-plan

The site is also listed on the Listed Land Use Register as a contaminated site. A Detailed Site Investigation has been carried out for the site and is attached to this package.

There is approximately 200 square metres of LUC 2 land in the top north east corner of the site.

The proposed yield of the rezone will be 6 residential allotments.

2.2 Landscape Values and Natural Character

There are limited landscape and natural character values associated with the site. The site has an established residential dwelling, with paddocks. There are limited landscape values associated with the site.

2.3 Biodiversity Constraints

There are no identified waterways or significant sites within the property that will require additional protection.

2.4 Cultural and/or Heritage Values

There are no identified Heritage Items or associated Heritage overlays that apply to the site.

There is an identified Site and Area of Significance to Māori (**SASM**) overlay on the site. The details of this are as follows:

- SASM4 - Waitarakao to Orari, inland to Seadown Road and including Arowhenua and Temuka

Discussions have been entered into with Aoraki Environmental Consultancy Limited (**AECL**) and no concerns have been raised, provided the site is serviced by reticulated infrastructure. As this is the intended method of servicing the site, it is considered that any cultural concerns will be adequately addressed through the appropriate management of earthworks through an Accidental Discovery Protocol being utilised and the matters of control within the SASM Chapter being followed at the time of development.

2.5 Reverse Sensitivity/Incompatible Land Uses

The site is adjacent to the General Residential Zone on the southern and western boundaries. The other sites on the northern and eastern boundary are less than a hectare in size but are zoned General Rural. This is considered to be a complementary land use to the proposed rezone and accordingly it is appropriate for the rezone to proceed as there are no identified concerns in relation to Reverse Sensitivity.

3.0 Infrastructure

3.1 Water Supply

The site will be serviced by reticulated infrastructure, as confirmed by Timaru District Council's Infrastructure Department. Attached to this response is correspondence entered into between Council and MFL.

3.2 Wastewater Management

The site is proposed to be serviced by reticulated sewer network. Confirmation has been sought from the Infrastructure Department as to the viability of the site connecting to reticulated network and confirmation that this is appropriate has been provided. A copy of this correspondence is included with this response.

3.3 Stormwater

Stormwater will be managed in the standard manner for stormwater in Temuka. Confirmation that it is appropriate for the site to utilise this has also been confirmed by Timaru District Council.

3.4 Funding for Council services

The comment obtained from Council is that there is sufficient capacity available to service the site, therefore it is not considered necessary for significant funding to be required.

4.0 Transportation

Approval has been obtained Timaru District Council for the site to utilise the Neal Street entrance to the property to provide access to the site. The residential dwelling has an existing access to King Street which would remain. The Council have provided approval for there to be one more dwelling to utilise the King Street entrance.

5.0 Hazards

A Flood Hazard Assessment was obtained from ECan at the time of prior subdivision consent application. A copy of the Flood Hazard Assessment is provided with this report, with no minimum floor height requirement other than compliance with the Building Act.

6.0 Growth Management Strategy

It is noted that there are 12 strategic directions listed in the Growth Management Strategy, of which District Character, Landscapes and Amenity, Settlement Pattern and Urban Form, Rural and Residential are applicable to the proposed rezone.

The table below outlines how the rezone is consistent with the strategic direction of the Growth Management Strategy.

Strategic Direction	Assessment of Proposal
1. District Character *To manage urban growth within the district to positively contribute to:* *(i) a well-planned district of interconnected and consolidated urban areas that reinforce the strengths, individual character and identity of each settlement;* *(ii) the reinforcement and consolidation of Timaru settlement as the main residential, commercial, cultural and civic settlement for the district; and* *((iii) the retention of the character and productive capacity of rural areas.*	District Character is focussed on retaining the amenity values and characteristics of existing towns within the District. This also focusses on consolidated urban areas and retaining the character and productive capacity of rural areas. In this instance there is no distinct rural character found at the subject site due to the size and layout of the current allotment, the inability to feasibly carry out commercial production activity on the site and the proximity of the proposed allotments to the Temuka town boundary and other small rural lifestyle sections in the surrounding environment. Commercial farming is not practical on the site, and would not be financially viable. While additional residential development may have an impact on the wider amenity of the area, this is considered to have a limited impact due to the existing vegetation, privacy of the section and the loss of amenity is largely restricted to two paddocks being converted to residential use. Existing residential development extends to the north of the dwelling at 340

	King Street on the western side of the State Highway for approximately 325 metres.
2. Landscapes and Amenity *To manage subdivision and land use development to:* *(i) recognise and protect outstanding natural landscapes and natural areas in the district from inappropriate activities, and otherwise manage activities within identified important heritage and cultural landscapes;* *(ii) improve amenity and design particularly in urban areas; and* *(iii) segregate polluting or noisy industrial uses and strategic infrastructure from sensitive activities and residential areas.*	There are no outstanding natural landscapes or areas identified on the subject site. There will be no detrimental impact on any vegetation or landscape as currently the subject site consists of a dwelling with garage and two paddocks, with established trees and vegetation.
3. Settlement Patterns and Urban Form *To accommodate future growth and capacity for commercial, industrial, community and residential activities primarily within the existing settlements of Timaru, Temuka, Geraldine, and Pleasant Point to strengthen compact patterns of development and integration with infrastructure.*	The proposed subdivision is situated immediately to the north of the Residential 1 Zone, with part of the site also zoned Residential 1. The subdivision will therefore not see residential activity established disconnected from the Temuka township, and this is further supported by the Council reticulated services available to the subdivision.
9. Rural *To provide for the efficient and effective functioning of rural areas, through encouraging the use and development of natural and physical resources that enable rural activities to support the district, including:* *(i) managing the subdivision, use and development of rural land to reflect rural amenity values, rural land use and maintain or enhance areas or features of cultural, historical, landscape or ecological value;* *(ii) ensuring development remains compatible with rural character, and avoids reverse sensitivity impacts.*	The site does not have existing primary productive potential due to the size and layout of the allotment. There is also no ecological value at the subject site that would be worthy of special protection. The development of the site will have minimal impacts on the surrounding rural land as it largely comprises smaller lifestyle sections so any reverse sensitivity that may arise is considered to be minimal.
10. Residential *To:* *(i) encourage opportunities for higher residential densities in close proximity to the Timaru and Geraldine town centres, and Highfield Village Mall; and*	While the land is currently primarily zoned Rural 1, the area is considered a peri urban zone, where there are very limited rural activities being carried out in the nearby vicinity (for clarity, we consider this to be where the primary income of the landowner is obtained from the land, and this is a commercially viable activity). Furthermore, the allotment sizes of nearby properties, along with the adjacent Residential 1 Zone along the southern and western boundaries of the subject site

(ii) provide sufficient residential development capacity to meet demand and household choice as it arises. *With demand relating to the number of dwellings, and higher densities and services arising from an increasingly aging population; and household choice relating to a diversity of types households, range of price points including affordable housing options, and choice of locations.*	support this site to be developed in a residential manner. This subdivision will provide larger vacant residential sections that are currently limited in the Temuka area.

7.0 Canterbury Regional Policy Statement

5.2.1 Location, Design and Function of Development (Entire Region)

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

1. achieves consolidated, well designed and sustainable growth in and around existing urban areas as the primary focus for accommodating the region's growth; and
2. enables people and communities, including future generations, to provide for their social, economic and cultural well-being and health and safety; and which:

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

b. provides sufficient housing choice to meet the region's housing needs;

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

d. minimises energy use and/or improves energy efficiency;

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

f. is compatible with, and will result in the continued safe, efficient and effective use of regionally significant infrastructure;

g. avoids adverse effects on significant natural and physical resources including regionally significant infrastructure, and where avoidance is impracticable, remedies or mitigates those effects on those resources and infrastructure;

h. facilitates the establishment of papakāinga and marae; and

i. avoids conflicts between incompatible activities.

Comment:

The site is on the outskirts of Temuka, parts of the site are already zoned Residential so it would be more prudent to have the zone boundary follow the property boundary. Adverse effects are mitigated by the site being able to access the reticulated infrastructure of Temuka and the surrounding environment of small allotments ensures that there are no reverse sensitivity effects on activities on neighbouring properties.

5.3.1 Regional growth (Wider Region)

To provide, as the primary focus for meeting the wider region's growth needs, sustainable development patterns that:

1. ensure that any
a. urban growth; and
b. limited rural residential development

occur in a form that concentrates, or is attached to, existing urban areas and promotes a coordinated pattern of development;

2. encourage within urban areas, housing choice, recreation and community facilities, and business opportunities of a character and form that supports urban consolidation;
3. promote energy efficiency in urban forms, transport patterns, site location and subdivision layout;
4. maintain and enhance the sense of identity and character of the region's urban areas; and
5. encourage high quality urban design, including the maintenance and enhancement of amenity values.

Comment:

The proposal is considered to achieve a consolidated and coordinated pattern of development due to the servicing availability and proximity to the urban boundary. The urban boundary falling within the site also demonstrates that the site is easily integrated into the urban setting.

5.3.2 Development conditions (Wider Region)

To enable development including regionally significant infrastructure which:

1. ensure that adverse effects are avoided, remedied or mitigated, including where these would compromise or foreclose :
a. existing or consented regionally significant infrastructure;
b. options for accommodating the consolidated growth and development of existing urban areas;
c. the productivity of the region's soil resources, without regard to the need to make appropriate use of soil which is valued for existing or foreseeable future primary production, or through further fragmentation of rural land;
d. the protection of sources of water for community supplies;
e. significant natural and physical resources;
2. avoid or mitigate:
a. natural and other hazards, or land uses that would likely result in increases in the frequency and/or severity of hazards;

b. reverse sensitivity effects and conflicts between incompatible activities, including identified mineral extraction areas; and

3. integrate with:

a. the efficient and effective provision, maintenance or upgrade of infrastructure; and

b. transport networks, connections and modes so as to provide for the sustainable and efficient movement of people, goods and services, and a logical, permeable and safe transport system.

Comment:

The site will not place significant strain on infrastructure, will not adversely effect natural or physical resources and will able to integrate with transport networks efficiently.

8.0 National Policy Statements

8.1 National Policy Statement for Highly Productive Land (NPS-HPL)

The Submitter acknowledges that:

a Section 75(3)(a) of the Resource Management Act 1991 requires that the PDP give effect to the NPS-HPL; and

b The NPS-HPL places restrictions on urban and rural-lifestyle rezonings, and subdivision, of "highly productive land", which includes land that has been identified as Land Use Capability Class 2 (LUC2).

The Submitter therefore accepts that those restrictions are a relevant consideration in the PDP planning process, and accordingly, the Panel's consideration of submissions.

Clause 3.5(1) of the NPS-HPL requires that no later than 3 years after the commencement date of the NPS every regional council must notify all the land in its region that is required to be mapped as highly productive land. Confirmation has been requested from Environment Canterbury in relation to when the updated mapping will be released, however no indicative timeframes were provided. It is understood that work on the new Canterbury Regional Policy Statement has been paused until January 2026 pending the release of updated national directions, however it is currently unclear whether this will also capture highly productive land matters which should be notified by 17 October 2025 in order to comply with the requirements of clause 3.5(1) of the NPS-HPL.

The current PDP hearing schedule includes submissions seeking urban and rural-residential rezonings of land within the scope of matters to be addressed during Hearing G (Growth), between 8 and 10 July 2025. Based on the requirements of Clause 3.5(1) of the NPS-HPL the updated mapping, which will be subject to the Schedule 1 process of the Resource Management Act 1991 (**RMA**) will be notified either prior to October 2025, or in the Regional Policy Statement update to be provided in January 2026. Either way, it is more than likely that there will be changes to how the NPS-HPL will apply to the site prior to

the release of the Hearings Panel's decisions in March 2026. The Submitter therefore considers it would be appropriate for the assessment against the NPS-HPL to be deferred and addressed initially in the s42A report, the Submitter's evidence and legal submissions (as it is expected that more information will be available by this time) for Hearing G based on the information that applies at the time.

Due to the likelihood that there will be a different framework in place by the time the Hearings Panel release their decision on the PDP, it is considered most appropriate for the rezone to be considered on its merits, with the Panel allowing Council's reporting officer and submitters the opportunity to update their report, evidence and legal submissions for Hearing G as relevant, and address the implications of any changes to the NPS-HPL for the PDP and submissions prior to the Panel's decision being released should the potential changes become a reality.

8.2 National Policy Statement for Urban Development (NPS-UD)

Location, area, density and infrastructure matters have already been addressed in this response. These matters demonstrate that the proposal is consistent with the following Objectives and Policies listed on the following page:

Objective 1: New Zealand has well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future.

Objective 6: Local authority decisions on urban development that affect urban environments are: integrated with infrastructure planning and funding decisions; and strategic over the medium term and long term; and responsive, particularly in relation to proposals that would supply significant development capacity.

Policy 1: Planning decisions contribute to well-functioning urban environments, which are urban environments that, as a minimum: have or enable a variety of homes that:

(i) meet the needs, in terms of type, price, and location, of different households; and

(ii) enable Māori to express their cultural traditions and norms; and

have or enable a variety of sites that are suitable for different business sectors in terms of location and site size; and have good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport; and support, and limit as much as possible adverse impacts on, the competitive operation of land and development markets; and support reductions in greenhouse gas emissions; and are resilient to the likely current and future effects of climate change.

As requested by the preliminary s42A Report the following comment is made in relation to whether there is demand in the Timaru District for sections:

The information provided by the Timaru District council includes growth projections from a Property Economics 2024 Report commissioned by the Council to consider the need for growth in the Timaru District. The growth projections contained in the report only show limited growth for the Timaru District and partially relied on growth data drawn from a date range when the COVID-19 pandemic was impacting the travel and movement of people throughout New Zealand. In particular the data states that it is unlikely that the population of Timaru would exceed 50,000 people in the short term. Information from Infometrics identifies that as of 2024 the population of the Timaru District sits at 50,100 persons.[1] This more aligns with the output of Venture Timaru which outlines how if an aspirational economic future is sought in the Timaru District that there will be a significant need for housing in the District. By the metrics provided in that report, a copy of which is included with this response, if Timaru District continues with the status quo the population would reach 53,000 by 2050 with significant increases if medium growth is achieved (67,500 persons). Due to the projections in the Property Economics 2024 report already being out of line with the statistics of Infometrics, it is considered that this should not be relied on for the purposes of considering the rezone request.

Prepared by:

Melissa McMullan
LLB BA MPlan
Planner

Reviewed by:

Andrew Rabbidge
BSurv (credit), RPSurv, Assoc NZPI, MS+SNZ, CSNZ
Licensed Cadastral Surveyor
Director, Milward Finlay Lobb Limited

20 February 2025

[1] https://rep.infometrics.co.nz/timaru-district/population/growth

Attachments

- Timaru District Council correspondence – Council Acceptance of Rural Connection to Urban Services, dated 30 November 2021
- Timaru District Council email from William Ching confirming connection to site reticulated networks, dated 19 December 2024
- Subdivision Plan dated 6 April 2023
- Environment Canterbury Flood Hazard Assessment dated 5 April 2022
- Environment Canterbury Listed Land Use Register dated 19 February 2025
- Momentum Environmental Soil Contamination Detailed Site Investigation Report, 340 King Street, Temuka, dated August 2022
- 'Scenarios of an Aspirational Economic Future of Timaru District', prepared by Benje Patterson – October 2022

TIMARU
DISTRICT COUNCIL
Te Kaunihera ā-Rohe
o Te Tihi o Maru

30 November 2021

Milward Finlay Lobb
C/- TA Johnston & WL Johnston
PO Box 434
Timaru 7940

Dear Sir or Madam

340 King Street Temuka, 7920
Council Acceptance of Rural Connection to Urban Services

We hope this correspondence finds you well. Timaru District Council's Infrastructure Group confirms that urban water supply and sewer disposal is available to the proposed development, as per the attached draft subdivision plan.

A subdivision consent is required to be granted prior to any approval for connection to Council's urban reticulation will be issued.

A service consent application will be required to be lodged with Council's Infrastructure Consents team prior to any physical works taking place.

If you have any questions regarding the subdivision consent process, please contact Council's Planning Unit, and for questions on the service consent process, please contact Council's Infrastructure Consents team.

Yours sincerely

Andrew Dixon
Group Manager - Infrastructure

e. andrew.dixon@timdc.govt.nz
p. 03 687 7555

Encl.

AD21/33955

From: William Ching <william.ching@timdc.govt.nz>
Sent: Thursday, 19 December 2024 7:40 am
To: Melissa McMullan; Kevin Kemp
Cc: Andrew Rabbidge; Kayne Robinson
Subject: RE: 340 King Street, Temuka - ability to connect to reticulated services

Hello Melissa,

I have caught up with Andrew. He would still be okay with connecting to the reticulated networks for this site. There would also be sufficient capacity available.

If you have further questions let me know.

Kind regards,

William

TIMARU DISTRICT COUNCIL
Te Kaunihera ā-Rohe o Te Tihi o Maru

William Ching | Infrastructure Planner

Timaru District Council | PO Box 522 | Timaru 7940
P:+64 3 687 7238 | Cell: +64 27 230 4623| W: www.timaru.govt.nz

From: Melissa McMullan <melissa@mflnz.co.nz>
Sent: Tuesday, 17 December 2024 1:32 pm
To: William Ching <william.ching@timdc.govt.nz>; Kevin Kemp <kevin.kemp@timdc.govt.nz>
Cc: Andrew Rabbidge <andrew@mflnz.co.nz>; Kayne Robinson <kayne@mflnz.co.nz>
Subject: 340 King Street, Temuka - ability to connect to reticulated services

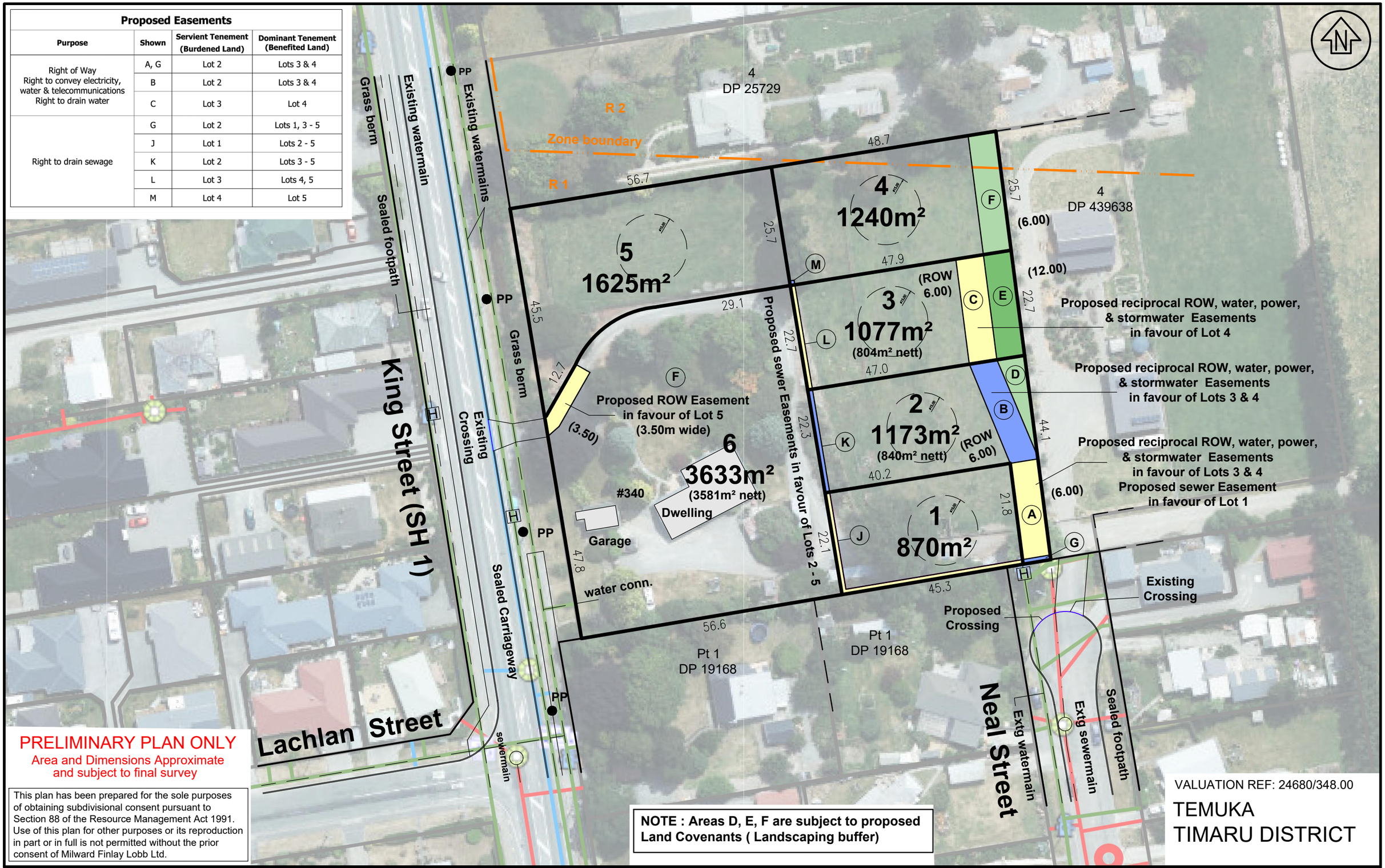
Hi William and Kevin,

In 2021 we made a subdivision consent application for 340 King Street Temuka and at this time confirmation was obtained from Timaru District Council (attached) that it was possible to utilise the reticulated water and sewer networks for the proposed subdivision, despite the underlying Rural zoning.

Our client is now seeking a rezone of the site and as part of the information request from the reporting officer are you able to please confirm that it is still possible to connect to the reticulated services for this site?

Proposed Easements

Purpose	Shown	Servient Tenement (Burdened Land)	Dominant Tenement (Benefited Land)
Right of Way Right to convey electricity, water & telecommunications Right to drain water	A, G	Lot 2	Lots 3 & 4
	B	Lot 2	Lots 3 & 4
	C	Lot 3	Lot 4
Right to drain sewage	G	Lot 2	Lots 1, 3 - 5
	J	Lot 1	Lots 2 - 5
	K	Lot 2	Lots 3 - 5
	L	Lot 3	Lots 4, 5
	M	Lot 4	Lot 5



PRELIMINARY PLAN ONLY
Area and Dimensions Approximate and subject to final survey

This plan has been prepared for the sole purposes of obtaining subdivisional consent pursuant to Section 88 of the Resource Management Act 1991. Use of this plan for other purposes or its reproduction in part or in full is not permitted without the prior consent of Milward Finlay Lobb Ltd.

NOTE : Areas D, E, F are subject to proposed Land Covenants (Landscaping buffer)

VALUATION REF: 24680/348.00

TEMUKA
TIMARU DISTRICT

SCALE : 1 : 750 @ A3 | Date : July 2021

Applicants: WL & TA Johnston
340 King Street
TEMUKA 7920

Surveyed	ASR
Drawn	VCJ
Amended	17.12.2021
Amended	6.04.2023

Resource Consent Application
Proposed Subdivision of Lot 1 DP 439638

milward finlay lobb
PLANNERS | SURVEYORS | ENGINEERS
6 The Terrace, Timaru 7910
PO BOX 434, Timaru 7940
P 03 684 7688
E admin@mflnz.co.nz
www.mflnz.co.nz

Client/Job No.
182378/01

Sheet 1 of 1

C:\Users\VickiJ\OneDrive - Milward Finlay Lobb Ltd\MFL\Johnston, Wendy - 182378\01 - Proposed Subdivision - 340 King Street, Temuka\Planning\RCA 2023.dwg

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

5 April 2022

Melissa McMullen
PO Box 434
Timaru, Canterbury 7940
New Zealand

Dear Melissa

Flood Hazard Assessment – Subdivision
340 King Street, Temuka
LOT 1 DP 439638, Valuation No: 24680-348-00

This 1-hectare property is located on the east side of King Street, 30 metres north of the intersection with Lachlan Street. The property is best described as flat, with no obvious depressions or swales within the property boundary.

The Temuka Flood Plain investigation 2009 (Report R09/80) carried out by the Canterbury Regional Council indicates the property is susceptible to minor nuisance flooding (likely less than 100 mm deep) in the 200-year Recurrence Interval (ARI) flood. More significant flooding, as a result of upstream breakouts from both the Waihi and Orari Rivers is expected across the property in the 500-year ARI flood, with depths of up to 350mm possible on the property.

Note: Average Recurrence Interval (ARI) represents the average time period between floods of a certain size.

To provide perspective, the 200- and 500- year ARI floods represent extreme events that will involve several river breakouts and result in the flooding of a significant part of the Temuka Township. The shallow flooding anticipated on this property is at the low-end of potential impacts during floods of that size. The last time there was significant flooding in the residential part of Temuka was in 1945 when the Orari and Waihi Rivers flooded the town. Environment Canterbury does not hold any records of that flood that are specific to this property.

As defined by the District Plan, the minimum floor height required for new dwellings by the Timaru District Council is above the 200-year ARI flood level. Any flooding that occurs on the proposed lots in a flood of that size will be minimal and therefore no floor level requirement would apply to any new dwelling in this subdivision (beyond what the Building Act requires).

The above comments relate to the risk of flooding from rivers and major streams. Environment Canterbury has no information on the potential for stormwater runoff that may occur following periods of very heavy or prolonged rainfall.

Predicting site specific flooding is not an exact science and requires many assumptions. Any additional elevation of the floor of any future dwellings (above that required by the Building Act) will provide greater protection against the risk of floodwaters affecting the dwelling in really extreme flooding events. In situations like this where the expected flooding is minor even a small increase in floor level (say 50 or 100 mm) could provide a significantly greater level of protection to any future dwelling.

When using the flood information provided in this letter it is important the following points are understood:

- The information provided is the best information Environment Canterbury has at this time. The District Council or local residents may have further information about flooding at the property.

- Environment Canterbury's understanding of flooding at the property may change in the future as further investigations are carried out and new information becomes available.

- It is assumed that flood protection works will be maintained to at least their current standard in the future.
- Flooding can occur in smaller floods if stopbanks are breached at lower than design flows. A breach can occur through lateral or internal erosion of the stopbank. The location of a stopbank breach or overtopping may affect flood depths at the property.

- Flood flow paths and depths can be affected by changes on the floodplain such as:
    - Altering swales, roads or irrigation features
    - Property development including buildings, fencing and hedges
    - Blockages in culverts, drains and bridges
    - Seasonal vegetation growth
    - Antecedent soil moisture conditions

The prediction of flood depths requires many assumptions and is not an exact science.

I hope the above information is of assistance. Please do not hesitate to contact me if you require any clarification.

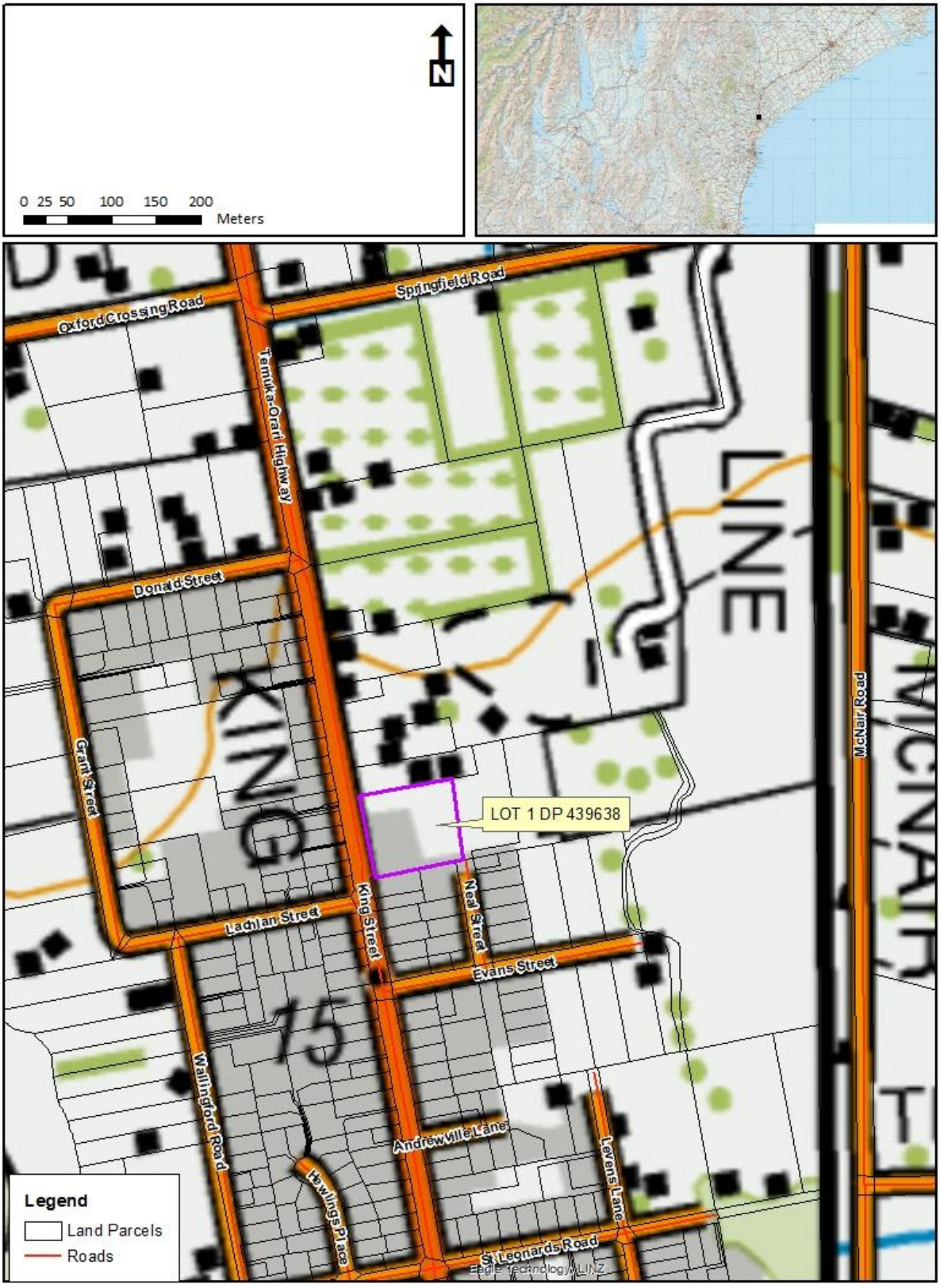
Yours sincerely,

Oliver Hermans
Science Analyst (Natural Hazards)

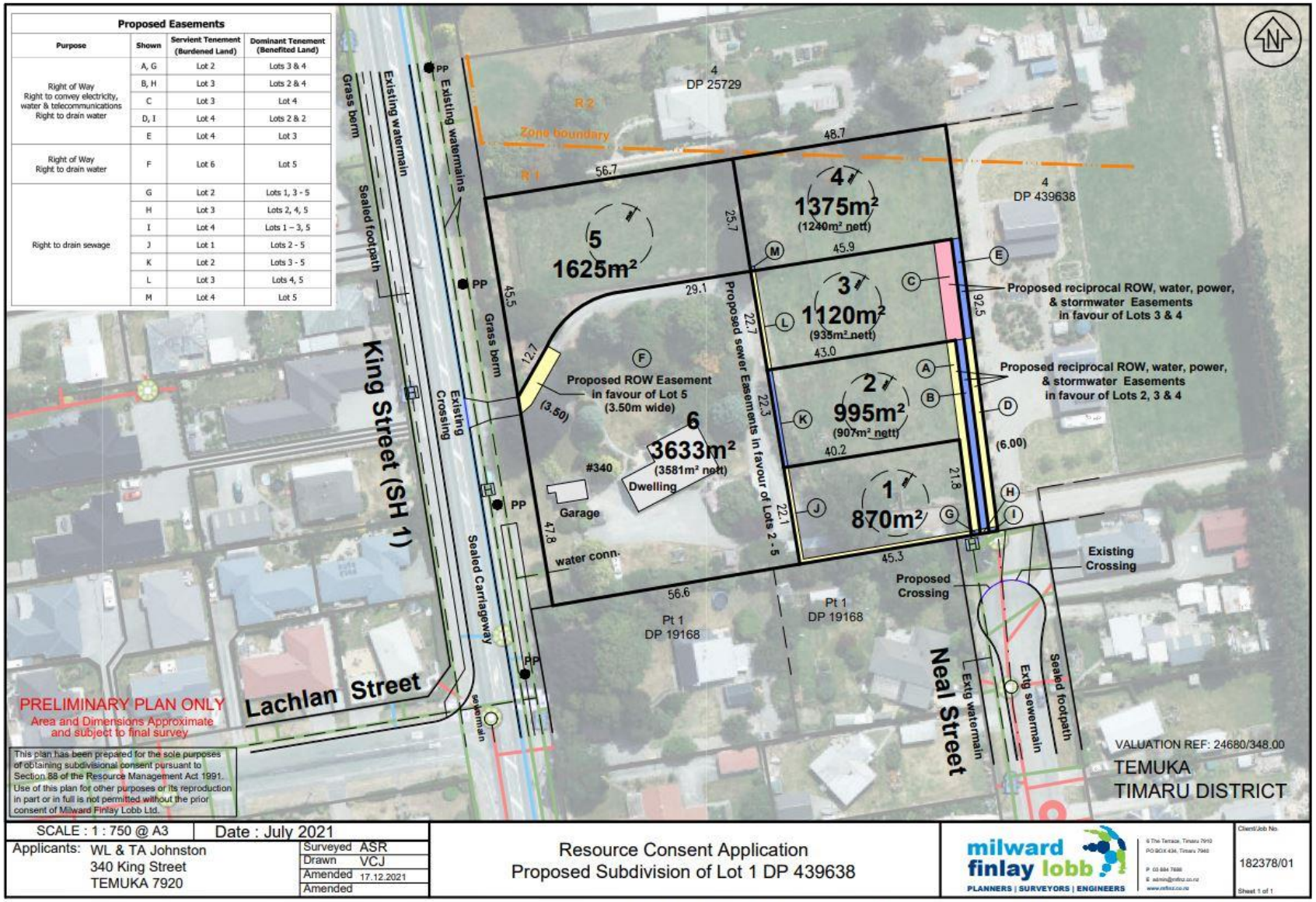
cc: John McKenzie (Subdivision and Compliance Officer)
Timaru District Council

Attachments:
- Topographic Map of the property and surrounding area
- Aerial Map showing the location of the property
- Site Plan (provided by applicant)

340 King Street, Temuka - Topo



340 King Street, Temuka - Aerial



Key Ref: 22090
Contact: Oliver Hermans

Property Statement
from the Listed Land Use Register

Visit ecan.govt.nz/HAIL for more information or
contact Customer Services at ecan.govt.nz/contact/ and quote ENQ405376

Date generated: 19 February 2025
Land parcels: Lot 1 DP 439638

The information presented in this map is specific to the property you have selected. Information on nearby properties may not be shown on this map, even if the property is visible.

Sites at a glance

Sites within enquiry area

Site number	Name	Location	HAIL activity(s)	Category
329163	340 King street, Temuka	340 King street, Temuka	A10 - Persistent pesticide bulk storage or use;G5 - Waste disposal to land;A18 - Wood treatment or preservation and bulk storage of treated timber;	Verified HAIL

More detail about the sites

Site 329163: 340 King street, Temuka (Intersects enquiry area.)

Category: Verified HAIL
Definition: The land-use / HAIL history has been confirmed.

Location: 340 King street, Temuka
Legal description(s): Lot 1 DP 439638

HAIL activity(s):

Period from	Period to	HAIL activity
1979	1987	Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds
Unknown	Present	Waste disposal to land (excluding where biosolids have been used as soil conditioners)
2015	Present	Wood treatment or preservation including the commercial use of anti-sapstain chemicals during milling, or bulk storage of treated timber outside

Notes:

Investigations:

INV 329165 **Preliminary Site Investigation Report 340 King Street, Temuka**
Momentum Environmental Limited - Preliminary Site Investigation
1 Feb 2022

Summary of investigation(s):

Environment Canterbury has received a Preliminary Site Investigation report that includes all or part of the property you have selected.

A Preliminary Site Investigation seeks to identify potential sources of contamination resulting from current and historical land uses.

The preliminary site investigation may not have found any potential sources of contamination on the property you have enquired about. Where potential sources of contamination have been identified, a site identification number (e.g. SIT 1234) and land uses from the Hazardous Activities and Industries List (HAIL) will be shown on your statement.

This investigation has not been summarised.

INV 329169 **Detailed Site Investigation Report 340 King Street, Temuka**
Momentum Environmental Limited - Detailed Site Investigation
11 Aug 2022

Summary of investigation(s):

Environment Canterbury has received a Detailed Site Investigation report that includes all or part of the property you have selected.

A DSI seeks to identify the type, extent and level of contamination (if any) in an area. Soil, soil-gas or water samples will have been collected and analysed.

This investigation has not been summarised.

Disclaimer

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987.

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or representation regarding the reliability, accuracy or completeness of the information provided or the level of contamination (if any) at the relevant site or that the site is suitable or otherwise for any particular purpose. Environment Canterbury accepts no responsibility for any loss, cost, damage or expense any person may incur as a result of the use, reference to or reliance on the information contained in this report.

Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

Soil Contamination Risk
Detailed Site Investigation Report

340 King Street,
Temuka

August 2022

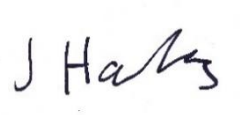
QUALITY CONTROL AND CERTIFICATION SHEET

Client: Wendy Johnston

Date of issue: 11 August 2022

Report written by:

Joshua Hawkes, Environmental Geologist, BSc, PGDip
(5 years contaminated land experience within 11 years environmental experience)

Signed: 

Email: josh@momentumenviro.co.nz
Phone: 027 711 2257

Report reviewed and certified as a Suitably Qualified and Experienced Practitioner by:

Nicola Peacock, Principal Environmental Engineer, NZCE, CEnvP
(13 years contaminated land experience within 29 years environmental experience)

Signed: 

Email: nicola@momentumenviro.co.nz
Phone: 021 1320 321

CONTENTS

APPENDICES

1 Executive Summary

The subject of this investigation is located at 340 King Street, Temuka. A proposed subdivision seeks to create six residential lots. This will involve a change in land-use, subdivision, and soil disturbance during the construction of the residential buildings/services. Therefore, an assessment under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) is required. It is also noted that Momentum Environmental Ltd is obligated to consider the requirements of Section 10 (4) of the Health and Safety at Work (Asbestos) Regulations 2016. This report details the work undertaken to assess the risks.

A Preliminary Site Investigation (PSI) undertaken by Momentum Environmental Limited (MEL) in February 2022 identified a risk to the subject site from potentially contaminating activities which would fall under the Ministry for the Environment's (MfE's) Hazardous Activities and Industries List (HAIL). These included:

- Horticultural land use including application to soils and storage/potential mixing of persistent pesticides in and around glasshouses (HAIL A10).
- Storage of treated timber along the fenceline north of the dwelling (HAIL A18).
- Potential burn piles located in the paddock north of the dwelling (HAIL G5).
- Demolition of multiple historical buildings including glasshouses (HAIL I).

Based upon the risk to future residents and the environment from the potentially contaminating activities identified above a Detailed Site Investigation was recommended.

Soil sampling was undertaken by MEL in July 2022. The results of the soil sampling identified the following:

- Heavy metal concentrations were below the 'residential 10% produce' SGVs across the subject site. The majority of soil samples contained at least one heavy metal above the expected background concentrations.
- Asbestos was detected in one surface soil sample (SS19) with subsequent semi-quantitative analysis showing concentrations of fibrous asbestos/asbestos fines above NZ GAMAS guideline values, and above the Class B criteria (0.039% AF/FA c.f. 0.01% AF/FA for Class B)
- Organochlorine pesticide (OCP) concentrations where tested were below ambient background concentrations.

The conceptual site model identified a low risk to human health from the elevated asbestos for current and future residents of proposed Lot 6, in proximity to SS19 in its current use and condition. However, there is a moderate risk to human health if the soils were to be disturbed in the future.

It is recommended that a consent notice be registered on the title of Lot 6 at subdivision stage with an ongoing condition requiring this area to be maintained in its current condition with no soil disturbance occurring unless under the control of a SQEP.

Results from the remainder of the subject site, covering the proposed new lots 1-5, were below the 'residential 10% produce' SGVs, and no further investigation is required. Soils excavated during the subdivision earthworks and subsequent building excavations may not qualify for disposal as cleanfill.

2 Objectives of the Investigation

This report has been written in general accordance with the Ministry for the Environment's (MfE) "Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand, revised 2021" (CLMG) and the "New Zealand Guidelines for Assessing and Managing Asbestos in Soils" (NZ GAMAS). The report includes all requirements for a Detailed Site Investigation Report.

The objective of this investigation is to:

- Collect and assess information from multiple sources to understand previous and current land uses.
- Describe the subject site's physical and environmental features to understand potential pathways and receptors.
- Collect and analyse subject site information, including soil sampling and testing, to determine the extent and type of any contamination present to inform remediation or site management options.
- Provide remediation or site management recommendations to the client based on the results of the investigation.

3 Scope of Work Undertaken

The scope of the work undertaken has included:

- Review of previous investigations undertaken on the subject site.
- Designing a sampling and analysis plan based on the identified contaminant risks.
- On site soil sampling and laboratory testing for contaminants of concern.
- Analysis of results against applicable soil guidelines values (SGVs).
- Preparation of this report in accordance with MfE guidelines.

4 Site Identification

The subject of this investigation (herein referred to as 'subject site') is located approximately 1.5km north of Temuka town centre in Canterbury. The subject site is legally described as Lot 1 DP 439638 and occupies an area of approximately 9,610m^2, as shown in **Figure 1** below.

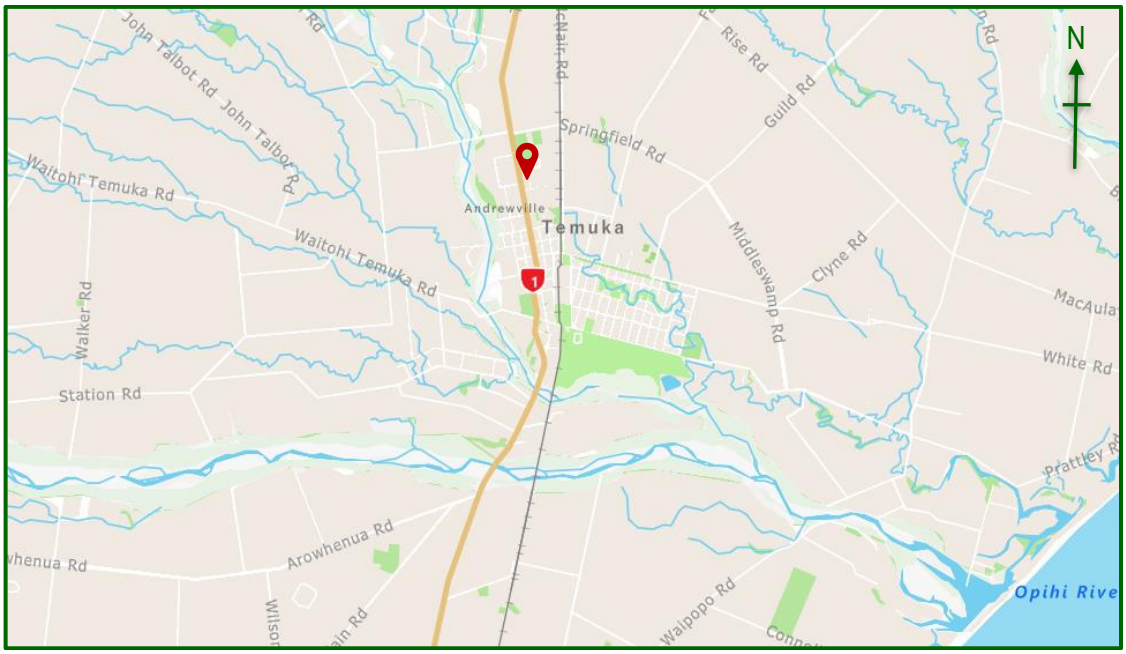


Figure 1 – Location Plan

5 Site Description

5.1 Environmental Setting

Table 1 – Environmental Setting

Topography	The subject site is generally flat land
Geology	The ECan GIS database describes the soils at the subject site as the Waimakariri deep loam, a weathered fluvial recent soil. Information obtained from nearby bore logs describe nearby soils as topsoils, underlain by shingle or clayey-silty gravels.
Soil trace elements	Natural concentrations of trace elements can be identified on the ECan GIS database within the 'Regional, Recent' soil group.
Groundwater	The subject site lies over the unconfined and semiconfined gravel aquifer system. Groundwater levels recorded on nearby bore logs are between 2.4-3.8m deep. The direction of groundwater flow is generally in a south-easterly direction.
Surface Water	The LINZ 1:50,000 Topomap River and Stream layer identifies an unnamed stream approximately 240m east of the subject site at its nearest point.

5.2 Site Layout and Current Site Uses

The subject site is used for residential purposes and contains a dwelling and curtilage area, a former ice-cream store and former cool-store in the central and south-western extents of the subject site. The eastern half and northern quarter of the subject site contains paddocks which are used to run cattle occasionally. The subject site was historically part of a berry orchard, which was removed in the early 2010's.

5.3 Surrounding Land Uses

The surrounding land is largely residential.

6 Proposed Site Use

The subdivision seeks to create five new vacant residential lots in the existing paddock areas ranging in size from 870m2 to 1625m2, with a balance lot of 3633m2 around the existing established dwelling and outbuildings. This will involve a change in land-use in the paddocks, subdivision, and soil disturbance during the construction of the residential buildings/services.

A subdivision scheme plan is included in **Appendix A**.

7 Summary of Investigations

7.1 Preliminary Site Investigation

A Preliminary Site Investigation (PSI) was undertaken by Momentum Environmental Limited (MEL) in February 2022. The investigation found that several potential current or historical activities which would fall under the Ministry for the Environment's (MfE's) Hazardous Activities and Industries List (HAIL) had occurred on the subject site. These included:

- Horticultural land use including application to soils and storage/potential mixing of persistent pesticides in and around glasshouses (HAIL A10).
- Storage of treated timber along the fence line north of the dwelling (HAIL A18).
- Potential burn piles located in the paddock north of the dwelling (HAIL G5).

- Demolition of multiple historical buildings including glasshouses (HAIL I).

These activities pose a risk of soil contamination that could pose a risk to human health and the environment. Based upon the risk to future residents and the environment from the potentially contaminating activities identified above a Detailed Site Investigation was recommended.

A copy of the PSI Site Inspection Plan is included as **Appendix B**.

7.2 Geotechnical Investigation

At the time of writing no geotechnical report was made available to Momentum Environmental Ltd (MEL).

8 Sampling and Analysis Plan

8.1 Soil Guideline Values

Human health soil contaminant standards for a group of 12 priority contaminants were derived under a set of five land-use scenarios and are legally binding under The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Health) Regulations 2011 (NES). These standards have been applied where applicable. The regulations describe these as Soil Contaminant Standards. For contaminants other than the 12 priority contaminants, the hierarchy as set out in the Ministry for the Environment Contaminated Land Management Guidelines No 2 has been followed. These are generally described as Soil Guideline Values. For simplicity, this report uses the terminology Soil Guideline Values (SGV) when referring to the appropriate soil contaminant standard or other derived value from the hierarchy. For soil, guideline values are predominantly risk based, in that they are typically derived using designated exposure scenarios that relate to different land uses. For each exposure scenario, selected pathways of exposure are used to derive guideline values. These pathways typically include soil ingestion, inhalation and dermal adsorption. The guideline values for the appropriate land use scenario relate to the most critical pathway.

The land-use scenario applied based upon the proposed subdivision is 'residential 10% produce'. The 'commercial/industrial' land use scenario has been applied as a proxy for workers involved in disturbing soils.

The adopted trigger value used to determine need for assessment of ecological receptors referred to as Ecological Guideline Values (EGVs) is the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (online) – Sediment GV-high (ANZWQ).

For comparison of site concentrations against expected background levels the following published concentrations will be used:

- Heavy metal concentrations will be assessed against the expected background levels as published in *Background Concentrations in Canterbury soils*, Tonkin and Taylor, July 2007.
- Organochlorine pesticide (OCP) concentrations will be assessed against the concentrations published in *Ambient Concentrations of Selected Organochlorine in Soils*, Buckland, Ellis and Salter, 1998.

8.2 Sampling Design

The potential sources of contamination identified by the PSI can be divided into two risk areas. The first is the area of historical horticultural use which includes burn areas and treated timber storage. The second is located close to the former dwelling, which includes a garage and tunnel houses. Therefore, the subject site has been divided into two exposure areas as detailed in **Tables 2-3** below and outlined red on **Figure 2**.

Figure 2 – Exposure Area Plan

Table 2 – Sampling Design in Residential Area

Contaminants of concern	Heavy metals and asbestos.
Sampling pattern and number of sample locations	A judgemental sampling methodology targeted to former historical buildings is to be implemented consisting of a minimum of five sample locations. Sampling will be undertaken in combination with XRF testing and additional sample locations will be added if deemed necessary.
Depth of samples	Due to the likely mode of contamination and likely exposure pathways present in a residential setting, surface (0-50mm) and shallow sampling (250mm) is appropriate. If the XRF indicates elevated concentrations of heavy metals exist at shallow depths, deeper sampling (450-500mm) may be carried out.
Testing methodology and analysis comparison	A selection of samples will be submitted for heavy metal analysis to confirm the XRF results. Samples may be submitted for asbestos presence/absence analysis based on in-field observations, with semi-quantitative analysis to follow any positive result. Results will be compared to the 'residential 10% produce' SGVs.
Field Sampling Technique	Samples to be taken by hand using a stainless-steel spade, trowel or fresh disposable nitrile gloves.

XRF Testing Procedure	As the device reads 23 metals, the contaminants to focus on should be narrowed down to those likely to be present based on the risk profile and the limitations of the XRF. It is noted that the XRF is not suitable for measuring cadmium with the limit of detection being higher than the residential SGV. As cadmium is primarily associated with fertiliser storage or industrial processes it is considered unlikely to be a significant contaminant of concern, however, is included in the standard laboratory metal suite tested. The results from the XRF for arsenic, chromium, copper, lead, nickel and zinc are to be analysed in detail but only reported if relevant to human health risk. For each sample location and depth, three XRF tests are to be performed over an approximate 10cm^2 area.

Table 3 –Sampling Design in Horticultural Area

Contaminants of concern	Heavy metals, organochlorine pesticides (OCPs) and asbestos.
Sampling pattern and number of sample locations	A judgemental sampling methodology consisting of a minimum of 20 sample locations targeted to the former orchard area, potential burn areas, areas of treated timber storage and locations of historical buildings. For burn areas, treated timber storage areas and locations of historical buildings sampling will be undertaken in combination with XRF testing and additional sample locations will be added if deemed necessary.
Depth of samples	Due to the likely mode of contamination and likely exposure pathways present in a residential setting, surface (0-50mm) and shallow sampling (250mm) is appropriate.
Testing methodology and analysis comparison	A selection of samples will be submitted for heavy metal analysis to confirm the XRF results. Surface samples from areas unaffected by burning and treated timber storage will be composited and analysed for OCPs. Compositing is considered to be justified as any application of pesticides would have resulted in a uniform spread of contaminants across the area. Individual analysis may be carried out if significant concentrations are detected. Samples may be submitted for asbestos presence/absence analysis based on in-field observations and proximity to historical buildings, with semi-quantitative analysis to follow any positive result. Results will be compared to the 'residential 10% produce' SGVs.
Field Sampling Technique	Samples to be taken by hand using a stainless-steel spade, trowel or fresh disposable nitrile gloves.
XRF Testing Procedure	As the device reads 23 metals, the contaminants to focus on should be narrowed down to those likely to be present based on the risk profile and the limitations of the XRF. It is noted that the XRF is not suitable for measuring cadmium with the limit of detection being higher than the residential SGV. As cadmium is primarily associated with fertiliser storage or industrial processes it is considered unlikely to be a significant contaminant of concern, however, is included in the standard laboratory metal suite tested. The results from the XRF for arsenic, chromium, copper, lead, nickel and zinc are to be analysed in detail but only reported if relevant to human health risk. For each sample location and depth, three XRF tests are to be performed over an approximate 10cm^2 area.

8.3 Quality Assurance and Quality Control

Field quality assurance measures as described in Section 4.3.1 of the "Contaminated Land Management Guidelines No 5: Site Investigation and Analysis of Soils, revised 2021" (CLMG) are to be followed. These include using trained staff, choosing appropriate sample containers, accurate and individual labelling and recording of locations, completing appropriate laboratory chain of custody forms, chilling of samples as appropriate and timely delivery to laboratories. All non-disposable sampling equipment should be decontaminated between samples using Decon 90 and rinsed with tap water. All samples are to be submitted to IANZ accredited laboratories. Quality control to ensure freedom from sample cross-contamination is to be measured by the appropriate use of duplicate and rinsate blank samples.

9 Sampling Results

9.1 Summary of Works/Field Observations

Soil sampling was undertaken on 20 July 2022. Due to saturated soils and persistent rain at the time of sampling it was decided that XRF testing was unlikely to provide reliable results. Therefore, the proposed 25 locations were lab tested only, and delineation samples would only be taken if visual or olfactory evidence of contamination was encountered. Sample location plans are included in **Appendix C**.

Residential Area

Since the PSI was undertaken a versatile garage had been added south-east of the dwelling. No visual or olfactory evidence of contamination was encountered, and no asbestos was observed.

The soil profile was composed of topsoil underlain by brown silt. Gravel was mixed into the topsoil in locations SS18 and SS21. At location SS20 positioned within the driveway, the hole could not be extended beyond the surface due to the presence of compacted gravel.

A total of nine soil samples from 0-250mm were collected from 5 sample locations. The samples were all analysed for seven heavy metals and four out of the five surface samples were analysed for asbestos presence/absence based upon their proximity to historical building footprints, with semi-quantitative analysis to follow any positive result. Asbestos was detected in one of the samples (SS19.1) and therefore, the remaining sample (SS20.1) was tested for asbestos presence/absence.

Photo 1 – Versatile garage added since PSI

Photo 2 – Location SS19

Horticultural Area

Sample locations were placed within the paddocks and in the driveway (location of former glasshouse). No visual or olfactory evidence of contamination was encountered, and no asbestos was observed.

The soil profile was generally similar to the residential area. At location SS14 adjacent to the driveway a blackish grey topsoil was encountered to 250mm before becoming a light brown gravelly sand. SS16 was positioned within the driveway and the hole could not be extended past the surface due to the presence of compacted hardfill. At location SS25 a large amount of surface water meant that the deeper sample was being cross-contaminated and only the surface sample was collected. There was no discernible difference in soil profile between the burn areas (SS23-25) and the remainder of the risk area, with no visible ash.

All of the soil samples (including two duplicates) were analysed for seven heavy metals from locations SS1-SS17. Only the surface samples from the burn areas were analysed for seven heavy metals, with the deeper samples held cold. Two of the surface samples positioned close to historical building footprints were analysed for asbestos presence/absence with semi-quantitative analysis to follow any positive result. A total of 40 soil samples were collected between 0-250mm depth across the risk area.

Photo 3 & 4 – Views across the horticultural area

9.2 Evaluation of Results

No soil samples contained concentrations of heavy metals above the 'residential 10% produce' SGVs. The majority of the soil samples contained at least one heavy metal above the expected background concentration for the soil type ('Regional, Recent'). In the paddock areas the background exceedences are generally copper which is a common fungicide used in horticulture, and cadmium which likely relates to use of fertilisers. The results for the burn piles showed that other than copper and cadmium from the same causes mentioned above, heavy metals were below background concentrations, this indicates that only green waste has been burnt in the past and that HAIL G5 does not apply to these areas.

The surface soil sample from SS19 contained asbestos. Subsequent semi-quantitative analysis showed concentrations of 0.039% fibrous asbestos/asbestos fines (FA/AF) and <0.001% asbestos containing material (ACM). This exceeds the NZ GAMAS guideline value for residential use and the Class B trigger value of 0.01% FA/AF. No other selected soil samples contained asbestos.

Traces of DDT/DDE were detected in all four composite samples, but total DDT concentrations were below accepted ambient background concentrations. The total DDT results were above the EGV of 0.005mg/kg. Minor concentrations of endrin were contained within composites A and B. No other OCPs were above the laboratory level of detection.

Tables of Laboratory Results are included in **Appendix D** and Copies of the Laboratory Reports are included in **Appendix E**.

9.3 Results of Field & Laboratory Quality Assurance and Quality Control

No quality control issues were identified during sampling. The Relative Percentage Differences (RPD) for the duplicate sample pairs (SS6.1/SS6.2 and SS10.1/SS10.2) was acceptable, ranging from 0-21%.

All laboratory tested samples were submitted to Analytica Laboratory for analysis. Analytica Laboratory hold IANZ accreditation. As part of holding accreditation the laboratory follows appropriate testing and quality control procedures. No quality control issues were identified.

10 Risk Assessment

No heavy metal and/or OCP concentrations were above the 'residential 10% produce' SGVs.

The concentration of total DDT for the composite samples was above the laboratory level of detection, and therefore above the EGV in the horticultural risk area.

The single asbestos exceedance is located within an already well-established landscaped part of the existing residential curtilage as per **Photo 2** above. The soils have a thick layer of healthy grass preventing soils from being directly exposed to the elements and therefore reducing the risk of human exposure. No soil disturbance or change of use is proposed for this part of the site and in its current condition poses a low risk to human health. If soils were disturbed in this area, then asbestos may become airborne representing a moderate risk to human health to workers and/or residents, with the measured concentration of 0.039% AF/FA.

Table 4 – Conceptual Site Model

Conceptual Site Model				
Source	**Pathways**		**Receptor**	**Risk Assessment**
Total DDT concentrations above the EGV	**Human**	Dermal contact, ingestion and inhalation	Future site occupiers / land users	Low risk to human health as the 'residential 10% produce' SGV was not exceeded.
			Workers involved in soil disturbance at the site	Low risk to human health as the 'commercial/industrial' SGV was not exceeded.
	Ecological	Infiltration through soils to groundwater	Groundwater is likely to be 2.4-3.8m deep at the subject site	Low risk given depth to groundwater

		Surface runoff to waterways	Unnamed stream approximately 240m east of the subject site at its nearest point.	Low risk to the nearby waterway given distance.

Conceptual Site Model				
Source	**Pathways**		**Receptor**	**Risk Assessment**
Asbestos above NZ GAMAS Class B guidelines at SS19	**Human**	Dermal contact, ingestion and inhalation	Future site occupiers / land users	Low risk in current use and condition. Moderate risk if soils were to be disturbed.
	Ecological	Infiltration through soils to groundwater	Groundwater is likely to be 2.4-3.8m deep at the subject site	Low risk due to an incomplete exposure pathway as asbestos fibres do not readily migrate through soils.
		Surface runoff to waterways	Unnamed stream approximately 240m east of the subject site at its nearest point.	Low risk due to separation distance.

11 NESCS Assessment

The investigation has found that levels of contaminants are above the applicable standards in Regulation 7. Therefore, the proposed subdivision will require resource consent as a 'restricted discretionary' activity.

12 Conclusions and Recommendations

The investigations undertaken identified the following:

- Heavy metal concentrations were below the 'residential 10% produce' SGVs across the subject site. The majority of soil samples contained at least one heavy metal above the expected background concentrations.
- Asbestos was detected in one surface soil sample (SS19) with subsequent semi-quantitative analysis showing concentrations of fibrous asbestos/asbestos fines above NZ GAMAS guideline values, and above the Class B criteria (0.039% AF/FA c.f. 0.01% AF/FA for Class B)
- Organochlorine pesticide (OCP) concentrations where tested were below ambient background concentrations.

The conceptual site model identified a low risk to human health from the elevated asbestos for current and future residents of proposed Lot 6, in proximity to SS19 in its current use and condition. However, there is a moderate risk to human health if the soils were to be disturbed in the future.

It is recommended that a consent notice be registered on the title of Lot 6 at subdivision stage with an ongoing condition requiring this area to be maintained in its current condition with no soil disturbance occurring unless under the control of a SQEP.

Results from the remainder of the subject site, covering the proposed new lots 1-5, were below the 'residential 10% produce' SGVs, and no further investigation is required. Soils excavated during the subdivision earthworks and subsequent building excavations may not qualify for disposal as clean fill.

In terms of planning status at the time of writing, the proposed subdivision will require land use resource consent as a 'restricted discretionary' activity under the NESCS.

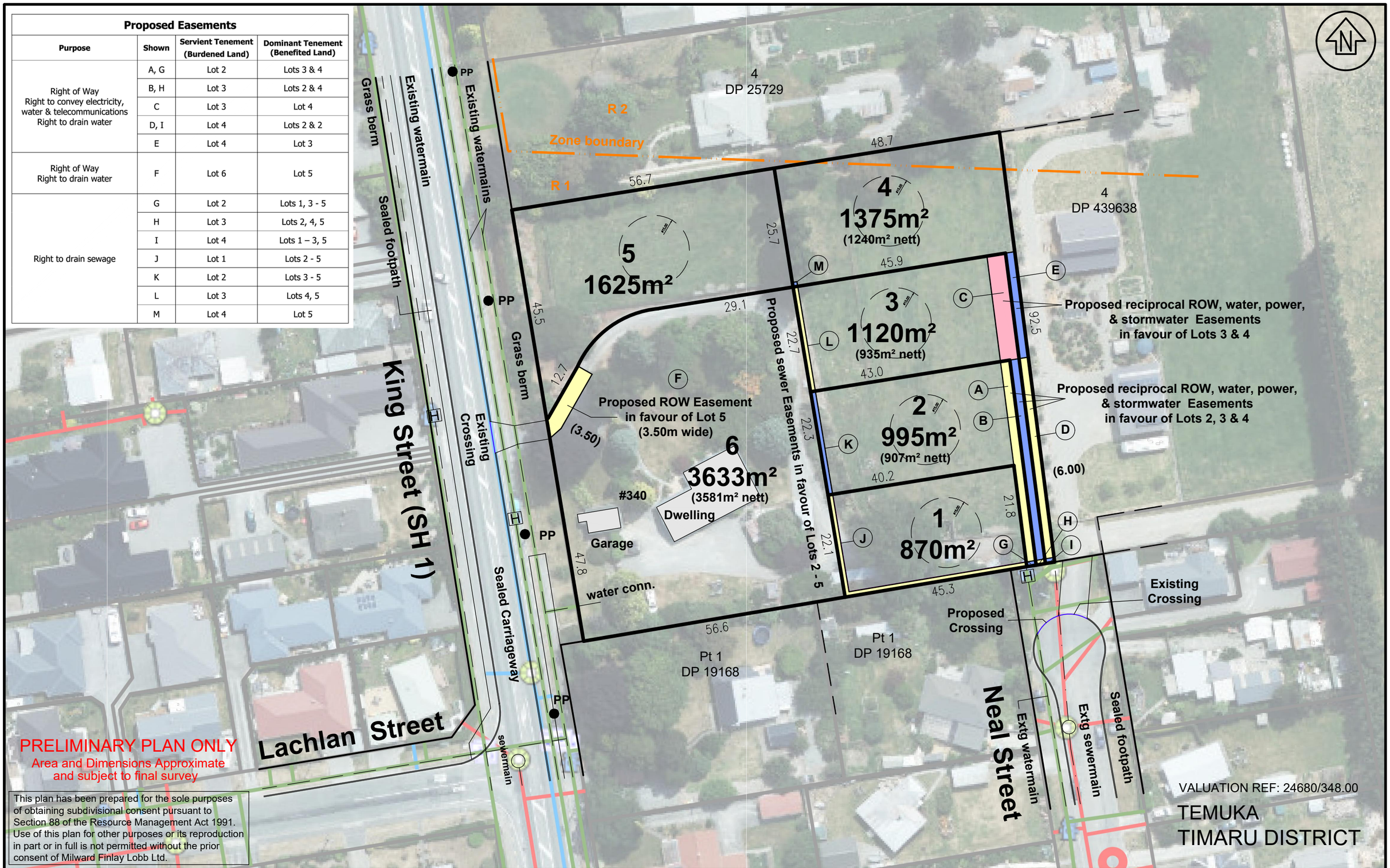
13 Limitations

Momentum Environmental Limited has performed services for this project in accordance with current professional standards for environmental site assessments, and in terms of the client's financial and technical brief for the work. Any reliance on this report by other parties shall be at such party's own risk. It does not purport to completely describe all the site characteristics and properties. Where data is supplied by the client or any third party, it has been assumed that the information is correct, unless otherwise stated. Momentum Environmental Limited accepts no responsibility for errors or omissions in the information provided. Should further information become available regarding the conditions at the site, Momentum Environmental Limited reserves the right to review the report in the context of the additional information.

Opinions and judgments expressed in this report are based on an understanding and interpretation of regulatory standards at the time of writing and should not be construed as legal opinions. As regulatory standards are constantly changing, conclusions and recommendations considered to be acceptable at the time of writing, may in the future become subject to different regulatory standards which cause them to become unacceptable. This may require further assessment and/or remediation of the site to be suitable for the existing or proposed land use activities. There is no investigation that is thorough enough to preclude the presence of materials at the site that presently or in the future may be considered hazardous.

Appendix A – Subdivision Scheme Plan

Proposed Easements			
Purpose	**Shown**	**Servient Tenement (Burdened Land)**	**Dominant Tenement (Benefited Land)**
Right of Way Right to convey electricity, water & telecommunications Right to drain water	A, G	Lot 2	Lots 3 & 4
	B, H	Lot 3	Lots 2 & 4
	C	Lot 3	Lot 4
	D, I	Lot 4	Lots 2 & 2
	E	Lot 4	Lot 3
Right of Way Right to drain water	F	Lot 6	Lot 5
Right to drain sewage	G	Lot 2	Lots 1, 3 - 5
	H	Lot 3	Lots 2, 4, 5
	I	Lot 4	Lots 1 – 3, 5
	J	Lot 1	Lots 2 - 5
	K	Lot 2	Lots 3 - 5
	L	Lot 3	Lots 4, 5
	M	Lot 4	Lot 5



PRELIMINARY PLAN ONLY
Area and Dimensions Approximate and subject to final survey

VALUATION REF: 24680/348.00

TEMUKA
TIMARU DISTRICT

SCALE : 1 : 750 @ A3 | Date : July 2021

Applicants: WL & TA Johnston
340 King Street
TEMUKA 7920

Surveyed	ASR
Drawn	VCJ
Amended	17.12.2021
Amended	

Resource Consent Application
Proposed Subdivision of Lot 1 DP 439638

milward finlay lobb
PLANNERS | SURVEYORS | ENGINEERS
6 The Terrace, Timaru 7910
PO BOX 434, Timaru 7940
P 03 684 7688
E admin@mflnz.co.nz
www.mflnz.co.nz

Client/Job No.
182378/01

Sheet 1 of 1

C:\Users\VickiJ\Dropbox (Milward Finlay Lobb)\MFL\Johnston, Wendy - 182378\01 - Proposed Subdivision - 340 King Street, Temuka\Planning\RCA.dwg

Appendix B – PSI Site Inspection Plan

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LEGEND

- text — Potential source of contamination
- text — Description of structures/areas not considered to pose a risk
- Approx. extent of risk area

Graphic scale is approximate only

0 12 24 36 48 60m

Date: 28 January 2022 **Drawing No:** 644/1

340 King Street, Temuka

Site Inspection Plan & Risk Areas Plan

Notes:

1. This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
2. Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
3. Soil sample locations are approximate only

Appendix C – Sample Location Plans

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LEGEND

- • SS1 — Soil sample location tested for asbestos
- • SS1 — Soil sample contains asbestos above NZ GAMAS guidelines

PLAN MUST BE PRINTED IN COLOUR

Graphic scale is approximate only

0 5 10 15 20 25m

Date: 10 August 2022 **Drawing No:** 644/3

340 King Street, Temuka

Sample Location Plan – Asbestos

Notes:

1. This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
2. Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
3. Soil sample locations are approximate only

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LEGEND

- SS1 Soil sample location
- OCP Composite Grouping

PLAN MUST BE PRINTED IN COLOUR

Graphic scale is approximate only

0 5 10 15 20 25m

Date: 10 August 2022 **Drawing No:** 644/2

340 King Street, Temuka

Sample Location Plan – Heavy Metals/OCP

Notes:

1. This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
2. Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
3. Soil sample locations are approximate only

Appendix D – Table of Laboratory Results

Table of Laboratory Results - 340 King Street, Temuka

Date of sampling: 20 July 2022

Analyte	Sample Name:	Composite A (SS1.1, SS2.1, SS3.1, SS4.1)	Composite B (SS5.1, SS6.1, SS7.1, SS8.1)	Composite C (SS9.1, SS10.1, SS11.1, SS12.1)	Composite D (SS14.1, SS15.1, SS16.1, SS17.1)	Soil Guideline Values					
Soil Results	Lab Number:	22-26592-50	22-26592-51	22-26592-52	22-26592-53	**Residential 10% Produce**	**Commercial/ Industrial**	**Reference**	**Ecological Receptors**	**Reference**	**Background$_1$**
	Depth (mm)	0-50	0-50	0-50	0-50						
Organochlorine pesticides											
2,4'-DDD	mg/kg dry wt	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-	-	-
2,4'-DDE	mg/kg dry wt	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-	-	-
2,4'-DDT	mg/kg dry wt	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-	-	-
4,4'-DDD	mg/kg dry wt	<0.0030	<0.0030	0.016	<0.0030	-	-	-	-	-	-
4,4'-DDE	mg/kg dry wt	0.054	0.062	0.2	0.022	-	-	-	-	-	-
4,4'-DDT	mg/kg dry wt	0.0094	0.011	0.089	<0.0050	-	-	-	-	-	-
Total DDT	mg/kg dry wt	*0.06*	*0.07*	*0.31*	*0.02*	70	1,000	NES	0.005	ANZWQ	0.43 $_2$
Endrin	mg/kg dry wt	0.057	0.072	<0.050	<0.050	-	-	-	-	-	-
All other Organochlorine pesticides analytes were below the laboratory limit of detection											

Indicates result exceeds 'Residential 10% Produce' guideline value
Indicates result exceeds ecological guideline value
Indicates result exceeds background value for soil type

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE

ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online)- Sediment GV-high

$_1$ Ambient Concentrations of Selected Organochlorine in Soils, Buckland, Ellis and Salter 1998

Table of Laboratory Results - 340 King Street, Temuka

Date of sampling: 20 July 2022

Asbestos in Soils			Qualitative	Semi-Quantitative 500					
			Fibre Types	ACM Types (>10mm)	ACM Types (2-10mm)	ACM Types (<2mm)	Fibre Types	Asbestos in ACM	Fibrous Asbestos + Asbestos Fines
Sample Name:	Lab Number	Depth						% w/w	% w/w
SS14.1 PA/SQ	22-26559-1	0-50	Asbestos NOT Detected Organic Fibres Synthetic Mineral Fibres						
SS17.1 PA/SQ	22-26559-4	0-50	Asbestos NOT Detected Organic Fibres						
SS18.1 PA/SQ	22-26559-5	0-50	Asbestos NOT Detected Organic Fibres						
SS19.1 PA/SQ	22-26559-6	0-50	Chrysotile (White Asbestos), Organic Fibres	No Asbestos Detected	Fibre Bundle	No Asbestos Detected	Chrysotile (White Asbestos),Organic Fibres	<0.001	0.039
SS20.1 PA/SQ	22-26786-1	0	Asbestos NOT Detected Organic Fibres						
SS21.1 PA/SQ	22-26559-8	0-50	Asbestos NOT Detected Organic Fibres						
SS22.1 PA/SQ	22-26559-9	0-50	Asbestos NOT Detected Organic Fibres						
Soil Guideline Values	Residential		-	-	-	-	-	0.01	0.001
	Class B trigger		-	-	-	-	-	1	0.01
	Reference		-	-	-	-	-	NZGAMAS	NZGAMAS

Indicates asbestos is present
Indicates result exceeds 'Residential' guideline value
Indicates result exceeds Class B trigger
NZGAMAS - New Zealand Guidelines for Assessing and Managing Asbestos in Soils, BRANZ, Nov. 2017

Table of Laboratory Results - 340 King Street, Temuka

Date of sampling: 20 July 2022

Analyte	Sample Name:	SS1.1	SS1.2	SS2.1	SS2.2	SS3.1	SS3.2	SS4.1	SS4.2	SS5.1	SS5.2	Soil Guideline Values					
Soil Results	Lab Number:	22-26592-1	22-26592-2	22-26592-3	22-26592-4	22-26592-5	22-26592-6	22-26592-7	22-26592-8	22-26592-9	22-26592-10	**Residential 10% Produce**	**Commercial/ Industrial**	**Reference**	**Ecological Receptors**	**Reference**	**Background$_1$**
	Depth (mm)	0-50	250	0-50	250	0-50	250	0-50	250	0-50	250						
Heavy Metals																	
Arsenic	mg/kg dry wt	6.8	6.9	5.1	4.6	5.2	4.8	4.6	4.3	11	11	20	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.25	0.21	0.26	0.23	0.28	0.24	0.26	0.24	0.24	0.21	3	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	15.7	17	18.8	17.1	16	17.7	17	17.7	16.6	15.8	460	6,300	NES	370	ANZWQ	22.7
Copper	mg/kg dry wt	21.1	21.4	35.7	29.4	24.3	23.5	45.8	28.8	26.3	22.9	>10,000	>10,000	NES	270	ANZWQ	20.3
Lead	mg/kg dry wt	25.2	22.5	26.2	21	19.5	17.9	19.9	16.9	18.2	16.9	210	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	10.4	11.1	11.4	11.1	10.3	11	12.2	11.9	10	10	400	6,000	NEPM	52	ANZWQ	20.7
Zinc	mg/kg dry wt	102	84.1	91.6	78.8	79.4	72.9	72.5	69.4	70.4	66	7,400	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SS6.1	SS6.2	SS6.3	SS7.1	SS7.2	SS8.1	SS8.2	SS9.1	SS9.2	RPD	Soil Guideline Values					
Soil Results	Lab Number:	22-26592-11	22-26592-12	22-26592-13	22-26592-14	22-26592-15	22-26592-16	22-26592-17	22-26592-18	22-26592-19	SS6.1 & SS6.2	**Residential 10% Produce**	**Commercial/ Industrial**	**Reference**	**Ecological Receptors**	**Reference**	**Background$_1$**
	Depth (mm)	0-50	0-50	250	0-50	250	0-50	250	0-50	250							
Heavy Metals																	
Arsenic	mg/kg dry wt	4.1	4.2	4	4.6	4.2	4.1	3.9	4	4	2%	20	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.24	0.27	0.24	0.23	0.18	0.26	0.19	0.18	0.14	12%	3	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	16.7	20.7	21.6	16.5	15.5	16	18.9	15.9	15.6	21%	460	6,300	NES	370	ANZWQ	22.7
Copper	mg/kg dry wt	25.6	27.1	24.3	33.4	21.6	54.3	38.9	21.1	17.1	6%	>10,000	>10,000	NES	270	ANZWQ	20.3
Lead	mg/kg dry wt	17.5	18.6	17.7	21.8	20.6	22.5	17.5	17.5	16	6%	210	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	10.3	11.9	13.1	10.2	9.79	10.2	11.6	9.72	9.79	14%	400	6,000	NEPM	52	ANZWQ	20.7
Zinc	mg/kg dry wt	65.3	67.4	66.2	79.7	69.8	83.5	72.2	66.9	64.6	3%	7,400	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SS10.1	SS10.2	SS10.3	SS11.1	SS11.2	SS12.1	SS12.2	SS13.1	SS13.2	RPD	Soil Guideline Values					
Soil Results	Lab Number:	22-26592-20	22-26592-21	22-26592-22	22-26592-23	22-26592-24	22-26592-25	22-26592-26	22-26592-27	22-26592-28	SS11.1 & SS11.2	**Residential 10% Produce**	**Commercial/ Industrial**	**Reference**	**Ecological Receptors**	**Reference**	**Background$_1$**
	Depth (mm)	0-50	0-50	250	0-50	250	0-50	250	0-50	250							
Heavy Metals																	
Arsenic	mg/kg dry wt	4	4	4.5	4.3	4	4.2	3.8	4.6	4.1	0%	20	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.23	0.23	0.21	0.25	0.21	0.19	0.23	0.19	0.16	0%	3	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	18.6	16.1	18.9	17.1	18.1	17.5	18.1	16.6	15.8	14%	460	6,300	NES	370	ANZWQ	22.7
Copper	mg/kg dry wt	23.7	23.2	24.5	21.2	18.1	20.8	16.3	25.4	22	2%	>10,000	>10,000	NES	270	ANZWQ	20.3
Lead	mg/kg dry wt	20	19.4	21.6	24.1	19.4	20.6	16	17.9	16.3	3%	210	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	11.1	9.95	11.6	10.7	10.9	10.6	11.2	9.94	9.77	11%	400	6,000	NEPM	52	ANZWQ	20.7
Zinc	mg/kg dry wt	75.6	74.8	77.1	76.7	67.8	71	65.2	75.2	64.2	1%	7,400	400,000	NEPM	410	ANZWQ	93.94

Indicates result exceeds 'Residential 10% Produce' guideline value

Indicates result exceeds ecological guideline value

Indicates result exceeds background value for soil type

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE

NEPM - National Environmental Protection Measures 2013, Formerly NEPC, Australia

ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online)- Sediment GV-high

Concentrations for "Regional, Recent soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Table of Laboratory Results - 340 King Street, Temuka

Date of sampling: 20 July 2022

Analyte	Sample Name:	SS14.1	SS14.2	SS15.1	SS15.2	SS16.1	SS17.1	SS17.2	SS18.1	SS18.2	SS19.1	Soil Guideline Values					
Soil Results	Lab Number:	22-26592-29	22-26592-30	22-26592-31	22-26592-32	22-26592-33	22-26592-34	22-26592-35	22-26592-36	22-26592-37	22-26592-38	Residential 10% Produce	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background$_1$
	Depth (mm)	0-50	250	0-50	250	0	0-50	250	0-50	0-50	250						
Heavy Metals																	
Arsenic	mg/kg dry wt	13.1	4.7	6.7	7.3	3	7.6	6.8	9.8	9.1	4.9	20	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.553	0.12	0.27	0.16	0.057	0.23	0.18	0.19	0.17	0.12	3	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	23	20	16	16.6	16.7	16.7	19.8	17.6	17.2	15.5	460	6,300	NES	370	ANZWQ	22.7
Copper	mg/kg dry wt	60.1	18.3	21.6	14.9	11.2	17.5	15.7	19.2	52	11.2	>10,000	>10,000	NES	270	ANZWQ	20.3
Lead	mg/kg dry wt	150	19.9	17.5	14.7	17.4	15.9	14.9	31.6	31.3	121	210	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	9.46	11.5	10.4	10.6	10.9	11.4	12	10.3	10.7	9.54	400	6,000	NEPM	52	ANZWQ	20.7
Zinc	mg/kg dry wt	303	67.3	71.2	65	59.7	67.3	65.1	102	104	139	7,400	400,000	NEPM	410	ANZWQ	93.94

Analyte	Sample Name:	SS19.2	SS20.1	SS21.1	SS21.2	SS22.1	SS22.2	SS23.1	SS24.1	SS25.1	Soil Guideline Values					
Soil Results	Lab Number:	22-26592-39	22-26592-40	22-26592-41	22-26592-42	22-26592-43	22-26592-44	22-26592-45	22-26592-47	22-26592-49	Residential 10% Produce	Commercial/ Industrial	Reference	Ecological Receptors	Reference	Background$_1$
	Depth (mm)	250	0	0-50	250	0-50	250	0-50	0-50	0-50						
Heavy Metals																
Arsenic	mg/kg dry wt	4	5.6	11	18.1	4	3.7	4.1	4	4.1	20	70	NES	70	ANZWQ	12.58
Cadmium	mg/kg dry wt	0.074	0.12	0.14	0.14	0.14	0.15	0.19	0.17	0.2	3	1,300	NES	10	ANZWQ	0.19
Chromium	mg/kg dry wt	17.8	23.4	15.5	18.4	15.9	16.9	15.5	17.7	16.3	460	6,300	NES	370	ANZWQ	22.7
Copper	mg/kg dry wt	9.73	20	12.4	11.4	16.6	18.1	23.9	21.3	23.2	>10,000	>10,000	NES	270	ANZWQ	20.3
Lead	mg/kg dry wt	31.7	32.8	89.8	27.8	21.7	17.1	18.1	18.2	20.6	210	3,300	NES	220	ANZWQ	40.96
Nickel	mg/kg dry wt	11	12.8	10	10.9	9.82	10.3	9.66	10.6	9.8	400	6,000	NEPM	52	ANZWQ	20.7
Zinc	mg/kg dry wt	87.7	96.7	87.4	66.6	73.2	68.3	70.2	69.2	73.6	7,400	400,000	NEPM	410	ANZWQ	93.94

Indicates result exceeds 'Residential 10% Produce' guideline value
Indicates result exceeds ecological guideline value
Indicates result exceeds background value for soil type

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE
NEPM - National Environmental Protection Measures 2013, Formerly NEPC, Australia
ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online)- Sediment GV-high
Concentrations for "Regional, Recent soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

Appendix E – Laboratory Reports

Analytica Laboratories Limited
34 Brisbane Street
Sydenham
Christchurch
sales@analytica.co.nz
www.analytica.co.nz

Certificate of Analysis

Momentum Environmental Ltd
19 Robertsons Road, Kirwee
Christchurch 7671
Attention: Nicola Peacock
Phone: 0277112257
Email: josh@momentumenviro.co.nz

Lab Reference: 22-26559
Submitted by: Joshua Hawkes
Date Received: 20/07/2022
Testing Initiated: 21/07/2022
Date Completed: 21/07/2022
Order Number: N/A
Reference: 644

Sampling Site: 340 King Street, Temuka
Description of Work: Combo - 340 King Street, Temuka

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories. Samples were in acceptable condition unless otherwise noted on this report.
Specific testing dates are available on request.

Asbestos in Soil (Qualitative)

Sample Details

Laboratory ID	Client Sample ID	Sample Location	Sample Description	Date Sampled	Date Analysed
22-26559-1	SS14.1 0-50		Soil	20/07/2022	21/07/2022
22-26559-4	SS17.1 0-50		Soil	20/07/2022	21/07/2022
22-26559-5	SS18.1 0-50		Soil	20/07/2022	21/07/2022
22-26559-6	SS19.1 0-50		Soil	20/07/2022	21/07/2022
22-26559-8	SS21.1 0-50		Soil	20/07/2022	21/07/2022
22-26559-9	SS22.1 0-50		Soil	20/07/2022	21/07/2022

Information in the above table supplied by the client: Client Sample ID, Sample Location, Date Sampled.

Laboratory ID	Client Sample ID	Fibre Types	Trace Asbestos (Presence / Absence)	Asbestos (Presence / Absence)
	Units			
22-26559-1	SS14.1 0-50	Asbestos NOT Detected. Organic Fibres Synthetic Mineral Fibres	Absent	Absent
22-26559-4	SS17.1 0-50	Asbestos NOT Detected. Organic Fibres	Absent	Absent
22-26559-5	SS18.1 0-50	Asbestos NOT Detected. Organic Fibres	Absent	Absent
22-26559-6	SS19.1 0-50	Chrysotile (White Asbestos) Organic Fibres	Absent	Present
22-26559-8	SS21.1 0-50	Asbestos NOT Detected. Organic Fibres	Absent	Absent
22-26559-9	SS22.1 0-50	Asbestos NOT Detected. Organic Fibres	Absent	Absent

Information in the above table supplied by the client: Client Sample ID.

Asbestos in Soil (Qualitative) Approver:

Aleesha van Eeden, M.Sc.
Technician

Method Summary

Asbestos Fibres in Soil (Qualitative)

Sample analysis was performed using polarised light microscopy with dispersion staining in accordance with AS4964-2004 Method for the qualitative identification of asbestos in bulk samples.

Note 1: The reporting limit for this analysis is 0.1g/kg (0.01%) by application of polarised light microscopy, dispersion staining and trace analysis techniques.

Note 2: Trace asbestos is indicative that freely liberated respirable fibres are present and dust control measures should be implemented or increased on site. This is not the sole indicator for the friable nature of the asbestos present.

Note 3: If mineral fibres of unknown type are detected, by PLM and dispersion staining, these may or may not be asbestos fibres. To confirm the identity of this fibre, another independent analytical technique such as XRD analysis is advised.

Note 4: The laboratory does not take responsibility for the sampling procedure or accuracy of sample location description.

Analytica Laboratories Limited
34 Brisbane Street
Sydenham
Christchurch
sales@analytica.co.nz
www.analytica.co.nz

Certificate of Analysis

Momentum Environmental Ltd
19 Robertsons Road, Kirwee
Christchurch 7671
Attention: Nicola Peacock
Phone: 0277112257
Email: josh@momentumenviro.co.nz

Lab Reference: 22-26559
Submitted by: Joshua Hawkes
Date Received: 20/07/2022
Testing Initiated: 21/07/2022
Date Completed: 22/07/2022
Order Number: N/A
Reference: 644

Sampling Site: 340 King Street, Temuka
Description of Work: Combo - 340 King Street, Temuka

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories. Samples were in acceptable condition unless otherwise noted on this report.
Specific testing dates are available on request.

Asbestos in Soil (Semi-Quantitative)

Sample Details

Laboratory ID	Client Sample ID	Sample Location	Sample Description	Date Sampled	Date Analysed
22-26559-6	SS19.1 0-50		Soil	20/07/2022	22/07/2022

Information in the above table supplied by the client: Client Sample ID, Sample Location, Date Sampled

Analysis Results (Summary)

Laboratory ID	Client Sample ID	Asbestos	Sample Weight as Received	Moisture Content	Trace Asbestos (Presence / Absence)	Asbestos (Presence / Absence)
Units			g	%		
22-26559-6	SS19.1 0-50	Chrysotile (White Asbestos) Organic Fibres	758.5	27.7	Absent	Present

Information in the above table supplied by the client: Client Sample ID

Analysis Results (Size Fraction Breakdown)

Laboratory ID	Client Sample ID	Fraction Size	Fraction Weight*	AF/FA Weight*	ACM Weight*	ACM Content*	Asbestos Matrix	Asbestos Weight*	W/W% Asbestos*
Units *Reporting Limit*			g 0	g 0	g 0	% 		g 0	
22-26559-6	SS19.1 0-50	>10mm	19.42	0.0000	0.0000	0	No Asbestos Detected	0.0000	<0.001 (ACM) 0.039 (AF/FA)
		2-10mm	44.11	0.2153	-	-	Fibre Bundle	0.2153	
		<2mm	484.80	0.0000	-	-	No Asbestos Detected	0.0000	

Information in the above table supplied by the client: Client Sample ID

Asbestos in Soil (Semi-Quantitative) Approver:

Aleesha van Eeden, M.Sc.
Technician

Method Summary

Asbestos Fibres in Soil (Semi-Quantitative)

Sample analysis was performed using polarised light microscopy with dispersion staining in accordance with AS4964-2004 Method for the qualitative identification of asbestos in soil samples.

Note 1: The reporting limit for this analysis is 0.1g/kg (0.01%) by application of polarised light microscopy, dispersion staining and trace analysis techniques.

Note 2: Trace asbestos is indicative that freely liberated respirable fibres are present and dust control measures should be implemented or increased on site. This is not the sole indicator for the friable nature of the asbestos present.

Note 3: If mineral fibres of unknown type are detected, by PLM and dispersion staining, these may or may not be asbestos fibres. To confirm the identity of this fibre, another independent analytical technique such as XRD analysis is advised.

Note 4: The laboratory does not take responsibility for the sampling procedure or accuracy of sample location description.

Analytica Laboratories Limited
Ruakura Research Centre
10 Bisley Road
Hamilton 3214, New Zealand
Ph +64 (07) 974 4740
sales@analytica.co.nz
www.analytica.co.nz

Certificate of Analysis

Momentum Environmental Ltd
19 Robertsons Road, Kirwee, RD1
Christchurch 7671

Attention: Nicola Peacock
Phone: 0277112257
Email: josh@momentumenviro.co.nz

Sampling Site: 340 King Street, Temuka

Lab Reference: 22-26592
Submitted by: Joshua Hawkes
Date Received: 22/07/2022
Testing Initiated: 22/07/2022
Date Completed: 27/07/2022
Order Number:
Reference: 644

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories. Samples were in acceptable condition unless otherwise noted on this report.
Specific testing dates are available on request.

Heavy Metals in Soil

		Client Sample ID	SS1.1 0-50	SS1.2 250	SS2.1 0-50	SS2.2 250	SS3.1 0-50
		Date Sampled	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-1	22-26592-2	22-26592-3	22-26592-4	22-26592-5
Arsenic	mg/kg dry wt	*0.125*	6.8	6.9	5.1	4.6	5.2
Cadmium	mg/kg dry wt	*0.005*	0.25	0.21	0.26	0.23	0.28
Chromium	mg/kg dry wt	*0.125*	15.7	17.0	18.8	17.1	16.0
Copper	mg/kg dry wt	*0.075*	21.1	21.4	35.7	29.4	24.3
Lead	mg/kg dry wt	*0.25*	25.2	22.5	26.2	21.0	19.5
Nickel	mg/kg dry wt	*0.05*	10.4	11.1	11.4	11.1	10.3
Zinc	mg/kg dry wt	*0.05*	102	84.1	91.6	78.8	79.4

Heavy Metals in Soil

		Client Sample ID	SS3.2 250	SS4.1 0-50	SS4.2 250	SS5.1 0-50	SS5.2 250
		Date Sampled	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-6	22-26592-7	22-26592-8	22-26592-9	22-26592-10
Arsenic	mg/kg dry wt	*0.125*	4.8	4.6	4.3	11	11
Cadmium	mg/kg dry wt	*0.005*	0.24	0.26	0.24	0.24	0.21
Chromium	mg/kg dry wt	*0.125*	17.7	17.0	17.7	16.6	15.8
Copper	mg/kg dry wt	*0.075*	23.5	45.8	28.8	26.3	22.9
Lead	mg/kg dry wt	*0.25*	17.9	19.9	16.9	18.2	16.9
Nickel	mg/kg dry wt	*0.05*	11.0	12.2	11.9	10.0	10.0
Zinc	mg/kg dry wt	*0.05*	72.9	72.5	69.4	70.4	66.0

Heavy Metals in Soil

Client Sample ID			SS6.1 0-50	SS6.2 0-50	SS6.3 250	SS7.1 0-50	SS7.2 250
Date Sampled			20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-11	22-26592-12	22-26592-13	22-26592-14	22-26592-15
Arsenic	mg/kg dry wt	*0.125*	4.1	4.2	4.0	4.6	4.2
Cadmium	mg/kg dry wt	*0.005*	0.24	0.27	0.24	0.23	0.18
Chromium	mg/kg dry wt	*0.125*	16.7	20.7	21.6	16.5	15.5
Copper	mg/kg dry wt	*0.075*	25.6	27.1	24.3	33.4	21.6
Lead	mg/kg dry wt	*0.25*	17.5	18.6	17.7	21.8	20.6
Nickel	mg/kg dry wt	*0.05*	10.3	11.9	13.1	10.2	9.79
Zinc	mg/kg dry wt	*0.05*	65.3	67.4	66.2	79.7	69.8

Heavy Metals in Soil

Client Sample ID			SS8.1 0-50	SS8.2 250	SS9.1 0-50	SS9.2 250	SS10.1 0-50
Date Sampled			20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-16	22-26592-17	22-26592-18	22-26592-19	22-26592-20
Arsenic	mg/kg dry wt	*0.125*	4.1	3.9	4.0	4.0	4.0
Cadmium	mg/kg dry wt	*0.005*	0.26	0.19	0.18	0.14	0.23
Chromium	mg/kg dry wt	*0.125*	16.0	18.9	15.9	15.6	18.6
Copper	mg/kg dry wt	*0.075*	54.3	38.9	21.1	17.1	23.7
Lead	mg/kg dry wt	*0.25*	22.5	17.5	17.5	16.0	20.0
Nickel	mg/kg dry wt	*0.05*	10.2	11.6	9.72	9.79	11.1
Zinc	mg/kg dry wt	*0.05*	83.5	72.2	66.9	64.6	75.6

Heavy Metals in Soil

Client Sample ID			SS10.2 0-50	SS10.3 250	SS11.1 0-50	SS11.2 250	SS12.1 0-50
Date Sampled			20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-21	22-26592-22	22-26592-23	22-26592-24	22-26592-25
Arsenic	mg/kg dry wt	*0.125*	4.0	4.5	4.3	4.0	4.2
Cadmium	mg/kg dry wt	*0.005*	0.23	0.21	0.25	0.21	0.19
Chromium	mg/kg dry wt	*0.125*	16.1	18.9	17.1	18.1	17.5
Copper	mg/kg dry wt	*0.075*	23.2	24.5	21.2	18.1	20.8
Lead	mg/kg dry wt	*0.25*	19.4	21.6	24.1	19.4	20.6
Nickel	mg/kg dry wt	*0.05*	9.95	11.6	10.7	10.9	10.6
Zinc	mg/kg dry wt	*0.05*	74.8	77.1	76.7	67.8	71.0

Heavy Metals in Soil

Client Sample ID			SS12.2 250	SS13.1 0-50	SS13.2 250	SS14.1 0-50	SS14.2 250
Date Sampled			20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-26	22-26592-27	22-26592-28	22-26592-29	22-26592-30
Arsenic	mg/kg dry wt	*0.125*	3.8	4.6	4.1	13.1	4.7
Cadmium	mg/kg dry wt	*0.005*	0.23	0.19	0.16	0.553	0.12
Chromium	mg/kg dry wt	*0.125*	18.1	16.6	15.8	23.0	20.0
Copper	mg/kg dry wt	*0.075*	16.3	25.4	22.0	60.1	18.3
Lead	mg/kg dry wt	*0.25*	16.0	17.9	16.3	150	19.9
Nickel	mg/kg dry wt	*0.05*	11.2	9.94	9.77	9.46	11.5
Zinc	mg/kg dry wt	*0.05*	65.2	75.2	64.2	303	67.3

Heavy Metals in Soil

Client Sample ID			SS15.1 0-50	SS15.2 250	SS16.1 0	SS17.1 0-50	SS17.2 250
Date Sampled			20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-31	22-26592-32	22-26592-33	22-26592-34	22-26592-35
Arsenic	mg/kg dry wt	*0.125*	6.7	7.3	3.0	7.6	6.8
Cadmium	mg/kg dry wt	*0.005*	0.27	0.16	0.057	0.23	0.18
Chromium	mg/kg dry wt	*0.125*	16.0	16.6	16.7	16.7	19.8
Copper	mg/kg dry wt	*0.075*	21.6	14.9	11.2	17.5	15.7
Lead	mg/kg dry wt	*0.25*	17.5	14.7	17.4	15.9	14.9
Nickel	mg/kg dry wt	*0.05*	10.4	10.6	10.9	11.4	12.0
Zinc	mg/kg dry wt	*0.05*	71.2	65.0	59.7	67.3	65.1

Heavy Metals in Soil

Client Sample ID			SS18.1 0-50	SS18.2 250	SS19.1 0-50	SS19.2 250	SS20.1 0
Date Sampled			20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-36	22-26592-37	22-26592-38	22-26592-39	22-26592-40
Arsenic	mg/kg dry wt	*0.125*	9.8	9.1	4.9	4.0	5.6
Cadmium	mg/kg dry wt	*0.005*	0.19	0.17	0.12	0.074	0.12
Chromium	mg/kg dry wt	*0.125*	17.6	17.2	15.5	17.8	23.4
Copper	mg/kg dry wt	*0.075*	19.2	52.0	11.2	9.73	20.0
Lead	mg/kg dry wt	*0.25*	31.6	31.3	121	31.7	32.8
Nickel	mg/kg dry wt	*0.05*	10.3	10.7	9.54	11.0	12.8
Zinc	mg/kg dry wt	*0.05*	102	104	139	87.7	96.7

Heavy Metals in Soil

Client Sample ID			SS21.1 0-50	SS21.2 250	SS22.1 0-50	SS22.2 250	SS23.1 0-50
Date Sampled			20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-41	22-26592-42	22-26592-43	22-26592-44	22-26592-45
Arsenic	mg/kg dry wt	*0.125*	11	18.1	4.0	3.7	4.1
Cadmium	mg/kg dry wt	*0.005*	0.14	0.14	0.14	0.15	0.19
Chromium	mg/kg dry wt	*0.125*	15.5	18.4	15.9	16.9	15.5
Copper	mg/kg dry wt	*0.075*	12.4	11.4	16.6	18.1	23.9
Lead	mg/kg dry wt	*0.25*	89.8	27.8	21.7	17.1	18.1
Nickel	mg/kg dry wt	*0.05*	10.0	10.9	9.82	10.3	9.66
Zinc	mg/kg dry wt	*0.05*	87.4	66.6	73.2	68.3	70.2

Heavy Metals in Soil

Client Sample ID			SS24.1 0-50	SS25.1 0-50
Date Sampled			20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-47	22-26592-49
Arsenic	mg/kg dry wt	*0.125*	4.0	4.1
Cadmium	mg/kg dry wt	*0.005*	0.17	0.20
Chromium	mg/kg dry wt	*0.125*	17.7	16.3
Copper	mg/kg dry wt	*0.075*	21.3	23.2
Lead	mg/kg dry wt	*0.25*	18.2	20.6
Nickel	mg/kg dry wt	*0.05*	10.6	9.80
Zinc	mg/kg dry wt	*0.05*	69.2	73.6

Organochlorine Pesticides - Soil

Client Sample ID			Composite 1 (SS1.1, SS2.1, SS3.1, SS4.1)	Composite 2 (SS5.1, SS6.1, SS7.1, SS8.1)	Composite 3 (SS9.1, SS10.1, SS11.1, SS12.1)	Composite 4 (SS14.1, SS15.1, SS16.1, SS17.1)
Date Sampled						
Analyte	Unit	*Reporting Limit*	22-26592-50	22-26592-51	22-26592-52	22-26592-53
2,4'-DDD	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
2,4'-DDE	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
2,4'-DDT	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
4,4'-DDD	mg/kg dry wt	*0.003*	<0.0030	<0.0030	0.016	<0.0030
4,4'-DDE	mg/kg dry wt	*0.005*	0.054	0.062	0.20	0.022
4,4'-DDT	mg/kg dry wt	*0.005*	0.0094	0.011	0.089	<0.0050
Total DDT	mg/kg dry wt	*0.02*	0.060	0.070	0.31	0.020
alpha-BHC	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
Aldrin	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
beta-BHC	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
cis-Chlordane	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
cis-Nonachlor	mg/kg dry wt	*0.01*	<0.010	<0.010	<0.010	<0.010
delta-BHC	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
Dieldrin	mg/kg dry wt	*0.05*	<0.050	<0.050	<0.050	<0.050
Endosulfan I	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
Endosulfan II	mg/kg dry wt	*0.01*	<0.010	<0.010	<0.010	<0.010
Endosulfan sulfate	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
Endrin	mg/kg dry wt	*0.05*	0.057	0.072	<0.050	<0.050
Endrin aldehyde	mg/kg dry wt	*0.01*	<0.010	<0.010	<0.010	<0.010
Endrin ketone	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
gamma-BHC	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
Heptachlor	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
Heptachlor epoxide	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
Hexachlorobenzene	mg/kg dry wt	*0.005*	<0.0050	<0.0050	<0.0050	<0.0050
Methoxychlor	mg/kg dry wt	*0.01*	<0.010	<0.010	<0.010	<0.010
trans-nonachlor	mg/kg dry wt	*0.01*	<0.010	<0.010	<0.010	<0.010
trans-Chlordane	mg/kg dry wt	*0.01*	<0.010	<0.010	<0.010	<0.010
Chlordane (sum)	mg/kg dry wt	*0.02*	<0.020	<0.020	<0.020	<0.020
TCMX (Surrogate)	%	*1*	98	100	110	120

Soil Composite

Client Sample ID			SS1.1 0-50	SS2.1 0-50	SS3.1 0-50	SS4.1 0-50	SS5.1 0-50
Date Sampled			20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-1	22-26592-3	22-26592-5	22-26592-7	22-26592-9
Soil - Composite prep - DS			Complete	Complete	Complete	Complete	Complete

Soil Composite

Client Sample ID			SS6.1 0-50	SS7.1 0-50	SS8.1 0-50	SS9.1 0-50	SS10.1 0-50
Date Sampled			20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-11	22-26592-14	22-26592-16	22-26592-18	22-26592-20
Soil - Composite prep - DS			Complete	Complete	Complete	Complete	Complete

Soil Composite

		Client Sample ID	SS11.1 0-50	SS12.1 0-50	SS14.1 0-50	SS15.1 0-50	SS16.1 0
		Date Sampled	20/07/2022	20/07/2022	20/07/2022	20/07/2022	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-23	22-26592-25	22-26592-29	22-26592-31	22-26592-33
Soil - Composite prep - DS			Complete	Complete	Complete	Complete	Complete

Soil Composite

		Client Sample ID	SS17.1 0-50
		Date Sampled	20/07/2022
Analyte	Unit	*Reporting Limit*	22-26592-34
Soil - Composite prep - DS			Complete

Method Summary

Elements in Soil Samples dried and passed through a 2 mm sieve followed by acid digestion and analysis by ICP-MS. In accordance with in-house procedure based on US EPA method 200.8.

OCP in Soil Samples are extracted with hexane, pre-concetrated then analysed by GC-MSMS. (Chlordane (sum) is calculated from the main actives in technical Chlordane: Chlordane, Nonachlor and Heptachlor). (In accordance with in-house procedure).

Total DDT Sum of DDT, DDD and DDE (4,4' and 2,4 isomers)

Soil Composite* Analytica Laboratories is not accredited for the preparation of composite samples; however, the chemical analysis does hold IANZ accreditation. As composite analysis is conducted when requested by the sampler if they deem fit as per the NES guideline, the results of the chemical analyses still hold proper accreditation based on Analytica's methods.

Sandra Mathews, B.Eng.
Laboratory Technician

Adam Ang
Team Leader

Divya Goundar DipSciTech
Technician

Analytica Laboratories Limited
34 Brisbane Street
Sydenham
Christchurch
sales@analytica.co.nz
www.analytica.co.nz

Certificate of Analysis

Momentum Environmental Ltd
19 Robertsons Road, Kirwee
Christchurch 7671
Attention: Nicola Peacock
Phone: 027 711 2257
Email: josh@momentumenviro.co.nz

Lab Reference: 22-26786
Submitted by: Joshua Hawkes
Date Received: 20/07/2022
Testing Initiated: 25/07/2022
Date Completed: 25/07/2022
Order Number: N/A
Reference: 644

Sampling Site: 340 King Street, Temuka
Description of Work: Combo - 340 King Street, Temuka

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories. Samples were in acceptable condition unless otherwise noted on this report.
Specific testing dates are available on request.

Asbestos in Soil (Qualitative)

Sample Details

Laboratory ID	Client Sample ID	Sample Location	Sample Description	Date Sampled	Date Analysed
22-26786-1	SS20.1 0		Soil	20/07/2022	25/07/2022

Information in the above table supplied by the client: Client Sample ID, Sample Location, Date Sampled.

Laboratory ID	Client Sample ID	Fibre Types	Trace Asbestos (Presence / Absence)	Asbestos (Presence / Absence)
	Units			
22-26786-1	SS20.1 0	Asbestos NOT Detected. Organic Fibres	Absent	Absent

Information in the above table supplied by the client: Client Sample ID.

Asbestos in Soil (Qualitative) Approver:

Aleesha van Eeden, M.Sc.
Technician

Method Summary

Asbestos Fibres in Soil (Qualitative)	Sample analysis was performed using polarised light microscopy with dispersion staining in accordance with AS4964-2004 Method for the qualitative identification of asbestos in bulk samples. Note 1: The reporting limit for this analysis is 0.1g/kg (0.01%) by application of polarised light microscopy, dispersion staining and trace analysis techniques. Note 2: Trace asbestos is indicative that freely liberated respirable fibres are present and dust control measures should be implemented or increased on site. This is not the sole indicator for the friable nature of the asbestos present. Note 3: If mineral fibres of unknown type are detected, by PLM and dispersion staining, these may or may not be asbestos fibres. To confirm the identity of this fibre, another independent analytical technique such as XRD analysis is advised. Note 4: The laboratory does not take responsibility for the sampling procedure or accuracy of sample location description.

Benje Patterson
People & Places

October 2022

Scenarios of an aspirational economic future for Timaru District

Report commissioned by Venture Timaru

Prepared by: Benje Patterson
Benje Patterson | People & Places
www.benjepatterson.co.nz
October 2022

1. Contents

2. Executive summary

This report has been commissioned by Venture Timaru. Its purpose is to highlight what an aspirational economic future could look like for Timaru, and what achieving such an outlook would rely on.

At its heart, this report helps show:

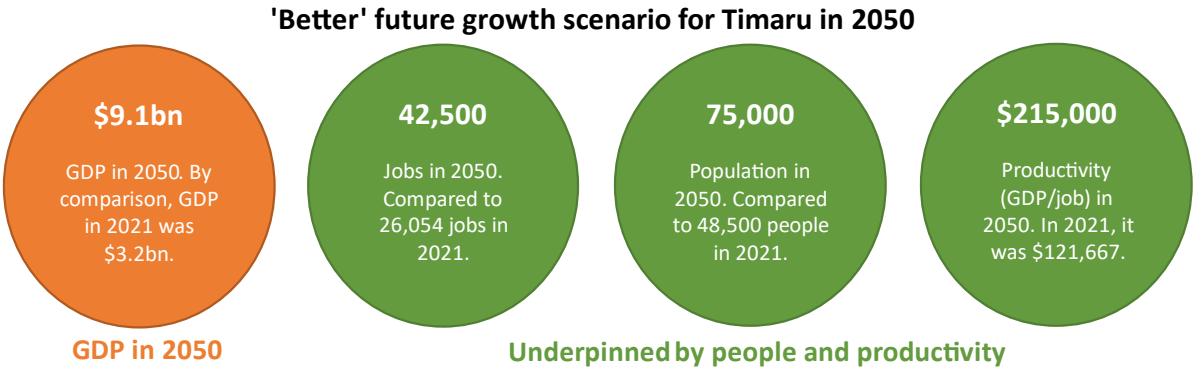
- Where will Timaru's economy be in 2050 if the status quo remains?
- How much larger could Timaru's economy be if there is an aspirational focus on doing better things?
- Which factors would achieving an aspirational economic future rely on?

2.1. Key findings

The potential 'size of the prize' for Timaru's economy from being ambitious is large:

- Timaru currently generates $3.2 billion of GDP (2021).
- If Timaru does no better than just muddle along, with its status quo level of employment and current productivity trajectory then the economy would be worth $4.2 billion in 2050.
- If, instead, there is transformational growth into high productivity employment, then Timaru's economy could be worth $9.1 billion by 2050, which is almost three times its current size.

Figure 1

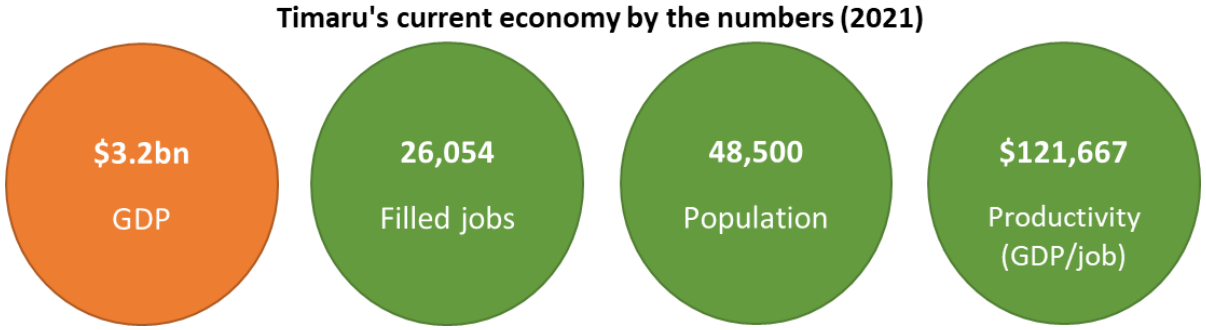


- The outcomes needed to achieve the 'better' future growth scenario are ambitious – both in terms of how many people Timaru would need to attract to fill jobs and how productive industries would need to be:
    - Timaru would need to attract average net migration gains of just over 1,000 people each year to reach a population of 75,000 by 2050.
    - The aspirational productivity outcome in the 'better' scenario would require transformation towards at least one third of Timaru businesses doing things that were at least twice as productive as opportunities under the status quo by 2050.
- Ambitious industry transformation won't happen overnight. Initially many of Timaru's productivity wins will be found working with existing businesses in existing industries. But through time, Timaru can progressively step out from this base and become more transformational in what it does, including breaking into new industries.
- Regardless of which industries help Timaru achieve an aspirational economic future, there will be many factors which are necessary foundations. For example, an additional 9,000 homes, 200-300 classrooms, and 1,500 more health and social assistance workers would be needed by 2050 to support the population growth needed under the aspirational 'better' future growth scenario.

3. Timaru's current economic context

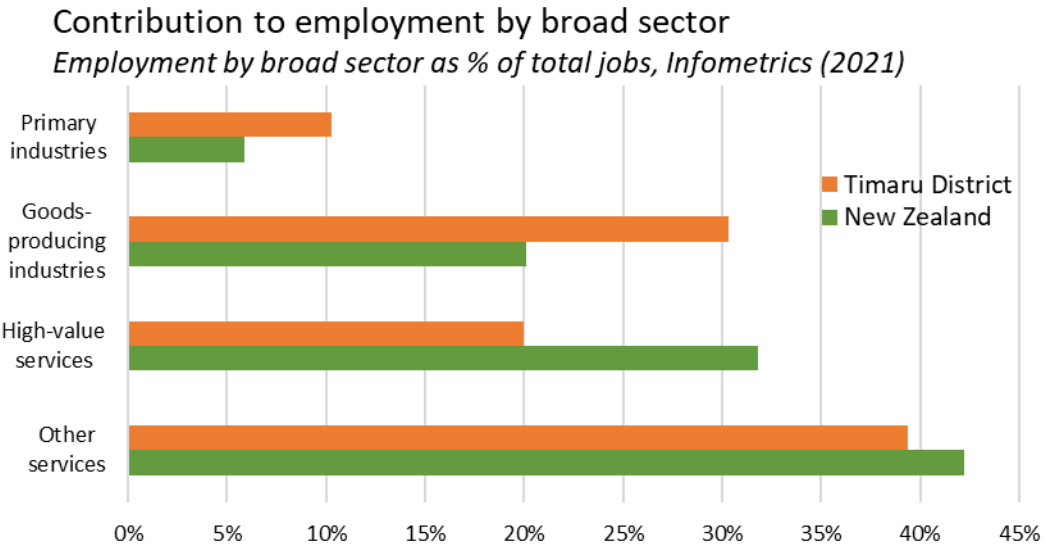
There were 48,500 residents in Timaru in 2021 and employment sat at 26,054 jobs. Each job produced $121,667 of GDP (compared to $124,980 nationally), meaning Timaru generated total GDP of $3.2 billion.

Figure 2 – The current size of Timaru's economy, source: Infometrics and Statistics NZ



Employment in Timaru is more heavily concentrated on primary and goods-producing industries than nationally. Primary industries centre on dairy farming, sheep and beef farming, arable farming, and fishing. Goods-producing industries tend to be concentrated on processing of food and fibre products, although there is some machinery and equipment manufacturing to support the primary sector. High-value professional services are less represented in Timaru than the rest of New Zealand, but Timaru is a service centre for South Canterbury so has relatively high health, education, and retail employment.

Figure 3



Over the past 10 years, growth in Timaru has lagged the New Zealand average for GDP, jobs, and population. But productivity growth in Timaru was slightly above the national average.

Table 1

Comparing growth in Timaru against New Zealand over the past decade
Annual average percentage change, 2011-2021, calculations from Infometrics and Statistics NZ data

	Timaru	NZ
GDP ($ billion)	2.2%	2.6%
Jobs	1.2%	1.9%
Population	0.8%	1.6%
Productivity (GDP/job)	1.0%	0.8%

4. Aspirational future scenarios for 2050

This section introduces three scenarios for where Timaru's economy could be in 2050. The scenarios range from conservative to aspirational – and are designed to highlight the 'size of the prize' from being ambitious.

4.2. Overview of future scenarios for the Timaru economy

The three hypothetical scenarios modelled in this report for Timaru's economy in 2050 are:

- **The 'status quo' (low) scenario**. This scenario highlights what will happen to Timaru's economy if it can only maintain the status quo level of employment and its industries merely muddle along their current productivity trajectories.
- **The 'more' (medium) scenario**. This scenario highlights what will happen to Timaru's economy if it can gradually expand its underlying level of employment, but only in industries based around the district's current productivity trajectory, rather than in anything transformational.
- **The 'better' (high/transformational) scenario**. This scenario is the most ambitious and is based on doing more of things that are better. It highlights what would happen if Timaru can evolve its economy and grow employment into an industry footprint with transformationally higher productivity.

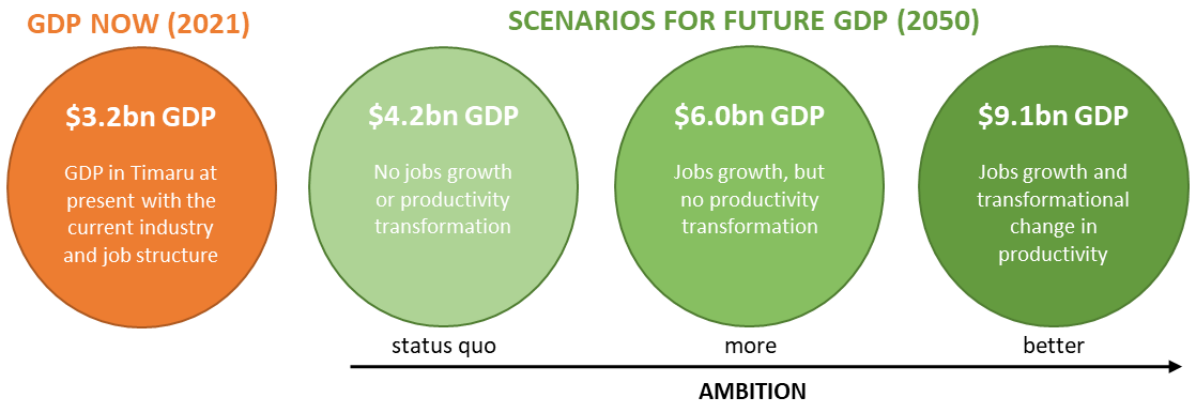
The rest of this section outlines the potential economic impacts for Timaru of each scenario. The detailed assumptions underpinning each scenario and their practicalities are also examined, with a focus on how many people and what productivity levels would be needed to support them.

4.3. 'Size of the prize' for Timaru's economy in each scenario

The potential 'size of the prize' for Timaru's economy from being ambitious is large. Calculations under the three future scenarios show that:

- If Timaru does no better than just muddle along, with its status quo level of employment and current productivity trajectory then the economy would be worth $4.2 billion in 2050, which is one third larger than its current level ($3.2 billion in 2021).
- If instead there is transformational growth into high productivity employment, then Timaru's economy could be worth $9.1 billion by 2050, which is almost three times its current size.

Figure 4 – Timaru's future economic activity (GDP) under conservative through to ambitious scenarios



4.4. Assumptions for achieving future scenarios

Each scenario of future economic activity is driven by assumptions based on jobs and productivity growth. The rest of section 4.4 unpacks the practicalities of each scenario's assumptions.

4.4.1. Assumptions for achieving the 'status quo' future scenario

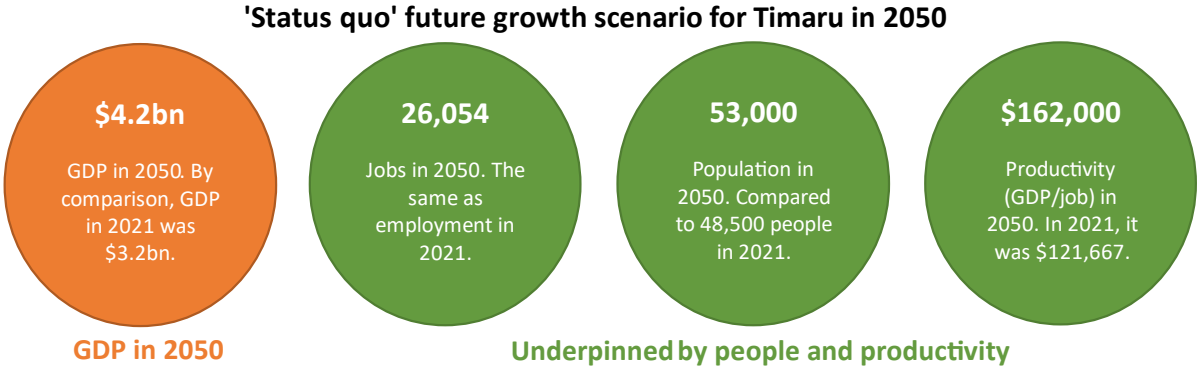
The 'status quo' scenario has the lowest level of ambition for 2050. It simply assumes that:

- Employment in Timaru remains at its current level (26,054 in 2021)
- Productivity growth muddles along at its current trajectory (1.0%pa growth).

In practical terms, achieving the 'status quo' scenario's two assumptions would imply that by 2050:

- Timaru would need a population of 53,000 people, up from its current population of 48,500
- Productivity (GDP per job) would reach $162,000, compared to $121,667 at present.

Figure 5



It might seem counterintuitive that Timaru would have to expand its population just to maintain its status quo employment levels. But the reason is simple, Timaru's population is rapidly aging and 30% of residents are expected to be aged over 65 by 2050[1], compared to just over 20% aged 65+ at present.

> Timaru would need to grow its population from 48,500 in 2021 to 53,000 by 2050 just to ensure there were sufficient people of working age to maintain Timaru's current level of employment and counteract increasing retirements.

The productivity growth assumption in the 'status quo' scenario is relatively unambitious. It only requires GDP per job in 2050 ($162,000) to sit approximately one third higher than it does currently ($121,667). Several places in New Zealand already have productivity at or approaching this level[2].

4.4.2. Assumptions for achieving the 'more' future growth scenario

The 'more' scenario is based around a slightly more ambitious growth scenario to 2050, where Timaru expands its underlying level of employment. It simply assumes that:

- Employment in Timaru grows at its current trajectory (1.2%pa growth)
- Productivity growth muddles along at its current trajectory (1.0%pa growth).

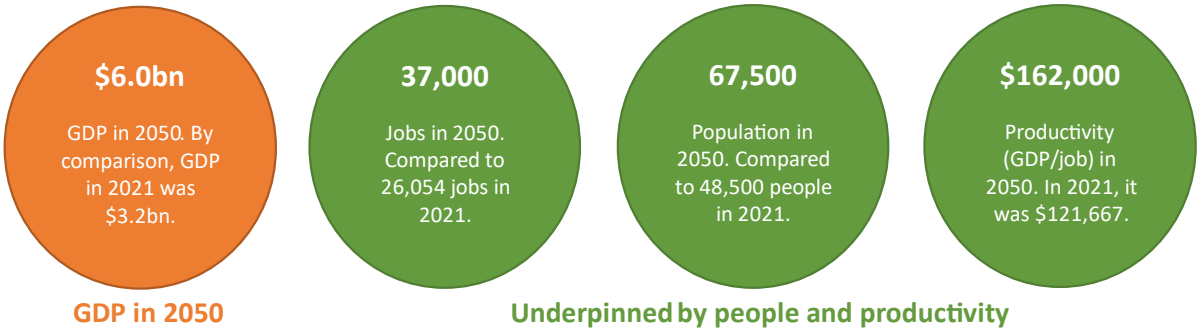
[1] Statistics NZ, subnational population projections (medium scenario), published 31/03/21.
[2] For example, Infometrics Regional Economic Profile shows that productivity (GDP per job) in Waitomo, Waitaki, South Taranaki, Wellington, New Plymouth, and Buller already exceeded $150,000 in 2021.

In practical terms, achieving the 'more' scenario's assumptions would imply that by 2050:

- Employment in Timaru would sit 11,000 jobs higher than currently
- To fill these jobs, Timaru's population would need to rise from 48,500 people to 67,500 people
- Productivity (GDP per job) would reach $162,000, compared to $121,667 at present.

Figure 6

'More' future growth scenario for Timaru in 2050



Timaru's aging population[3] means that lifting the population from 48,500 to 67,500 would need to increasingly be driven by migration from around New Zealand and overseas rather than natural increase.

> Timaru would need to attract a net 800 people each year to lift the population to 67,500 by 2050. This level of migration would be twice as high as Timaru's average migration gains in recent history[4].

4.4.3. Assumptions for achieving the 'better' future growth scenario

The **'better' scenario is the most ambitious and transformational** scenario. It assumes that up to 2050:

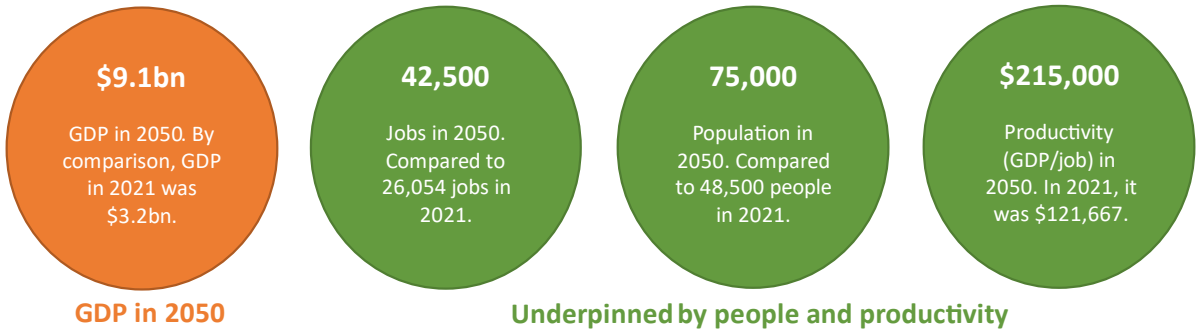
- Employment will grow by 0.5%pa above its current trajectory (1.7%pa growth instead of 1.2%pa)
- Productivity will grow at 1%pa above its current rate (2.0%pa growth instead of 1.0%pa).

In practical terms, achieving the 'better' scenario's assumptions would imply that by 2050:

- Employment in Timaru would sit 16,500 jobs higher than it does currently
- To fill these jobs, Timaru's population would need to rise from 48,500 people to 75,000 people
- Productivity (GDP per job) would need to reach $215,000, compared to $121,667 at present.

Figure 7

'Better' future growth scenario for Timaru in 2050



[3] A rising death rate, relative to births, is projected to reduce Timaru's population by an average of 175 people a year from 2023 to 2048. Source: Statistics NZ subnational population projections (published 31/03/21).
[4] Between 2013 and 2018, net migration to Timaru averaged 400 people per annum. Source: Statistics NZ subnational population projections (published 31/03/21) which drew on censuses for historical perspectives.

The outcomes needed to achieve the 'better' future scenario are ambitious – both in terms of how many people Timaru would need to attract to fill jobs and how productive industries would need to be.

> Timaru would need to attract average net migration gains of just over 1,000 people each year to reach a population of 75,000 by 2050. This level of migration is ambitious – even during the high growth years of 2013 to 2018 Timaru only attracted an average of 400 people a year.

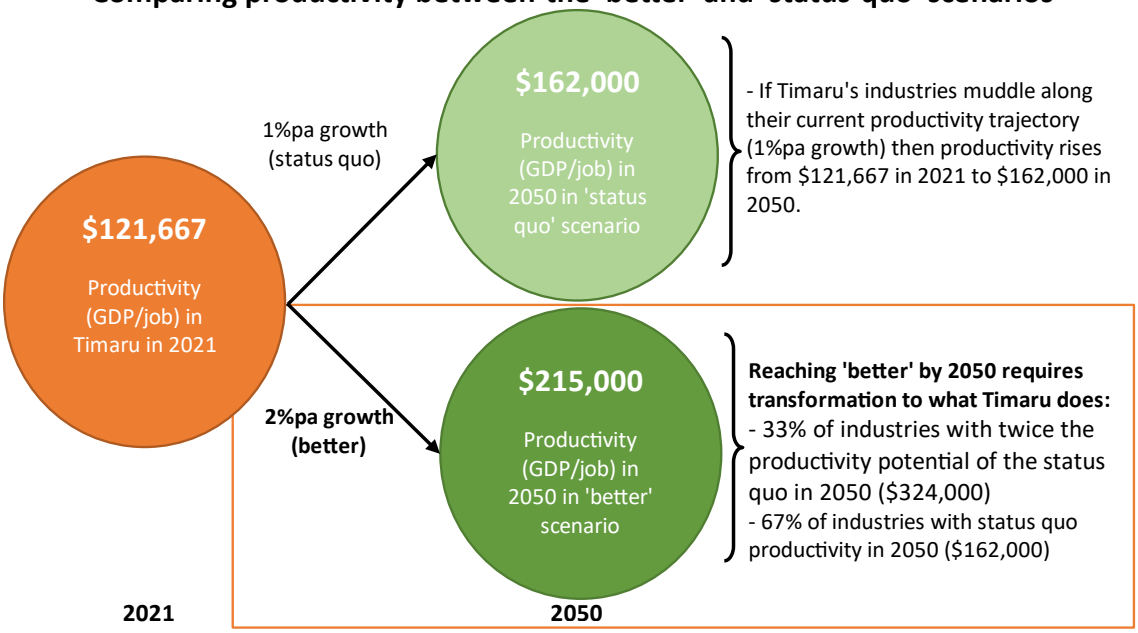
The 'better' scenario's assumption that the long-term rate of productivity growth in Timaru increases from 1.0%pa to 2.0%pa might not sound too ambitious at first brush, but only one district in New Zealand has achieved sustained productivity growth of at least 2.0%pa over the past decade[5].

Only fundamentally shifting the productivity dial into better ways of doing business would allow Timaru to achieve such a sustained high level of productivity growth over a 30-year period to 2050.

> The aspirational productivity outcome in the 'better' scenario would require transformation towards at least one third of Timaru businesses doing things that were at least twice as productive as opportunities under the status quo.

Figure 8

Comparing productivity between the 'better' and 'status quo' scenarios



Achieving transformational change in Timaru's productivity would be a powerful thing, particularly given that attracting new workers to Timaru will be difficult against a context of heightened national and global competition for people. After all, productivity is about working smarter, not harder.

> To put things in perspective, even in the extreme situation that Timaru can't attract enough new residents to lift employment, then a transformative shift in productivity alone would be enough to almost double the size of Timaru's economy (from $3.2 billion of GDP in 2021 to $5.6 billion of GDP in 2050).

[5] Infometrics Regional Profile shows only Tararua (2.0%pa) had productivity (GDP/job) growth of at least 2.0%pa over the past decade. New Zealand's average productivity growth over the past decade was 0.7%pa.

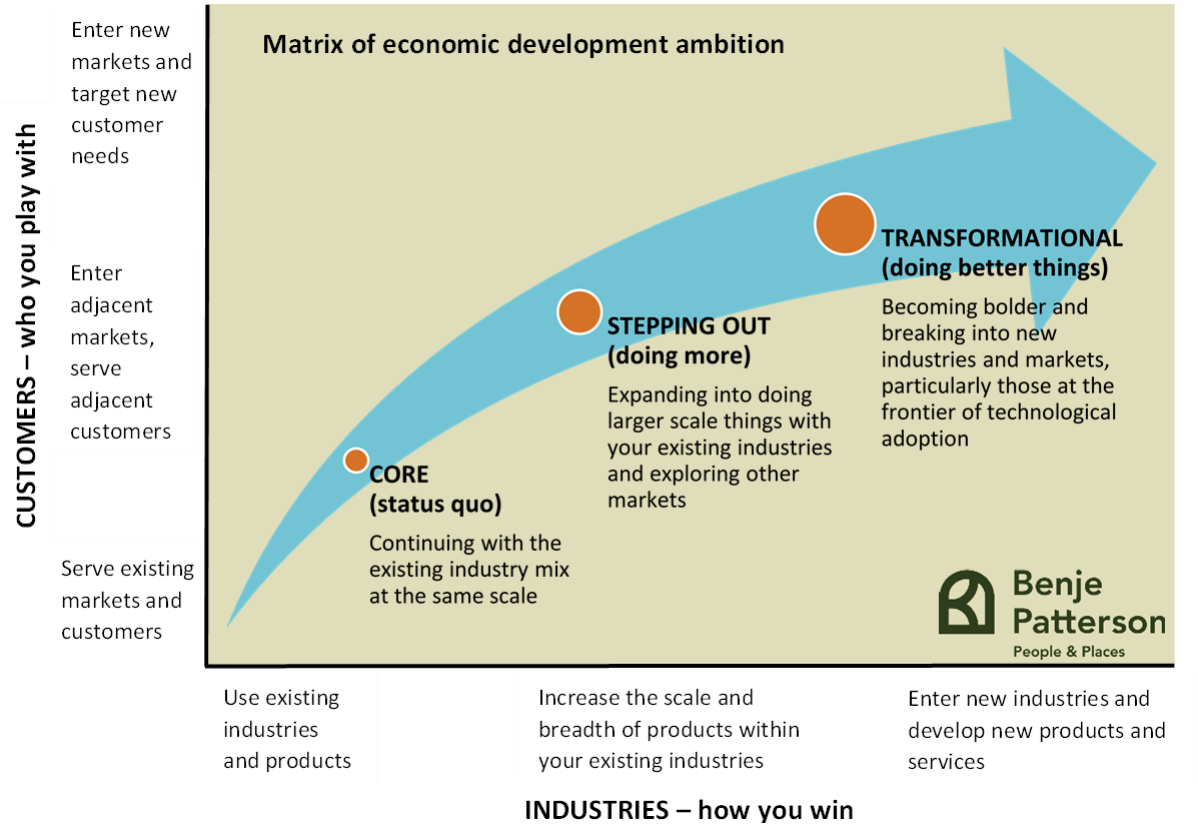
4.5. Stepping towards ambitious industry transformation

The previous sub-section highlighted that under the most aspirational scenario Timaru's economy could expand three-fold over the thirty years to 2050. This aspiration relies on growing and transforming the economy to at least one third of jobs having twice the productivity opportunities to the status quo.

The precise composition of what these industry transitions will be is uncertain and beyond the scope of this report. Nevertheless, this sub-section makes general comments about the decision-making context.

Transformations that build on existing strengths are easier to conceptualise, but 'blue sky' opportunities in new industries are harder to map out and many are reliant on yet-to-be-developed technologies.

Figure 9- Matrix of economic development ambition



What is known is that achieving ambitious industry transformation won't happen overnight. Initially many of Timaru's productivity wins will be found working with existing businesses in existing industries to streamline processes, explore adjacent products, and invest in proven technologies.

This approach is consistent with the Productivity Commission's recent inquiry into New Zealand's 'frontier firms' (businesses in the top 10% of those with the highest productivity)[6]. The inquiry researched how the economic contribution of frontier firms can be maximised to lift productivity across the economy. In its findings, the Commission said that we need to identify our frontier firms, learn about the characteristics of these businesses, implement focused innovation policy to strengthen the ecosystems that support them, and encourage the diffusion of their knowledge into non-frontier firms.

The 2021 Timaru District Economic Development Strategy (EDS) highlighted that the sectors in which Timaru has a competitive advantage are related to:

[6] Available here: https://www.productivity.govt.nz/assets/Documents/benchmarking-new-zealands-frontier-firms/2d6a4cd0ea/Benchmarking-New-Zealands-frontier-firms.pdf.

- Food and fibre (particularly dairy, meat, seafood, and food manufacturing)
- Logistics
- Professional, scientific and technical services.

These three sectors are a logical starting point for shifting Timaru's productivity dial. Furthermore, these sectors are also well-aligned to central government strategies and funding mechanisms. For example, all three are embedded directly and indirectly across the government's various Industry Transformation Plans[7], while optimising logistics is the focus of the New Zealand freight and supply chain strategy[8].

Through time, Timaru can progressively step out from this base and become more transformational in what it does, including breaking into new industries with at least twice the productivity potential to the status quo. Exactly what new industries will succeed is uncertain, but in exploring high productivity opportunities, Timaru must be cognisant of broader megatrends. These megatrends are long-term forces that can structurally change the industries in which Timaru might be competitive. Some megatrends to take note of when considering potential new high productivity opportunities include:

- **An increased focus on inclusive growth**. Higher GDP isn't the only goal, instead there must be a balance with the wellbeing of people, communities, and the environment. Investment in productivity can be a vehicle to inclusive growth, as high productivity, technologically driven industries can achieve prosperity and higher wages without unduly pressuring resources.
- **COVID-19's legacy will endure long after the pandemic is over**. Consumer demand patterns have evolved, and businesses may permanently adjust their practices, logistics, and supply chains to minimise future risks of disruptions. The changes create opportunities for localism and for regional locations with good transport connections to major metropolitan areas.
- **The nature of work is changing**. Younger workers have different expectations of work and are more likely to prioritise lifestyle with shorter working weeks and remote working. With good digital and transport connections there are opportunities for Timaru to capitalise on remote working trends and in other jobs that can deliver services 'weightlessly' to customers.
- **Automation will have widespread effects**, particularly in sectors with a lot of routine tasks. Automation brings productivity benefits, but new opportunities will likely focus on workers needing to develop different skills. There may be scope for Timaru to develop and pilot automation on local industries, for example agritech and drone-based agricultural solutions.
- **Adapting to emissions and other environmental factors will have direct and indirect effects**. Government regulations will directly create costs and constraints, particularly within agriculture for those with intensive pastoral farming models. Changing consumer preferences will also create indirect effects, which will likely favour more sustainably managed and lower impact business models. These changes will bring opportunities, for example to research and test how Timaru's food and fibre sector can pilot world-leading productive and sustainable transitions.

The above list should only be taken as a starting point when considering potential 'blue sky' industry opportunities that could help tranformationally lift Timaru's productivity. Megatrends by their very nature are uncertain – it is important to regularly consider other emerging forces. As stated in the Timaru EDS: "Timaru District, its people and businesses, need to embrace and respond to these changes, realising new opportunities and responding to disruptions".

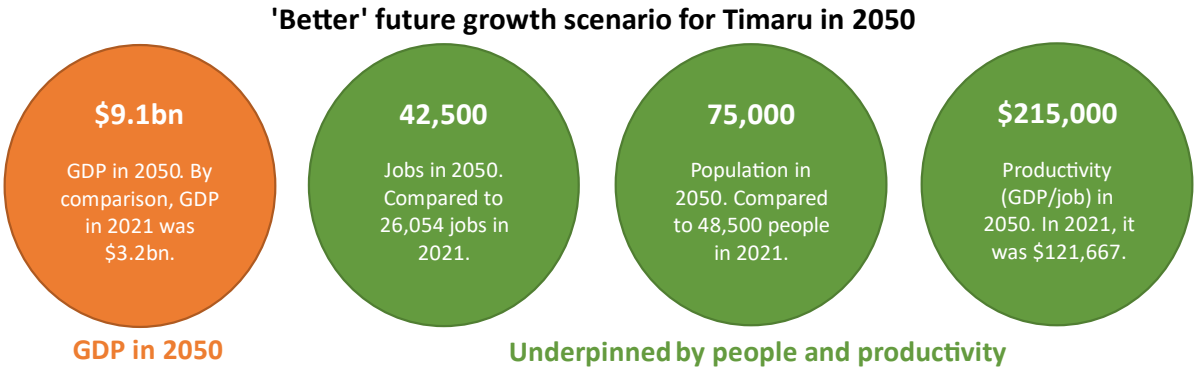
[7] Industry Transformation Plans (ITPs) are a mechanism for implementing the Government's industry policy. ITPs have actions focused on long-term transformation. More here: https://www.mbie.govt.nz/business-and-employment/economic-development/industry-policy/industry-transformation-plans/

[8] The New Zealand freight and supply chain strategy takes a 30+ year view and will inform government and private sector investment. Productivity is key to the strategy. More here: https://www.transport.govt.nz/area-of-interest/freight-and-logistics/new-zealand-freight-and-supply-chain-strategy/

5. Which enabling factors does ambition rely on?

Regardless of which industries help Timaru achieve an aspirational economic future, there will be many factors which are necessary enablers. Productivity, employment, and population growth are key drivers of economic prosperity (see Figure 10), but these can't happen in isolation and in turn rely on underlying foundations related to skills, natural resources, housing, infrastructure, and social and cultural capital.

Figure 10



Enabling factors needed to support achieving the 'better' future growth scenario for 2050 include:

- **Sufficient business land and the right infrastructure**. For businesses to do better things, they will need suitable premises. Even at the lower end of land needed per worker, 16,500 additional jobs would demand a minimum of 30 extra hectares of adequately serviced business land by 2050[9].
- **Access to capital**. Transformational changes in productivity are inherently capital intensive. Accessing investment capital for small to medium businesses is especially difficult in the regions.
- **Digital and transport connections**. Digital and transport connectivity are crucial for businesses' productivity. Remaining connected to friends and family is also important for new residents.
- **People with the right skills**. The 16,500 new jobs would be in much higher productivity roles, with different skills demands to the status quo. Ongoing training to build capability of existing workers to use new technologies will be as important as attracting people with the right skills.
- **Housing**. Population growth of 26,500 people could equate to 9,000 more households by 2050. This number of new households is equivalent to 300 extra houses per year for the next 30 years.
- **Schools.** Within the population expansion of 26,500 people, there would be around 6,000 children of early childhood and school age. Depending on average classroom sizes this could mean an additional 200 to 300 classrooms would be needed in Timaru District by 2050.
- **Health**. An increasing population will place higher demand on health services. In order to maintain similar health service levels[10], Timaru would need at least 1,500 more health and social assistance workers by 2050[11] to account for population growth from 48,500 to 75,000 people.
- **Social and recreational infrastructure**. Community infrastructure and services play an important role in supporting wellbeing, as well as helping to integrate and retain new residents. Investment should scale as populations increase. The 2019/20 Timaru Resident Opinion Survey showed 87% of residents visited a park or reserve in the past year, while 91% used a community facility.

[9] A BERL study showed businesses require 17 to 100 sqm per employee depending on if they are service-based or heavy industry (see page 14: https://www.waikatoregion.govt.nz/assets/WRC/Services/regional-services/BERL-Report-UNISA-Industrial-Land-Demand-Study.pdf).
[10] There were 2,837 employed in health and social assistance in Timaru in 2021 against a population of 48,500.
[11] This estimate is conservative as there would also be additional health demands from an aging population.

6. Concluding remarks

This report has highlighted the power of being ambitious and transformational.

If Timaru can do no better than maintain its current level of employment and muddle along its status quo productivity trajectory then it will only be one third larger by 2050 than it is today.

However, if Timaru can be aspirational in terms of how many jobs it creates, people it attracts, and how productive these jobs are then Timaru's economy could triple in size over the same period. Such a goal would require a transformational shift into at least one third of Timaru's businesses doing things that were at least twice as productive as opportunities under the status quo.

Getting there won't be easy. Transformations that build on existing strengths are easier to conceptualise, but 'blue sky' opportunities in new industries are harder to map out and many are reliant on yet-to-be-developed technologies.

Furthermore, regardless of which industries help Timaru achieve an aspirational economic future, there will be many factors which are necessary enablers. Productivity, employment, and population growth are key drivers of economic prosperity, but these can't happen in isolation and in turn rely on investments in underlying foundations related to skills, natural resources, housing, infrastructure, and social and cultural capital.