WAIMAKARIRI
DISTRICT COUNCIL

Extraordinary Council Meeting

Agenda

Tuesday 31 May 2022

11am

Council Chamber
215 High Street
Rangiora

Members:

Mayor Dan Gordon (Chair)
Cr Neville Atkinson
Cr Kirstyn Barnett
Cr Al Blackie
Cr Robbie Brine
Cr Wendy Doody
Cr Niki Mealings
Cr Philip Redmond
Cr Sandra Stewart
Cr Joan Ward
Cr Paul Williams

The Mayor and Councillors

WAIMAKARIRI DISTRICT COUNCIL

AN EXTRAORDINARY MEETING OF THE WAIMAKARIRI DISTRICT COUNCIL WILL BE HELD IN THE COUNCIL CHAMBERS, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA, ON TUESDAY 31ST MAY 2022 COMMENCING AT 11AM

Sarah Nichols
GOVERNANCE MANAGER

Recommendations in reports are not to be construed as Council policy until adopted by the Council

BUSINESS

Page No

1. APOLOGIES

2. CONFLICTS OF INTEREST

Conflicts of interest (if any) to be reported for minuting.

3. REPORT

3.1. **Notification of Private Plan Change 31 – Rolleston Industrial Developments Ltd – Mark Buckley (Principal Policy Planner)**

RECOMMENDATION

THAT the Council:

(a) **Receives** report No. 220315037010.

(b) **Accepts** the plan change request from Rolleston Industrial Development Ltd (as numbered PC 31) for processing in accordance with clause 25(2)(b) of Schedule 1 of the Resource Management Act 1991 as lodged on 14 December 2021, and superseded in response to further information requested (included information dated March 2022).

(c) **Directs** staff to notify Plan Change 31 at the first available opportunity.

(d) **Notes** that this decision is a procedural step and does not signal support or otherwise for Plan Change 31.

(e) **Circulates** this report to the Rangiora-Ashley, Oxford-Ohoka and Kaiapoi-Tuahiwi Community Boards for their information.

4. NEXT MEETING

The next scheduled ordinary meeting of the Council will commence at 1pm on Tuesday 7 June 2022.

WAIMAKARIRI DISTRICT COUNCIL
REPORT FOR DECISION

FILE NO and TRIM NO:	DDS-06-05-01-31-01/ 220315037010
REPORT TO:	Council
DATE OF MEETING:	31 May 2022
FROM:	Mark Buckley – Principal Policy Planner
SUBJECT:	Notification of Private Plan Change 31 – Rolleston Industrial Developments Ltd

SIGNED BY:
(for Reports to Council, Committees or Boards)

Department Manager	Chief Executive

1. SUMMARY

1.1 This purpose of this report is to request approval to notify Private Plan Change 31 (the plan change) to the operative Waimakariri District Plan. The plan change proposes to:

a. Rezone 155.931ha from Rural to Residential 3, Residential 4A, Residential 8 and Business 4;

b. Amend the Operative District Plan maps by inserting the proposed Outline Development Plan - Mill Road (dated 4/3/2022) and associated narrative;

c. Insert a new definition for *Education Facilities*;

d. Amend the following policies or their explanations or reasons: 16.1.1.1, 16.1.1.12, 18.1.1.9;

e. Amend rules 30.1.1.9, 30.6.1.1, 31.1.1.4, 31.1.1.6, 31.1.1.10, 31.1.1.24, 31.1.1.35, 31.1.1.39, 31.1.1.49, 31.1.1.53, 31.1.1.54, 31.2.2, 31.2.3, 32.1.1.1, 32.1.1.11, 32.1.1.28, 32.3.7.

1.2 The proponent of the plan change is Rolleston Industrial Developments Ltd. The plan change is a privately initiated change to the operative Waimakariri District Plan. As a private plan change, the Council has the option to adopt the request as its own plan change, accept the request for notification, treat the request as a resource consent, or reject the request (on certain grounds).

1.3 A Section 32 analysis, required under the Resource Management Act 1991 (RMA), has been prepared by the proponent to ascertain the most appropriate way for the District Plan to address the issues of managing potential or actual adverse environmental effects relating to the rezoning of land, and application of the associated provisions.

1.4 This report seeks the approval of the Council to accept the request and to notify the plan change. Upon approval, staff will publicly notify the plan change in accordance with the requirements of the First Schedule of the RMA.

1.5 It is important to note that a decision to accept the request does not infer any support or otherwise of the plan change and is simply a procedural step to begin the process of notification.

Attachments:

i. Plan Change 31 – Application section 32 (220307031568)

2. RECOMMENDATION

THAT the Council:

(a) **Receives** report No. 220315037010.

(b) **Accepts** the plan change request from Rolleston Industrial Development Ltd (as numbered PC 31) for processing in accordance with clause 25(2) (b) of Schedule 1 of the Resource Management Act 1991 as lodged on 14 December 2021, and superseded in response to further information requested (included information dated March 2022).

(c) **Directs** staff to notify Plan Change 31 at the first available opportunity.

(d) **Notes** that this decision is a procedural step and does not signal support or otherwise for Plan Change 31.

(e) **Circulates** this report to the Rangiora-Ashley, Oxford-Ohoka and Kaiapoi-Tuahiwi Community Boards for their information.

3. BACKGROUND

3.1 The plan change request primarily relates to rezoning of 155.9 ha from Rural to Residential 3, Residential 4A, Residential 8 and Business 4 to the south of Ohoka village.

3.2 The intent of the request is to provide for:

a. 700 new households within the Residential 3 Zone;

b. 150 new households within the Residential 4A Zone;

c. A new Residential 8 Zone to provide for a possible school or retirement village or residential activities commensurate with a Residential 3 Zone if neither activity is developed;

d. A new commercial area (Business 4 Zone) which will provide for approximately 5700m^2 to 6900m^2 of commercial floorspace and carparking.

3.3 The request relates to a block of currently zoned rural land to the south of Ohoka, bordered by Bradleys, Mill and Whites Roads (see Figure 1). It does not include the already Residential 3 zoned land near the intersection of Mill Road and Whites Road. The south-western boundary extends between Bradleys Road and Whites Road roughly 1.5 kilometres from the Mill Road end.

Figure 1: Location of rezoning.

3.4 Under the operative Waimakariri District Plan (November 2005) the proposed private plan change area is zoned Rural. It is also contained within the Greater Christchurch Boundary.

3.5 The Private Plan Change was lodged with Council on 14 December 2021. On 17 February 2022, Council (via staff) issued the proponents of the plan change with a request for additional information pursuant to clause 23(1) of Schedule 1 of the RMA. A response to this request was provided back to Council staff on the 4th March 2022. The response received from the further information request was subsequently sent to the relevant Council staff for comment. Council's external planner has confirmed that the application now contains sufficient information to understand the nature of the application, and at a high level the ways which any adverse effects are proposed to be mitigated and the nature of consultation that was undertaken. These will be tested through the plan change process.

4. ISSUES AND OPTIONS

4.1. Section 73 of the RMA provides the opportunity for any person to request a change to a district plan and the plan may be changed in the manner set out in the First Schedule of the RMA.

4.2. A local authority must consider the request.

4.3. The local authority may accept or adopt the request in whole or in part (clause 25(2)), deal with the request as if it were an application for a resource consent (clause 25(3)), or reject the request in whole or in part (clause 25(4)).

4.4. A request may only be rejected if one of five grounds exist (clause 25(4)(a) to (e)), including that the substance of the request has been considered in the last two years, the plan has been operative for less than two years, or that the request does not constitute 'sound resource management practice'.

4.5. Clause 27(1) creates a right of Appeal to the Environment Court, against a decision to reject the request under clause 23(6) or clause 25(4).

4.6. The primary options are therefore to accept or reject the request.

4.7. There are limited grounds for rejecting a Plan Change, as follows –

(a) Under Clause 23 a proponent has declined to provide the further information requested.

(b) Under Clause 25(4):

i. The request or part of the request is frivolous or vexatious; or

ii Within the last 2 years the substance of the request has been considered by the Council or Environment Court;

iii. The request or part of the request is not in accordance with sound resource management practice; or

iv. The request or part of the request would make the plan inconsistent with Part 5 (of the Act); or

v. The plan has been operative for less than 2 years.

4.8. The merits of the plan change are not relevant at this stage of the process, apart from a 'coarse scale merit assessment'[1] as a determination as to whether the request would offend 'sound resource management practice'.

4.9. Clause 25 is an administrative decision to accept the request for processing. The Council does not need to have formed a view on the merits of the request, nor does it need to agree with the independent expert assessment of the environmental effects, or be satisfied that all possible information has been provided that will assist with a substantive decision on the Plan Change, which this application does not.

Is the request frivolous or vexatious- Clause 25(4)(a)?

4.10. The request is neither frivolous nor vexatious. The Plan Change is a genuine proposal that seeks to enable a significant residential development, with associated commercial activity. It has been informed by assessments from a number of technical experts commensurate with the scale of development proposed.

Has the substance been considered in the last two years – Clause 25 (4)(b)?

4.11. While the Council has considered in general terms possible growth options for the District as part of the Waimakariri District Development Strategy (2018) (the "DDS") this particular proposal has not been considered by the council in the last two years under the RMA by either Council or the Court, therefore staff consider that this provision does not apply as a valid reason to reject the plan change.

Does the request accord with 'Sound Resource Management Practice' - Clause 25(4)(c)

4.12. The term 'sound resource management practice' is undefined. Case law has identified that for the phrase to be given any coherent meaning it must be tied to the Act's purpose and principles. This should be limited to only a 'coarse scale merits assessment', and also in relation to the methods, techniques and timing of the request.

[1] Malory Corporation Limited vs Rodney District Council CIV-2009-404-004472 [95]

4.13. This request is straightforward as to its purpose. The proponents are seeking to rezone an area from Rural to Residential 3, Residential 4A, Residential 8 and Business 4. What is being sought, the plan provisions and framework are able to be reasonably understood by a member of the public.

4.14. Clause 25(4)(c) provides Council with the ability to undertake a coarse level assessment of whether a private plan change request clearly does not accord with the RMA's purpose and principles. In undertaking this assessment, staff have noted the following:

a) Although Council staff have concerns regarding information provided by the proponent to date, particularly as these relate to the three waters, roading and reserves, these concerns do not reach the high threshold of the plan change request not being in accordance 'sound resource management practice', so that the request can be rejected from further processing. Council staff intend to continue working with the proponent to obtain additional clarity prior to notification, if the plan change request is accepted for processing.

b) There remain opportunities through the notification, submissions and hearing of the Plan Change to alleviate information gaps which remain material in the context of a substantive assessment of the request including submissions and evidence at a substantive hearing.

4.15. It is considered that the request cannot be rejected assuming a high, and largely merit driven, threshold as to what would therefore constitute 'sound resource management practice'.

The request or part of the request would make the plan inconsistent with Part 5 (of the Act);

4.16. Part 5 of the RMA enables the preparation of standards, policy statements and plans. Accordingly, the Council must be satisfied that the request does not render a plan inconsistent with the provisions of the RMA that govern their formation, including failures to give effect to higher order documents.

4.17. The request includes an assessment of the respective provisions against Part 5 of the Act (the Act's purpose), which the proponent considers is achieved. The proponents rely heavily on the NPS-UD to support their proposal and argue that their proposal "*is generally consistent with the objectives and policies of the NPS-UD*". It is considered that the extent to which it is consistent or not is more of a merits-based assessment that is best assessed through evidence at a substantive hearing. There is potentially some conflict between the NPS-UD and the CRPS as to whether development in this location within Greater Christchurch is acceptable, however this is also best assessed through a substantive hearing.

Summary – Clause 25 (4)

4.18. Overall, it is considered that there are no clear and certain planning grounds to reject the request under Clause 25(4) of the First Schedule of the RMA.

4.19. For completeness it is noted that the Council could decide to deal with the request if it were an application for resource consent. Staff consider that there is an insufficient information provided to treat the application as a resource consent.

Clause 25(2) (a) and (b) Adopt or Accept the Request

4.20. If the request is not to be rejected, this clause allows the Council to either adopt the request as its own plan change and process it accordingly; or accept it to process as a private plan change.

4.21. Staff do not recommend that the Council adopt the request as its own. This is primarily due to the Council then needing to absorb the associated costs of processing and the fact that the substance of the request is essentially about rezoning an area of privately owned land.

4.22. Accepting the request would mean the Council accepts it for processing and public notification, with costs falling on the proponent. Accepting the request also allows for a more robust testing of the Plan Change, and for Council to remain neutral, which is especially important given the promulgation of the District Plan review.

4.23. Therefore, Council staff recommend that Council accepts this Plan Change for notification.

4.24. The Management Team have reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Groups and Organisations / Wider Community

The s32 supporting the proposed plan change (beginning at paragraph 53) identifies the consultation undertaken by the proponents. This includes:

- Waimakariri District Council Officers, primarily to ensure that the development can be adequately serviced and in respect of flood hazard risk.
- Local Rūnanga via Mahaanui Kurataiao Limited.

5.2. Upon public notification of the plan change, the wider community will be able to submit on the plan change through the submission and further submission process under the requirements of the First Schedule of the RMA. A hearing will then be required for a hearing panel or commissioner to make a decision on the plan change.

5.3. Mana whenua

Te Ngāi Tūāhuriri hapū are not likely to be affected by, or have an interest in the subject matter of this report. The recommendations in the report on focus on the Private Plan Change process and not the merits of the application.

6. IMPLICATIONS AND RISKS

6.1. Financial Implications

6.1.1. The financial considerations differ depending on how Council decides to process this request. Council will bear some costs, although direct staff time and consultant costs will be carried by the proponent (see below).

Reject the Plan Change

6.1.2 Should the Council reject the request under clause 25(4), the applicant is able to appeal that decision in the Environment Court pursuant to clause 27(1) of the Act. An appeal process would be costly regardless of the outcome. Costs cannot be predicted accurately, as there is limited case law relating to the rejection of a request.

Accept the Plan Change

6.1.3 Should the Council accept and notify the request there will be no direct costs to the Council, as all 'fair and reasonable' costs are recoverable from the proponent.

Adopt the Plan Change

6.1.4 Should the Council adopt the request as its own Plan Change, then the Council will need to absorb all of its own costs and the hearing costs which could be considerable (estimated to be in excess of $20,000). Adoption would also place the Development Planning Unit under additional pressure given the current District Plan review process and will likely require additional external resource.

6.2. **Community Implication**

There are no direct community implications at this time, as the requested approval is limited to beginning the process of notifying the plan change for public consultation and submissions.

6.3. **Sustainability and Climate Change Impacts**

The recommendations in this report do not have sustainability and/or climate change impacts. The recommendations in the report on focus on the Private Plan Change process and not the merits of the application.

6.4. **Risk Management**

Notification of the plan change does not affect Council's risk profile. The decision to notify the Proposed Private Plan Change was assessed by an external planning consultant who recommended that Council to publicly notify the plan change in accordance with the requirements of the First Schedule of the RMA. The public notification of the Proposed Private Plan Change cannot be considered as Council supporting the application, as the decision is only on the process around public notification and not a merits based assessment of the application.

6.5. **Health and Safety**

There are not health and safety matters to consider in this report.

7. CONTEXT

7.1. **Policy**

This is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. **Legislation**

Schedule 1 clause 25 of the Resource Management Act 1991 applies in relation to the preparation of changes to the District Plan:

25 Local authority to consider request

(2) The local authority may either—

(a) adopt the request, or part of the request, as if it were a proposed policy statement or plan made by the local authority itself and, if it does so,—

(i) the request must be notified in accordance with clause 5 or 5A within 4 months of the local authority adopting the request; and

(ii) the provisions of Part 1 or 4 must apply; and

(iii) the request has legal effect once publicly notified; or

(b) accept the request, in whole or in part, and proceed to notify the request, or part of the request, under clause 26.

(3) The local authority may decide to deal with the request as if it were an application for a resource consent and the provisions of Part 6 shall apply accordingly.

(4) The local authority may reject the request in whole or in part, but only on the grounds that—

(a) the request or part of the request is frivolous or vexatious; or

(b) within the last 2 years, the substance of the request or part of the request—

(i) has been considered and given effect to, or rejected by, the local authority or the Environment Court; or

(ii) has been given effect to by regulations made under section 360A; or

(c) the request or part of the request is not in accordance with sound resource management practice; or

(d) the request or part of the request would make the policy statement or plan inconsistent with Part 5; or

(e) in the case of a proposed change to a policy statement or plan, the policy statement or plan has been operative for less than 2 years.

(5) The local authority shall notify the person who made the request, within 10 working days, of its decision under this clause, and the reasons for that decision, including the decision on notification.

7.3. **Community Outcomes**

Governance

Effect is given to the principles of the Treaty of Waitangi

7.3.1. The Council in partnership with Te Ngāi Tūāhuriri Rūnanga, continue to build our relationship through mutual understanding and shared responsibilities.

There are wide ranging opportunities for people to contribute to the decision making that effects our District

7.3.2. The Council makes information about its plans and activities readily available.

7.3.3. The Council takes account of the views across the community including mana whenua.

7.3.4. The Council makes known its views on significant proposals by others affecting the District's wellbeing.

7.3.5. Opportunities for collaboration and partnerships are actively pursued.

Places and Spaces

The distinctive character of our takiwā – towns, villages and rural areas is maintained

7.3.6. The centres of our towns are safe, convenient and attractive places to visit and do business

Services

Businesses in the District are diverse, adaptable and growing

7.3.7. There are sufficient and appropriate places where business are able to set up in our District.

7.4. Delegations

7.4.1. The Council has the delegation to make decisions on the pathway for plan changes under clause 25 of the RMA (there is no sub-delegation below Council).

novo group
Planning. Traffic. Development.

Request for Change to the Waimakariri District Plan

prepared for

ROLLESTON INDUSTRIAL DEVELOPMENTS LIMITED

535 Mill Road, Ohoka

March 2022

Request for Change to the Waimakariri District Plan

prepared for

ROLLESTON INDUSTRIAL DEVELOPMENTS LIMITED

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Request to Change the Waimakariri District Plan under Clause 21 of the First Schedule of the Resource Management Act 1991

TO: The Waimakariri District Council

Rolleston Industrial Developments Limited (**'RIDL') requests** changes to the Waimakariri District Plan as described below.

1. The location to which this request relates is:

   - The subject land is located at 511, 531, 535 and 547 Mill Road and 290 and 344 Bradleys Road and is for the most part bounded by Whites, Mill and Bradleys roads. The land is legally described as Part Rural Section 2220 held in Certificate of Title CB26B/467, Lot 1 Deposited Plan 318615 held in Certificate of Title 72971, Lot 2 & 3 Deposited Plan 318615, Lot 2 and Part Lot 1 Deposited Plan 8301, and Lot 2 Deposited Plan 61732 held in Certificates of Title 72972, 72973, CB19B/21, and CB36C/1075, Part Lot 1 Deposited Plan 2267 held in Certificate of Title CB742/18, Lot 1 Deposited Plan 55849 held in Certificate of Title CB35A/112, and Lot 2 Deposited Plan 55404 held in Certificate of Title CB33F/218. All the titles are contained in **Attachment 1**.

   - The total area of land subject to the request is 155.931 hectares.

   - The subject land is currently zoned Rural in the operative Waimakariri District Plan.

   - A location plan indicating the location of the subject land is included as **Attachment 2**.

   - A plan indicating proposed amendments to the operative District Planning maps is included as **Attachment 3**.

   - An outline development plan proposed for the subject land is included as **Attachment 4**.

2. The plan change request proposes the following changes to the operative Waimakariri District Plan (changes <u>underlined</u> or ~~struck through~~):

   1. To amend the operative Waimakariri District Plan Planning Maps, by rezoning the site to Residential 3, Residential 4A, Residential 8 and Business 4 as detailed in **Attachment 3**.

   2. To amend the operative Waimakariri District Plan Planning Maps by inserting the Outline Development Plan included at **Attachment 4**.

   3. To amend the following operative District Plan provisions:

      Objectives and Policy

      Definitions

      <u>Educational facilities</u>

      <u>means land or buildings used for teaching or training by childcare services, schools, or tertiary education services, including any ancillary activities.</u>

16 Business Zones

Policy 16.1.1.1

…

Reason

…

The Business 4 Zone provides for activities existing at 20 June 1998, and limited future expansion of retail and business activities with similar effects on the southwestern corner of Williams and Carew Streets in Kaiapoi (District Plan Maps 104 and 105), and the Lilybrook Shops on the corner of Percival Street and Johns Road, Rangiora (District Plan Maps 113 and 117). This zoning recognises the commercial zoning that these sites enjoyed under the Transitional District Plan. The Business 4 Zone also provides for a local community business zones at West Kaiapoi (District Plan Map 104), ~~and~~ within the Mandeville North settlement (District Plan Map 182) and at Ohoka (District Planning Map 185).

Policy 16.1.1.12

Provide for retail and business activities in the Ohoka Business 4 Zone, in a way that:

a) *maintains the characteristics of the Ohoka settlement as set out in Policy 18.1.1.9; and*

b) *provides for limited business activities to provide for day-to-day convenience needs of the local community, is designed to achieve high quality urban design principles and a high standard of visual character and amenity.*

Principal Reasons For Adopting Objectives, Policies and Methods 16.1.4

…

The Business 4 Zone enables site-specific areas of existing retail and business activity located outside of the Kaiapoi and Rangiora town centres. The effects of activities are known for those already developed, including those impacting on adjoining residential areas. Activity and development standards constrain the scale and nature of possible future effects. A specific policy and rule framework exists for the Business 4 Zone in West Kaiapoi, ~~and the Business 4 Zone in~~ Mandeville North and Ohoka to ensure suitable scale and characteristics of any development within the zone and with regard to Mandeville North to recognise community desires.

18. Constraints on Subdivision and Development

Policy 18.1.1.9

Ensure that any growth and development of Ohoka settlement occurs in a manner that:

- *maintains a rural village character comprising a predominantly low density living environment with dwellings in generous settings;*

- *achieves, as far as practicable, a consolidated urban form generally centred around and close to the existing Ohoka settlement;*

- *encourages connectivity with the existing village and community facilities;*

- *achieves quality urban form and function;*

- *allows opportunities for a rural outlook;*

- *encourages the retention and establishment of large-scale tree plantings and the use of rural style roads and fencing;*

- *limits the potential for reverse sensitivity effects;*

- *avoids significant flood hazards;*

- *promotes the efficient and cost-effective provision and operation of infrastructure;*

- *recognises the low lying nature of the area and the need to provide for stormwater drainage; and*

- *ensures that any residential development occurring in the Ohoka settlement does not increase the flood risk within Ohoka and adjoining areas.*

Explanation

Growth of Ohoka settlement, defined by the Residential 3, 4A and 4B zones, is constrained by the need to ensure that any future residential development maintains its rural village character. This is most likely to be achieved by consolidating growth around or adjacent to the existing urban area and ensuring that development complements the existing low density rural residential environment. A consolidated growth pattern will provide opportunities for establishing connections with the existing settlement and community facilities, including the Ohoka School. This form of development is also anticipated to promote the efficient provision of reticulated water and wastewater infrastructure and reduce the potential for reverse sensitivity effects on surrounding rural activities.

It is important that any further rural residential development occurs in a way, and to an extent, that does not overwhelm the special semi-rural character of the settlement.

It is expected that the type of growth and development required to maintain the rural village character of Ohoka is that of low density living, where larger allotments ~~dwellings are situated within generous settings comprising an average lot size of between 0.5 – 1.0 hectare~~ surround smaller properties which form a walkable community around the village centre. The presence of rural village attributes within ~~such~~ the low density residential areas, including the retention and establishment of large-scale tree plantings and the use of rural style roads and fencing, will also assist

in maintaining the settlement's rural themed characteristics. This type of settlement pattern is anticipated to generate a high level of amenity, including opportunities for a range of lifestyle living activities and an aesthetic rural outlook. This can be achieved either by enabling views into open green space or by the establishment of treed vegetation areas within or adjoining properties.

Another development constraint for growth at Ohoka is the need to avoid land subject to significant flood risk. It will therefore be necessary for any proposed development to demonstrate that the land is suitable for its intended use and is not subject to undue risk of inundation. This includes the impact of cumulative effects on the area's drainage systems.

Rules

30 Utilities and Traffic Management

30.1.1.9 Roads constructed after 20 June 1998 shall comply with Table 30.1 (except for roads constructed in the Residential 6, 6A and Business 1 Zones at Pegasus, or in the Pegasus Rural Zone, which shall comply with Rule 32.1.1.32d, or in the Residential 7 Zone or in the Residential 4A Zone at Bradleys Road, Ohoka, or in the Residential 3, 4A and 8 Zones and Business 4 Zone in Ohoka shown on Planning Map 185).

30.6.1.1 All land uses in any Residential Zone or Business Zone, and any dwellinghouse in any Rural Zone, shall be located on a site that has access to a road which complies with the design attributes of Table 30.1 or, Table 30.2 for the Residential 7 Zone, except for the Residential 3, 4A and 8 Zones and Business 4 Zone in Ohoka shown on Planning Map 185). other than lLand uses in the Residential 6, 6A and Business 1 Zones at Pegasus which shall be located on a site that has access to a road which complies with the design attributes of Table 32.2.

31. Health, Safety and Wellbeing

Dwellinghouses

31.1.1.4 In Residential 1, 2, 3, 6, 6A, and 7 and 8 Zones and Business 2 Zones any dwellinghouse shall be on a site that complies with the area and dimensions set out in Table 32.1 (Subdivision – Rules) as though the site was an allotment, except as provided for by Rule 32.1.1.8.

31.1.1.6 In any Residential 2, 3, 4A, 4B, or 7 (Areas B and C), or 8 Zone, where there is more than one dwellinghouse on a site, it shall be able to be shown that:

…

b) for Residential 2, and 3 and 8 Zones, that the areas and dimensions of any delineated area can comply with the standards and terms of Rule 32.1.1.1 as though the delineated area was an allotment;

Structure Coverage

31.1.1.10 The structure coverage of the net area of any site shall not exceed:

…

m) 45% in the Residential 8 Zone

n) 55% in Business 4 Zone in Ohoka as shown on the District Plan Map 185

Setbacks For Structures

Table 31.1: Minimum Structure Setback Requirements

Location	***A setback is required from***	***Setback depth (minimum)***
Residential 4A Zone (Ohoka) shown on District Plan Map 185	*Any road boundary* *Any internal site boundary*	*10m* *5m*
Residential 8	*Any road boundary* *Any internal site boundary*	*2m* *1m*
Business 4 (Ohoka) shown on District Plan Map 185	*Any residential zone*	*3m*

Structure Height

31.1.1.24 Any structure in a Residential 1, 2, 3, 6, ~~or~~ 7 ~~Zone~~ (Areas B and C) or 8 Zone, or the Residential 4A Zone (Ohoka) shown on District Plan Map 185, shall not exceed a height of 8m except in the Residential 8 Zone (Ohoka) shown on District Plan Map 185 where a site is larger than 6,000m^2, the maximum height of any building shall be 12m above ground level where the setback of buildings from the internal boundary is more than 10m.…

31.1.1.35 Any structure in the ~~Mandeville North~~ Business 4 Zone at Mandeville North or Ohoka shall not exceed a height of 8 metres.

Screening and Landscaping

31.1.1.39 Where a site within any Business Zone, other than the Business 4 – West Kaiapoi Zone and Business 4 Zone at Ohoka, shares a boundary with any Residential Zone, the site shall be screened from the adjoining Residential Zone site(s) to a minimum height of 1.8m except where a lesser height is required in order to comply with Rule 30.6.1.24, for unobstructed sight distances.

31.1.1.49 Within the Residential 4A Zone, Bradleys Road, Ohoka identified on District Plan Map 169 and the Residential 4A Zone, Ohoka identified on District Plan Map 185 any fences/walls within any boundary setback shall be:

a) limited to a maximum height of 1.2m and a minimum height of 0.6m; and

b) limited to traditional post and wire or post and rail fences, and be at least 50% open; and

c) of a length equal to or greater than 80% of the length of the front boundary.

31.1.1.53 Within the Residential 3, 4A and 8 zones shown on District Plan Map 185, landscaping for all residential properties (excluding retirement village activities) shall provide a minimum of:

a) one tree within the road boundary setback for every 15 metres of road frontage (or part thereof) and;

b) one additional tree elsewhere on the property for every 400m^2 of site area (or part thereof);

c) all trees shall be not less than 1.5 metres high at the time of planting;

d) all trees and landscaping required by this rule shall be maintained and if dead, diseased or damaged, shall be replaced

31.1.1.54 Within the Residential 3 and 8 zones shown on District Plan Map 185, fencing of all residential properties (excluding retirement village activities) shall comply with the following:

a) No fencing between the road boundary and the road-facing elevation of the dwellinghouse except on a corner site where one road boundary can be fenced.

b) All fencing shall be 30% transparent except solid fencing to a maximum height of 1.8 metres along internal boundaries which must:

i. not extend further than 6 metres beyond the the dwellinghouse in any direction; and

ii. be screened by evergreen planting where visible from the street.

31.2 Controlled Activities

31.2.2 A retirement village, in the Residential 8 Zone as shown on District Plan Map 185, and the Residential 2 zone subject to South Belt Outline Development Plan as shown on District Plan Map 184, that meets all applicable conditions for permitted activities under Rule 31.1 shall be a controlled activity.

…

31.2.3 Educational facilities in the Residential 8 Zone as shown on District Plan Map 185 that meets all applicable conditions for permitted activities under Rule 31.1, and where no more than 500 students are enrolled, shall be a controlled activity.

In considering any application for resource consent under Rule 31.2.3, the Council shall in granting consent and in deciding whether to impose conditions, exercise control over the following matters:

a) *Whether the development, while bringing change to existing environments, is appropriate to its context, taking into account:*

   i. *Context and character:*

      The extent to which the design of the educational facility is in keeping with, or complements, the scale and character of development anticipated for the surrounding area and relevant significant natural, heritage and cultural features.

      Relationship to the street and public open spaces:

      Whether the educational facilities engage with and contribute to adjacent streets, and any other adjacent public open spaces to contribute to them being lively, safe and attractive.

   ii. *Built form and appearance:*

      The extent to which the educational facilities are designed to minimise the visual bulk of the buildings and provide visual interest.

   iii. *Access, parking and servicing:*

      The extent to which the educational facilities provide for good access and integration of space for parking and servicing.

iv. Safety:

The extent to which the educational facilities incorporate CPTED principles to achieve a safe, secure environment.

32. Subdivision

32.1.1 Standards and Terms

Allotment Areas and Dimensions

32.1.1.1 All allotments shall comply with Table 32.1.

Zone	Minimum Allotment Area	Minimum Dimensions of Allotment (m)	
		Internal Square	Frontage
Residential 3 at Ohoka as identified on District Plan Map 185	500m^2	15 x 15	15
Residential 8	500m^2	15 x 15	15

Residential 4A Zone

32.1.1.11 The minimum area for any allotment created by subdivision in any Residential 4A Zone shall be 2500m^2. The average area of all allotments in any Residential 4A Zone shall not be less than 5000m^2 except within the Residential 4A Zone (Ohoka) identified on District Plan Map 185 where the average area of all allotments shall not be more than 3300m^2. Any allotment over 1ha in area is deemed to be 1ha for the purposes of this rule.

Outline Development Plans

32.1.1.28 Subdivision within the following areas shall generally comply with the Outline Development Plan for that area.

…

ak) The Residential 3, 4A and 8 Zones and Business 4 Zone (Ohoka) identified on District Plan Map 185 including the associated Outline Development Plan text.

32.3 Discretionary Activities

32.3.7 Any subdivision that does not comply with Rule 32.1.1.28.ak is a discretionary activity.

3. An assessment is provided in **Attachment 5** in accordance with the requirements of the Resource Management Act 1991 including Section 32 of that Act.

DATED: 4 March 2022

Tim Walsh, Senior Planner

(Signature of requester or person authorised to sign on behalf)

Address for service:

Novo Group Limited
PO Box 365
Christchurch 8140

Attention: Tim Walsh

T: 03 365 5588

E: tim@novogroup.co.nz

Address for Council fees:

Rolleston Industrial Developments Limited
PO Box 2726
Christchurch 8140

Attention: Tim Carter

T: 03 379 1650

E: tim@cartergroup.co.nz

Attachment 1: Certificates of Title

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General of Land

Identifier **72972**

Land Registration District **Canterbury**

Date Issued 26 March 2003

Prior References

CB35A/113 CB420/50 CB659/2

Estate Fee Simple

Area 22.9220 hectares more or less

Legal Description Lot 2 Deposited Plan 318615

Registered Owners

Peter John Sherriff and HC Trustees 2010 Limited as to a 1/2 share

Rhonda Jane Sherriff and HC Trustees 2010 Limited as to a 1/2 share

---

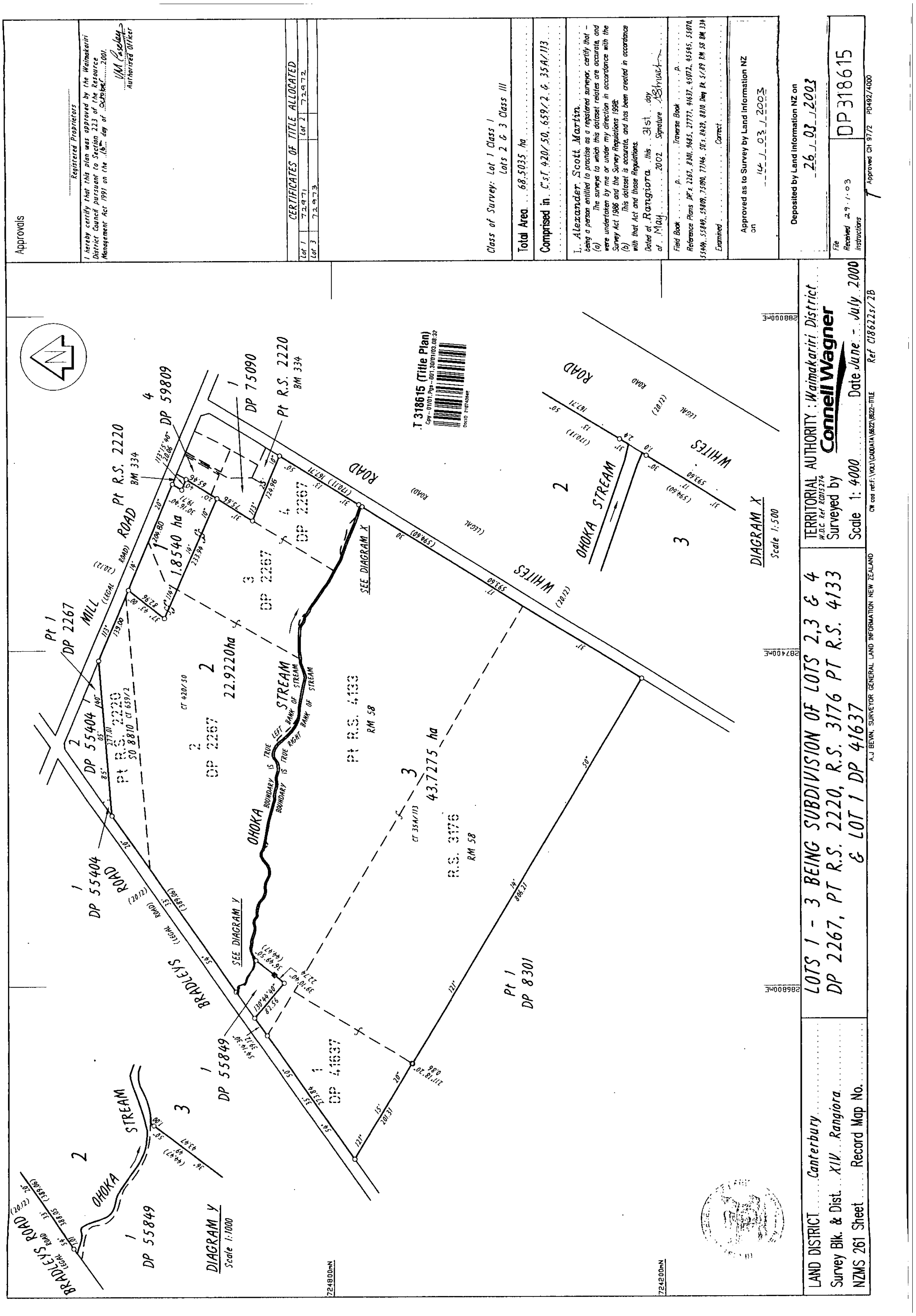
Interests

52390 (89 D 530) Outstanding Agreement to clean out the Ohoka Creek (affects part formerly in CT CB437/205) - 9.12.1879 at 9:00 am

52396 (89 D 533) Deed of Easement with the Eyreton Road Board to clean out the Ohaka Creek (affects part formerly in CT CB420/50) - 9.12.1879 at 9:00 am

5532709.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 26.3.2003 at 9:00 am

8847430.3 Mortgage to Bank of New Zealand - 1.9.2011 at 2:21 pm


LOTS 1 - 3 BEING SUBDIVISION OF LOTS 2,3 & 4
DP 2267, PT R.S. 2220, R.S. 3176 PT R.S. 4133
& LOT 1 DP 41637
DP 318615
LAND DISTRICT Canterbury
Survey Blk. & Dist. XIV Rangiora
NZMS 261 Sheet
Record Map No.
TERRITORIAL AUTHORITY : Waimakariri District
Surveyed by Connell Wagner
Scale 1: 4000
Date June - July 2000
Approvals
CERTIFICATES OF TITLE ALLOCATED
Class of Survey: Lot 1 Class I
Lots 2 & 3 Class III
Total Area 68.5035 ha
Comprised in C.s.T. 420/50, 659/2, & 35A/113
Deposited by Land Information NZ on
26/03/2003
WHITES ROAD
BRADLEYS ROAD
MILL ROAD
OHOKA STREAM
22.9220ha
43.7275 ha
1.8540 ha
DIAGRAM X
Scale 1:500
DIAGRAM Y
Scale 1:1000

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **72973**
Land Registration District **Canterbury**
Date Issued 26 March 2003

Prior References
CB35A/113 CB420/50

Estate Fee Simple
Area 43.7275 hectares more or less
Legal Description Lot 3 Deposited Plan 318615
Registered Owners
Peter John Sherriff and HC Trustees 2010 Limited as to a 1/2 share
Rhonda Jane Sherriff and HC Trustees 2010 Limited as to a 1/2 share

---

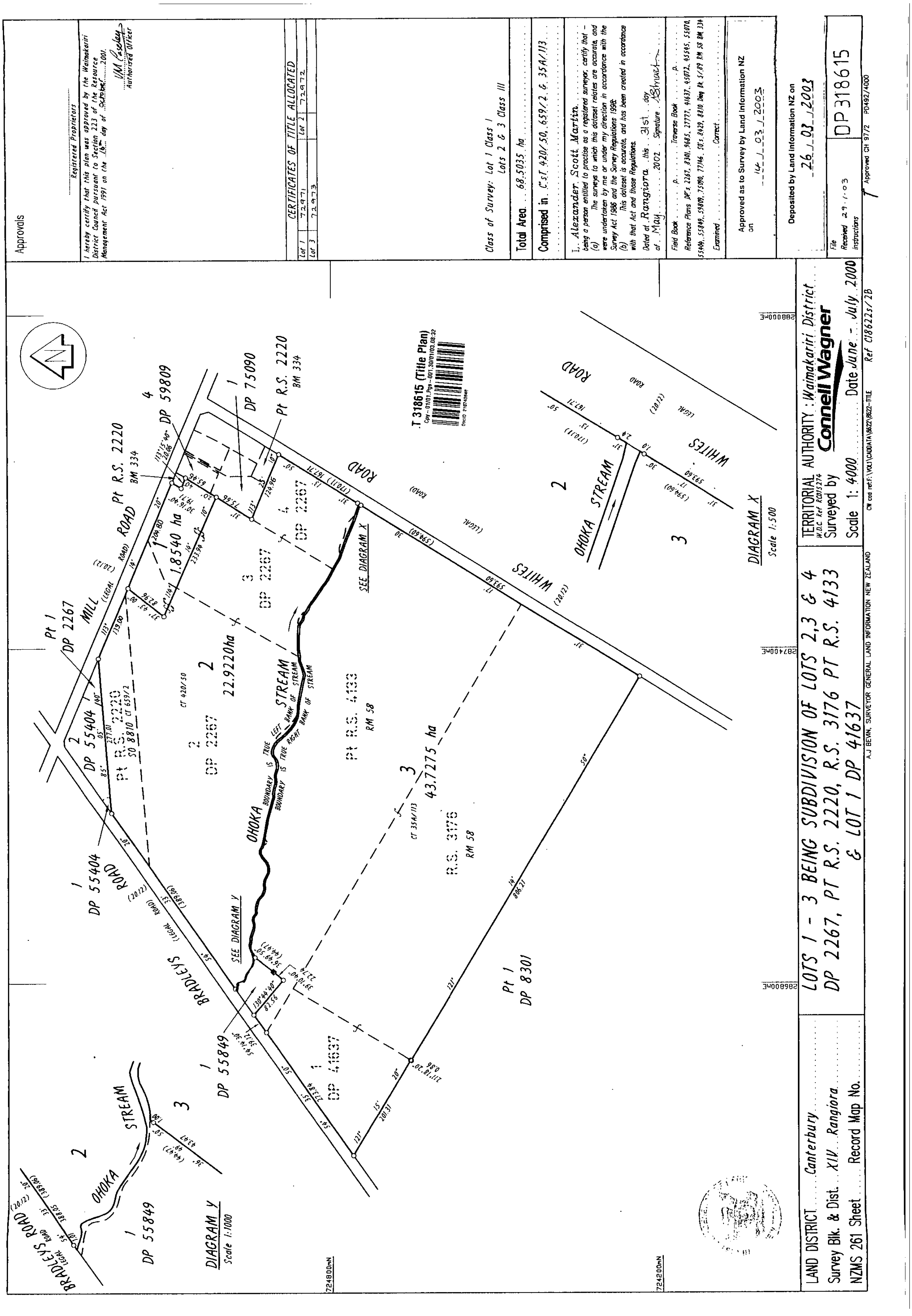
Interests

52390 (89 D 530) Outstanding Agreement to clean out the Ohoka Creek (affects part formerly in CT CB437/205) - 9.12.1879 at 9:00 am

52396 (89 D 533) Deed of Easement with the Eyreton Road Board to clean out the Ohaka Creek (affects part formerly in CT CB420/50) - 9.12.1879 at 9:00 am

5532709.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 26.3.2003 at 9:00 am

8847430.3 Mortgage to Bank of New Zealand - 1.9.2011 at 2:21 pm


LOTS 1 - 3 BEING SUBDIVISION OF LOTS 2,3 & 4
DP 2267, PT R.S. 2220, R.S. 3176 PT R.S. 4133
& LOT 1 DP 41637
DP 318615
Connell Wagner
TERRITORIAL AUTHORITY : Waimakariri District
LAND DISTRICT Canterbury
Survey Blk. & Dist. XIV Rangiora
Scale 1: 4000
Date June - July 2000
Approvals
CERTIFICATES OF TITLE ALLOCATED
Total Area 68.5035 ha
DIAGRAM X
Scale 1:500
DIAGRAM Y
Scale 1:1000
OHOKA STREAM
BRADLEYS ROAD
WHITES ROAD
MILL ROAD

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**CB19B/21**
Land Registration District	**Canterbury**
Date Issued	23 January 1979

Prior References
CB2B/487

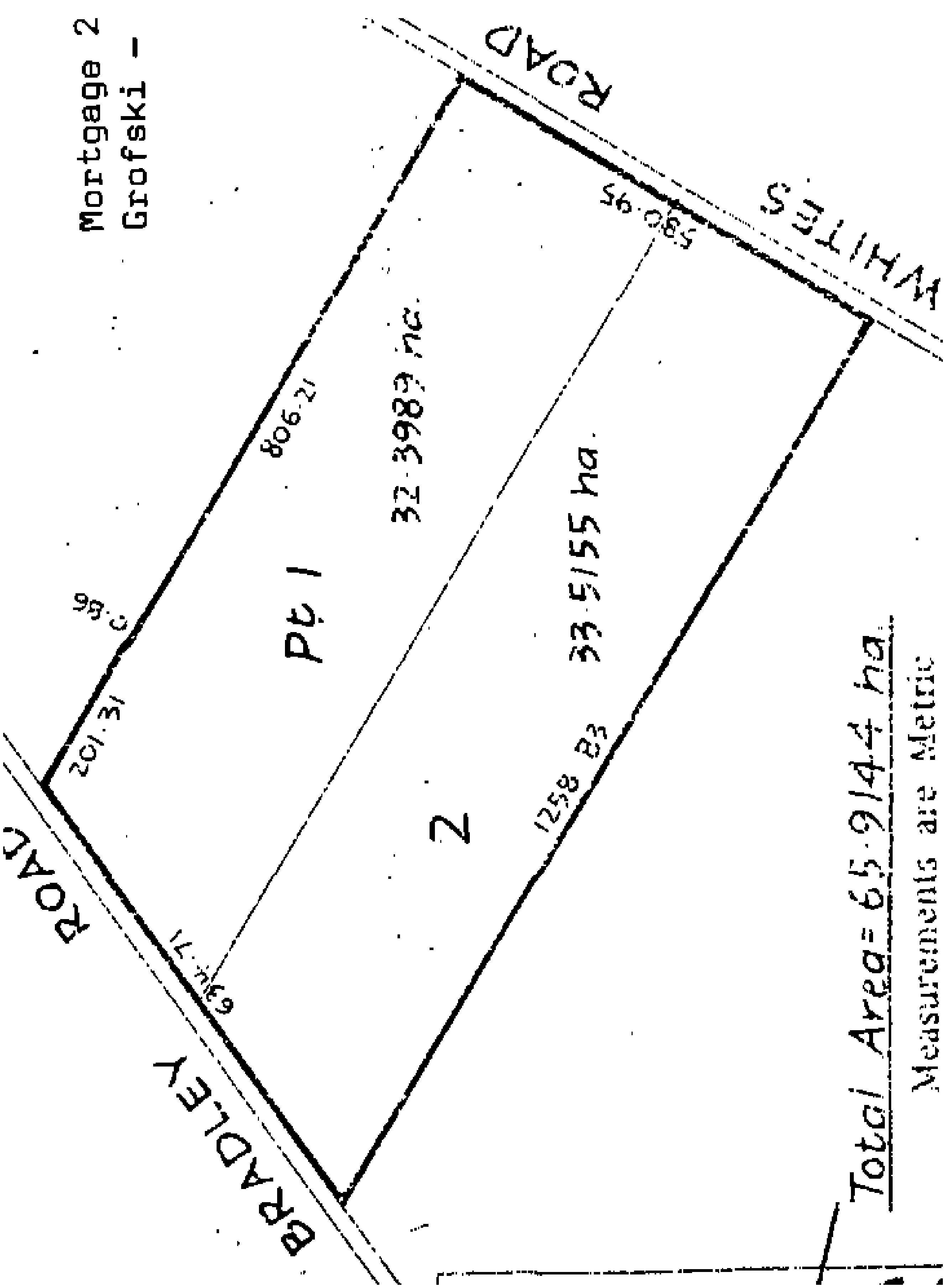
Estate	Fee Simple
Area	65.9144 hectares more or less
Legal Description	Lot 2 and Part Lot 1 Deposited Plan 8301

Registered Owners

Peter John Sherriff and HC Trustees 2010 Limited as to a 1/2 share
Rhonda Jane Sherriff and HC Trustees 2010 Limited as to a 1/2 share

Interests

8847430.3 Mortgage to Bank of New Zealand - 1.9.2011 at 2:21 pm


Mortgage 2
Grofski -
WHITES ROAD
BRADLEY ROAD
580.95
806.21
98.0
201.31
634.71
1258.83
Pt 1
32.3989 ha
33.5155 ha
2
Total Area= 65.9144 ha
Measurements are Metric

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General of Land

Identifier **CB36C/1075**
Land Registration District **Canterbury**
Date Issued 01 December 1992

Prior References
CB33F/624

Estate Fee Simple
Area 20.0000 hectares more or less
Legal Description Lot 2 Deposited Plan 61732
Registered Owners
Peter John Sherriff and HC Trustees 2010 Limited as to a 1/2 share
Rhonda Jane Sherriff and HC Trustees 2010 Limited as to a 1/2 share

---

Interests

894859.4 Easement Certificate specifying the following easements

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Right of way, rights to convey electric power and telephonic communications	Lot 2 Deposited Plan 56611 - CT CB33F/625	ABF DP 56611	Lot 2 Deposited Plan 61732 - herein	

The easement specified in Easement Certificate 894859.4 is subject to (now) Section 243(a) Resource Management Act 1991

421843.5 Transfer creating the following easements

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Drain water	Lot 1 Deposited Plan 60126	Part	Lot 2 Deposited Plan 61732 - herein	
Drain water	Lot 2 Deposited Plan 60126	Part	Lot 2 Deposited Plan 61732 - herein	

692889.3 Easement Certificate specifying the following easements

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Right of way and rights to convey telephonic communications and electric power	Lot 2 Deposited Plan 56611 - CT CB33F/625	ABC DP 51690	Lot 2 Deposited Plan 61732 - herein	
Convey electric power	Lot 2 Deposited Plan 56611 - CT CB33F/625	Part	Lot 2 Deposited Plan 61732 - herein	

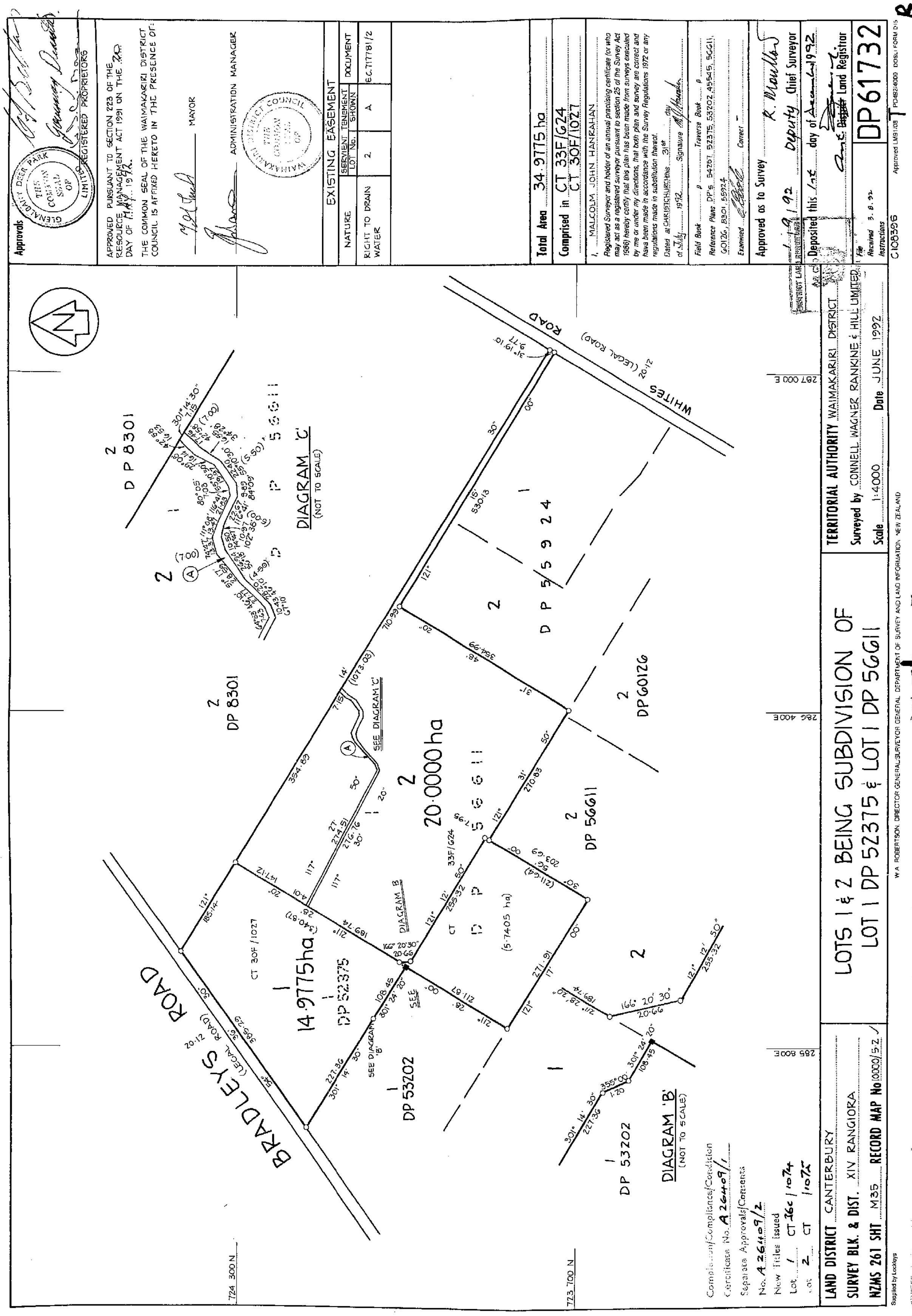
717781.2 Easement Certificate specifying the following easements

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction

Drain water	Lot 2 Deposited Plan 61732 - herein	Part herein	Part Lot 1 Deposited Plan 61732 - CT CB36C/1074

A26409.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 1.12.1992 at 11.32 am

8847430.3 Mortgage to Bank of New Zealand - 1.9.2011 at 2:21 pm


Approvals
REGISTERED PROPRIETORS
APPROVED PURSUANT TO SECTION 223 OF THE RESOURCE MANAGEMENT ACT 1991 ON THE 20 DAY OF MAY 1992.
THE COMMON SEAL OF THE WAIMAKARIRI DISTRICT COUNCIL IS AFFIXED HERETO IN THE PRESENCE OF:
MAYOR
ADMINISTRATION MANAGER
EXISTING EASEMENT
NATURE
SERVIENT TENEMENT LOT No.
SHOWN
DOCUMENT
RIGHT TO DRAIN WATER
2
A
E.C.717781/2
Total Area 34.9775 ha
Comprised in CT 33F/624 CT 30F/1027
Approved as to Survey
Deputy Chief Surveyor
District Land Registrar
DP 61732
TERRITORIAL AUTHORITY WAIMAKARIRI DISTRICT
Surveyed by CONNELL WAGNER RANKINE & HILL LIMITED
Scale 1:4000 Date JUNE 1992
LOTS 1 & 2 BEING SUBDIVISION OF
LOT 1 DP 52375 & LOT 1 DP 56611
LAND DISTRICT CANTERBURY
SURVEY BLK. & DIST. XIV RANGIORA
NZMS 261 SHT M35 RECORD MAP No
BRADLEYS ROAD
(LEGAL ROAD) 20.12
WHITES ROAD
(LEGAL ROAD) 20.12
1
14.9775 ha
2
20.0000 ha
DIAGRAM 'B' (NOT TO SCALE)
DIAGRAM 'C' (NOT TO SCALE)
DP 8301
DP 53202
DP 56611
DP 60126
DP 55924
DP 52375

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**CB35A/112**
Land Registration District	**Canterbury**
Date Issued	11 October 1991

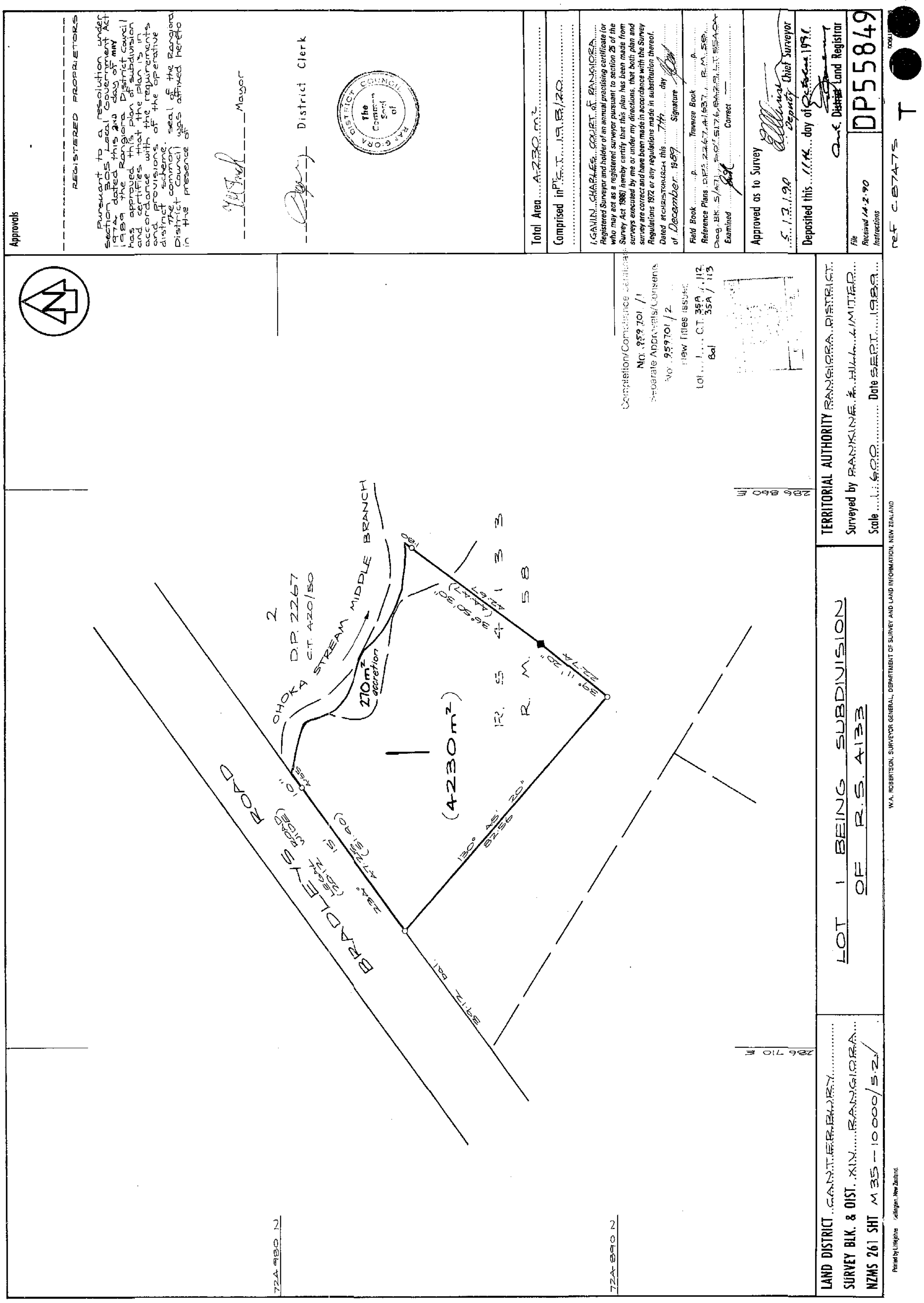
Prior References
CB19B/20

Estate	Fee Simple
Area	4230 square metres more or less
Legal Description	Lot 1 Deposited Plan 55849

Registered Owners
Philip George Driver and Michelle Driver

Interests

Subject to a Deed of Easement 52390 (89 D 530) to clean out the Ohoka Creek


Approvals
REGISTERED PROPRIETORS
Mayor
District Clerk
Total Area 4230 m²
Comprised in Pt C.T. 19B/20
Approved as to Survey
Deposited this
DP55849
TERRITORIAL AUTHORITY RANGIORA DISTRICT
Surveyed by RANKINE & HILL LIMITED
Scale 1:600 Date SEPT 1989
LOT 1 BEING SUBDIVISION OF R.S. 4133
LAND DISTRICT CANTERBURY
SURVEY BLK. & DIST. XIV RANGIORA
NZMS 261 SHT M35-10000/5.2
BRADLEY'S ROAD
OHOKA STREAM MIDDLE BRANCH
D.P. 2267
C.T. 420/50
270m² accretion
(4230m²)

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

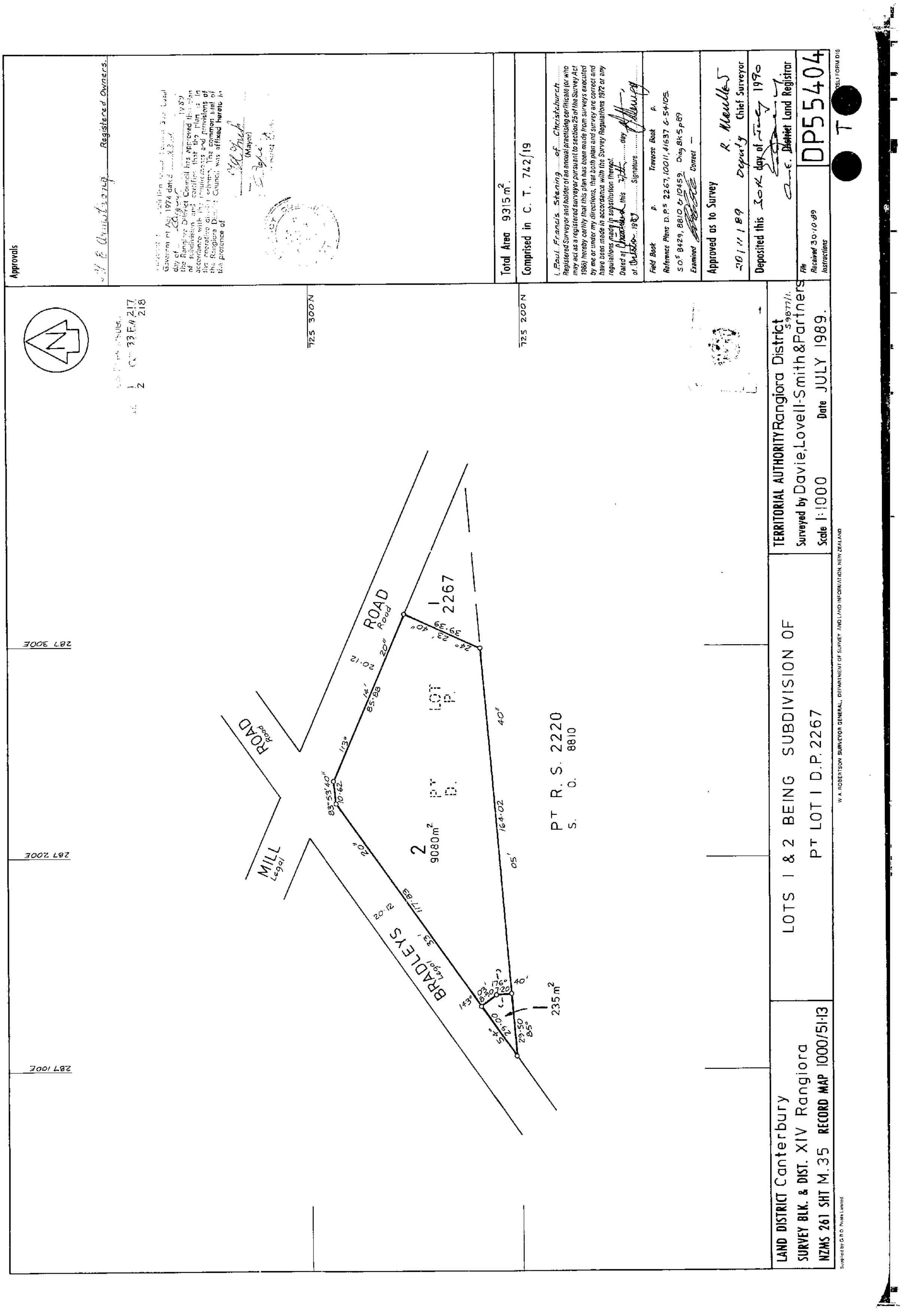
Identifier	**CB33F/218**
Land Registration District	**Canterbury**
Date Issued	30 July 1990

Prior References
CB742/19

Estate	Fee Simple
Area	9080 square metres more or less
Legal Description	Lot 2 Deposited Plan 55404
Registered Owners	

Brian Colin Chambers and Barbara Mary Chambers

Interests



Approvals
Registered Owners.
Total Area 9315 m²
Comprised in C. T. 742/19
Approved as to Survey
Chief Surveyor
Deposited this
District Land Registrar
DP 55404
725 300N
725 200N
287 300E
287 200E
287 100E
ROAD
MILL
ROAD
BRADLEYS
1
2267
LOT
PT
PT R. S. 2220
S. O. 8810
2
9080m²
1
235m²
LAND DISTRICT Canterbury
SURVEY BLK. & DIST. XIV Rangiora
NZMS 261 SHT M.35 RECORD MAP 1000/51:13
LOTS 1 & 2 BEING SUBDIVISION OF
PT LOT 1 D.P. 2267
TERRITORIAL AUTHORITY Rangiora District
Surveyed by Davie, Lovell-Smith & Partners
Scale 1:1000 Date JULY 1989.

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

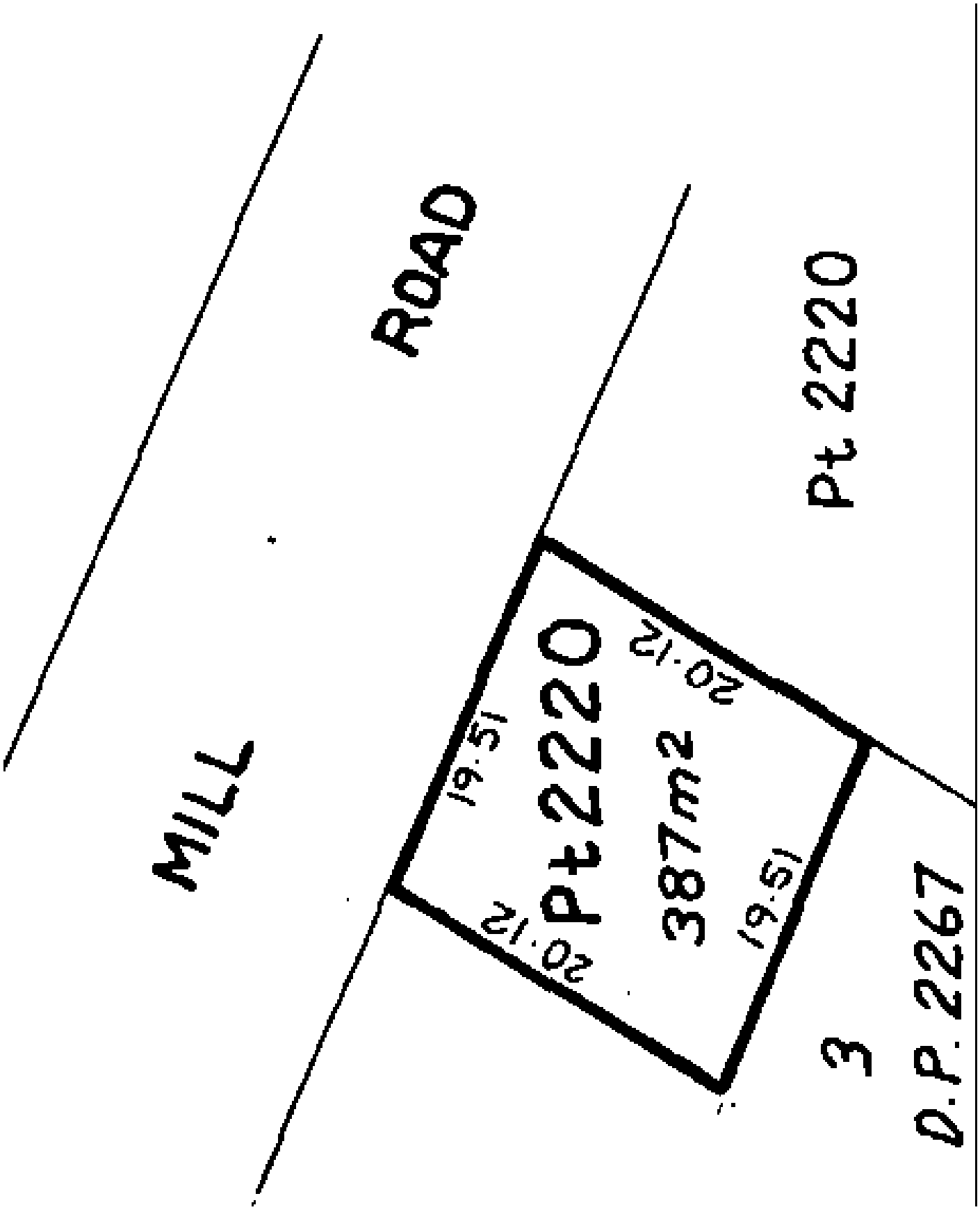
Identifier	**CB26B/467**
Land Registration District	**Canterbury**
Date Issued	24 July 1984

Prior References
CB186/163

Estate	Fee Simple
Area	387 square metres more or less
Legal Description	Part Rural Section 2220
Registered Owners	

Elizabeth Janet Hadfield

Interests


ROAD
MILL
Pt 2220
Pt 2220
387m2
20.12
19.51
20.12
19.51
3
D.P. 2267

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

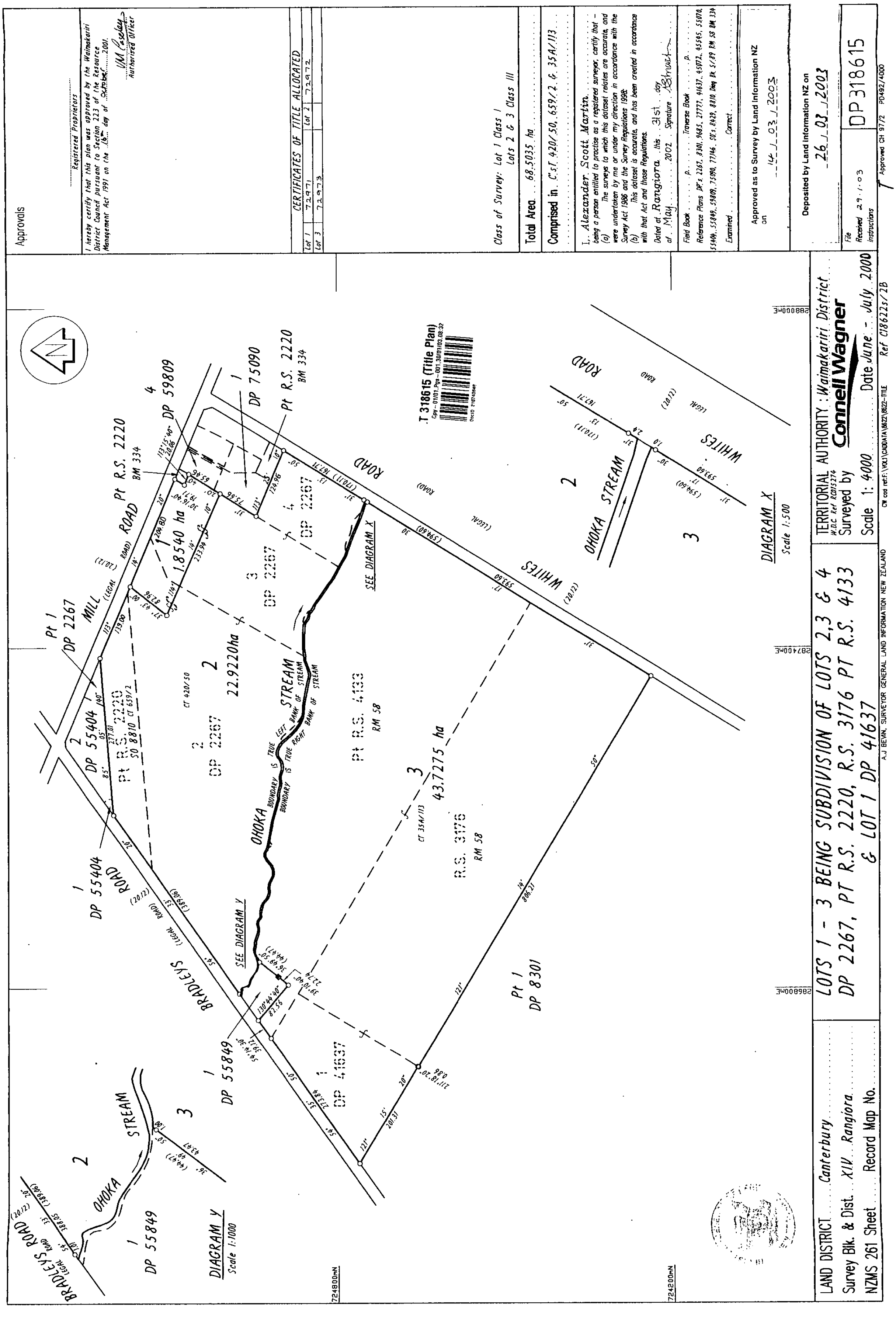
Identifier	**72971**
Land Registration District	**Canterbury**
Date Issued	26 March 2003

Prior References
CB420/50

Estate	Fee Simple
Area	1.8540 hectares more or less
Legal Description	Lot 1 Deposited Plan 318615
Registered Owners	

Donald Stuart Hunt, Laura Merle Rea-Hunt and Lindsay Muncaster Bisman

Interests



LOTS 1 - 3 BEING SUBDIVISION OF LOTS 2,3 & 4
DP 2267, PT R.S. 2220, R.S. 3176 PT R.S. 4133
& LOT 1 DP 41637
LAND DISTRICT Canterbury
Survey Blk. & Dist. XIV Rangiora
NZMS 261 Sheet
Record Map No.
TERRITORIAL AUTHORITY: Waimakariri District
Surveyed by Connell Wagner
Scale 1: 4000
Date June - July 2000
DP 318615
Deposited by Land Information NZ on 26/03/2003
Approvals
CERTIFICATES OF TITLE ALLOCATED
Class of Survey: Lot 1 Class I Lots 2 & 3 Class III
Total Area 68.5035 ha
Comprised in C.s.T. 420/50, 659/2, & 35A/113
T 318615 (Title Plan)
DIAGRAM X
Scale 1:500
DIAGRAM Y
Scale 1:1000
OHOKA STREAM
WHITES ROAD
BRADLEYS ROAD
MILL ROAD
1.8540 ha
22.9220ha
43.7275 ha

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

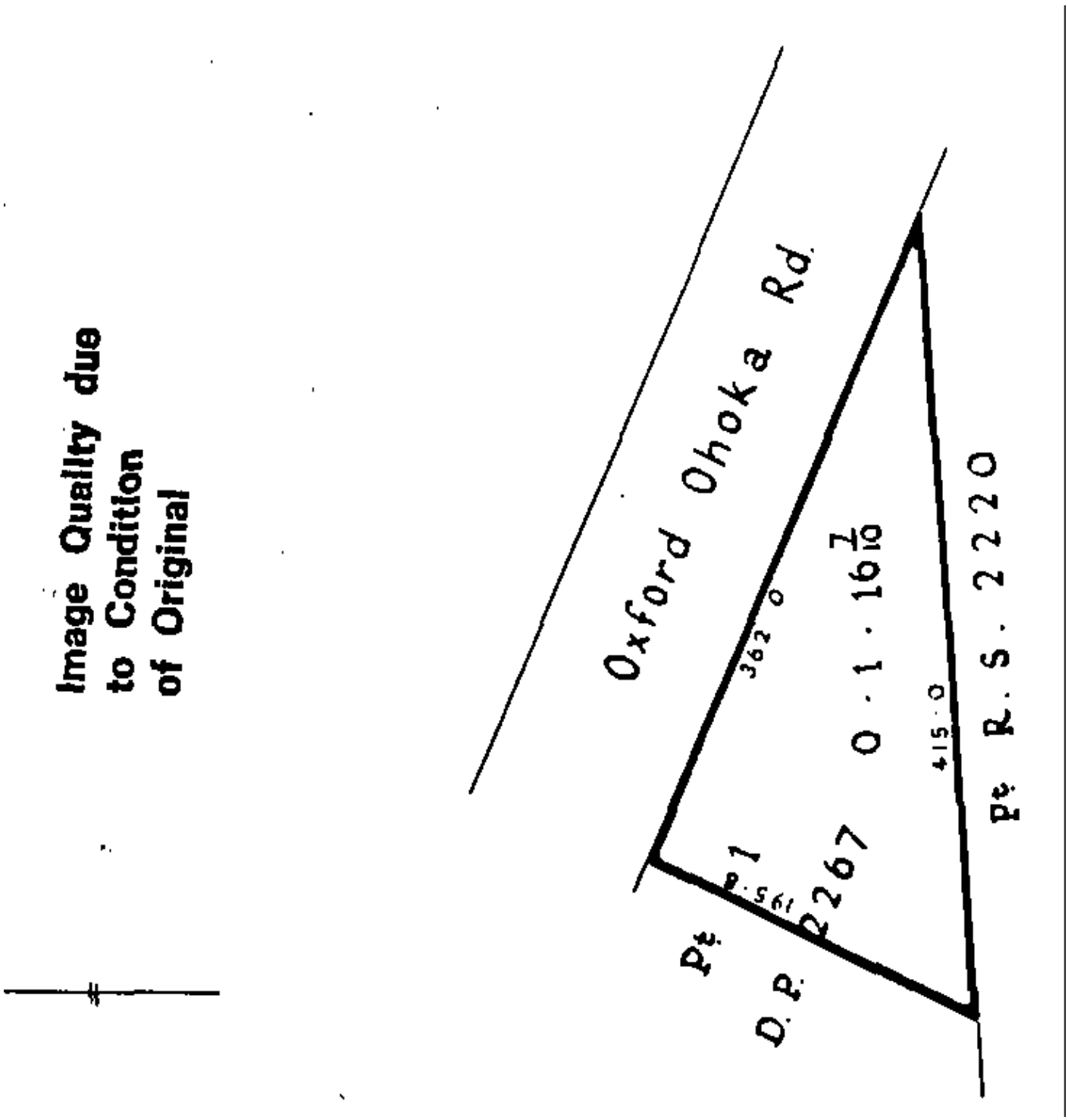
Identifier	**CB742/18**
Land Registration District	**Canterbury**
Date Issued	19 December 1957

Prior References
CB234/249

Estate	Fee Simple
Area	1434 square metres more or less
Legal Description	Part Lot 1 Deposited Plan 2267
Registered Owners	

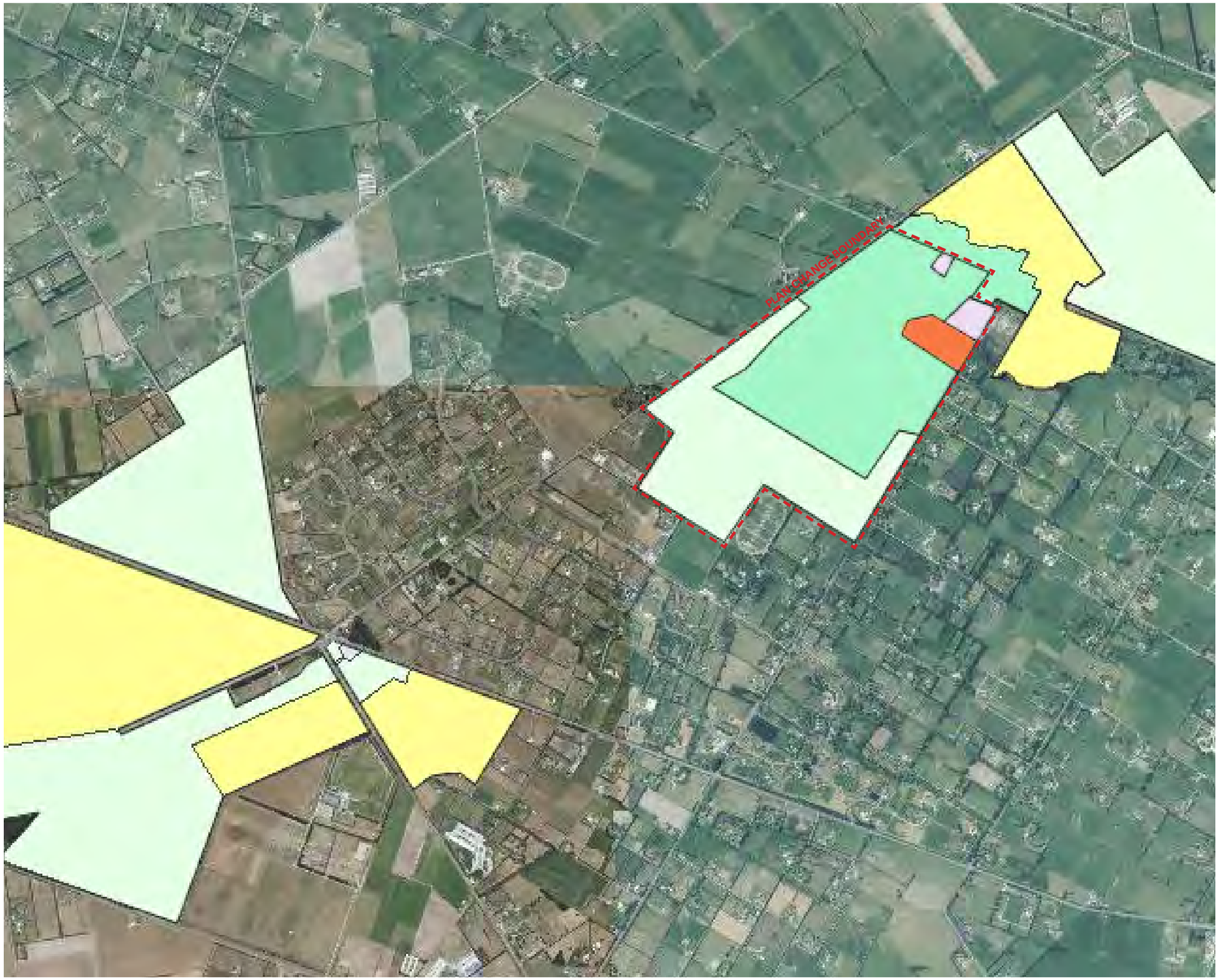
Glenn Daniel Walls

Interests



Attachment 2: Location Plan

Attachment 3: Proposed Planning Map Changes



A. PROPOSED DISTRICT PLANNING MAP FOR PLAN CHANGE AREA

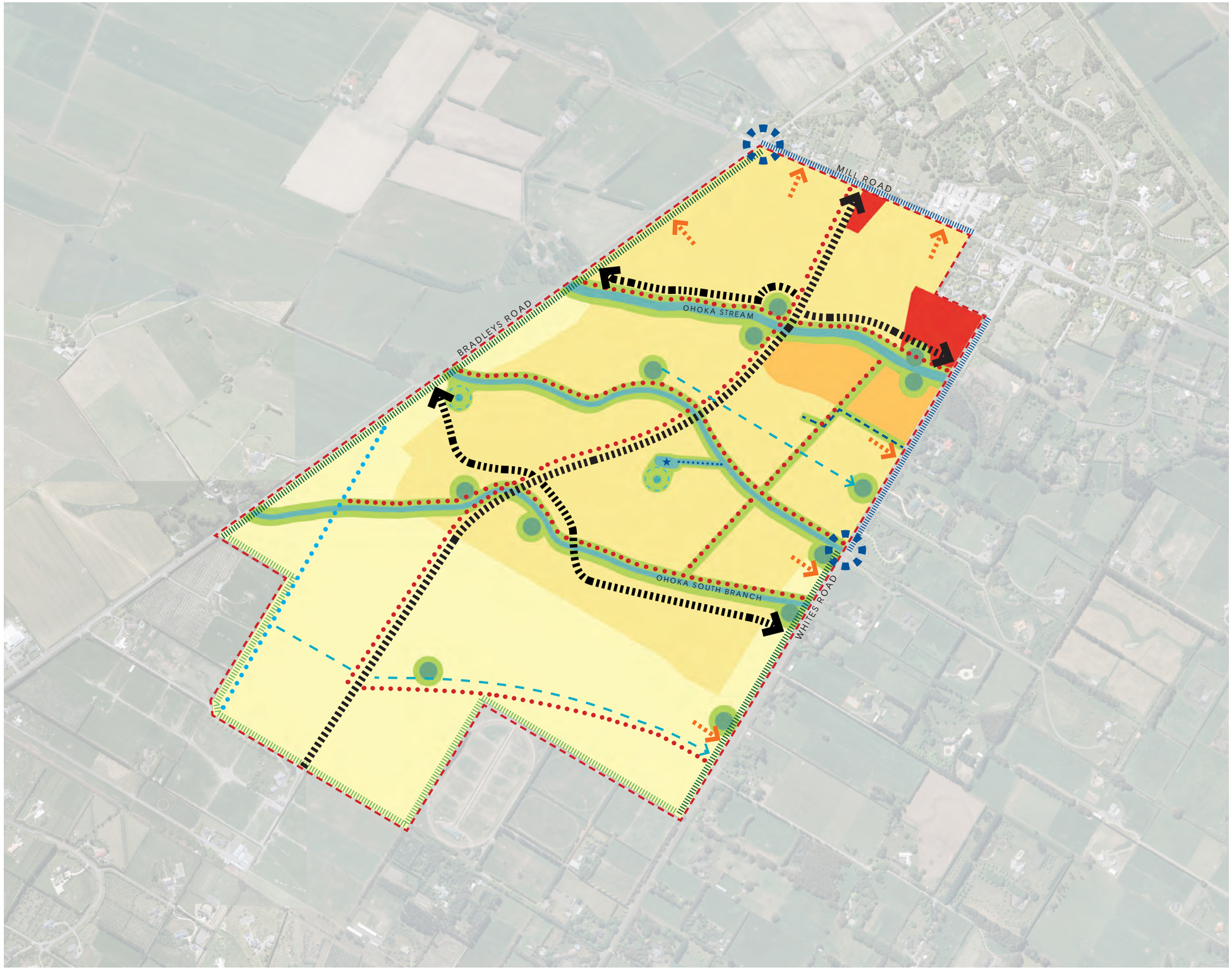
Map / image source: Waimakariri District Council

Attachment 4: Proposed Outline Development Plan

OUTLINE DEVELOPMENT PLAN - MILL ROAD

LEGEND

- Outline Development Plan Area
- Residential 3
- Residential 4a
- Residential 8
- Business 4 Zone
- Indicative Road
- Indicative Local Road Connection
- Threshold / Gateway
- Indicative Pedestrian Network
- Indicative Stormwater Management Areas (size and location to be confirmed)
- Existing / Naturalised Waterways
- Existing Springs and Associated Setback
- Stormwater Conveyance Flow Path
- Groundwater Seep
- Existing Pond (size and location to be confirmed)
- Southern Spring Channel
- Green Network
- Landscape Treatment A
- Landscape Treatment B
- Extent of Road Frontage Upgrade
- Overhead 66kV Power Lines



OUTLINE DEVELOPMENT PLAN – OHOKA

Introduction

The Ohoka Outline Development Plan ('**ODP**') provides for a comprehensive expansion of Ohoka. The area covers approximately 156 hectares extending in a southwest direction from Mill Road and bounded on either side by Bradleys Road and Whites Road.

Key features of ODP area include:

- a village centre providing local convenience goods and services for residents and a small village square for community events/gatherings,
- provision for approximately 850 residential units and a school or retirement village,
- a green and blue network providing for movement, recreation, and ecological enhancement of waterways, and
- high amenity streets appropriate for the rural setting.

All requirements specified below are to be designed/coordinated to the satisfaction of Council prior to approval of any subdivision consent application.

Land Use Plan

The development area shall achieve a minimum net density of 12 households per hectare, averaged over the Residential 3 zoned land. The zone framework supports a variety of site sizes to achieve this minimum density requirement. Staging is likely required to ensure the ODP area develops in a logical and appropriate manner in recognition of the current urban form of Ohoka. Should staging be required, it will likely proceed from the Mill Road end towards the southwest. Ohoka Stream forms the first line of containment, the realigned and naturalised spring channel forms the second line, Ohoka South Branch the third, and Landscape Treatment B the last.

Should this area be developed in stages, confirmation at the time of subdivision of each stage, and an assessment as to how the minimum net density of 12 households per hectare for the overall area can be achieved, will be required.

Residential activities are supported by key open spaces, waterbodies, and two small commercial centres, the larger of which is to become part of the village centre of Ohoka. These commercial centres will provide good accessibility and help to meet some of the convenience needs of residents in the immediate area. Car parking within the village centre will be of a high amenity standard enabling it to be integrated into a village square to provide additional hard surface area when required for community events, as well as providing for parking for the Ohoka farmers market at the neighbouring Ohoka Domain.

Provision is made for educational facilities or a retirement village in the area immediately adjoining the larger of the two commercial zones on Whites Road. The prospect of developing such facilities will be subject to a needs assessment. If educational facilities or a retirement village are not established, additional residential properties will be developed at a minimum net density of 12 households per hectare.

The Residential 4A zoned development shall retain rural characteristics within the street environments and along property boundaries. Wherever possible the existing shelterbelts are to be retained to create a distinct difference between the two proposed residential environments.

Movement Network

A road network and classification for the ODP site shall be developed that together with the green network delivers a range of integrated movement options. A key design principle of the movement network shall be facilitating movement towards the village centre and within the ODP site, particularly on foot or bicycle. In recognition of the character of the Ohoka setting, several specific road types within the ODP area shall be developed with varying widths and layouts depending on the function and amenity. Indicative cross-sections of the street types are shown in Figure 1.

Gateway treatments are located at the intersection of Mill Road and Bradleys Road, and on Whites Road midway along the ODP area. The Mill Road / Bradleys Road gateway is directly at the intersection with a hard contrast from flat open rural land to a built-up edge supported by the verticality of landscape treatment. The Whites Road gateway is located where the road crosses over the 'southern spring channel' and will use the slight level change

and slight narrowing of the road at the crossing point as a distinct design feature. Combined with specific landscape treatment and bespoke design details, such as lighting and signage, this will create a strong rural gateway. The existing 100km/hr speed limit would ideally reduce to 50km/hr through Ohoka from the gateways. Additionally, the speed limit would ideally reduce to 70km/hr on Bradleys Road and Whites Road alongside the ODP (outside the gateways).

The road classification shall deliver an accessible and coherent neighbourhood that provides safe and efficient access to the new development. The movement network for the area shall integrate into the existing and proposed pedestrian and cycle network beyond the ODP area. Wherever possible, other bicycle and pedestrian routes shall be integrated into the green network. Cycling and walking shall otherwise be provided for within the road reserve and incorporated into the road design of the overall road network where applicable. Adequate space must be provided to accommodate cyclists and to facilitate safe and convenient pedestrian movements.

Trees in the road reserve will assist in reducing the perceived width of the road corridors and provide a sense of scale. Further, the street trees will break up the roof lines of the denser areas and provide shade and texture. The trees may be located between carriageway and footpaths on larger roads, and closer to the carriageway on smaller roads. Swales will also assist in softening the road appearance. Aside from the functional aspects, the different street environments will significantly contribute to differentiating Ohoka from the typical suburban character found in the main centres of the District.

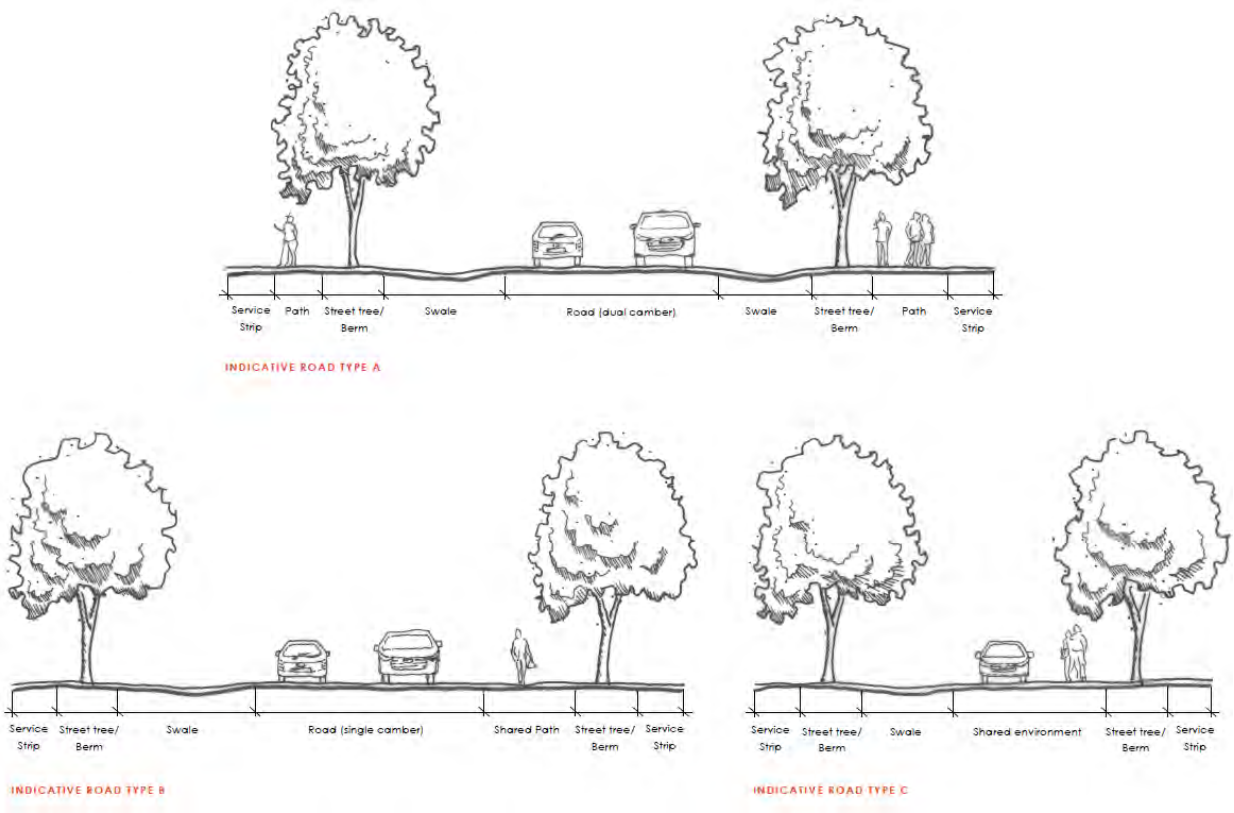


Figure 1: Indicative road cross-sections

The ODP provides road links to Mill Road, Bradleys Road and Whites Road. These intersections will be priority-controlled with priority given to the external road network. Direct vehicular access to private properties can be provided to Mill Road and Whites Road where road frontage upgrades are indicated on the ODP. Otherwise, direct vehicular access to Bradleys Road and Whites Road from Residential 4A zoned properties shall be limited as much as practical with up to six properties sharing an access. Where direct property access is proposed to the Whites Road frontage, this road would also include a shared path connecting to the shared path on Mill Road.

Water and Wastewater Network

Water reticulation is to be provided from either the establishment of a new source or from upgrading of the existing source and headworks in Ohoka. Fire-fighting flows to FW2 standards will be provided for Residential 3 zoned properties. Hydrants will be provided for emergency requirements within the large lot property areas, zoned Residential 4A, in a similar manner to the neighbouring Mandeville and Ohoka areas.

Wastewater reticulation within the site can gravitate to a new pump station sized specifically for this new development or via a low-pressure sewer system. Either option will be able to discharge into the existing Bradleys

Road rising main which flows into the Rangiora Wastewater Treatment Plant.

Open Space, Recreation and Stormwater Management

The green network combines the open space, recreational reserves including pedestrian connections, and stormwater management throughout the ODP area. The green network largely follows waterways and provides access to open space for all future residents within a short walking distance of their homes. Pedestrian and cycle paths will integrate into the green network to ensure a high level of connectivity is achieved, and to maximise the utility of the public space.

Detailed stormwater solutions shall be determined by the developer at subdivision stage and in accordance with Environment Canterbury requirements. Stormwater management systems shall be designed to integrate into both the movement and open space networks where practicable.

The proposed green and blue network provides an opportunity to create ecological corridors. Plant species in the new reserves and riparian margins shall include native tree and shrub plantings. The plant species selection process shall involve consultation with local Rūnanga. The green network will ensure that dwellings are setback an appropriate distance from waterbodies.

Character and amenity through landscape and design

The character of Ohoka is strongly reliant on landscaping, in particular trees, in both public and private environments. The landscape treatment of the waterway margins shall therefore include large specimen trees. Space for street trees is to be provided on both sides of all road types and are to be placed strategically to create an organic street scene avoiding a typical suburban street appearance. Additional tree planting is required on larger private properties (Residential 4A) and shall be controlled and enforced through developer covenants.

An overall planting strategy is to be developed for the ODP site at subdivision consent stage.

Specific measures to protect and enhance landscape values will be addressed at the time of subdivision, and development within the ODP area shall include:

a. An assessment by a suitably qualified and experienced arborist, guided by a suitably qualified terrestrial ecologist, that:

    i. Identifies trees that are to be retained and integrated into the development

    ii. Specifies protection measures during construction to ensure survival of selected trees

To further support the distinct village character of Ohoka, street furniture, lighting and all other structures in the public realm are to reflect the rural characteristics with regard to design, type, scale, material and colour.

Landscape Treatment A

Landscape Treatment A shall be designed to assist in retaining a rural residential character along Whites and Bradley Roads. It shall consist of a 10-metre-wide strip in the location identified on the ODP and include a post and rail fence or post and wire fence. Solid fencing within this strip shall be avoided. A double row of landscape planting within the strip shall consist of:

a. An outer row (adjacent to the road boundary fence) with hedge species maintained at a minimum height of 1500mm consisting of one, or more, of the following species (planted at 1 metre centres):

    i. Griselinia littoralis

    ii. Pittosporum tenufolium or similar

    iii. Korokia species

    iv. Prunus lusitanica

b. An inner row planted 2 metres from the centre of the hedge row consisting of specimen tree species at a maximum distance of 3 metre centres. Tree species selected should be able to grow to a minimum height of 8 metres at maturity.

Landscape Treatment B

Landscape Treatment B, as indicated on the ODP, shall be designed to provide a visual buffer between the ODP site and adjacent rural land to the southwest. The treatment shall consist of a single row of shelter belt trees (maximum spacing of 2 metre centres), using one or more of the following species:

a. Popular
b. Macrocarpa
c. Pittosporum
d. Totara
e. Ribbonwood, or similar

Water Bodies and Freshwater Ecosystems

The ODP area contains several waterbodies with varying characteristics. Development of the ODP area provides potential for higher ecological values to be re-established through restoration and enhancement. This could include protected reserve space, native planting, naturalisation, and instream enhancement. Development shall protect and enhance selected water bodies and freshwater ecosystems within the ODP area and incorporate these features into the wider green and blue network of the site.

In terms of specific measures to be addressed at the time of subdivision in order to protect and enhance freshwater values and ecosystems, development within the ODP area shall:

a. Include an assessment by a suitably qualified and experienced practitioner that:
    i. Provides the results of detailed groundwater level investigations across the site; and,
    ii. Specifies construction measures to ensure appropriate management of shallow groundwater.
b. Be in accordance with an Ecological Management Plan prepared by a suitably qualified and experienced practitioner that, as a minimum, includes:
    i. Plans specifying spring head restoration, riparian management, waterway crossing management, and segregation of spring water and untreated stormwater.
    ii. Aquatic buffer distances, including minimum waterbody setbacks for earthworks and buildings of:
        - 10 metres from the Ohoka Stream tributary, Groundwater Seep, Northern and Southern Spring Channel and South Ohoka Branch.
        - 20 metres from the northern springhead identified on the ODP.
        - 30 metres from the large southern springhead identified on the ODP.
        - 5 metres from the un-named waterway along the furthermost southwest boundary of the ODP area.
    iii. Ongoing maintenance and monitoring requirements that are to be implemented.
c. Maintain the perennial course of the lower Southern Spring Channel.
d. Possible re-alignment of the Northern Spring Channel baseflow into the Southern Spring Channel downstream of the spring-fed ponds. Both channels are perennial and could be meandered and naturalised.
e. Possible meandering and naturalisation of the Groundwater Seep.

The aquatic buffers shall be protected by appropriate instruments (whether that be esplanade reserves/strips, recreation reserves or consent notice condition imposed setbacks) at subdivision consent stage.

Cultural

The importance of natural surface waterbodies and springs to Manawhenua is recognised and provided for by the ODP and the specific measures described above in respect of waterbodies and freshwater ecosystems that will support cultural values associated with the ODP area. The Ngāi Tahu Subdivision and Development Guidelines shall be referred to throughout the subdivision design process with guidance adopted where practical/applicable.

For all earthworks across the site, an Accidental Discovery Protocol will be implemented at the time of site development, in addition to appropriate erosion and sediment controls, to assist in mitigating against the potential effects on wahi tapu and wahi taonga values generally.

Detailed Site Investigation

Due to the previous agricultural land use including the storage and spreading of dairy effluent, a Detailed Site Investigation shall be carried out at subdivision consent stage. This investigation will identify what (if any) remediation is required to satisfy the requirements of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

Attachment 5: Section 32 Evaluation

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List of Figures and Tables

Appendices

Introduction

1. Rolleston Industrial Developments Limited ('**RIDL**') requests a change to the Operative Waimakariri District Plan ('**the District Plan**' or '**Plan**') to rezone approximately 156 hectares of Rural zoned land, to Residential 3, 4A and 8 Zone and Business 4 Zone at Ohoka.

2. This document contains the Section 32 evaluation of the plan change. It consists of an evaluation of the contents of the plan change request ('**the request**'), and includes the following appendices:

   - **Appendix A** Potential Loss of Productive Land Assessment
   - **Appendix B** Geotechnical Assessment
   - **Appendix C** Preliminary Site Investigation Report
   - **Appendix D** Ecology Assessment
   - **Appendix E** Landscape Assessment
   - **Appendix F** Urban Design Assessment
   - **Appendix G** Infrastructure Assessment
   - **Appendix H** Integrated Transport Assessment
   - **Appendix I** Economic Assessment
   - **Appendix J** Rūnanga Consultation Report

3. The subject land is presently zoned Rural and adjoins the Ohoka settlement, which is zoned a combination of Residential 3, 4A and 4B. The density of development sought by way of this plan change request is compatible with the existing Ohoka settlement zoning to the northeast of the plan change area. It is the intention of RIDL that the proposed expansion of Ohoka, while significant, will maintain and enhance the rural village character of the settlement.

4. This plan change specifically accounts for the National Policy Statement on Urban Development 2020 ('**NPS-UD**') which recognises the national significance of having well-functioning urban environments; and providing sufficient development capacity to meet the different needs of people and communities.

5. The Ministry for the Environment ('**MfE**') note that the NPS-UD is needed because:

   > *Some urban areas in New Zealand are growing quickly. To support productive and well-functioning cities, it is important that there are adequate opportunities for land to be developed to meet community business and housing needs*[1].

[1] https://www.mfe.govt.nz/about-national-policy-statement-urban-development

6. Additionally, MfE note:

> *The NPS-UD 2020 requires councils to plan well for growth and ensure a well-functioning urban environment for all people, communities and future generations. This includes… ensuring that plans make room for growth both 'up' and 'out', and that rules are not unnecessarily constraining growth'.*

7. This plan change supports and is consistent with the direction set out in the NPS-UD, as is explained further in the following assessment.

Statutory Requirements of the Act

8. This plan change request is made under the Resource Management Act 1991 ('**the Act**'). This section sets out the relevant framework of the Act under which the request is made, with the subsequent sections then providing the relevant assessment of each part of the framework.

9. Section 73(2) of the Act provides that:

> *Any person may request a territorial authority to change a district plan, and the plan may be changed in the manner set out in Part 2 or 5 of Schedule 1.*

10. Part 5 of Schedule 1 is not relevant to this request as it relates to the use of the 'streamlined planning process', which is not sought.

11. Part 2 of Schedule 1 relevantly relates to requests for changes to plans of local authorities. Clause 21(1) restates that any person may request a change to a district plan. Clause 22 of Part 2 of Schedule 1 states:

> *1) A request made under clause 21 shall be made to the appropriate local authority in writing and shall explain the purpose of, and reasons for, the proposed plan or change to a policy statement or plan and contain an evaluation report prepared in accordance with section 32 for the proposed plan or change.*
>
> *2) Where environmental effects are anticipated, the request shall describe those effects, taking into account clauses 6 and 7 of Schedule 4, in such detail as corresponds with the scale and significance of the actual or potential environmental effects anticipated from the implementation of the change, policy statement, or plan.*

12. The purpose of this plan change is to provide for expansion and enhancement of the Ohoka settlement. The request includes provision for local convenience commercial activities and a retirement village or school. While respecting the existing rural village character of Ohoka, the plan change adds significant development capacity to the District and provides for increased competition and choice in residential land markets while managing adverse effects of the change in land use on the surrounding area.

13. Provision for a variety of densities (from 500m^2 up to one hectare plus) within the plan change area is considered appropriate to provide choice, help address declining housing affordability, and enable people and the community to provide for their health and wellbeing, while avoiding, remedying or mitigating potential adverse effects. While the

proposal will result in a change to the current open rural character of the site, it is considered that the proposal provides for an efficient use of the physical land resource.

14. The reasons for the plan change are:

    a. The plan change area provides for a logical expansion of the Ohoka settlement and the size of the landholding is such that the expansion can be planned comprehensively.

    b. The plan change will provide opportunities for people who seek a rural village lifestyle in a walkable community without the cost and upkeep involved in larger rural properties of four hectares and above. It will also provide local convenience goods and services for residents and potentially retirement living facilities or education facilities.

    c. The plan change provides the opportunity to enhance the quality and ecology of existing waterways throughout the site and to create a high amenity open space network for the benefit of residents and the wider population. The open space network will also effectively manage stormwater.

    d. Efficiencies can be gained through the availability of three waters infrastructure, available capacity of the road network, and the proximity to the two largest main centres in the District (Rangiora and Kaiapoi) and Christchurch.

    e. As concluded in the economic assessment included at **Appendix I**, the proposed plan change will not give rise to economic externality costs, enables people and communities to provide for their economic and social well-being, is an efficient use and development of natural and physical resources, and would add significantly to residential development capacity both in the context of the existing scale of the Waimakariri District, and for the future forecast growth of the District.

    f. The proposed plan change is consistent with the NPS-UD.

15. The evaluation report undertaken in accordance with section 32 of the Act and an assessment of the environmental effects anticipated by the implementation of the changes, is set out later in this report.

16. Consideration must be given to whether the plan change accords with and will assist Waimakariri District Council ('**Council**') in carrying out its functions under section 31 of the Act to, among other things, achieve integrated management of the effects of the use, development, or protection of land and associated resources. This includes the control of the actual and potential effects of land use or development on the environment in accordance with the provisions of Part 2, while recognising and providing for section 6 matters, having particular regard to section 7 matters, and taking into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

17. Sections 74 and 75 of the Act also set out statutory obligations when changing a district plan. As required by these sections, the plan change must specifically be in accordance with, give effect to, not be inconsistent with, take into account, or have regard to the

specified documents / provisions. Consideration of these documents is set out later this report.

The Site and Surrounding Environment

18. The subject land is approximately 156 hectares in area and is bounded in large part by Bradleys Road, Mill Road and Whites Road. It does not include the already Residential 3 zoned land near the intersection of Mill Road and Whites Road. The southwestern boundary extends between Bradleys Road and Whites Road roughly 1.5 kilometres from the Mill Road end.

19. The Certificates of Title of affected land are included in **Attachment 1** of the plan change request. The location of the site is indicated on the aerial photograph in Figure 1 over the page, and in the location plan, planning map proposal, and Outline Development Plan ('**ODP**') contained in **Attachments 2 - 4** of the plan change request. RIDL controls 535 Mill Road, which is approximately 152.56 hectares in area. Properties also included in the plan change, but not controlled by RIDL, are 290 and 344 Bradleys Road, and 511, 531 and 547 Mill Road. All these properties contain dwellings.

20. For the most part, the current land use of the plan change site is a dairy farm with the farmhouse and farm buildings in a cluster towards the western corner and an additional cluster of farm buildings near the boundary of 531 Mill Road. Open paddocks predominate, but the site comprises a variety of mature trees and shelterbelts. A high water table extends over the site and several waterways, including Ohoka Stream and the Ohoka South Branch, flow in an easterly direction. Roughly 350 metres from the farmhouse is another more recent dwelling situated next to a pond mostly surrounded by mature vegetation. The pond is fed by one spring, while another spring nearer to Bradleys Road drains through a channel within the plan change area. Another notable feature of the site is the 66kV electricity transmission lines that run through the western part of plan change area.

21. Ohoka, as a place, is difficult to define in terms of its extent. People often refer to Ohoka to describe the wider area which merges into Mandeville somewhere to the southwest and includes the rural lifestyle areas extending north (east of Bradleys Road) and east towards Kaiapoi between Tram Road, at the southern extent, and possibly Hicklands Road and Main Drain Road to the north. Others refer to Ohoka as the Residential 3 and 4B zoned land, including the Ohoka Domain, around a notional centre somewhere near the intersection of Mill Road and Whites Road. The District Plan includes Ohoka as being part of the urban environment of the District (see the explanatory material associated with Objective 15.1.1 and Policy 15.1.1.1 in the Urban Environment section of the Plan). For the purposes of this plan change request, the existing Ohoka settlement includes the Residential 3, 4A and 4B zoned land including the Ohoka Domain.

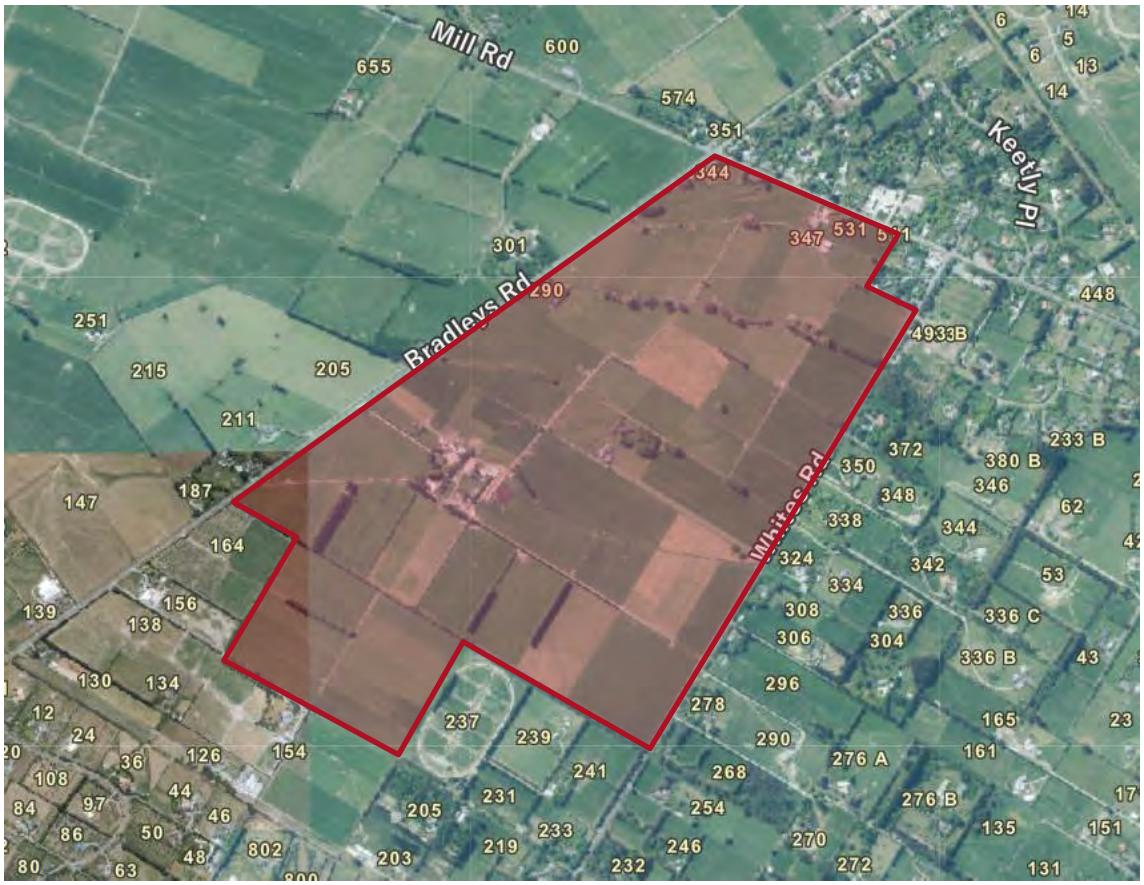

Figure 1: Aerial photograph indicating subject land (Source: Canterbury Maps)

22. Commercial activities are currently limited in Ohoka with only one business providing day-to-day type goods and services for the local population. This is the Ohoka GAS service station with automotive servicing and attached dairy which is located on the corner of Mill Road and Whites Road opposite the Domain. Other commercial operations in the settlement include Millwood Weddings, which offers wedding services including its onsite chapel as wedding venue, WaterForce, and the Baby Kulture Handkits baby clothing store.

23. Ohoka Domain is a notable feature of the settlement and is the venue for a popular Friday morning farmers market. Occupying over 6 hectares, the Domain includes car parking, tennis courts, a playground, picnic and barbeque facilities, a children's bike track, public toilets, and a pavilion available for hire. It is noted that the northern third of the Domain is zoned Residential 3.

24. Local recreational facilities also include the Ohoka Stream Walkway which runs along the true left of Ohoka Stream from Bradleys Road to Keetly Place, and the walkways through Ohoka Bush at the southern end of the Domain.

25. Ohoka School, which includes a sports and event centre available for wider community and corporate use, is located on Jacksons Road roughly 1.5 kilometres from the intersection of Whites Road and Mill Road. The plan change site is within the Ohoka School zone.

26. The plan change site adjoins the Ohoka settlement which extends mainly in a northeast direction. The block bounded by Whites, Mill, Jacksons and Tram roads to the east of the site is predominately comprised of rural lifestyle properties as is the area to the southeast of the site centred around the Mandeville North Business 4 Zone. Rural land use predominates to the west, and north beyond the Ohoka settlement.

27. The attributes of the site and surrounds are further described in the technical reports appended to this assessment.

The Plan Change

Description of the Proposal

28. It is proposed to rezone approximately 156 hectares of Rural Zone land to expand the Ohoka settlement, with the ODP guiding the form and layout of future development.

29. The plan change and ODP adopt three current zones from the District Plan, being Residential 3 & 4A and Business 4 with a proposed amendment to the Residential 4A Zone (in respect of the plan change site only) increasing the average density from a minimum 5,000m^2 per allotment to a maximum of 3,300m^2. The plan change also creates a new zone, Residential 8, to provide for a possible school or retirement village, or residential activities commensurate with the Residential 3 Zone if neither a school nor a retirement village is developed. The principal change is to the planning maps and the insertion of an ODP into the Plan. Further amendments to provisions are requested to enable the proposed expansion of Ohoka in a manner appropriate for its rural setting.

30. The proposed Residential 3 and 8 zones occupy roughly two thirds of the plan change area. The Residential 3 Zone will provide for variable lot sizes with the minimum allotment size being 500m^2. In general, the smaller properties will be located closer to the two proposed Business 4 zones and the density will decrease towards the Residential 4A Zone. The Residential 4A Zone occupies the southwest end of the site with corridors wrapping along a section of Bradleys Road and Whites Road back towards the northeast. A network of open space corridors along waterways are included in these residential zones, significantly reducing the developable land area.

31. The larger of the two Business 4 zones has frontage to Whites Road and immediately adjoins the existing Residential 3 zoned land to the northeast. This is intended to be the location of an expanded village centre for Ohoka. This modestly sized local centre is envisaged to serve the local community with day-to-day goods and services. After roads, stormwater management, pedestrian links, car parking and a small village square are subtracted from the Business 4 area, roughly 25-30 percent of the zone will be left to accommodate commercial activities, or approximately 5,700m^2 to 6,900m^2 of commercial floorspace. Car parking within the Business 4 Zone will be of a high amenity standard, with generous tree planting, and integrated into the village square. The car parking will provide additional hard surface area when required for community events, including for the Ohoka Farmers Market.

32. Based on the developable area within the plan change site[2], the proposed plan change will provide for the establishment of up to 850 new households (700 within the Residential 3 Zone and 150 within Residential 4A Zone). The Residential 3 zoned land will achieve an overall minimum net density of 12 households per hectare. If neither a school nor a retirement village is developed in the Residential 8 Zone, approximately 50 additional households could be established.

Outline Development Plan

33. **Attachment 4** to the plan change includes the proposed ODP which has been designed to ensure the future expansion of Ohoka occurs in the manner set out in Policy 18.1.1.9 of the District Plan. Rule 32.1.1.28 of the District Plan requires subdivision to be designed and carried out in accordance with the ODP (including the associated text). Non-compliance with the ODP would require a discretionary subdivision consent.

34. Existing ODPs in the Plan convey all relevant information via a planning map with associated legend to identify features. In the context of the District Plan, the proposed ODP is unusual because, in addition to the planning map, it includes a body of text with further detail of how the area is to be developed. However, this approach is not novel. It is used in respect of several 'New Development Areas' in the Proposed Waimakariri District Plan.

Urban Design Attributes

35. The urban design attributes of the plan change are described in detail in the urban design assessment by A+ Urban in **Appendix F.** The assessment sets out the key design drivers that underpin the plan change proposal as follows:

> ***Land based design philosophy***
>
> *The design concept builds on the inherent qualities of the underlying land by:*
>
> - *recognising and retaining the natural hydrology of the site naturalising the existing waterways,*
> - *protecting the waterways and local springs through building setbacks and landscaped margins,*
> - *polishing stormwater runoff from the development before entering the waterways,*
> - *retaining the existing tree cover and shelterbelts wherever possible,*
> - *creating new landscape margins to waterways with a focus on tree planting,*
> - *introducing native plant species within stormwater management areas to add to the biodiversity of the site, and*

[2] The developable area of the plan change land accounts for the definition of 'net density' in the Canterbury Regional Policy Statement which specifies land that is to be included and excluded for the purposes of determining net density.

- *use extensive landscaped areas to offset the introduction of more hard surfaces*

Strengthen the village identity

The design concept builds on the inherent qualities of the village character of Ohoka by:

- *creating residential environments that are compatible with the existing development pattern with smaller sites in proximity to the village centre and larger sites adjoining the rural environment,*
- *creating settings for dwellings to nestle into, which are visually contained by landscaped margins,*
- *providing opportunities for people to live and work in Ohoka,*
- *assisting in the creation of a village centre around the historic setting of Mill / Whites road intersection and the Domain,*
- *providing opportunities for commercial and community facilities to be integrated in the village centre,*
- *creating streetscapes that are reflective of the rural character of the village,*
- *allowing for the growth of the village through carefully staged development.*

Creating a community through connectivity

The pedestrian and cycle routes in Ohoka are very limited and do not properly support connectivity of the community. To improve this connectivity the design concept introduces a strong interconnected pedestrian and cycling network that:

- *provides a high amenity for all internal connections to support pedestrian and cycle movement,*
- *is embedded in the naturalised waterway margins, stormwater treatment areas and new green links throughout the site,*
- *creates a strong interface and new connections with the immediate neighbours on Mill Road,*
- *creates a new direct interface with the local Domain, and*
- *supports a potential direct connection along Ohoka Stream to the local school to the east.*

36. As shown on an indicative master plan at section 4.4 of the urban design assessment report, community green spaces have been considered for inclusion in the design of the plan change site. Any required community reserves (to be identified at subdivision consent stage) would logically form part of the green network identified on the ODP. The size and location of any reserve spaces will need to be balanced against the existing generous provision in the Ohoka Domain nearby.

37. To ensure development enabled by the proposed plan change is of the quality and character required to achieve a rural village aesthetic, it will be necessary to establish design guidance and an independent design approval process (as has been successful in other locations such as Jacks Point in Queenstown and Kirimoko in Wanaka). This detail can be developed at subdivision consent stage in collaboration with Council.

Transport Attributes

38. The transport assessment in **Appendix H** and the urban design assessment in **Appendix F** describe the relevant transport attributes of the proposal, which are expressed in the ODP.

39. The transport assessment identifies road widening as being required for:

    a. Tram Road, regardless of the proposed plan change;

    b. Bradleys Road, regardless of the proposed plan change;

    c. Whites Road, where some widening is required regardless of the proposed plan change with further widening required because of the additional traffic associated with the plan change; and

    d. Mill Road, where as above, some widening is required now, and additional widening is required to accommodate the traffic associated with the plan change request.

40. RIDL will work with Council to develop a fair and equitable cost sharing arrangement for road widening at the appropriate time.

41. While widening of the roads surrounding the plan change site is required, the intention is that the rural aesthetic of these roads will be maintained. The roads would continue to have grassed berms/swales with no kerb and channel.

42. Direct vehicular access to private properties can be provided to Mill Road and Whites Road where road frontage upgrades are indicated on the ODP. Otherwise, direct vehicular access to Bradleys Road and Whites Road from Residential 4A zoned properties are proposed to be limited as much as practical with up to six properties sharing an access. Where direct property access is proposed to the Whites Road frontage, this road would also include a shared path connecting to the shared path on Mill Road.

43. Like the roads surrounding the plan change site, the intention is to design streetscapes that have a rural aesthetic without kerb and channel. In recognition of the character of the Ohoka setting, there will be several specific road types which will vary in width and layout depending on the function and amenity.

44. Changes to the transport provisions of the District Plan are proposed to enable the construction of bespoke roads appropriate to maintain the rural village character of Ohoka. Concept road cross-sections are included in the ODP. Because these designs are unlikely to comply with existing Council standards, the ODP establishes a mechanism for developing appropriate road standards to the satisfaction of Council prior to approval of any subsequent subdivision consent application. This same mechanism would be used to

develop appropriate gateway treatments into Ohoka which are discussed in section 5.3 of the urban design assessment.

45. An indicative master plan included at section 4.4 of the urban design assessment shows how the main roads could be laid out. As is common practice, the road network for the plan change area would be developed at subdivision consent stage.

Servicing

46. The plan change area can be fully serviced as set out in the infrastructure assessment (**Appendix G**). The following summarises the servicing options for wastewater, water, stormwater, electricity and telecommunications.

Wastewater

47. Effluent will be reticulated to the Rangiora Wastewater Treatment Plant either via gravity reticulation or a low-pressure sewer system. RIDL's civil engineering consultants prefer a low-pressure system given it provides a superior level of resilience during periods of high rainfall.

Water

48. Potable water will either be supplied via the existing Ohoka Water supply scheme or from a community drinking water scheme by transferring existing water take consents, or a combination of the two.

49. Existing reticulation and well capacity does not provide sufficient fire fighting water flows. An upgrade to the headworks will be required along with additional supply to comply with the relevant fire fighting standards.

Stormwater

50. Stormwater management areas are proposed within the plan change area to provide for treatment and attenuation. As set out in the infrastructure report the Stormwater management areas will consist of:

- *a first flush basin to capture and remove total suspended solids in the runoff generated by the first 20mm of rainfall on the catchment (primary treatment);*

- *constructed stormwater wetland areas for secondary treatment to provide water quality polishing in rainfall events up to the first flush volume and provide live storage in large rainfall events exceeding the 20% AEP (1 in 5 year) event; and*

- *a detention basin to provide water quantity attenuation in large rainfall events greater than the first flush event, but up to the 2% AEP.*

Electricity and Telecommunication

51. Sufficient power for the development is available from the existing electricity network bordering the site and telecommunications can be provided underground to future allotments from an existing fibre network in Mill Road.

Proposed Amendments to the District Plan

52. The proposed amendments to the Waimakariri District Plan are included at the beginning of this plan change request document.

Consultation

53. RIDL's consultants have liaised with Waimakariri Council staff during the development of the plan change proposal, primarily to ensure that the development can be adequately serviced and in respect of flood hazard risk.

54. Consultation with local Rūnanga via Mahaanui Kurataiao Limited, has also been undertaken. A consultation report from Mahaanui Kurataiao Limited is included at **Appendix J**.

55. The report concludes that:

> *The protection of waterways is a significant concern to the rūnanga. Additionally, there are no known New Zealand Archaeological Authority Māori sites identified within the proposed area.*

56. The requester shares the concern expressed regarding protection of waterways which is reflected in the way that waterway enhancement and protection is a key design principle of the plan change proposal.

57. The consultation report includes six recommendations which are reproduced and discussed below.

> *Recommendation 1:*
>
> *Where practicable, there should be a 20m setback between the proposed subdivision development and waterways that flow through the site. Additionally, there should be a 10 buffer within the setback which should be planted with locally sourced indigenous plants to assist with nutrient uptake and to enhance biodiversity values.*

58. Aquatic buffer distances are included in the ODP, including minimum waterbody setbacks for earthworks and buildings of:

- 10 metres from the Ohoka Stream tributary, Groundwater Seep, Northern and Southern Spring Channel and South Ohoka Branch.
- 20 metres from the northern springhead identified on the ODP.
- 30 metres from the large southern springhead identified on the ODP.
- 5 metres from the un-named waterway along the furthermost southwest boundary of the ODP area.

59. The springhead setbacks clearly satisfy the recommendation. Setbacks from the other waterways will be organic. It is likely that the setback will be greater than 20 metres along certain stretches, and less than along other portions (but always greater than 10 metres).

Recommendation 2:

The inclusion of locally sourced indigenous planting in landscaping plans is an important mitigation measure for subdivision development. This includes street trees and landscaping, which may include indigenous species like Plagianthus regius.

When available, the final landscape plan/plans for the site should be sent to the Rūnanga.

60. The ODP includes a requirement to consult with Rūnanga at subdivision consent stage regarding landscaping in public spaces.

Recommendation 3:

Robust erosion and sediment controls must be installed and maintained in accordance with ECan's Erosion and Sediment Control guidelines.

61. This is standard practice and would be expected as a condition of any subdivision consent.

Recommendation 4:

The policies identified in the Ngāi Tahu Subdivision and Development Guidelines should be referred to by the developer, particularly regarding stormwater management, water supply and use (grey water recycling) and indigenous planting. These guidelines have been attached at the end of this document.

62. This recommendation is incorporated in the ODP.

Recommendation 5:

Future subdivision development should incorporate best practice onsite stormwater management controls to mitigate the effects of development and allow for stormwater infiltration.

Stormwater should be directed to detention ponds and swales to reduce runoff from site and allow for infiltration.

Stormwater discharge from roads and carparks should not be directed to waterways.

63. This recommendation is incorporated in the ODP.

Recommendation 6:

To protect any potential wāhi tapu/wāhi taonga values for the site, an Accidental Discovery Protocol consistent with Appendix 3 of the Mahaanui Iwi Management Plan is recommended for all earthworks. Even shallow soil disturbance has the potential to uncover culturally significant material.

64. The ODP includes this requirement.

Assessment of Environmental Effects of the Proposed Plan Change

65. This assessment is being undertaken in respect of Clause 22(2) of Schedule 1 of the Act that requires the following be undertaken:

> *(2) Where environmental effects are anticipated, the request shall describe those effects, taking into account clauses 6 and 7 of Schedule 4, in such detail as corresponds with the scale and significance of the actual or potential environmental effects anticipated from the implementation of the change, policy statement, or plan. 7.2 Clause 6 outlines the information required in an assessment of environmental effects. In comparison Clause 7 specifies the range of matters that must be addressed by an assessment of environmental effects.*

66. The range of actual or potential environmental effects arising from the plan change request are seen as being limited to the following matters:

a. Loss of agricultural production

b. Natural hazards and contaminated land

c. Ecology

d. Landscape visual effects and amenity values

e. Urban form and urban design

f. Infrastructure

g. Transport

h. Reverse sensitivity

i. Sites of significance to Iwi

j. Retail

k. Economic.

Loss of Agricultural Production

67. The proposed plan change will result in land that, for the most part, is used for dairy farming being developed for residential and associated activities at urban and peri-urban densities. The nature, extent and effects of the loss is the principal focus of the Potential Loss of of Productive Land report (**Appendix A**) prepared by Victor Mthamo of Reeftide Environmental & Projects. Mr Mthamo concludes that only 0.64 hectares of the plan change area contains versatile soils and identifies a number of factors that affect productive intensification of the site or mitigate loss of productive land. These factors are discussed in Mr Mthamo's report and listed in his summary and conclusions section.

68. In addition to Mr Mthamo's assessment, it is relevant to note that the land is currently zoned Rural, a zone which provides for rural development with a minimum allotment size of four hectares. This type of development is prevalent in the vicinity of the site, and it is not unreasonable to assume that the site would also be developed in this manner in years to come if the plan change was refused. In this scenario, the current level of agricultural production would likely be substantially reduced.

69. In terms of costs associated with lost agricultural production, the economic assessment prepared by Mike Copeland of Brown, Copeland & Co (**Appendix I**) notes that:

> *…any lost agricultural production is not an external cost of using the site for residential development. The productive value of the land in alternative uses (such as agricultural and other use) has been internalised into the cost structure of the development – in other words RIDL in agreeing to purchase the land has agreed a price reflective of future net returns from alternative uses for the land. Such costs are not costs to be borne by the wider community.*

70. Taking into consideration the above, while the plan change proposal will result in the loss agricultural production, the associated adverse effects will be minor.

Natural Hazards and Contaminated Land

71. The plan change site is subject to potential flood hazard. The infrastructure assessment prepared by Tim McLeod of Inovo Projects (**Appendix G**) notes that:

> *Flooding on the site for 200-year and 500-year events results from significant rainfall events generating overland runoff from the upstream catchment. The site is not at risk of overland flows resulting in breakout of Cust Main Drain, the Eyre River or any other large watercourses in the vicinity such as Ashley River. Any groundwater breakout is expected to be delayed and not compound surface flooding during storm events.*
>
> *… the flood risk for the site is assessed as very low to low, with some smaller pockets of medium hazard along overland flowpaths coinciding with existing streams and channels.*

72. A further, and more detailed, flood risk assessment has been carried out by Ben Throssell of PDP (see the memo appended to the infrastructure assessment at **Appendix G**). The assessment examines the feasibility of the development from a flood risk perspective with particular attention to conveyance of overland flows through the development.

73. Further, Chris Thompson of Tetra Tech Coffey notes in the geotechnical assessment (**Appendix B**) that the risk of inundation will be low with the appropriate stormwater and flood control systems. Indeed, stormwater management has been a key factor in the development of the ODP.

74. Based on Mr McLeod and Mr Thompson's assessment, flood hazard effects associated with the proposal can be adequately avoided or mitigated.

75. Aside from flooding, the plan change site is not subject to any other notable natural hazards. The geotechnical assessment concludes that the site is "TC1-like".

76. A Preliminary Site Investigation (**Appendix C**) has also been undertaken by Tetra Tech Coffey. While the investigation found the presence of HAIL activities on the site, the report concludes that:

> *Due to the likely presence of HAIL activities on the site, the NESCS regulations are considered to apply to the site. Subdividing or changing land use is a permitted activity under section 8(4)(b) of the NESCS if the report on the site states that it is highly unlikely that there will be a risk to human health if the activity is done to the piece of land.*
>
> *The potential of contamination to soil associated with the identified potential sources of contamination are considered low to high … depending on the activity identified. However, it is considered unlikely that there will be a risk to human health with the proposed subdivision providing that the potential contaminant source areas … are assessed and associated risks to human health and/or the environment are mitigated.*

77. A Detailed Site Investigation will be carried out at subdivision consent stage. This investigation will identify what (if any) remediation is required to satisfy the requirements of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

78. Based on the relevant assessments discussed above, any potential adverse effects associated with natural hazards and/or contaminated land can be adequately avoided or mitigated.

Ecology Effects

79. The existing ecological values of the plan change area and the potential effects associated with the development likely to result from the proposed plan change has been undertaken by Mark Taylor of Aquatic Ecology (**Appendix F**).

80. Surveys in the various waterways across the site identified four species of fish including the upland bully, shortfin eel, longfin eel and brown trout. Freshwater invertebrates were not surveyed because these are typically surveyed at subdivision consent stage. However, Mr Taylor notes that invertebrate fauna will be present given the stream conditions and that koura are likely to be present within the plan change area.

81. The ODP accounts for Mr Taylor's findings and recommendations including providing at least a 10-metre setback either side of principal waterways (which include the Ohoka Stream tributary, Groundwater Seep, the South Ohoka Branch, and Northern and Southern spring-fed channels) and a minimum 20-metre setback from the northern spring and a minimum 30-meter setback for the large southern spring as identified in the plan change area. These buffers would be protected by appropriate instruments (whether that be esplanade reserves/strips, recreation reserves or consent notice setbacks) at subdivision consent stage.

82. Mr Taylor concludes his assessment by stating the proposed plan change will maintain and/or improve the current aquatic ecological values provided his waterway realignment and setback recommendations are implemented. Given these recommendations have been incorporated into the ODP, it is considered that the potential adverse aquatic ecological effects of the proposal can be adequately avoided or mitigated.

83. Aside from the aquatic ecology assessment undertaken by Mr Taylor to identify aquatic features on site and assist with future planning, a detailed terrestrial assessment has not been completed at this stage. This is largely due to the nature of the site (agricultural land use). The land has been used for farming for a significant period of time and has been significantly altered to the extent that very few natural areas remain. A detailed terrestrial assessment, which identifies existing vegetation on site that could be retained and advises on future planting and enhancement strategies, will be completed at the subdivision consent stage.

84. Initial site walkovers, review of relevant Canterbury Maps layers, and the tables in Appendix 25.1 (Vegetation and Habitat Sites) and Appendix 29.1 (Notable Plants) of the District Plan do not indicate any significant natural areas on the site or threatened species or habitats of indigenous vegetation within the site. Natural terrestrial areas associated with aquatic features on site (i.e. spring-fed streams, ponds, potential wetland habitat), are to be enhanced as part of the plan change proposal (as discussed in the water bodies and freshwater ecosystems section of the ODP text), and will be included as part of the sites Ecological Management Plan.

85. Shelterbelts are the predominant vegetation on site, with areas of riparian vegetation associates with waterways described in Mr Taylor's assessment. These riparian areas will be enhanced as part of the plan change proposal. As per the character and natural amenity section of the ODP text, an assessment by a suitably qualified and experienced arborist, guided by a suitably qualified terrestrial ecologist, will identify trees that are to be retained and integrated into the development, and specifies protection measures during construction to ensure survival of selected trees.

Landscape / Visual Effects and Amenity Values

86. The current character and amenity of the site and surrounds can be characterised as rural and rural lifestyle. As noted previously, while the current land use of the site is a dairy farm (for the most part) with open paddocks and a general lack of built form, the District Plan anticipates that it could be subdivided into four-hectare rural lifestyle properties similar to those to the southwest and east.

87. A Landscape and Visual Impact Assessment of the proposed plan change has been undertaken by DCM Urban, and is attached in **Appendix E**. That assessment considers the existing landscape character of the environment, and the potential landscape character and visual amenity impacts of the proposed rezoning.

88. The site is not identified as an outstanding landscape or visual amenity landscape in any statutory planning document, nor is it considered to contain any features or landforms of significant landscape value (in respect of section 6(b) of the Act).

89. In respect of landscape character, the assessment concludes:

> *… subject to the mitigation measures proposed, the proposal will result in an acceptable magnitude of change on the existing rural landscape character and values. The existing character of the Plan Change area is already highly modified and with the proposed mitigation measures both protecting and enhancing existing waterways, the proposal will retain existing natural features. The semi-open character of the site will change to a character which is more dense and compartmentalised (similar*

to the properties on the eastern side of Whites Road) but can be partially mitigated through fencing controls and landscape planting to retain a high level of amenity.

90. The assessment then refers to mitigation measures that are incorporated within the plan change (primarily through the ODP) to either avoid or mitigate any potential effects on landscape character, landscape values and/or visual amenity. In respect of visual amenity, the assessment concludes:

…the adjacent rural properties will experience a change in the openness of views across the space. Adjoining residential properties, current and future, overlooking the Plan Change area have a mix of open, partial, and screened views of future development. The changes in the landscape experienced by these residents are considered Low given the character of the existing environment, the existing high level of compartmentalisation and the ability to retain/create a high amenity environment along both Whites and Bradleys Roads.

91. The findings of that assessment are accepted and adopted, and on that basis, it is considered that the potential adverse visual and landscape effects of the proposal can be adequately mitigated.

92. The effects in terms of broader amenity values are considered to be minor. The character of the plan change site will clearly change with the introduction of dwellings at urban and peri-urban densities, roads, a local commercial centre, and possibly a school or retirement village. However, while the proposed density of development is not rural, the village will maintain a rural-like aesthetic with appropriate tree planting, minimal hard surfaces, and an absence of typical suburban features such 1.8 metre solid fencing and concrete kerb and channel. Further, landscape treatments (A and B as shown on the ODP) along Bradleys Road and Whites Road will mitigate visual amenity effects from vantage points outside the site.

93. Further, it is considered that the change will increase those amenity values associated with markedly improved local convenience, improved ecology and amenity of waterways, and additional recreational opportunities by way of new public open spaces.

94. With reference to the definition of amenity values in the Act, it is considered that Ohoka will remain a pleasant and aesthetically coherent settlement, with its cultural attributes retained and its recreational attributes enhanced. The settlement will continue to exist as a village, albeit of a larger size, within a rural landscape.

Urban Form and Urban Design

95. Council's preference is to restrict growth of the District's smaller settlements, including Ohoka. The now historic residential growth strategy, *Directions for Residential Growth 1997-2016*, states that:

Council does not favour Ohoka (population 160) as one of the locations for further residential development because of the:

- *high water table which leads to drainage and effluent disposal difficulties*

- *effect on the character of Ohoka. The township has already experienced considerable development Further development has the potential to overwhelm the present small town characteristics or Ohoka (refer Planning Tribunal 1994 Armstrong versus Waimakariri District Council)*

- *need to upgrade the water supply and provide a reticulated sewerage system*

- *no logical boundaries to limit further expansion*

- *lineal form of the township along Mill Road which should not be extended.*

The township has the benefits of being adjacent to Mill Stream and has the advantage of stream-side access provided by reserve land. There is potential to build local community links based on such reserves and a road network that only serves the local area.

96. This general sentiment carries through to Council's recently adopted growth strategy to 2048, *Our District, Our Future*, where the approach to growth of small settlements is to enable:

…existing vacant areas in the small settlements to develop and provides for some further 'organic' expansion opportunities, generally consistent with historic growth rates. By focusing most new greenfield and intensification development in the District's larger towns, the character of the District's small settlements will generally be retained.

97. This approach to growth has been front of mind in the development of the proposed plan change which responds to the NPS-UD and the impetus it provides for increasing development capacity. Balancing the goals of the NPS-UD, RIDL understands that any expansion of the Ohoka settlement must also address previously identified constraints and be carefully planned so that resulting development is sympathetic and the rural village character of the place is retained.

98. Below is the response to the constraints listed in the *Directions for Residential Growth 1997-2016* strategy.

high water table which leads to drainage and effluent disposal difficulties

99. As set out previously, stormwater can be managed within the site and effluent disposal can and will be reticulated to the Rangiora Wastewater Treatment Plant.

effect on the character of Ohoka. The township has already experienced considerable development. Further development has the potential to overwhelm the present small town characteristics of Ohoka

100. While it is not agreed that the settlement has experienced considerable development, it is agreed that further development could overwhelm the rural village character of Ohoka if not carefully considered and planned. It is considered that the development enabled by the proposed plan change would be delivered in a way that preserves the rural village characteristics of Ohoka.

need to upgrade the water supply and provide a reticulated sewerage system

101. As demonstrated in the infrastructure assessment, the development enabled by the proposed plan change can be fully serviced, and upgrades have likely occurred since the writing of the *Directions for Residential Growth 1997-2016*.

no logical boundaries to limit further expansion

102. Taking into consideration the urban design assessment (**Appendix F**), it is considered that the development enabled by the proposed plan change will comprehensively complete the development of Ohoka for the foreseeable future, negating the need for further expansion (except for possible residential infill around the Domain to the east of Whites Road). In the foreseeable future, it is considered that Bradleys Road will become the western extent of Ohoka, and the southwest boundary will mark the southern extent of the settlement.

lineal form of the township along Mill Road which should not be extended.

103. The form of the proposed plan change comprehensively addresses this previous concern. The proposed plan change ensures that the settlement radiates from an expanded village centre avoiding further lineal extensions.

104. A consideration of the NPS-UD (which is addressed in further detail later in this report) is whether the plan change will provide for a well-functioning urban environment. This includes consideration of the urban form and, in particular, whether the direction of growth provided for by this plan change request will create an appropriate urban form and density for Ohoka village. Ms Lauenstein considers that the form and density is appropriate for the context. While the proposed residential density is higher than within the existing settlement, Ms Lauenstein considers that:

The notion that low density environment such as Residential 4A Zone with an average density of 5000m^2 are the only option to provide a village character for Ohoka is incorrect and outdated. The rural character in particular of a small settlement the size of Ohoka, is not reliant on lot size, but reliant of the integration of specific characteristics of the village through design, and in the case of Ohoka, through landscaping, in particular tree planting.

105. The preparation of the plan change proposal has been carefully guided by the key design drivers listed earlier. Ultimately, this will result in an expansion of the existing settlement that conforms to the expectation set by the District Plan through Policy 18.1.1.9 which is replicated below:

Policy 18.1.1.9

Ensure that any growth and development of Ohoka settlement occurs in a manner that:

- *maintains a rural village character comprising a predominantly low density living environment with dwellings in generous settings;*
- *achieves, as far as practicable, a consolidated urban form generally centred around and close to the existing Ohoka settlement;*
- *encourages connectivity with the existing village and community facilities;*
- *achieves quality urban form and function;*

- *allows opportunities for a rural outlook;*
- *encourages the retention and establishment of large-scale tree plantings and the use of rural style roads and fencing;*
- *limits the potential for reverse sensitivity effects;*
- *avoids significant flood hazards;*
- *promotes the efficient and cost-effective provision and operation of infrastructure;*
- *recognises the low lying nature of the area and the need to provide for stormwater drainage; and*
- *ensures that any residential development occurring in the Ohoka settlement does not increase the flood risk within Ohoka and adjoining areas.*

106. In terms of the wider urban form of the District, Ohoka will become a more significant node within the constellation of centres of the District and Greater Christchurch. This is considered appropriate given its close proximity to Kaiapoi and Rangiora and easy access (including by public transport via park and ride facilities) to Christchurch.

107. Taking into consideration the assessment above, the proposed plan change will provide a high standard of urban design and will positively contribute to the urban form of the District.

Infrastructure

108. The plan change site is located beyond the Canterbury Regional Policy Statement Map A Projected Infrastructure Boundary, which wraps around the existing Residential 3 zoned land in Ohoka. Despite this, the infrastructure assessment prepared for the plan change proposal demonstrates that the anticipated development can be satisfactorily serviced through a combination of existing, upgraded and new infrastructure.

109. The infrastructure assessment (**Appendix A**) concludes:

> *From an infrastructure perspective, the proposed plan change can be supported by either the extension of existing infrastructure from neighbouring subdivisions or the provision of new water supply and wastewater infrastructure to service the development areas.*

110. This conclusion is accepted and adopted, and on that basis, it is considered that any adverse effects associated with infrastructure to service the development anticipated by the proposed plan change can be adequately avoided or mitigated.

Transport

111. Transport effects on the safety and efficiency of the road network may arise from the proposed rezoning. A transport assessment has been prepared for the proposal by Nick Fuller of Novo Group (**Appendix H**).

112. That assessment considers the proposed transport connections provided by the proposed ODP, and transport related impacts of the likely traffic volumes associated proposed plan change.

113. Mr Fuller is satisfied that the level of development enabled by the proposed plan change does not give rise to undue road network safety and efficiency effects. Further, access to, from and within the plan change area is acceptable. Overall, Mr Fuller concludes that:

> *…subject to the above road widening, the traffic effects of the proposed Plan Change are considered to be acceptable.*

114. The findings of Mr Fuller's assessment are accepted and adopted, and on that basis, it is considered that the potential adverse traffic effects of the proposal can be adequately avoided or mitigated. Further, it is considered that positive transport outcomes will be achieved through the creation of a walkable village with local services at its centre.

115. Accounting for the above, the proposal will support a well-functioning urban environment and the aspiration in Policy 1 of the NPS-UD that urban environments:

> *c. 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*
>
> *d. are resilient to the likely current and future effects of climate change.*

116. It is noted that gateway treatments are proposed at the intersection of Mill Road and Bradleys Road and on Whites Road midway along the ODP area. As Mr Fuller notes, the speed limit would ideally reduce to 50km/hr through Ohoka from these thresholds. Further, a 70km/hr speed limit is preferred for Bradleys Road and Whites Road (outside the gateways) alongside the ODP site. It is acknowledged that the setting of speed limits is outside the plan change process and will be dealt with separately.

Reverse Sensitivity

117. The plan change site shares a boundary (separated by Bradleys Road) with land used for rural productive activities, predominantly pastoral farming. While these activities may produce noise and odour at times, residential areas commonly border rural productive activities, and residents accept such effects. Further, the District Plan already manages the effects of intensive farming activities and farm effluent treatment.

118. Figure 2 over the page indicates the location and extent of existing farm effluent spreading consents in the vicinity of the plan change site. Effluent spreading is authorised in the blue areas. When the practice ceases within the plan change site, future residential activities within it will be located beyond the buffer zones indicated around the existing consented effluent spreading areas.

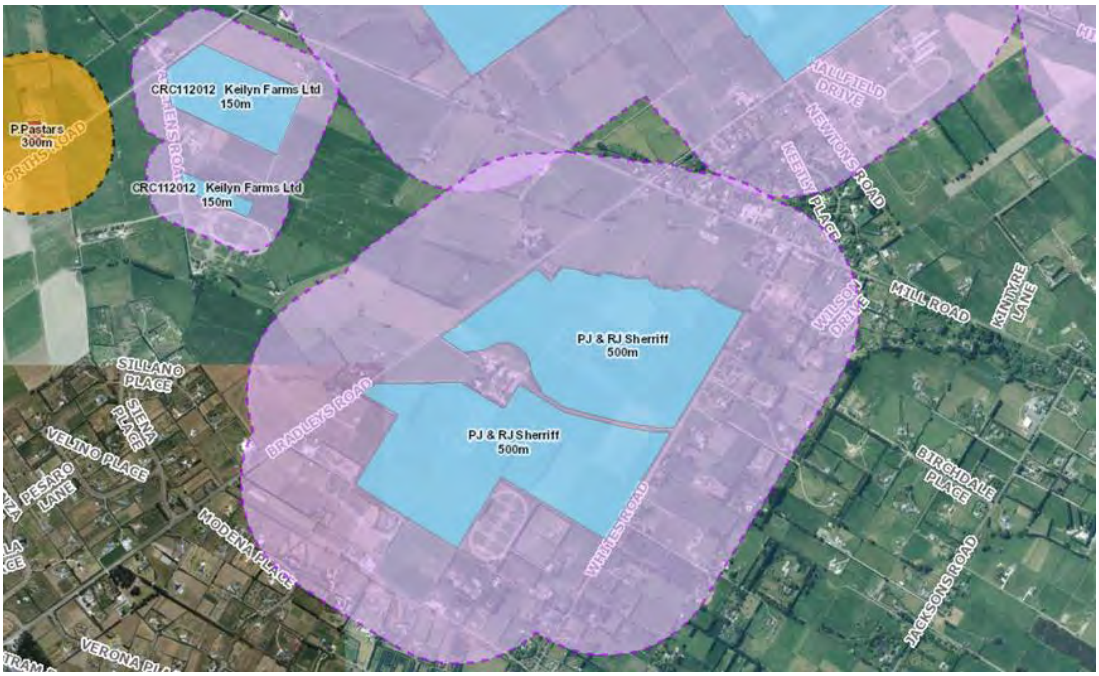

Figure 2: Effluent spreading consent areas (Source: WDC)

119. It is considered that there are no other potentially incompatible activities in the vicinity. Accordingly, the potential adverse reverse sensitivity effects from the plan change proposal are considered to be negligible.

Sites of Significance to Iwi

120. While the District Plan does not identify any features/sites of significance to Māori within the plan change area, the Proposed Waimakariri District Plan ('**Proposed Plan**') identifies the Waimakariri River and its tributaries (which include Ohoka Stream) as having significance to Māori. The associated provisions have legal effect pursuant to s86B(3) of the Act. Ohoka Stream is ngā wai, which is described in the Proposed District Plan as water and represents the essence of all life, is integral to tribal identity, and source of mahinga kai. As discussed previously, the principal waterways that run through the site form a key feature of the ODP. It is RIDL's intention that these waterways be enhanced, and this aligns with feedback from local Rūnanga.

121. Based on feedback from Rūnanga, it is anticipated that the proposed stormwater management and adoption of Accidental Discovery Protocol at the time of site development will assist in mitigating potential adverse effects development on cultural values. Further, the establishment of locally sourced indigenous vegetation within the plan change site throughout its development is a matter that will be addressed at the time of subdivision and development, and this will support cultural values associated with the site.

Retail Effects

122. The proposed Business 4 zoning is of a modest scale and will principally provide for the convenience needs of local residents. After pedestrian links, public amenity spaces,

landscaping, car parking and roads are subtracted, the area available for commercial activities reduces to approximately 25-30 percent of the total Business 4 Zone (within the plan change area). It is not of a scale where it could undermine the function, viability and vibrancy of the key activity centres in the District. More likely, the increased resident population resulting from the plan change will strengthen the function of the key activity centres and increase their viability and vibrancy. Further, the District Plan ensures appropriate scrutiny of larger scale retail activities. Rule 31.25.3 specifies that activities generating more than 250 motorised vehicle movements per day require a restricted discretionary resource consent. Among other matters, Council has discretion to consider effects on urban form and function.

123. The conclusions above are endorsed by the economic assessment in **Appendix I**.

Economic Effects

124. Beyond the potential economic costs and effects discussed above, the economic assessment in **Appendix I** addresses other potential economic benefits and costs associated with the plan change proposal. This includes:

    a. Additional employment, income and expenditure generated by the proposal, including increased economies of scale, increased competition, reduced unemployment and underemployment, and increased quality of central government provided services.

    b. Increased competition and choice in residential housing markets, in a manner that is consistent with the NPS-UD.

    c. Benefits from potential (but unconfirmed) educational facilities or retirement village activities through additional economic activity for the local economy during their construction and operation.

    d. The internalised costs of lost agricultural production, which are not borne by the wider community.

    e. Utility costs, which will not arise in a manner that requires cross-subsidisation by other ratepayers, residents or businesses within the Waimakariri District.

    f. Transport costs, which may arise relative to residential development in closer proximity to centres of employment, commercial activity, etc. However, such transport costs are internalised to future residents, or externalised in respect of potential road accidents, congestion, greenhouse gas emissions, etc., which are likely to be similar to alternative semi-rural residential development sites within the Waimakariri District.

125. Taking into consideration the economic assessment in **Appendix I**, the economic effects of the proposed plan change are considered to be acceptable.

Summary of Effects

126. In summary and for the reasons set out above, it is concluded that the potential adverse effects of the proposed plan change can be adequately avoided or mitigated.

Statutory Requirements of Section 32 of the Act

127. Before a proposed plan change is publicly notified an evaluation must be carried out by the person making the request. The evaluation, carried out under Section 32 of the Act, must examine:

> *(a) the extent to which the objectives of the proposal being evaluated are the most appropriate way to achieve the purpose of the Act; and*
>
> *(b) whether, the provisions in the proposal are the most appropriate way to achieve the objectives by:*
>
> *(i) identifying other reasonably practicable options for achieving the objectives; and*
>
> *(ii) assessing the efficiency and effectiveness of the provisions in achieving the objectives; and*
>
> *(iii) summarising the reasons for deciding on the provisions; and*
>
> *(c) contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal.*

128. In assessing the efficiency and effectiveness of the provisions, the evaluation must also:

- Identify and assess the benefits and costs of effects, including opportunities for economic growth and employment;
- If practicable, quantify these benefits and costs;
- Assess the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions.

129. Section 32(6) clarifies that where no actual objectives are stated in the proposal, the objective is the purpose of the proposal.

130. A MfE guide to Section 32[3] notes that Section 32 case law has interpreted *most appropriate* to mean *suitable, but not necessarily superior*. *Effectiveness* is noted in the guide as assessing the contribution new provisions make towards achieving the objective, and how successful they are likely to be in solving the problem they were designed to address. *Efficiency* is noted as measuring whether the provisions will be likely to achieve the objectives at the lowest total cost to all members of society or achieves the highest net benefit to all of society. The assessment of efficiency under the Act involves the inclusion of a broad range of costs and benefits, many intangible and non-monetary.

[3] MfE, A Guide to Section 32 of the Resource Management Act 1991 (2017), Wellington.

Most appropriate way to achieve the purpose of the Act?

131. Section 32(1)(a) requires examination of the extent to which the objectives of the proposal are the most appropriate way to achieve the purpose of the Act.

132. The proposal does not involve any new, or the alteration of any existing, objectives of the Waimakariri District Plan. The existing objectives are assumed to be the most appropriate for achieving the purpose of the Act, having previously been assessed as such.

133. The more general objective of the proposal (the purpose of the proposal) is to provide for an expansion of the Ohoka settlement, with provision for some associated local business services, in a manner that maintains the rural village character of Ohoka. It will achieve this while adding significantly to development capacity and providing for increased competition and choice in residential land markets. The evaluation must therefore consider the extent to which enabling the proposed expansion of Ohoka achieves the purpose of the Act.

134. The purpose of the Act is to promote sustainable management of natural and physical resources.

135. This means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while:

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

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

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

136. It is considered that the proposal achieves the purpose of the Act (for the reasons set out later in the report):

Most Appropriate way to Achieve the Objectives?

137. Section 32(1)(b) requires examination of whether the proposed plan change provisions are the most appropriate way of achieving the District Plan objectives by:

    identifying other reasonably practicable options for achieving the objectives; and

    assessing the efficiency and effectiveness of the provisions in achieving the objectives; and

    summarising the reasons for deciding on the provisions

138. These matters are addressed in turn.

Other Options to Achieve Objectives

139. The provisions of the proposal are set out at the beginning of the report and the proposed ODP for the site is contained within **Attachment 4**. In addition to this plan change request, other reasonably practicable options for achieving the proposal include:

- Applying for a resource consent(s) for subdivision and development as intended for the site (the status quo); or

- Seeking the proposed zoning through a submission on the Proposed District Plan.

140. The resource consent(s) option is not favoured. While resource consents have the potential to enable the same or similar development sought through the proposed plan change, given the Rural policy framework in the District Plan, which seeks to avoid the type of development proposed, the resource consent process would not provide sufficient certainty of outcome. The amount of upfront detail that would be required in such a resource consent application(s) is prohibitive without certainty of outcome. Further, resource consents for a development of the scale proposed are inefficient, with changes to consents commonly required as the site develops, resulting in ongoing time and costs to the consent holders (preparation of applications), to Council (processing and administration of applications), and potentially for adjoining landowners (where they may be identified as affected persons).

141. Given the timing of this plan change request relative to the closing date of submissions on the Proposed District Plan (26 November 2021), RIDL has also made a submission on the Proposed District Plan seeking relief that will enable the development sought through this plan change request. It is likely that the plan change process will be resolved before the Proposed District Plan and therefore have a bearing on that process.

Assessment of Efficiency and Effectiveness of the Plan Change

142. Section 32 of the Act requires consideration of the benefits and costs of the proposal when assessing efficiency and effectiveness, including environmental, economic, social and cultural effects. Consideration is directed by s32(2)(a)(i) and (ii) to include consideration of opportunities for economic growth and employment. Section 32(2)(b) requires all effects to be quantified where practicable. These matters are addressed in the tables below.

143. In assessing the benefits and costs of the plan change, three options have been considered:

- Leave the area zoned Rural

- Rezone the site as proposed

- Apply for resource consent(s) for subdivision and development under the current zoning to otherwise achieve an extension to the Ohoka settlement.

144. The following **Tables 1-3** provide an assessment of these options.

Table 1: Benefits and Costs of Option 1 – Leave the area zoned Rural

Benefits/Advantages	Costs/Disadvantages
• Maintains the existing rural character and amenity of the site area. • No time or costs arising from a plan change process. • No additional demands on infrastructure. • Potentially provides for demand for four-hectare rural activity.	• Does not meet full market demand for residential sites in Ohoka. • Less efficient use of the land resource.

Table 2: Benefits and Costs of Option 2 – Rezone the site (the proposal)

Benefits/Advantages	Costs/Disadvantages
• Significantly increased availability of allotments within Ohoka village. • Economic benefit to Council from larger rating base through additional properties being added upon subdivision. • Economic benefit to the landowner from development of the property. • Provision of high-quality rural village amenity for future residents including local convenience goods and services. • Ecological enhancement of existing waterways • Extended open space network in Ohoka providing additional recreation opportunities. • Additional supply of housing will assist in avoiding price rises resulting from otherwise suppressed housing supply. • Additional commercial and employment opportunities.	• Change in character and amenity of the site from rural to urban densities. • Increase in traffic generated in and around Ohoka. • Additional infrastructure capacity required, to be provided at the developer's cost. • Loss of agricultural production land.

Table 3: Benefits and Costs of Option 3 – Apply for resource consent(s)

Benefits/Advantages	Costs/Disadvantages
• Council has the ability to more fully assess the proposal, in light of more detailed information required as part of a subdivision and land use consent application(s). • Council has the ability to place more restrictive controls on the development through consent conditions than is practical/possible through a plan change. • Similar benefits as in Table 3 (if consent could be obtained – which is unlikely).	• Landowners would need to obtain consent for alternative uses beyond those permitted in the District Plan or already consented. • Restricted timeframe to give effect to the consent, leading to potential economic costs for landowner/developer. • Less flexibility in being able to develop the land. • Possibly higher costs to develop land through the placing of tighter controls on the development by way of restrictive conditions on a consent. • Significant uncertainty of obtaining resource consent. • Similar costs as in Table 3 (if consent could be obtained – which is unlikely).

145. The above assessment indicates that the costs of Option 3 outweigh the benefits. Numerically the benefits of Option 1 outweigh the costs, but the lost opportunity to provide for additional residential housing capacity carries considerable weight. Option 2, the proposal, has benefits that outweigh the costs.

Effectiveness

146. Beyond the rezoning of the subject land, only minor amendments to existing provisions are required, and new provisions are limited. It is intended that existing Residential 3 and 4A zones and Business 4 Zone provisions apply to the subject land. New provisions involve:

    a. the introduction of the ODP for the plan change area and requiring that subdivision of the land generally complies with the ODP, and a discretionary consent requirement for non-compliance;

    b. a new Residential 8 Zone providing for possible educational facilities or a retirement village as a controlled activity, and permitting residential activities commensurate with the Residential 3 Zone if not developed as a school or retirement village;

    c. a definition of *educational facilities* (National Planning Standard definition);

    d. a new policy (Policy 16.1.1.12) in the Business Zones chapter which supports limited commercial activities via the Business 4 Zone in Ohoka;

    e. reducing the minimum allotment size for the Residential 3 Zone from 600m^2 to 500m^2 within the plan change area;

    f. reducing the average allotment size for the Residential 4A Zone to a maximum of 3,300m^2;

    g. excluding the roads within the plan change area from having to comply with the current road construction standards;

    h. establishing building setbacks, heights and coverage rules appropriate for the location (and generally consistent with existing District Plan standards); and

    i. establishing landscaping and fencing rules to ensure appropriate development of plan change area.

147. Option 2 is considered to be the most effective means of achieving the objective of the proposal which is to provide for the expansion of Ohoka settlement with provision for some associated local business services, in a manner that adds significantly to development capacity and provides for increased competition and choice in residential land markets while still maintaining the rural village character of Ohoka.

Efficiency

148. With reference to the costs and benefits outlined above, the potential benefits of the proposed plan change are considered to outweigh the costs. The proposed plan change is, therefore, considered to be an efficient means of achieving the objective.

Risks of Acting or Not Acting

149. Section 32(2) also requires an assessment of the risk of acting or not acting if there is any uncertain or insufficient information about the subject matter of the provisions (s32(s)(c)). Given previous attention given to the Ohoka settlement, the relevant issues associated with the development of land in this location are well understood. Accounting for the background information to and assessments for those developments, and the technical assessments accompanying this plan change application, there is minimal uncertain or missing information in relation to this proposal. Accordingly, there are no notable risks of acting or not acting.

Examination of the Proposal in terms of the Objectives of the District Plan

150. Table 4 below provides an assessment of the proposed plan change against the relevant objectives of the District Plan. Reference is also made to supporting policies in respect of each objective, where relevant. The relevant objectives (and policies) address the rural and urban environments, residential and business development, and constraints on subdivision and development.

151. Taking into consideration the assessment of effects, it is considered that the proposed plan change is consistent with those objectives.

Table 4: Assessment of relevant plan provisions against the objectives of the District Plan

District Plan provisions	Comment / Assessment
11. Utilities and Traffic Management	
Objective 11.1.1 *Utilities that maintain or enhance the community's social, economic and cultural wellbeing, and its health and safety.* *Objective 11.1.3 Parking* *Parking facilities that:* *a. provide for parking demand in an efficient, functional and sustainable manner;* *b. enhance the amenity and function of town centre and residential environments;* *c. are safe places for people to use and move through;* *d. are accessible and convenient for pedestrians;* *e. provide safe, secure and convenient cycle parking;* *f. support greater use of public transport;* *g. provide for loading and manoeuvring requirements without reducing amenity or compromising safety; and* *h. support town centre consolidation and the development of continuous street frontages within identified sites in the Business 1 Zone where parking is principally located within public parking areas and not provided on individual sites..* *Objective 11.2.1* *Adverse effects on the environment caused by the provision, use, maintenance and upgrading of utilities are avoided, remedied or mitigated.*	Based on the relevant infrastructure and transport assessments (**Appendix G** and **Appendix H** respectively), the plan change proposal is considered to achieve consistency with the relevant objectives of section 11 of the Plan.

12. Health Safety and Wellbeing	
Objective 12.1.1 *Maintain the amenity values and a quality of environment appropriate for different parts of the District which protects the health, safety and wellbeing of present and future generations, and ensure that any potential adverse environmental effects from buildings and structures, signs, glare, noise and hazardous substances are avoided or mitigated.* *Objective 12.1.4* *The retention of plants that contribute significantly to the amenity of a site, or the character or quality of the surrounding environment.*	The plan change proposal is consistent with Objective 12.1.1 given it has been carefully developed to achieve the amenity and environmental expectations set out at Policy 18.1.1.9 which specifically relates to further development of Ohoka. The requirements of the ODP will ensure development of the plan change site is consistent with Objective 12.1.4. In particular, the ODP requires a suitably qualified and experienced arborist, guided by a suitably qualified terrestrial ecologist, to identify trees that are to be retained and integrated into the development and that these trees are protected during construction.
13. Resource Management Framework	
Objective 13.1.1 *Recognise and provide for the community's social and economic relationships within the District and external to the District, particularly those with Christchurch City, so that the District's natural, living, and productive environments:* *a. are managed in an integrated and sustainable way;* *b. provide for and safeguard the community's wellbeing, health, and safety;* *c. are managed to enable the protection and enhancement of natural and physical resources; and* *d. are not adversely affected by resource use, development and protection.* *Policy 13.1.1.1* *Management of natural and physical resources based on areas where there are differences in:* *a. the area's relationships with Christchurch City;* *b. amenity values and environmental qualities;* *c. the area's connection to, and dependence on, the national transport corridor;* *d. the area's form and function;* *e. the area's relationship with other areas within the District;* *f. community resource management expectations;* *g. actual and potential effects of subdivision, use and development; and* *h. historical and cultural associations with Māori Reserve 873.* *Policy 13.1.1.2* *Avoid, remedy or mitigate the adverse effects of the development of Residential 4A and 4B Zones by limiting the establishment of new zones to locations where the subdivision and development will not:* *a. adversely affect significant natural and physical resources;*	This objective sets an overarching framework for resource management in the District. Given the high-level nature of the objective, an assessment against the relevant supporting policies is required to determine consistency of the proposed plan change with the objective. ***Policy 13.1.1.1*** The proposed plan change has been developed in response to the specific characteristics of the Ohoka settlement and surrounds. The following commentary assesses the matters listed a. to h. in the policy. *the area's relationships with Christchurch City* The site is located within the catchment of Christchurch along with the larger proportion of the District's population. *amenity values and environmental qualities* The plan change proposal has been carefully developed to achieve the amenity and environmental expectations which are set out at Policy 18.1.1.9. *the area's connection to, and dependence on, the national transport corridor* The plan change site has good access to State Highway 1 via Tram Road or Mill Road/Ohoka Road. The level of dependence on this transport corridor is likely to be of a similar level as the other urban areas in the east of the District. However, the level of dependence into the future will be influenced by factors such as employment growth within the District. As noted in the economic assessment at **Appendix I**, employment growth in the District increased by 118.2% in the 20 years to 2021 compared to 42.3% nationally. *the area's form and function* A significant design driver of the plan change proposal as described in the urban design assessment (**Appendix F**) is that:

b. *exacerbate damage from natural hazards (including flood damage); and*

c. *create conflict with neighbouring land uses.*

Policy 13.1.1.3

Promote a standard of servicing that recognises:

a. *the different physical environments and servicing constraints of areas within the District;*

b. *the varying densities of the population in different areas; and*

c. *the different amenity values, environmental quality, and community expectations associated with the different zones*

Policy 13.1.1.4

Encourage patterns and forms of settlement, transport patterns and built environment that:

a. *reduce the demand for transport;*

b. *provide choice of transport modes which have low adverse environmental impact;*

c. *decrease the production of motor vehicle emissions;*

d. *make efficient use of regional transport network;*

e. *reduce the rate of use of non-renewable energy sources;*

f. *enable opportunities for intensification and redevelopment within town centres; and*

g. *efficiently manage parking and loading within town centres*

The design concept builds on the inherent qualities of the village character of Ohoka by:

- *creating a residential environment that is compatible with the existing development pattern with smaller sites in proximity to the village centre and larger sites adjoining the rural environment*
- *creating settings for dwellings to nestle into, which are visually contained by landscaped margins*
- *providing opportunities for people to live and work in Ohoka*
- *assisting in the creation of a village centre around the historic setting of Mill / Whites Road intersection and the Domain*
- *providing opportunities for commercial and community facilities to be integrated in the village centre*
- *creating streetscapes that are reflective of the rural character of the village*
- *allowing for the growth of the village through carefully staged development.*

The plan change proposal builds on the existing characteristics of Ohoka to create an enhanced urban node with expanded local convenience, additional recreational space and possibly educational facilities while retaining a rural village character.

the area's relationship with other areas within the District

The expanded Ohoka village will become a more significant urban node within a relatively tight cluster of the District's eastern centres which include Rangiora, Woodend and Kaiapoi.

community resource management expectations

Council documents express a reluctance for further development, which is not uncommon in respect of small rural settlements. However, as addressed in the preceding assessment of effects, the plan change proposal successfully addresses the reasons behind the reluctance for further development.

actual and potential effects of subdivision, use and development

The preceding assessment found that the actual and potential effects of the plan change proposal are acceptable in the specific context of Ohoka.

historical and cultural associations with Māori Reserve 873

Reserve 873 is not relevant to the plan change proposal.

Policy 13.1.1.2

It is considered that subdivision and development within the proposed Residential 4A Zone will not adversely affect significant natural and physical resources, exacerbate damage from natural

	hazards or create conflict with neighbouring land uses. ***Policy 13.1.1.3*** The infrastructure assessment at **Appendix G** demonstrates that development in accordance with the plan change proposal can be adequately serviced in a manner appropriate for type of development envisaged. ***Policy 13.1.1.4*** In a broad sense, this policy encourages land use that supports a sustainable transport system with reduced reliance on fossil fuels. On one hand, approving the plan change proposal would likely result in more private motor vehicle trips, including to and from Christchurch. While this may initially increase vehicle emissions, the trend over the coming years will be towards electric vehicle ownership. Therefore, emissions may reduce overtime despite the increase in trips. Further, initial increases in vehicle emissions will be offset (to an unquantified extent) by a reduction in greenhouse gas emissions through the discontinuation of the current dairy farm operation. On the other hand, the plan change proposal provides for local convenience goods and services within a walkable village. This may also lead to a reduction in vehicle trips for existing residents who live close to the site. Further, park and ride facilities are available at Kaiapoi and Rangiora for inter-district public transport services. It is also relevant to note that the plan change site is within cycling distance (for many people) to Kaiapoi and Rangiora, especially considering the increasing prevalence of e-bikes. **Conclusion** It is considered that the plan change proposal generally accords with Objective 13.1.1.
14. Rural Zones	
Objective 14.1.1 *Maintain and enhance both rural production and the rural character of the Rural Zones, which is characterised by:* *a. the dominant effect of paddocks, trees, natural features, and agricultural, pastoral or horticultural activities;* *b. separation between dwellinghouses to maintain privacy and a sense of openness;* *c. a dwellinghouse clustered with ancillary buildings and structures on the same site;* *d. farm buildings and structures close to lot boundaries including roads;* *e. generally quiet – but with some significant intermittent and/or seasonal noise from farming activities;* *f. clean air – but with some significant short term and/or seasonal smells associated with farming activities; and* *g. limited signage in the Rural Zone.*	Given the purpose of the proposed plan change is to change the existing rural zoning to a combination of urban zones, this objective would no longer be relevant for development within the site if the plan change were approved. However, it remains important that development enabled by the proposed plan change does not prevent this objective from being achieved within the surrounding rural environment (also see Policy 15.1.1.2.a below). The development enabled by the proposed plan change will not detract from the rural characteristics listed in the objective and the objective will continue to be achieved within the adjacent Rural Zone.

15. Urban Environment	
Objective 15.1.1 *Quality urban environments which maintain and enhance the form and function, the rural setting, character and amenity values of urban areas.* *Policy 15.1.1.1* *Integrate new development, subdivision, and activities into the urban environments in a way that maintains and enhances the form, function and amenity values of the urban areas.* *Policy 15.1.1.2* *Within the urban environment subdivision, land use, development and protection should avoid, or mitigate adverse effects on:* *a. the rural setting of the District's towns and settlements;* *b. efficient and effective functioning of roads;* *c. ease and efficiency of access;* *d. urban water bodies, and downstream effects on rural water bodies;* *e. mixed density housing from low scale, low density to higher density levels in areas designed as a comprehensive development. This provides for flexibility in some areas allowing for varied housing needs;* *f. quiet and safe environments;* *g. cycleways; and* *h. the individual character of the settlement.* *Policy 15.1.1.3* *Promote subdivision design and layout that maintains and enhances the different amenity values and qualities of the different urban environments by:* *a. providing links to public open spaces including walkways, cycleways and roads;* *b. ensuring allotment lay out maximises the amenity and sustainable energy benefits;* *c. enhancing the form and function of the surrounding environment;* *d. providing efficient and effective transport networks including cycleways;* *e. integrating new developments with the rest of the urban area, where they adjoin existing urban areas; and* *f. avoiding or mitigating conflicts between the effects of different land uses, such as between residential and business activities.*	Given the sensitivity of the local environment to urban growth (also see Policy 18.1.1.9 below), subdivision and development enabled by the proposed plan will be highly planned and curated to ensure high amenity outcomes appropriate for the setting. In light of the design concept and mitigation proposed, development enabled by the proposed plan change will not detract from the surrounding rural environment. On this basis, the proposed plan change is consistent with this objective. Further, in light of the assessment of effects, the proposed plan change is also supported by the relevant policies associated with the objective.
16. Business Zones	
Objective 16.1.1 *Maintain different zone qualities which provide opportunities for a range of business development appropriate to the needs of the business community, residents and visitors while sustaining the form and function of the urban environments.* *Policy 16.1.1.1*	The location, size and intended function of the proposed Business 4 Zone within the plan change area is consistent with this objective. Supporting policies are concerned that establishment of new business activities do not adversely impact the viability of the Key Activity Centres. As discussed previously, the proposed commercial area within the plan change site will provide for local convenience goods and services but is not of a

Recognise and provide for several Business Zones with different qualities and characteristics which meet the needs of people, businesses and community expectations while: *a. providing for the needs of the business community, residents and visitors;* *b. sustaining the form, function and accessibility of the urban environments;* *c. enhancing the amenity and character of buildings and public open spaces within the town centres;* *d. facilitating private and public services, facilities and activities;* *e. avoiding loss of social, cultural, administrative, and business activities to elsewhere in the towns, the district or to Christchurch;* *f. ensuring an effective and efficient business sector by concentrating activity;* *g. avoiding or remedying any adverse environmental effects on surrounding Residential and Rural Zones; and* *h. ensuring the town centres remain and provide the dominant location and focal point for business, social, cultural, and administration activities.* *Policy 16.1.1.2* *Encourage the establishment of business activities that avoid adverse effects on the function and viability of Key Activity Centres taking into account:* *a. the ability to accommodate the activity within Key Activity Centres;* *b. the potential for significant distributional effects; and* *c. any urban form and transport network effects.* *Policy 16.1.1.12* *Provide for retail and business activities in the Ohoka Business 4 Zone, in a way that:* *a. maintains the characteristics of the Ohoka settlement as set out in Policy 18.1.1.9; and* *b. provides for limited business activities to provide for day-to-day convenience needs of the local community, is designed to achieve high quality urban design principles and a high standard of visual character and amenity.*	scale that could diminish the viability or vibrancy of the Key Activity Centres in the District. For reference the proposed new policy (Policy 16.1.1.12) is included, which is necessary to both enable and limit retail and business activities in Ohoka.
17. Residential Zones	
Objective 17.1.1 *Residential Zones that provide for residents' health, safety and wellbeing and that provide a range of living environments with distinctive characteristics.* *Policy 17.1.1.1* *Maintain and enhance the characteristics of Residential Zones that give them their particular character and quality of environment and provide for comprehensive residential development within the Residential 1, 2, and 6 Zones.* *Policy 17.1.1.2* *Recognise and provide for differences between Residential Zones reflecting the community's expectations that a range of living environments will be maintained and enhanced.*	The plan change request will result the establishment of a high amenity residential environment consistent with the existing rural village character of Ohoka. Existing and proposed rules alongside a non-statutory design guide and design approval process will ensure the desired outcomes are achieved. The proposal is consistent with this objective and the relevant associated policies.

18. Constraints on Subdivision and Development

Objective 18.1.1 *Sustainable management of natural and physical resources that recognises and provides for:* *a. changes in the environment of an area as a result of land use development and subdivision;* *b. changes in the resource management expectations the community holds for the area; and* *c. the actual and potential effects of subdivision, use and development.* *Policy 18.1.1.1* *Growth and development proposals should provide an assessment of how:* *- the use, development, or protection of natural and physical resources affected by the proposal will be managed in a sustainable and integrated way; and* *- the adverse effects on those resources and the existing community will be avoided, remedied, or mitigated.* *Policy 18.1.1.3* *Any proposal for extensions to existing zones, or for new zones, should recognise the nature, scale and intensity of effects arising from existing activities adjoining or near to the site of the plan change and show how the proposal will avoid, remedy or mitigate any adverse effects on the environment arising from those existing activities.* *Policy 18.1.1.9* *Ensure that any growth and development of Ohoka settlement occurs in a manner that:* *- maintains a rural village character comprising a predominantly low density living environment with dwellings in generous settings;* *- achieves, as far as practicable, a consolidated urban form generally centred around and close to the existing Ohoka settlement;* *- encourages connectivity with the existing village and community facilities;* *- achieves quality urban form and function;* *- allows opportunities for a rural outlook;* *- encourages the retention and establishment of large-scale tree plantings and the use of rural style roads and fencing;* *- limits the potential for reverse sensitivity effects;* *- avoids significant flood hazards;* *- promotes the efficient and cost-effective provision and operation of infrastructure;* *- recognises the low lying nature of the area and the need to provide for stormwater drainage; and* *- ensures that any residential development occurring in the Ohoka settlement does not increase the flood risk within Ohoka and adjoining areas.* *Explanation*	This objective seeks sustainable management of the natural and physical resources of the District and provides a framework for change. The policy that implements this objective in respect of the growth and development of Ohoka is 18.1.1.9. In relation to the growth and development of Ohoka, the policy lists an extensive list of expectations. As discussed previously in the assessment of effects and in the urban design assessment (**Appendix F**), the plan change proposal is consistent with this policy direction. As per the explanatory material in the Plan, Policy 18.1.1.1 provides: *the basis of determining the effects of any plan change proposal. The environmental quality and community expectations for an area can be the foundation for determining the impact of the proposal and providing for integrated management of the District's resources.* The full text of the policy has not been included in the left column given the length of the listed requirements. Based on the preceding assessment of effects, and the supporting assessments referred to therein, it is considered that the plan change proposal achieves consistency with the relevant policy direction. In respect to Policy 18.1.1.3, the preceding assessment of effects finds that there are no noteworthy reverse sensitivity issues affecting the plan change site. Minor changes are proposed to the explanatory material relating to Policy 18.1.1.9 to accommodate the densities proposed by the plan change which are supported by the urban design assessment.

Growth of Ohoka settlement, defined by the Residential 3, 4A and 4B zones, is constrained by the need to ensure that any future residential development maintains its rural village character. This is most likely to be achieved by consolidating growth around or adjacent to the existing urban area and ensuring that development complements the existing low density rural residential environment. A consolidated growth pattern will provide opportunities for establishing connections with the existing settlement and community facilities, including the Ohoka School. This form of development is also anticipated to promote the efficient provision of reticulated water and wastewater infrastructure and reduce the potential for reverse sensitivity effects on surrounding rural activities.

It is important that any further rural residential development occurs in a way, and to an extent, that does not overwhelm the special semi-rural character of the settlement.

It is expected that the type of growth and development required to maintain the rural village character of Ohoka is that of low density living, where larger allotments ~~dwellings are situated within generous settings comprising an average lot size of between 0.5 – 1.0 hectare~~ surround smaller properties which form a walkable community around the village centre. The presence of rural village attributes within ~~such~~ the low density residential areas, including the retention and establishment of large-scale tree plantings and the use of rural style roads and fencing, will also assist in maintaining the settlement's rural themed characteristics. This type of settlement pattern is anticipated to generate a high level of amenity, including opportunities for a range of lifestyle living activities and an aesthetic rural outlook. This can be achieved either by enabling views into open green space or by the establishment of treed vegetation areas within or adjoining properties.

Another development constraint for growth at Ohoka is the need to avoid land subject to significant flood risk. It will therefore be necessary for any proposed development to demonstrate that the land is suitable for its intended use and is not subject to undue risk of inundation. This includes the impact of cumulative effects on the area's drainage systems.

152. Overall, it is considered that the proposed plan change is generally consistent with the objectives and policies of the Waimakariri District Plan, albeit one new policy is proposed which enables and limits commercial activities in Ohoka through the Business 4 zoning. As such, it is considered that the resultant character, amenity and environmental effects of the proposal are consistent with those sought in the District Plan. Further, it is considered that the proposal is an appropriate means of achieving the outcomes sought by the objectives and policies of the District Plan.

Overall Assessment

153. Based on the above assessment, it is concluded that the proposed plan change is the most appropriate method for achieving the objectives and policies of the District Plan and the objective of the proposal. Further, it is concluded that the economic, social and environmental benefits of the proposed plan change outweigh the potential costs. On this basis, the proposed rezoning is considered to be an appropriate, efficient and effective means of achieving the purpose of the Act.

Statutory Framework

Sections 74 & 75 of the Act

154. Section 74 of the Act prescribes that Council must prepare and change a district plan in accordance with its functions under s31 and the provisions of Part 2.

155. Council must also have regard to an evaluation report prepared in accordance with s32.

156. Section 74(2) requires Council to also have regard to proposed regional plans, management plans, the Historic Places Register, regulations or the Plans of adjoining territorial authorities to the extent that these may be relevant.

157. It is noted that the proposal does not involve any cross territorial issues, any matters of historical reference (on the Historic Places Register) or matters addressed by management plans or strategies prepared under other legislation. With respect to Regional Plans, these are identified and addressed later in this report.

158. Section 74(2A) requires Council to take into account relevant planning documents recognised by an iwi authority, to the extent that its content has a bearing on resource management issues.

Section 31 – Functions of Council

159. Any plan change must assist Council to carry out its functions so as to achieve the purpose of the Act. The functions of a territorial authority are set out in s31 of the Act and include:

- establishing, implementing and reviewing objectives, policies, and methods to achieve integrated management of the effects of the use and development of land; and

- controlling actual or potential effects of the use and development of land.

160. The plan change request accords with these stated functions. The proposal provides for the use and development of land for residential activities as an extension of Ohoka settlement, with only such amendments as are necessary to recognise the site and the proposed ODP. The proposed ODP provides the methods for Council to manage potential effects of this activity and demonstrates an integrated management approach.

Section 75 – Contents of District Plans

161. Section 75 requires a District Plan to state objectives for the District, policies to implement the objectives and rules to then implement the policies.

162. The proposal does not introduce any new, or alter any existing, objectives. As discussed previously, the proposal involves a minor amendment to one policy and minor amendments to the explanations relating to two other policies.

163. Section 75 requires a District Plan to not be inconsistent with Regional Plans. These are identified and discussed in paragraphs further below.

164. Section 75(3)(a), (b) and (c) also requires a District Plan to give effect to any National Policy Statement, the New Zealand Coastal Policy Statement and the Regional Policy Statement. These are discussed as follows:

National Policy Statements and New Zealand Coastal Policy Statement

165. The Waimakariri District Plan is required under Section 74(1)(ea) of the Act to prepare or change its district plan in accordance with National Policy Statements ('**NPS**'), and the New Zealand Coastal Policy Statement.

166. The New Zealand Coastal Policy Statement is not relevant to the site, given the site is not located in or near the coastal environment.

167. With regard to the NPS for Renewable Electricity Generation 2011, the proposal does not involve nor is it located in the proximity of a renewable electricity generation activity. The plan change site is traversed in the western corner by 66kV electricity transmission lines, meaning the NPS for Electricity Transmission 2008 is relevant. Any development will comply with required setbacks and restrictions relating to works and activities near the transmission lines. For this reason, it is considered that the proposal is consistent with the NPS for Electricity Transmission 2008.

168. Stormwater and wastewater discharges will be dealt with at subdivision; however, no practices or effects are anticipated that would be inconsistent with the NPS for Freshwater Management 2020. This is supported by the ecology assessment (**Appendix D**).

169. Aside from the above, the National Policy Statement for Urban Development 2020 (NPS-UD) which took effect on 20 August 2020 is of principal relevance to this plan change.

170. The most relevant objectives and policies of the NPS-UD are as follows:

> *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 2: Planning decisions improve housing affordability by supporting competitive land and development markets.*
>
> *Objective 3: Regional policy statements and district plans enable more people to live in, and more businesses and community services to be located in, areas of an urban environment in which one or more of the following apply:*
>
> *a. the area is in or near a centre zone or other area with many employment opportunities*
>
> *b. the area is well-serviced by existing or planned public transport*
>
> *c. there is high demand for housing or for business land in the area, relative to other areas within the urban environment.*

Objective 4: New Zealand's urban environments, including their amenity values, develop and change over time in response to the diverse and changing needs of people, communities, and future generations.

Objective 6: Local authority decisions on urban development that affect urban environments are:

a. *integrated with infrastructure planning and funding decisions; and*

b. *strategic over the medium term and long term; and*

c. *responsive, particularly in relation to proposals that would supply significant development capacity.*

Objective 8: New Zealand's urban environments:

a. *support reductions in greenhouse gas emissions; and*

b. *are resilient to the current and future effects of climate change.*

Policy 1: Planning decisions contribute to well-functioning urban environments, which are urban environments that, as a minimum:

a. *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

b. *have or enable a variety of sites that are suitable for different business sectors in terms of location and site size; and*

c. *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*

d. *support, and limit as much as possible adverse impacts on, the competitive operation of land and development markets; and*

e. *support reductions in greenhouse gas emissions; and*

f. *are resilient to the likely current and future effects of climate change.*

Policy 2: Tier 1, 2, and 3 local authorities, at all times, provide at least sufficient development capacity to meet expected demand for housing and for business land over the short term, medium term, and long term.

Policy 3: In relation to tier 1 urban environments, regional policy statements and district plans enable:

…

d. *in all other locations in the tier 1 urban environment, building heights and density of urban form commensurate with the greater of:*

(i) the level of accessibility by existing or planned active or public transport to a range of commercial activities and community services; or

(ii) relative demand for housing and business use in that location.

Policy 4: Regional policy statements and district plans applying to tier 1 urban environments modify the relevant building height or density requirements under Policy 3 only to the extent necessary (as specified in subpart 6) to accommodate a qualifying matter in that area.

Policy 6: When making planning decisions that affect urban environments, decision-makers have particular regard to the following matters:

a. *the planned urban built form anticipated by those RMA planning documents that have given effect to this National Policy Statement*

b. *that the planned urban built form in those RMA planning documents may involve significant changes to an area, and those changes:*

(i) may detract from amenity values appreciated by some people but improve amenity values appreciated by other people, communities, and future generations, including by providing increased and varied housing densities and types; and

(ii) are not, of themselves, an adverse effect

c. *the benefits of urban development that are consistent with well-functioning urban environments (as described in Policy 1)*

d. *any relevant contribution that will be made to meeting the requirements of this National Policy Statement to provide or realise development capacity*

e. *the likely current and future effects of climate change.*

Policy 8: Local authority decisions affecting urban environments are responsive to plan changes that would add significantly to development capacity and contribute to well-functioning urban environments, even if the development capacity is:

a. *unanticipated by RMA planning documents; or*

b. *out-of-sequence with planned land release.*

171. While the development enabled by the plan change proposal is unanticipated by the Waimakariri District Plan and Canterbury Regional Policy Statement, it is type of proposal which Policy 8 of the NPS-UD seeks to enable by requiring councils to be responsive. The purpose of the responsive planning policy is to enable, in qualifying circumstances, the consideration of unanticipated or out-of-sequence land development. Whether a development proposal *qualifies* for consideration depends on its consistency with the objectives of the NPS-UD, in particular, whether the development adds significantly to development capacity and contributes to well-functioning urban environments.

172. The proposed plan change will add significantly to development capacity in the District. The economic assessment at **Appendix I** calculates that residential development capacity of the plan change area represents around 3.4% of the existing dwellings in the District.

173. The term *urban environment* is defined in the NPS-UD as area of land that is or is intended to be predominantly urban in character; and is or is intended to be part of a housing and labour market of at least 10,000 people. Ohoka is part of the Greater Christchurch urban area and therefore part of the *urban environment*. Indeed, the District Plan in the Urban Environment chapter lists Ohoka as forming part of the urban environment of the Waimakariri District. The question is, will approving the plan change proposal contribute to a well-functioning urban environment? To answer this question, the component parts of the criteria listed in Policy 1 are addressed below.

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

174. This is achieved through the combination of Residential 3 and 4A zones and by possibly providing for a retirement village in the Residential 8 Zone (accepting that it may not be developed). This provides for variety and choice through the supply of approximately 850 to 900 households. The proposal will also enable Māori to express their cultural traditions and norms, to the extent relevant to the site context.

have or enable a variety of sites that are suitable for different business sectors in terms of location and site size; and

175. Appropriately sized commercial areas are proposed within the plan change area to provide for local convenience goods and services.

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

176. Natural and open spaces are a feature of Ohoka and will be added to through the development of the plan change area. Community services are located in nearby Rangiora and Kaiapoi, and in Christchurch. In term of employment, apart from those who work from home and the few who may be employed in Ohoka, most of the future working age residents of the plan change area will be employed in Kaiapoi or Rangiora, or most likely in Christchurch. As noted in the economic assessment, while the District remains a dormitory area for Christchurch, it has experienced comparatively higher growth in employment over the past 20 years than for Christchurch (and for New Zealand as a whole).

177. People travelling to places of employment in the District or in Christchurch will be well served by a road network that has capacity to accommodate expected level of traffic from future development enabled by the plan change. A vehicle trip to Christchurch is straightforward via Tram Road, or Mill Road and Ohoka Road, and the Northern Motorway. Alternatively, residents can travel to Christchurch using by bus using park and ride facilities in nearby Kaiapoi. As noted in the transport assessment:

The bus that serves these facilities has four buses into central Christchurch in the morning and five return services in the evening. The trip to / from the City takes approximately 30 minutes and has no interim stops (after the Kaiapoi southern Park and Ride). The bus is able to use the 'T2' lanes on the State highway to avoid congestion.

178. Active transport is promoted by the compact walkable/cyclable form of the proposed village expansion which will feature local convenience at the centre. Bicycling to nearby Kaiapoi takes between 20 and 30 minutes along flat roads (15 to 25 minutes to the commercial centre in Silverstream). The distance will be achievable for many future residents, particular on an E-bike.

support, and limit as much as possible adverse impacts on, the competitive operation of land and development markets; and

179. This will be achieved as set out in the economic assessment at **Appendix I**.

support reductions in greenhouse gas emissions; and

180. The proposed plan change will support reductions in greenhouse gas emissions through its compact walkable/cyclable urban form (including the provision of local convenience good and services) and the removal of the existing dairy farm from the site.

are resilient to the likely current and future effects of climate change.

181. The plan change proposal achieves this through:

- the distance of the site from coastal and low-lying areas susceptible to sea-level rise and storm surges,
- resilience to heavy rainfall events built into the proposed stormwater management system, and
- the potential for building and landscape design to respond to climatic extremes.

182. The above assessment demonstrates that the plan change proposal will result in, and contribute to, a well-functioning urban environment.

183. It is considered that the plan change proposal is generally consistent with the objectives and policies of the NPS-UD, for the reasons discussed earlier in this report and in the attached expert assessments, particularly the economic assessment at **Appendix I**.

Canterbury Regional Policy Statement

184. The Waimakariri District Plan is required under Section 73(4) of the Act to give effect to the Canterbury Regional Policy Statement 2013 ('**RPS**'). Section 74(2) of the Act also requires territorial authorities to have regard to any proposed regional policy statement when preparing or changing a district plan.

185. The relevant objectives and policies of the RPS are primarily found in Chapters 5 and 6, relating to land-use and infrastructure, and the recovery and rebuilding of Greater

Christchurch. Chapter 15 is also of relevance as it addresses soils and the maintenance of soil quality.

186. Turning to Chapter 5 (and noting that only those objectives and policies applying to the entire region are relevant to this request), Objective 5.2.1 addresses the location, design and function of development. It seeks that:

- development be consolidated in and around existing urban areas as the primary focus;
- the overall quality of the natural environment is maintained and, where appropriate, enhanced;
- economic development is encouraged in appropriate locations;
- adverse effects on significant infrastructure are avoided; and
- conflicts between incompatible activities are avoided.

187. Development enabled by the plan change proposed is not within an existing urban area but will be consolidated around the existing urban area of Ohoka.

188. The plan change site is highly modified with low levels of natural character. While the character of the site will change significantly, from an open pastural landscape to a compact village, the quality of the environment will be maintained, and enhanced in some respects, particularly in relation to ecology.

189. The proposal will not affect significant infrastructure and there are no incompatible activities in the vicinity.

190. With regard to Chapter 6, Objective 6.2.1 (Recovery framework), the objective seeks to enable recovery, rebuilding and development within Greater Christchurch through a land use and infrastructure framework that achieves various things, including:

- avoiding urban development outside of existing urban areas or greenfield priority areas for development;
- maintaining or improves the quantity and quality of water in groundwater aquifers and surface waterbodies;
- maintaining the character and amenity of rural areas and settlements; and
- integrating strategic and other infrastructure and services with land use development.

191. Objective 6.2.2 (Urban form and settlement pattern) seeks to achieve consolidation and intensification of urban areas and avoids unplanned expansion of urban areas.

192. Policy 6.3.1 (Development within the Greater Christchurch area) seeks to give effect to the urban form identified in Map A. That form indicates that the site adjoins but is outside the existing urban area. The policy seeks to ensure new urban activities only occur within existing urban areas or identified greenfield priority areas as shown on Map A.

193. Policy 6.3.5 (Integration of land use and infrastructure) seeks that development be integrated with infrastructure, including by only providing for new development that does not affect the operation, use, development, upgrading and safety of strategic infrastructure.

194. The policy framework referenced above clearly articulates that urban development is to occur inside the existing urban area and greenfield priority area within Greater Christchurch. The proposal is inconsistent with those objectives and policies seeking to avoid urban development outside the urban area. However, as noted above, NPS-UD Policy 8 provides for inconsistency with this requirement.

195. Otherwise, with regard to Objective 6.2.1, the proposal will enhance surface waterbodies, maintain the rural character and amenity of the area, achieve a consolidated and integrated urban form in respect of Ohoka. Further, development enabled by the plan change proposal can be fully serviced without generating unacceptable adverse effects.

196. Objective 6.3.2 (Development form and urban design) seeks that development give effect to urban design principles including integration, connectivity, safety, choice and diversity, environmentally sustainable design, and creativity and innovation. As demonstrated in the various assessments accompanying this plan change request (particularly the urban design assessment), the proposal accords well with this objective.

197. In respect of the transport related objectives and policies in Chapter 6, the plan change site is well served by the road network, with good connections to local key activity centres and to Christchurch, including access to public transport via park and ride facilities. The transport assessment (**Appendix H**) has confirmed the suitability of the adjoining road network for the anticipated vehicle movements. Further, the plan change itself will create a walkable community with provision for local convenience goods and services.

198. Chapter 15 of the RPS contains an objective (15.2.1) seeks to maintain and improve the quality of soils to safeguard their mauri, life supporting capacity, health and productive capacity. In light of the findings in the assessment of potential loss of productive land included at **Appendix A**, the proposal is considered to be consistent with this objective.

199. Overall, the development is considered to be inconsistent with those provisions of the RPS that require new urban development to be located within the existing urban area or identified greenfield priority areas (noting this is overcome through the NPS-UD), but generally consistent otherwise.

Our Space

200. 'Our Space 2018-2048: Greater Christchurch Settlement Pattern Update Whakahāngai O Te Hōrapa Nohoanga' ('**Our Space**') was prepared to satisfy the requirements of the National Policy Statement on Urban Development Capacity (NPS-UDC) for high growth councils to produce a future development strategy that shows there will be sufficient, feasible development capacity to support housing and business growth needs over the medium (next 10 years) and long term (10 to 30 years).

201. The proposal is not expressly contemplated by Our Space which identifies indicative locations of future development areas in Greater Christchurch within the Projected Infrastructure Boundary. However, consistent with the findings regarding the directive

policies in Chapter 6 of the RPS, the recently released NPS-UD provides a more enabling and responsive approach to growth.

202. Accounting for the NPS-UD, the recognition in Our Space that responsive planning is required in response to drivers of change, and that the proposal is otherwise consistent with the key outcomes sought in Our Space in respect of the location and form of growth, the proposal is assessed as being not inconsistent with Our Space.

Land and Water Regional Plan & Canterbury Air Regional Plan

203. The operative Land and Water Regional Plan broadly seeks to manage land and water within the Canterbury Region, by setting water allocation limits and limits on the type and amount of discharges permitted. The objectives and policies of the Canterbury Air Regional Plan broadly seek (in relation to those activities emitting discharges to air) best practicable options to minimise the effects of discharges, manage and in some situations avoid discharges of PM10, manage discharges of odour and dust from solid or liquid waste, and addressing localised effects of discharges including relative to sensitive receptors.

204. The plan change proposal is not considered to be inconsistent with these regional plans.

Mahaanui – Iwi Management Plan 2013

205. The Mahaanui Iwi Management Plan ('**IMP**') sets out Ngāi Tahu's issues, objectives, and policies for natural resource and environmental management within the area bounded by the Hurunui River in the north and the Ashburton River in the south. Under Section 74(2A) of the Act, a territorial authority must take into account any such plan to the extent that it has a bearing on the resource management issues of the district. The IMP is primarily a tool for the Rūnanga in the area it covers. The plan also provides guidance to territorial authorities and others.

206. The IMP sets out the broad issues as well as the specifics for particular areas. These matters are considered below, as they are relevant to the plan change proposal. The IMP does not identify any specific cultural values associated with the subject land that might be adversely impacted by its development.

Ranginui

207. The relevant matters identified in IMP are discharges to air and the protection of night-time darkness. The proposed plan change does not contain controls on these matters. The main discharge to air that could occur through this proposal is the establishment of log burners or similar within individual houses, as well as discharges of dust to air during the development of the site. Such discharges are controlled by Environment Canterbury through the Regional Air Plan. While specific controls in respect of night-time lighting have not been proposed, one would expect lighting to be at a minimum given the rural context.

Wai Māori

208. Freshwater is of considerable cultural significance to Rūnanga. The main matters of concern relate to water quality and quantity and mixing waters from different waterbodies. With the reticulation of effluent disposal from new dwellings the potential from adverse

impacts on groundwater quality are limited. Comprehensive stormwater management is a key design driver of the proposal which provides confidence that no untreated stormwater will reach groundwater or surface water bodies. As discussed previously, the freshwater ecology of surface water bodies within the site will be enhanced.

Papatūānuku

209. The use of land and how it is developed is of importance to Rūnanga. This section identifies matters such as the urban planning, the subdivision and development of land, stormwater, waste management, and discharges to land. The potential effects of the proposal on the environment have been discussed in the assessment of effects above. That assessment concludes that there will minimal adverse impacts on the quality of the natural environment as no waste or contamination will be discharged in a manner that will compromise the mauri of surface or groundwater.

Tāne Mahuta

210. This section addresses the significance of indigenous biodiversity and mahinga kai to Rūnanga. The application site is not located in a known mahinga kai area. The subject land has been used for farming purposes for many years. However, surveys by Aquatic Ecology Ltd. in the various waterways across the site identified four species of fish including the upland bully, shortfin eel, longfin eel and brown trout. Invertebrate fauna, including koura, are expected to be present also although not surveyed. The proposed protection and enhancement of the principle waterways and their margins will maintain and likely improve the current freshwater ecological values of the land.

Ngā tūtohu whenua

211. There are no known wāhi tapu or wāhi taonga sites within the application site or close by.

Summary

212. It is considered that the proposal will not have an adverse impact on the cultural values of iwi as set out within IMP.

Proposed Waimakariri District Plan

213. The Proposed Plan was notified on 18 September 2021 and submissions closed 26 November 2021. The Proposed Plan is subject to hearings, decisions, and appeals. Further, as mentioned previously, the requester has filed a submission on the Proposed Plan seeking rezoning of this land consistent with this request. Accounting for the above, little weight should be afforded to the provisions of the Proposed Plan at this time. Notwithstanding, an assessment of the most relevant high-level provisions in the Proposed Plan is provided below in Table 1Table 5 below.

Table 5: Assessment of relevant plan provisions against the objectives of the Proposed Plan

District Plan provisions	Comment / Assessment
Strategic Directions	
SD-O1 *Natural environment* *Across the District:* 1. *there is an overall net gain in the quality and quantity of indigenous ecosystems and habitat, and indigenous biodiversity;* 2. *the natural character of the coastal environment, freshwater bodies and wetlands is preserved or enhanced, or restored where degradation has occurred;* 3. *outstanding natural features and outstanding natural landscapes are identified and their values recognised and protected;* 4. *people have access to a network of natural areas for open space and recreation, conservation and education, including within riparian areas, the coastal environment, the western ranges, and within urban environments; and* 5. *land and water resources are managed through an integrated approach which recognises the importance of ki uta ki tai to Ngāi Tahu and the wider community, and the inter-relationships between ecosystems, natural processes and with freshwater.*	The plan change proposal would ultimately result in an improvement to the quality of the natural environment within the site in respect of waterways and their margins, which the public will have access to.

SD-O2
 	
Urban development
 	
Urban development and infrastructure that:
 	
1. *is consolidated and integrated with the urban environment;*
2. *that recognises existing character, amenity values, and is attractive and functional to residents, businesses and visitors;*
3. *utilises the District Council's reticulated wastewater system, and potable water supply and stormwater infrastructure where available;*
4. *provides a range of housing opportunities, focusing new residential activity within existing towns, and identified development areas in Rangiora and Kaiapoi, in order to achieve the housing bottom lines in UFD-O1;*
5. *supports a hierarchy of urban centres, with the District's main centres in Rangiora, Kaiapoi, Oxford and Woodend being:*
   a. *the primary centres for community facilities;*
   b. *the primary focus for retail, office and other commercial activity; and*
   c. *the focus around which residential development and intensification can occur.*
6. *provides opportunities for business activities to establish and prosper within a network of business and industrial areas zoned appropriate to their type and scale of activity and which support district self-sufficiency;*
	The proposed expansion of Ohoka represents consolidation of, and integration with, an existing urban environment in a manner that is sympathetic to the rural village characteristics of the settlement.
	
	The proposal leverages existing Council infrastructure though connection to the reticulated wastewater network.
	
	Development of the plan change site would extend the range of housing options in the District and support/complement the hierarchy of urban centres in the east of the District.
	
	The proposed commercial areas within the plan change site will provide for local convenience goods and services but is not of a scale that could diminish the viability or vibrancy of the main urban centres.
	
	The green and blue network shown on the ODP, as well as the street network, will provide a network of public space which will enhance recreation in the area.
	
	The proposal provides for larger allotments in the southern part of the site (including flanking corridors along Bradleys Road and Whites Road) which act as a density transition into the rural environment.
	
	The plan change proposal would result in the enhancement and protection of Ohoka Stream (along its length through the plan change site) which is a site of significance to Māori.

7. *provides people with access to a network of spaces within urban environments for open space and recreation;* 8. *supports the transition of the Special Purpose Zone (Kāinga Nohoanga) to a unique mixture of urban and rural activities reflecting the aspirations of Te Ngāi Tūāhuriri Rūnanga;* 9. *provides limited opportunities for Large Lot Residential development in identified areas, subject to adequate infrastructure; and* 10. *recognise and support Ngāi Tūāhuriri cultural values through the protection of sites and areas of significance to Māori identified in SASM-SCHED1.*	Overall, the plan change proposal is considered to be consistent with Objective SD-O2.
SD-O3 *Natural environment* *Energy and infrastructure* *Across the District:* 1. *improved accessibility and multi-modal connectivity is provided through a safe and efficient transport network that is able to respond to technology changes and contributes to the well-being and liveability of people and communities;* 2. *infrastructure, including strategic infrastructure, critical infrastructure and regionally significant infrastructure:* a. *is able to operate efficiently and effectively; and* b. *is enabled, while:* i. *managing adverse effects on the surrounding environment, having regard to the social, cultural and economic benefit, functional need and operational need of the infrastructure; and* ii. *managing the adverse effects of other activities on infrastructure, including managing reverse sensitivity;* 3. *the nature, timing and sequencing of new development and new infrastructure is integrated and coordinated; and* 4. *encourage more environmentally sustainable outcomes as part of subdivision and development, including though the use of energy efficient buildings, green infrastructure and renewable electricity generation.*	The plan change provides opportunities for multi-modal connectivity and improved local access to recreational opportunities and local convenience goods and services. The proposal will not adversely affect strategic infrastructure. While the development enabled by the plan change proposal is not *currently* anticipated by the Proposed Plan (pending consideration of the requester's submission), it is considered that it is the type of proposal which Policy 8 of the NPS-UD seeks to enable by requiring councils to be responsive.
SD-O6 *Natural hazards and resilience* *The District responds to natural hazard risk, including increased risk as a result of climate change, through:* 1. *avoiding subdivision, use and development where the risk is unacceptable; and* 2. *mitigating other natural hazard risks.*	The plan change site is not subject to unacceptable hazard risks. In respect to increased risk resulting from climate change, the plan change proposal is relatively insulated because of: - the distance of the site from coastal and low-lying areas susceptible to sea-level rise and storm surges, - resilience to heavy rainfall events built into the proposed stormwater management system, and

	- the potential for building and landscape design to respond to climatic extremes.
Urban Form and Development	
UFD-O1 *Feasible development capacity for residential activities* *Sufficient feasible development capacity for residential activity to meet specified housing bottom lines and a changing demographic profile of the District as follows:* [table omitted]	Consistent with the directions in Policy 2 of the NPS-UD to provide 'at least sufficient development capacity to meet expected demand', the proposal supports the provision of 'sufficient feasible development capacity'.
UFD-P2 *Identification/location of new Residential Development Areas* *In relation to the identification/location of residential development areas:* 1. *residential development in the new Residential Development Areas at Kaiapoi, North East Rangiora, South East Rangiora and West Rangiora is located to implement the urban form identified in the Future Development Strategy;* 2. *for new Residential Development Areas, other than those identified by (1) above, avoid residential development unless located so that they:* a. *occur in a form that concentrates, or are attached to, an existing urban environment and promotes a coordinated pattern of development;* b. *occur in a manner that makes use of existing and planned transport and three waters infrastructure, or where such infrastructure is not available, upgrades, funds and builds infrastructure as required;* c. *have good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport;* d. *concentrate higher density residential housing in locations focusing on activity nodes such as key activity centres, schools, public transport routes and open space;* e. *take into account the need to provide for intensification of residential development while maintaining appropriate levels of amenity values on surrounding sites and streetscapes;* f. *are informed through the development of an ODP;* g. *supports reductions in greenhouse gas emissions; and* h. *are resilient to natural hazards and the likely current and future effects of climate change as identified in SD-O6.*	It is considered that the plan change proposal largely accords with the criteria set out under Policy UFD-P2 2.a.-h.
UFD-P3 *Identification/location and extension of Large Lot Residential Zone areas* *In relation to the identification/location of Large Lot Residential Zone areas:*	It is considered that the plan change proposal is consistent with the criteria set out under Policy UFD-P3 2.a.-e.

1. *new Large Lot Residential development is located in the Future Large Lot Residential Zone Overlay which adjoins an existing Large Lot Residential Zone as identified in the RRDS and is informed through the development of an ODP;* 2. *new Large Lot Residential development, other than addressed by (1) above, is located so that it:* a. *occurs in a form that is attached to an existing Large Lot Residential Zone or Small Settlement Zone and promotes a coordinated pattern of development;* b. *is not located within an identified Development Area of the District's main towns of Rangiora, Kaiapoi and Woodend identified in the Future Development Strategy;* c. *is not on the direct edges of the District's main towns of Rangiora, Kaiapoi and Woodend, nor on the direct edges of these towns' identified new development areas as identified in the Future Development Strategy;* d. *occurs in a manner that makes use of existing and planned transport infrastructure and the wastewater system, or where such infrastructure is not available, upgrades, funds and builds infrastructure as required, to an acceptable standard; and* e. *is informed through the development of an ODP.*	
Energy and Infrastructure	
EI-O2 *Adverse effects of energy and infrastructure* *Adverse effects of energy and infrastructure on the qualities and characteristics of surrounding environments and community well-being are avoided, remedied or mitigated.* *EI-O3* *Effects of other activities and development on energy and infrastructure* *The safe, efficient and effective operation, maintenance, repair, renewal, upgrading and development of energy and infrastructure is not constrained or compromised by activities and development, including by reverse sensitivity effects.*	As per the findings of the infrastructure assessment (**Appendix G**), the proposal can be supported by infrastructure, and will not otherwise compromise the continued operation of existing infrastructure.
Transport	
TRAN-O1 *A safe, resilient, efficient, integrated and sustainable transport system* *An integrated transport system, including those parts of the transport system that form part of critical infrastructure, strategic infrastructure, regionally significant infrastructure, and strategic transport networks, that:* 1. *is safe, resilient, efficient and sustainable for all transport modes;* 2. *is responsive to future needs and changing technology;* 3. *enables economic development, including for freight;* 4. *supports healthy and liveable communities;*	The plan change proposal does not compromise the safety, resilience or efficiency of the transport network. Given the location of Ohoka relative to key urban centres in the District and Christchurch, the plan change proposal is unlikely to reduce dependency on private motor vehicles. However, because the plan change proposal provides for local convenience goods and services within a walkable village, this may reduce some vehicle trips of future and existing residents. Further, park and ride facilities are available at Kaiapoi and Rangiora for inter-district public transport services. It is also relevant to note that the plan change site is within cycling distance (for many people) to Kaiapoi and Rangiora.

5. *reduces dependency on private motor vehicles, including through public transport and active transport; and* 6. *enables the economic, social, cultural and environmental well-being of people and communities.*	
Contaminated Land	
CL-O1 *Contaminated land* *The subdivision, use and development of contaminated land does not adversely affect people, property, and the environment.*	A Detailed Site Investigation will be undertaken at subdivision stage to identify what (if any) remediation is required to satisfy the requirements of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.
Natural Hazards	
NH-O1 *Risk from natural hazards* *New subdivision, land use and development:* 1. *manages natural hazard risk, including coastal hazards, in the existing urban environment to ensure that any increased risk to people and property is low;* 2. *is avoided in the Ashley Fault Avoidance Overlay and high hazard areas for flooding outside of the urban environment where the risk to life and property are unacceptable; and* 3. *outside of the urban environment, is undertaken to ensure natural hazard risk, including coastal hazard risk, to people and property is avoided or mitigated and the ability of communities to recover from natural hazard events is not reduced.*	The plan change site is not subject to unacceptable hazard risks. It is noted that if the site were rezoned as requested, parts of it would be subject to the Urban Flood Assessment overlay.
Sites and Areas of Significance to Māori	
SASM-O1 *Ngā tūtohu whenua* *The historic and contemporary cultural significance for Ngāi Tūāhuriri mana whenua, of and their relationship with ancestral lands, water, sites, wāhi tapu, wāhi taonga and coastal environment is recognised and provided for.*	The plan change proposal would result in the enhancement and protection of Ohoka Stream (along its length through the plan change site) which is a site of significance to Māori.
Ecosystems and indigenous biodiversity	
ECO-O1 *Ecosystems and indigenous biodiversity* *Overall, there is an increase in indigenous biodiversity throughout the District, comprising:* *protected and restored SNAs; and* *other areas of indigenous vegetation and habitat of indigenous fauna that are maintained or enhanced.*	The plan change proposal will ultimately result in ecological enhancement of the waterways and their margins within the plan change site in line with this objective.
Natural Character of Freshwater Bodies	
NATC-O2 *Restoration of natural character*	As above, the proposal achieves consistency with this objective.

Restoration of the natural character of surface freshwater bodies and their margins where degradation has occurred. *NATC-O3* *Use of freshwater body margins* *The use of wetlands, and lakes and rivers and their margins are managed to preserve their natural character.*	
General Objectives and Policies for all Residential Zones	
RESZ-O1 *Residential growth, location and timing* *Sustainable residential growth that:* 1. *provides more housing in appropriate locations in a timely manner according to growth needs;* 2. *is responsive to community and district needs; and* 3. *enables new development, as well as redevelopment of existing Residential Zones.* *RESZ-O2* *Residential sustainability* *Efficient and sustainable use of residential land and infrastructure is provided through appropriate location of development and its design.* *RESZ-O3* *Residential form, scale, design and amenity values* *A form, scale and design of development that:* 1. *achieves a good quality residential environment that is attractive and functional;* 2. *supports community health, safety and well-being;* 3. *maintains differences between zones; and* 4. *manages adverse effects on the surrounding environment.* *RESZ-O5* *Housing choice* *Residential Zones provide for the needs of the community through:* 1. *a range of residential unit types; and* 2. *a variety of residential unit densities.*	The plan change proposal demonstrates consistency with the general residential objectives. In particular, it provides additional housing options in a location assessed as appropriate within the District.
General Objectives and Policies for all Commercial and Mixed Use Zones	
CMUZ-O1 *Commercial development and location* *Sustainable and self-sufficient commercial economic development occurring in a hierarchical network of consolidated commercial centres.* *CMUZ-O2* *Urban form, scale and design* *A scale, form and design of development in all Commercial and Mixed Use Zones that:*	The proposed commercial areas within the plan change site will provide for local convenience goods and services but is not of a scale that could diminish the viability or vibrancy of the main urban centres.

1. *recognises and enhances the centre's role and function and the overall centres hierarchy;*
2. *supports achieving a good quality urban environment;*
3. *recognises the functional and operational requirements of activities and the existing built form; and*
4. *manages adverse effects on the surrounding environment.*

214. Overall, it is considered that the plan change proposal achieves consistency with the relevant high-level objectives of the Proposed Plan.

Part 2 of the Act

215. Part 2 of the Act sets out its purpose and principles which are to promote the sustainable management of natural and physical resources. This is defined to mean:

> *managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety while –*
>
> *(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
>
> *(b) Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
>
> *(c) Avoiding, remedying or mitigating any adverse effects of activities on the environment.*

216. Whether the purpose of the Act is being met involves an assessment informed by reference to the matters set out in sections 6, 7 and 8.

217. Section 6 sets out matters of national importance, none of which are of particular relevance to this application.

218. Section 7 requires particular regard to be had to 'other matters.' Of relevance to this application are:

> *(b) the efficient use and development of natural and physical resources;*
>
> *(c) the maintenance and enhancement of amenity values; and*
>
> *(f) maintenance and enhancement of the quality of the environment;*

219. The proposed plan change is considered to be an efficient use of the land resource as it provides for the expansion of an existing settlement in a sympathetic manner while adding significantly to development capacity in the District.

220. Amenity values will be maintained and enhanced. As assessed previously, while the character of the site will change and become less open, the village will maintain a rural-like aesthetic through careful design.

221. Environmental quality will be enhanced in respect of ecology and through large scale landscaping. More generally, the proposed plan will deliver a high-quality village environment.

222. Section 8 requires the principles of the Treaty of Waitangi to be taken into account. There are also no known cultural values that need to be taken into account in respect of the plan change proposal.

223. The preceding assessment demonstrates that the plan change proposal achieves the purpose of the Act.

Appendix A

Assessment of Potential Loss of Productive Land

Reeftide Environmental
& Projects Ltd
8 Butler Court,
Rolleston, 7614
New Zealand

e: reeftide@gmail.com

TO Rolleston Industrial Developments Ltd
Level 2, ASB House, The Crossing
166 Cashel Street
Christchurch
Attention: Tim Carter/Bruce Van Duyn

FROM Victor Mthamo

DATE 23 November 2021

FILE 181-2021 – 535 Mill Road

SUBJECT Proposed Plan Change – 535 Mill Road/347 Whites Road – Assessment of Potential Loss of Productive Land

☒ MemoReport

☐ For Information Only

☐ For Your Action

1. Introduction

Rolleston Industrial Developments Ltd (RIDL) are seeking a plan change through Waimakariri District Council to rezone approximately 156 ha of rural land at and near 535 Mill Road (or 347 Whites Road) in Ohoka to a residential and commercial zone.

RIDL has engaged Reeftide Environmental & Projects Limited (Reeftide) to carry out a desktop study of the actual and potential effects of the proposed zone change on the productive potential of land and soils.

2. Site Description - Location, Existing and Proposed Land Uses

2.1. Site Location

The main property at 535 Mill Road/347 Whites Road (Sherraine Holsteins Farm – 152.56 ha) is bound by Mill Road, Whites Road, Bradleys Road and some lifestyle blocks to the southwest. Figure 1 shows the location of the proposed plan change area. Table 1 shows the individual land parcels making up the proposed plan change area.

Table 1 – Details of the Individual Land Parcels

Legal Description	Area (ha)
Lot 2 DP61732	20 (part of Sherraine Holsteins Farm)
Lot 2 DP318615	22.922 (part of Sherraine Holsteins Farm)
Lot 3 DP318615	43.7275 (part of Sherraine Holsteins Farm)
Part Lot 1 DP8301	65.9144 (part of Sherraine Holsteins Farm)
Lot 1 DP55849	0.4230
Lot 2 DP55404	0.9080
Pt RS 2220	0.0387
Lot 1 DP318615	1.8540
Pt Lot 1 DP 2267	0.1434
Total	155.931

Table 1 shows that the Sherraine Holsteins Farm makes up 97.8% of the proposed plan change area.

2.2. Land Use

The 152.56 ha Sherraine Holsteins farm comprises a 111-ha milking platform and a 41 ha support block.

The milking herd averages 170 cows. The replacements and bulls are raised on the support block. The farm winters all the stock on the attached support block.

Milking cows are contained within the dairy platform. During autumn, winter and spring any stock on the milk platform spend time on the feed pad. The feed pad reduces the time stock are on the pasture to prevent compaction to the soil.

All stock are fed on grass with maize silage grown and used as feed on the pad over winter, autumn and spring.

Figure 1 – Proposed Plan Change Area Site

2.3. Surface Water

There are multiple waterways or drains that run through the property. The most significant of the waterways is the Ohoka Stream that runs from the northwest to the southeast. There are two springs and one groundwater seep that originate within the property and these feed into drains that run southeast and across Whites Road. The waterways and drains are all permanently fenced to exclude stock. Figure 2 shows the location of the springs and some of the main surface waterways.

2.4. Groundwater Water

Groundwater flows from northwest to southeast. The highest groundwater levels recorded within the plan change area are:

- 0.6 m below ground level in Well M35/0367. This bore is just along Bradleys Road towards the north of the plan change area.
- 0.645 m below ground level in Bore M35/0596 which is within the site.

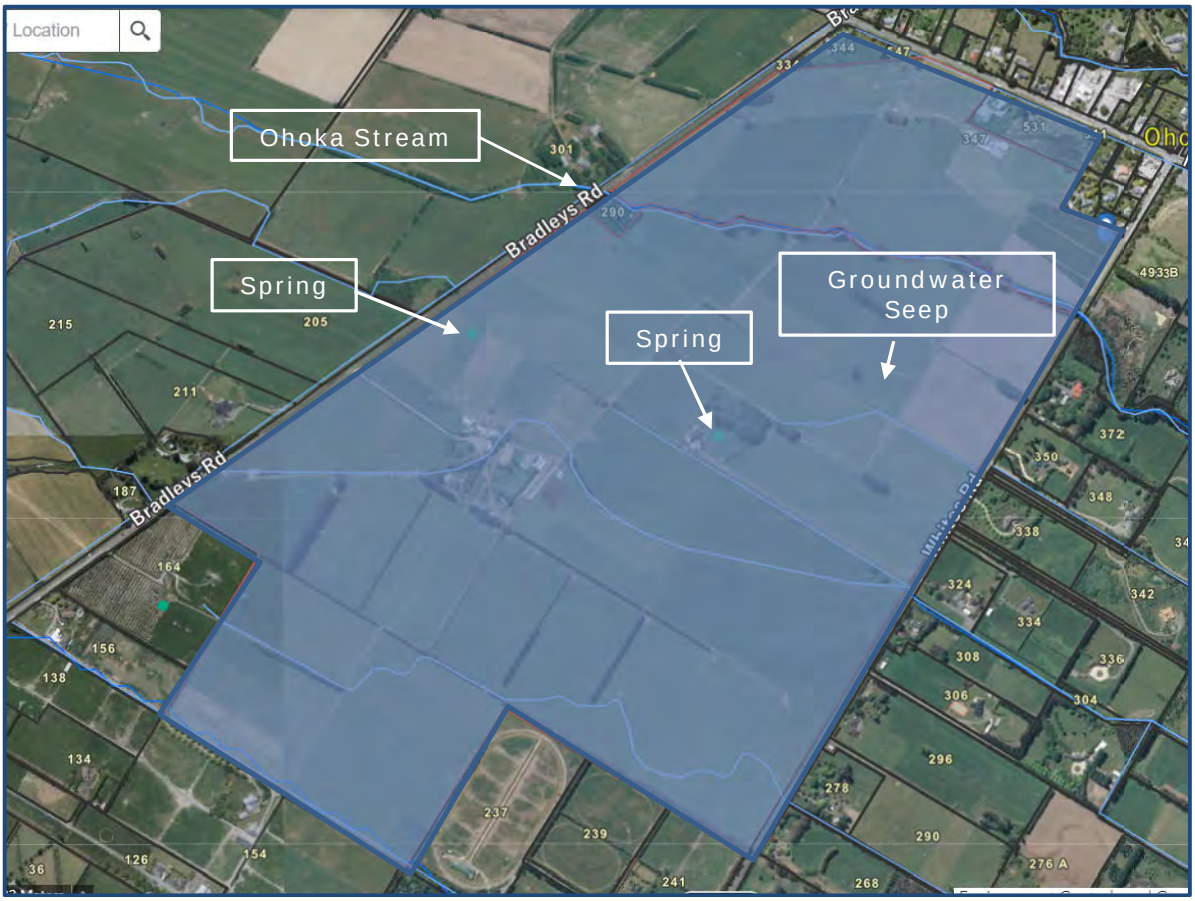

Figure 2 – Location of the Drains and Springs Through the Plan Change Area

2.5. Existing Irrigation

The Sherraine Holstein Farm has consents to take ground water for irrigation. 146 ha of the property is irrigated using guns and k-line systems. The irrigated areas and the irrigation systems are shown in Figure 3.

The other small blocks within the plan change area are not irrigated.

Figure 3 – Current Irrigation Plan (Source- Farm Environment Plan Prepared By Farmsource)

3. Proposed Plan Change Area Soils

S-Maps[1] provides details of the soils under the proposed plan change area. Table 2 has details of each soil sub class.

Table 2 – Area Under Each Soil Type

Soil Name	SMap Name	Soil Texture	Soil Depth (cm)	Permeability	Area (ha)	Percentage (%)
Ayreburn Soils	Ayre_2a.1	Clay	45-100	Moderate/Slow	74.6	48%
Leeston Soils	Lees_1a.1	Clay	20-45	Moderate/Slow	31	20%
Ayreburn Soils	Ayre_1a.1	Clay	>100	Moderate/Slow	32.1	21%
Paynter Soils	Payn_6a.1	Peat over Clay	>100	Slow	16.2	10%
Pahau Soils	Paha_31a.1	Silty Loam over Clay	45-100	Moderate/Slow	1.5	<1%
Darnley Soils	Darn_1a.1	Silty Loam	20-45	Moderate/Slow	<1	<0.4
Leeston Soils	Lees_3a.1	Stony Clay	20-45	Moderate/Slow	<1	<0.3
Total Area					155.9	100

Table 3 summarises the drainage properties of the proposed plan change area and the areas under each drainage class.

[1] https://smap.landcareresearch.co.nz/1

Table 3 – Drainage Properties of the Soils

Drainage Description	Area (ha)	Percentage (%)
Very Poorly Drained	16.5	10.5
Poorly Drained	136.4	87.5
Imperfectly Drained	<3	<2
Moderately Well Drained	<1	<1
Total Area	155.9	100

98% of the soils have poor drainage. Permeability is moderate to slow with most trending towards the slower scale. Poor drainage has significant impact on the soil's productive potential and crop/plant yields, unless the crop types grown are suited to wet feet.

4. Defining Highly Productive Land and Versatile Soils

4.1. Introduction

The purpose of this report is to discuss the effect of the proposed plan change on the land's productive potential. Land productive potential encompasses many facets of which soil is one. Most discussions on soils as relates to its ability to support a multitude of productive uses refer to the soils as being versatile. The words high productive land/soil, high class land/soils, versatile soils/land are always used interchangeably (though there could be some technical differences between them) as Reeftide has done in this report.

Various documents and statutory planning tools in New Zealand provide definitions of versatile soils. Therefore, it is necessary to provide a common understanding of what versatile soils are. Some of the most pertinent definitions are discussed in the following sections.

4.2. The New Zealand Land Resource Inventory (NZLRI)

The Land Use Capability (LUC) is described by Lynn et al. (2009)[2]. It is a general purpose, qualitative evaluation system which has been widely applied in New Zealand for planning land use, especially for management and conservation. The land use capability:

- Is the broadest grouping in the capability classification.
- Classifies land according to properties that determine its capacity for sustainable production for cropping, pastoral farming, forestry and soil/water conservation.
- Reflects general versatility of the land and gives the general degree of limitation to use, taking into account the physical limitations to sustained production.

LUC classification system defines eight LUC classes. Classes 1–4 are classified as arable land, while LUC Classes 5–8 are non-arable. Versatile soils are defined as Class 1, 2, or 3 soils as delineated by the New Zealand Land Resource Inventory (New Zealand Soil Bureau amended 1986).

Figure 4 shows the potential land uses and the relationship between the versatility and LUC classes.

The productive capacity of the land is determined by the physical qualities of the land, soil and environment and its limitations. The limitations are used to define the subclasses under the LUC system. Limitations include susceptibility to erosion, steepness of slope, susceptibility to flooding, liability to wetness or drought, salinity, depth of soil, soil texture, structure and nutrient supply and climate[3].

[2] *Lynn IH, Manderson AK, Page MJ, Harmsworth GR, Eyles GO, Douglas GB, Mackay AD, Newsome PJF 2009. Land Use Capability survey handbook: a New Zealand handbook for the classification of land, 3 rd ed. Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, GNS Science. 163 p.*

[3] *Lynn, IH, Manderson, AK, Harmsworth, GR, Eyles, GO, Douglas, GB, Mackay, AD, Newsome PJF. 2009. Land Use Capability Handbook - a New Zealand handbook for the classification of land 3rd Ed. Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, GNS Science*

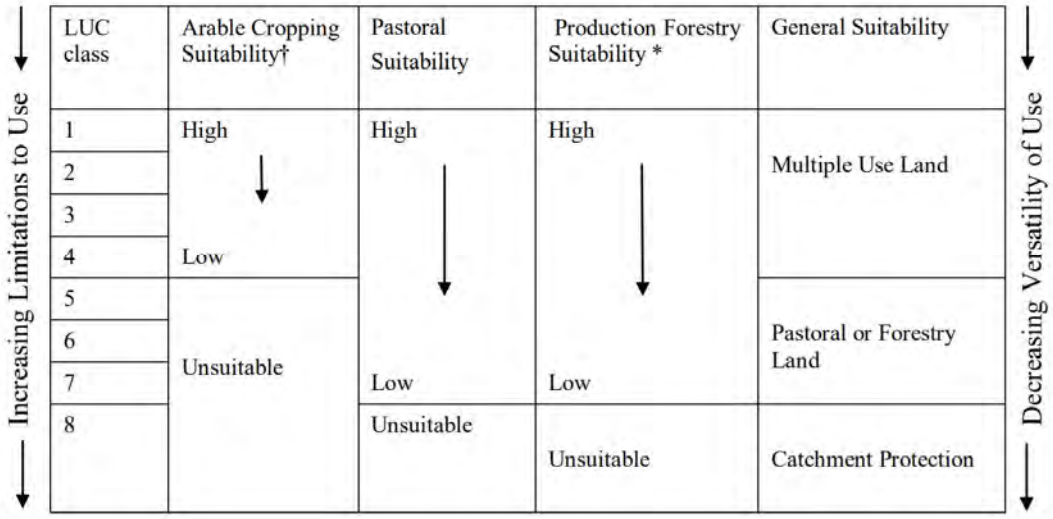

Figure 4 – Relationship between the Versatility and LUC Classes (Lynn et al, 2009[4])

4.3. Canterbury Regional Council

Canterbury Regional Council (CRC) has policies and plans that cover the use of productive land. These are highlighted below.

4.3.1. Regional Policy Statement (RPS)

The RPS states that "*Soil versatility is an expression used to describe the land use capability of soils. A highly versatile soil has few limitations for use, that is it will be suitable for primary production with few inputs such as additional water or nutrients. Less versatile soil will need more inputs to achieve similar production or will simply be unsuitable for agriculture or forestry. In the Canterbury Regional Policy Statement, versatile soils are those soils that are classified as Land Use Capability I or II in the New Zealand Land Resource Inventory*".

Policy 5.3.12 in Chapter 5 of the Regional Policy Statement (RPS) notes that *"Different soils are valued for different reasons. Versatile soils (Classes I and II under the Land-use Capability Classification System) are that part of the soil resource that will support the widest range of productive uses with the least inputs. Soils with lower versatility can be valued for other rural productive activities, such as vineyards*".

Therefore, in summary CRC defines versatile soils as those that are in LUC classes 1 and 2. LUC Class 3 is not included. The total area in Canterbury of LUC Classes 1 and 2 is 293,700 ha[5].

4.4. Waimakariri Council (WDC)

The Waimakariri District Plan addresses the issue of versatile soils in its policies and objectives. Policy 4.1.1.6 refers specifically to versatile soils and seeks to promote land uses which safeguard the life supporting capacity of soils that have been classified as versatile and promote their availability for future uses. The Plan does not define versatile soils but states that they are deemed to be those "*identified as Class 1 and Class 2 land under the LUC system".*

WDC's definition of versatile soils or highly productive land relies a lot on the definition in the RPS (Section 4.3). Therefore, versatile soils are those soils that are in LUC 1 and 2 as per the RPS. There is a total of approximately 33,000 ha[6] to 39,478 ha[7] of land that is classified as versatile soils within the Waimakariri District boundaries.

[4] http://envirolink.govt.nz/assets/Envirolink/83-mldc7-MarlboroughSoilsAdvice.pdf
[5] https://www.tandfonline.com/doi/full/10.1080/00288233.2015.1092996
[6] http://www.greaterchristchurch.org.nz/assets/Documents/greaterchristchurch/Report1.pdf
[7] https://www.mpi.govt.nz/assets/dmstemp/HPL_submissions/2-3-21/E6.-Waimakiriri-DC-Attachment-Redacted.pdf

4.5. Proposed National Policy Statement for Highly Productive Land (Proposed NPS-HPL)

The proposed NPS-HPL defines versatile soils as "*…those soils that fall into land use capability classes (LUC) 1, 2 and 3, meaning those soils with the fewest limitations to their use".*

The stated purpose of the proposed NPS-HPL is to improve the way that highly productive land is managed under the RMA and to protect it from inappropriate use, development, or subdivision.

The proposed NPS-HPL also discusses the importance of specific agricultural production on soil versatility and intends "*….to give councils and their communities the flexibility to identify land that has a lower LUC class rating (i.e. the less versatile land of LUC Classes 4–8), but also contains special properties that make it highly productive and worth protecting (e.g. suitability of the climate, water availability, size of the area of land)*".

It is important to note that the proposed NPS-HPL is still in draft form and has no legal effect yet, and the provisions will likely change to some extent at least.

In summary, the proposed NPS-HPL considers land that is in LUC classes 1-3 as highly productive land or versatile soils.

4.6. Various Authors

A review of literature provides other definitions by various authors.

Hewitt[8] describes a versatile soil as one that is capable of many uses and such a soil *"…needs to be deep, fine-textured, moist, free-draining, loamy, and have an organic-rich topsoil. These properties best enable plant roots to take up nutrients, water and oxygen, and get enough support for rapid growth.*"

Chapman[9] defines a versatile soil as one that has "*..the ability to support production and management of a wide range of crops. It is mainly assessed in terms of soil and land physical characteristics, which have few limitations, such as poor drainage or slope instability*".

4.7. Case law

In Canterbury Regional Council vs Selwyn District Council [W142/96], Environment Court Judge Treadwell[10] ruled that the term versatile soils/land should not be based just on the soils inherent properties but must be defined based on broader considerations than the land use capability. The comprehensive list of factors suggested by Judge Treadwell when defining versatile soils is provided in Table 4 below.

Table 4 – List of Factors Determining Versatility (Treadwell, 1997[10])

Soil texture	Soil structure	Soil water holding capacity
Soil organic matter stability	Site's slope	Site drainage
Temperature of the site	Aspect of the site	Stormwater movements
Floodplain matters	Wind exposure	Shelter planted
Availability of irrigation water	Transport, both ease and distance	Effect of the neighbours on the use
Access from the road	Proximity to airport	Proximity to port
Supply of labour	Previous cropping history	Soil contamination
Sunlight hours	Electricity supply	District scheme
Economic and resale factors		

Judge Treadwell's list shows that a good soil that falls into the LUC Classes 1-3 can still be disqualified for a farming use by one of several of the factors.

[8] *Hewitt, A. E. 'Soils - What makes a good soil?', Te Ara - the Encyclopedia of New Zealand, updated 1-Mar-09 URL: http://www.TeAra.govt.nz/en/soils/*

[9] *Chapman, R. K. 2010. Soil Assessment for the Kingseat Village Structure Plan site - May - 2010. Evidence submitted to Franklin District Council.*

[10] *Canterbury Regional Council v Selwyn District Council [1997] NZRMA 25, Judge Treadwell presiding.*

4.8. Summary Commentary of the Definitions of Soils Versatility

Use of LUC classes appear to be the main method of defining versatile soils. Depending on the reference document versatile soils are either in Class 1 and 2 (Canterbury Regional Council Regional Policy Statement) or in Classes 1, 2 and 3 (NZLRI and the proposed NPS-HPL).

While the proposed NPS-HPL is still at the consultation stage, it is likely to come into effect in late 2021 or in 2022. The proposed NPS-HPL ultimately delegates the responsibility of classifying versatile soils to the regional councils. While some submitters to the proposed NPS-HPL supported the use of LUC Classes 1–3 as the basis for the transitional definition of HPL, there were other submitters who expressed a contrary view that the transitional definition of HPL should be narrower, based on LUC Classes 1 and 2. Therefore, we have considered the use of the RPS definition as the existing best approach. The discussion on soil productive potential is based on the definition in the RPS.

5. Versatility of the Soils at the Proposed Plan Change Area Site

The LUC Classes of the proposed plan change area soils are mapped on Canterbury Maps, S-Maps and LRIS Portal[11]. Figure 5 shows the locations and areas of the LUC Classes. The land is primarily in LUC Class 3 with a small area of LUC Class 2 to the north. Table 5 provides details of the LUC classes.

Table 5 – LUC Classes within the Proposed Plan Change Area

LUC Class	Area (ha)	Percentage
LUC 2	3.82	2.45%
LUC 3	152.111	97.55%
Total	155.93	100%

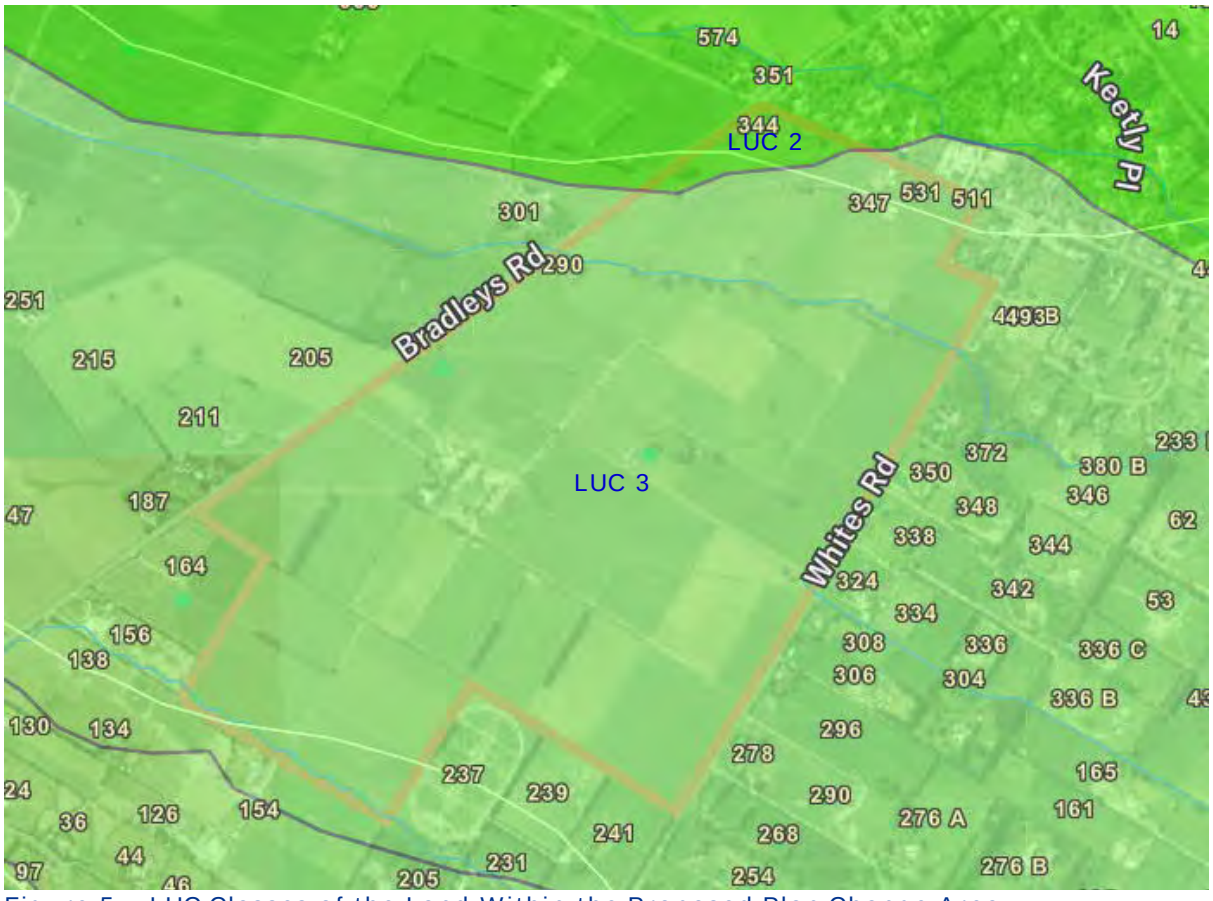

Figure 5 – LUC Classes of the Land Within the Proposed Plan Change Area

[11] https://soils.landcareresearch.co.nz/soil-data/the-lris-portal/

6. Short Coming of the LUC Classification System

The use of the LUC is based on information from S-Maps, NZLRI and Canterbury Maps. It is important to note that:

- The NZLRI LUC maps information should be treated with caution due to the scale (which can be 1:30,000 to 1:50,000 scale), especially with regard to the accuracy of LUC map unit boundaries. Applying regional scale LUC (and soil) map information at property scale should only be used as a guide rather than assumed to represent the definitive soils and LUC map units for the property.
- The LUC alone does not drive land and soil quality. Other factors such as those listed by Treadwell (1997)[10] are likely to restrict the soil/land's capability to support a wider range of horticulture and cropping land uses. For the proposed plan change area, drainage and soil permeability are a considerable limiting factor.
- Since LUC classifications were developed, technologies and farm management have improved significantly. This means that they can be applied to radically alter the productivity of the soils.

7. Assessment of the Productive Potential and Potential Loss of Productive Land

7.1. General

In this section we discuss the actual or potential effect of the proposed plan change on highly productive soils.

7.2. Available and Proportions of Productive Land

7.2.1. Available Productive Land

The areas presented in Tables 1, 2, 3 and 5 are gross areas. For example, in Table 5 the LUC Classes 2 and 3 soils are 3.82 ha and 152.11 ha respectively. Not all of the soils are productive – the homestead is over an area of 6 ha, all waterways are fenced off and riparian areas are not grazed or farmed. The exact area of these and tracks etc has not been delineated as part of the desktop study but will likely be the order of 10-25% based on the high-level maps on Canterbury Maps.

Therefore, the unproductive areas have been conservatively approximated at 21-40 ha (made up of the homestead and the other unproduction area) giving a net productive area of 116-136 ha across the plan change area. Most of these unproductive areas are within the LUC Class 3 soils which means the productive LUC Class 3 soils are in the range of 112-132 ha.

7.2.2. Effect of the Community Drinking Water Exclusion Zone

The Ohoka Township water supply comes from Wells M35/5609 and BX24/0262. The Canterbury Map GIS shows the drinking water protection zones for these bores. Figure 6 shows the extent of the two protection zones. The protection zones are over an area of 7.14 ha of the proposed plan change area. 3.96 ha of this is LUC Class 3 and 3.18 ha of LUC Class 2 soils.

The purpose of the protection zone is to ensure that activities that might have adverse effects on the drinking water supply are not able to be carried out so as to protect the community water supply. This means that intense agricultural activity within the protection would be limited. This further reduces the productive area under LUC Class 3 discussed in Section 7.2.1 to 108.8 -127.8 ha and the LUC Class 2 in Table 5 to just 0.64 ha.

Table 6 is an updated version of Table 5 after removing the areas that are potentially unproductive due to the drinking water exclusion zone, riparian areas etc.

Table 6 – Updated LUC Classes Areas within the Proposed Plan Change Area

LUC Class	Area (ha)	Percentage
LUC 2	0.64	0.5-0.6%
LUC 3	108.8-127.8	99.4-99.5%
Total	109.4-128.4	100%

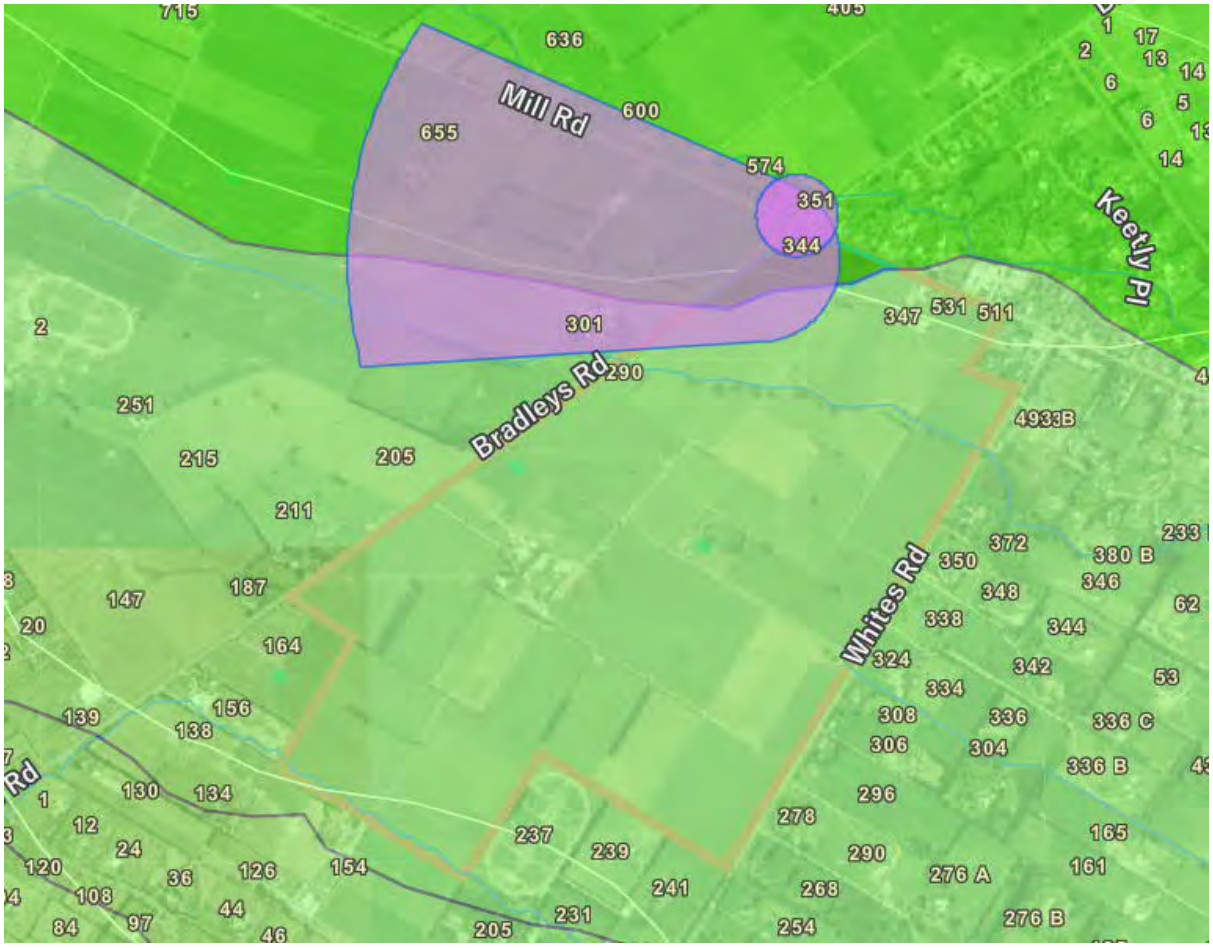

Figure 6 – Drinking Water Protection Zones for Wells BX24/0262 and M35/5609

7.2.3. Scale of Reduction in High Productive Soils

Depending on the LUC definition used, either only 0.5-2.5% or 99.5-100% of the soils are highly productive. If the RPS definition is used 0.64 ha (Sections 7.2.1 and 7.2.2) of the land under the plan change area would be removed from the:

- 39,478 ha[7] of LUC Class 1 and 2 within Waimakariri District; or.
- 293,700 ha of LUC Class 1 and 2 within Canterbury.

Under the NPS-HPL definition, all 155.9 ha to 108.8 ha (excluding areas that are not productive - Sections 7.2.1 and 7.2.2) would be classed as NPS-HPL.

Table 7 provides a summary of the proportional reduction in highly productive land under the proposed plan change.

Table 7 – Potential Reduction in HPL as a Result of the Proposed Plan Change

LU Class	Canterbury (ha)	Waimakariri (ha)	Plan Change Area (ha)	Potential Reduction in HPL Under the RPS		Potential Reduction in HPL Under the NPS-HPL	
				Canterbury	Waimakariri[1]	Canterbury	Waimakariri
LUC1	23,200	39,478	0	0.0002%	0.0016%	0.013-0.015%	0.28-0.33%
LUC2	270,500		0.64				
LUC3	543,000	N/A	108.8-127.8				
Total Area	836,700	39,478	109.4-128.4				

1 – This is a conservative estimate. The actual proportion is less than this as there is no literature on LUC Class 3 soils within Waimakariri.

Using the RPS definition of highly productive land, the reduction in HPL would be 0.0002% and 0.0016% in Canterbury and in Waimakariri District, respectively.

If the NPS-HPL definition is adopted the reduction highly productive land in the district and region would be <0.33% and 0.015% respectively. The 0.28-0.33% reduction in productive land in Waimakariri is conservative as this does not include the total area under LUC Class 3 soils in the district.

These potential reductions in highly productive land are in important give recent case law. In Jay Gock and Fay Gock v Auckland Council [2019] NZHC 276, the High Court in that case found the Environment Court in error for not considering the proportion of soils on the site relative to the wider region. The bench summarised the case as follows:

"*The Environment Court, in assessing whether the relevant areas of premium soils were significant for their ability to sustain food production, had erred by failing to take into account the insignificant area of such soils involved in the present case (100 ha) in the context of the total area of such soils in the Auckland region (63,000 ha)".*

The decision by the High Court is relevant to this proposed plan change given the proportions in Table 7.

7.3. Effects of High Groundwater and Poor Drainage

7.3.1. Effects of High Groundwater

The groundwater levels in the proposed plan change areas have been discussed in Section 2.4.

FAO Drainage Pape No 24[12] note that "*Higher groundwater tables are generally permitted in sandy rather than loam and clay soils due to the difference in capillary fringe above the groundwater table. For most crops minimum depth of groundwater table required for maximum yield has been expressed as : for sand, rooting depth + 20 cm; for clay, rooting depth + 40 cm; for loam, rooting depth + 80 cm".*

The groundwater table can be within 0.6 m of the ground and in clay soils capillary action will cause the water levels to come into the root zone. Roots need to be able to breathe. Inadequate aeration has adverse effects on root function and can result in suppression of yield and crop failure.

Furthermore, the combined effects of the high groundwater table and the poorly drained soils can result in the risk of short periods (up to one week) of anaerobic conditions in the soil after heavy rain, which can:

- Have marked effects on plant growth and yield.
- Induce nitrogen deficiency symptoms e,g, in fruit crops. This is not necessarily due to low soil nitrogen supply, but more likely a root health problem.
- Lead to anaerobic conditions which limits root penetration as well as leading to nitrogen losses in the form of nitrogen and nitrous oxide gas.

All these factors associated with high groundwater have significant adverse effects on production even on soils that are classed as high productive soils using the LUC Class system.

7.3.2. Effects of Poor Drainage

The drainage rating of the soils is highlighted in Tables 2 and 3. Heavy soils such as those found in the proposed plan change area can be hard to work with. Too much moisture can lead to compaction during mechanised activities. Good management is essential as poor management significantly impacts the productive potential of the land.

[12] *Food and Agricultural Organisation Drainage Paper 24. Crop Water Requirements.*

Poor management and excessively poor drainage affect production as some crops/plants do not do well in these soils. Reid and Morton (2019)[13] carried out surveys of commercial crops in Hawke's Bay and Gisborne in 1998–99 and 1999–2000 and concluded that "*…70% lost yield because of insufficient or poorly timed irrigation, and 84% lost yield because of inadequate nutrition. The nutrients most usually in short supply were nitrogen (N) and phosphorus (P). However, extra fertiliser will not compensate for poor crop establishment, water stress, or waterlogging due to heavy rain, excessive irrigation or poor drainage*".

Regardless of the management strategies some plants/arable crops do not tolerate waterlogged soils. A few examples of these are:

- Swedes do not tolerate waterlogging.
- Barley.
- Chicory.
- Lucerne is highly susceptible to waterlogging due to lack of oxygen reaching the deep tap root.
- Pipfruit, stonefruit, berryfruit and avocadoes which experience stunted growth particularly in late winter-spring when soils are waterlogged and bordering on anaerobic.

The list above is only a small sample of crops affected by poor drainage and this demonstrates that while the soils are versatile, they do have inherent limitations that reduces the range of crops that can be grown.

7.3.3. Summary

At least 98% (Table 3) of the soils are Poorly or Very Poorly Drained. Poor drainage, limited aeration, moderate to slow permeability, heavy soil structure and waterlogging vulnerability (Table 2) significantly limits the soil's suitability for horticulture and several arable crop options (Section 7.3.2).

7.4. Moisture Availability and Irrigation

Despite the poor drainage, the land still requires water for irrigation in order to ensure maximum agricultural productivity. Therefore, water availability is an important limiting factor for primary production. The property holds two water take and use consents which are:

CRC991827 permits:

- The taking and using water at:
  - 16-22.8 L/s and a daily volume of 1,809-5,069 m^3/day each from M35/0326 and M35/0367 depending on the flow in the Ohoka Stream (i.e. >800 and >300 L/s).
- Maximum annual volume = 382,872 m^3 from M35/0326 and 382,872 m^3 from M35/0367.
- The taking and using of water for " *…irrigation of crops and pasture for grazing livestock including milking dairy cows*".

CRC991022 permits:

- The taking a maximum of 60 L/s from wells M35/9423, M35/3064, M35/3065 at a combined volume not exceeding 4,968 m^3/day.
- Maximum annual volume = 526,608 m^3.
- The taking and using of water for " *…irrigation of crops and pasture for grazing livestock including milking dairy cows".*
- The application of effluent provided a backflow prevented is used.

CRC991827 has restrictions associated with the flow rates in Ohoka Stream. There are no readily available statistics on the ECan website to determine the probability exceedance statistics associated with the restrictions. In the absence of such flow statistics, it can be surmised that:

[13] http://www.processvegetables.co.nz/assets/Uploads/Nutrient-Management-for-Vegetable-Crops-in-NZ-Manual-Feb-2019.pdf

- When there are no restrictions there is sufficient water available to irrigate the full area.
- When partial restrictions are in place there is insufficient water to irrigate the full area.

Table 8 shows summary statistics of soil moisture deficit for Ohoka based on the climatic data available at the Ohoka CWS (Station 43251).

Table 8 – Sample Statistics for Maximum Soil Moisture Deficits (Ohoka CWS)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	130.9	111.4	42.9	53.2	6.1	2.7	4.7	13.9	36.6	62.8	50.9	41.3
2019	121.4	139.5	133.2	123.5	92.1	5.9	9.3	9.8	19.5	39.9	94.3	132
2020	146.4	146.9	132.7	90.6	91.1	71.6	4.9	25.3	35.5	96.2	100.3	128.2
2021	134.2	133.2	134.6	132.9	120.1	1.3	-	-	-	-	-	-

Table 8 shows that moisture deficits of 111.4-146.9 mm in January and February and this, for many crops, is the period of peak demands and it is likely to coincide with the periods of the lowest Ohoka Stream flows.

When these restrictions come into effect during the peak growing period for any crops the productivity is significantly impacted regardless of the soil's inherent productive potential.

7.5. Statutory Considerations

7.5.1. Canterbury Land and Water Regional Plan (CLWRP)

The CLWRP includes numerous provisions that regulate land use and farming activities. These provisions make it difficult to intensify land use and agricultural production thus constrain the productive potential of the land/soils irrespective of the LUC Class. Examples of policies in the CLWRP that relate to farming intensity are:

- Policies 4.34-4.36 relates to management of nutrient loss from farming among other activities.
- Policies 4.37 to 4.38H which apply to individual farming activities, nutrient user groups and farming enterprises.
- Policy 4.38 which restricts increases in nitrogen loss from farming activities to no more than a total of 5kg/ha/yr above the Baseline GMP Loss Rate.
- Policies 4.41A-D requires that applications for resource consents for farming activities be accompanied by a Farm Environment Plan that has been prepared in accordance with Schedule 7.
- Policy 4.74 requires resource consents for the use of land for farming activities and the associated discharge of nutrients in catchments that are zoned Red. The proposed plan change area is a Red Nutrient Allocation Zone.

The proposed CLWRP Plan Change 7 will also limit some farming activities (e.g. commercial vegetable growing operations) due to the proposed nutrient limits.

OverseerFM modelling was carried out for the farm. Attachment 1 (supplied by the current farm owner) is a copy of the modelling results. This shows a nitrogen loss across the blocks ranges from 4-18 kgN/ha with an average for the farm of 16 kgN/ha/year. The farm has been operated at low stocking levels for several years and the nitrogen baseline would reflect this. Under Policy 4.38 of the CLWRP nitrogen loss levels of >5 kg/ha/year would not be permitted. Therefore, any future production within the plan change area cannot increase the nitrogen loss above these limits. This will constrain any future productivity within the proposed plan change area and will limit the soil productivity. It is, therefore, important that the soils productive potential is not overstated given the constraints that are imposed by the CLWRP.

7.6. Modern Farming Techniques and Soil Management

Reeftide also notes that farming techniques which include technology, soil management, improved plant/crop varieties and cultivars have improved immensely over the last two

decades. This now enables a range of pastoral and arable activities to be undertaken and successfully managed for high productivity on a range of soils.

Figure 7 has been extracted from Horizon Regional Council (2008)[14]. The paper discusses the possibility of agricultural production beyond the soils' natural capital by using technology. Soils in LUC Classes >4 can achieve productivity potential greater than that in soils with LUC Classes <4 by applying one more technological advances (e.g. cultivation, irrigation, fertiliser uses, better crop cultivars etc).

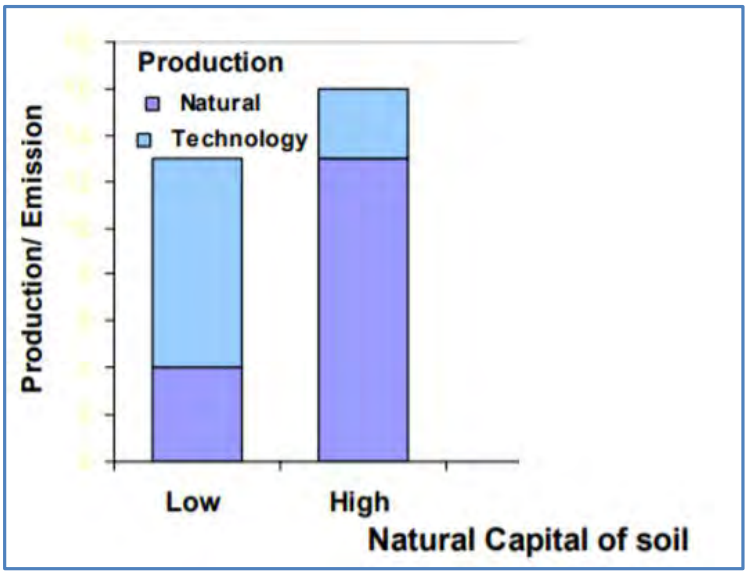

Figure 7 - Production and Emissions from A Well Managed Legume Pasture Top-dressed With P And S Fertiliser Before The Introduction Of Production Technologies (Extracted from Horizon Regional Council[14])

In summary, because of technology there is now more land potentially available as high value land i.e. land that is in the higher LUC Classes can produce high yields when appropriate agricultural practices are in place. Therefore, the proposed change of the 155.9 ha (or approximately 108.8-127.8 ha net) from rural to residential and commercial within Waimakariri District and Canterbury in general will not necessarily reduce the district or the region's agricultural productivity or output.

7.7. Positive Benefits of the Plan Change on the Environment

The proposed plan change will convert dairy agricultural land to residential land. Under dairy production nutrient discharges and impact on the waterways within the farm and downgradient of the farm.

The effects of the current farming activities are best summarised by The Environment Canterbury Technical Report No. R18/81[15]. The report concluded that:

- *"Any increases of nitrate in groundwater are likely to affect the ecology of spring-fed streams, especially the Cust Main Drain, Ohoka Stream and Kaiapoi River. Groundwater in parts of the Cust subzone are also close to the drinking-water limit for nitrate and some groundwater may become unpotable without decreasing nitrogen discharges".*
- *"Groundwater nitrate-N data from two of the wells, at Eyrewell and Ohoka did have increasing trends. Concentrations have risen from around 6.5 mg/L to 7.5 mg/L nitrate-N at our monitoring site in Ohoka in 10 years".*

[14] https://www.horizons.govt.nz/HRC/media/Media/One%20Plan%20Documents/Land2008Implementation-of-FARM-Stratagies-for-Contaminant-management-Further-QuestionsSLURI.pdf?ext=.pdf

[15] *Environment Canterbury Technical Report. 2016. The current state of groundwater quality in the Waimakariri CWMS zone. Report No. xxxx. 2018*

The proposed plan change will change the nature and character of the discharges. Wastewater will be reticulated and pumped to the Council's wastewater treatment system which is in Kaiapoi. Stormwater will be the main source of discharges. Typical contaminants associated with stormwater are sediment, heavy metals and hydrocarbons. Nutrients (nitrates and phosphorus) and pathogens will also be likely contaminants. However, these will be at levels significantly less than those discharged from dairy farming activities.

Stormwater from the development will need to be treated via a treatment train that will ensure removal of various contaminants to levels below the limits in Schedule 8 of the CLWRP so that discharges to the waterways will have no more than minor or less than minor effects on the receiving environments.

8. Summary and Conclusions

The soils in the proposed plan change area fall in LUC Classes 2 (2.45% or 3.82 ha) and 3 (97.55% or 152.11 ha). Under the RPS definition of highly productive soils there is only 2.45% or 3.82 ha of such soils. The rest (152.11 ha) are not highly productive. When unproductive areas (e.g. farm tracks, riparian areas, drinking water protection zone etc) are taken into account the area of versatile soils is only 0.64 ha.

In Section 6, shortcomings of the LUC Classes to define the soil or land's productive potential have been highlighted. Use of LUC Classes is good for planning purposes. However, as discussed in Section 4.7, there are other factors that should be taken into account when assessing the soils' productive potential. Judge Treadwell provided an alternative list of factors that should be considered since these, and many other factors has the potential to affect a piece of land's productive potential.

In Section 7, factors that potentially impact the productive potential of the land within the proposed plan change area have been discussed. Factors beyond the LUC Classes that will affect the production intensification or mitigate against the potential loss of land classed as highly productive land. These include:

- Poor drainage and high groundwater will limit the range of crops that can be grown under the plan change area. This will make the soils or land less versatile than is assumed by the LUC Classes.
- The proportion of versatile soils in the proposed plan change area to those found in Waimakariri District is very small. When the unproductive areas are taken out this is:
  - 0.0016% under the RPS definition of highly productive soils.
  - <0.33% under the NPS-HPL definition of highly productive soils. This is conservative as the area of LUC Class 3 soils has not been included (this is unknown).
- The proportion of the proposed plan change area of versatile soils to those found in the Canterbury Region is even smaller (when the non-productive areas are taken out). This is:
  - 0.0002% under the RPS definition of highly productive soils.
  - 0.015% under the NPS-HPL definition of highly productive soils.
- Potential irrigation availability due to the restrictions associated with the flow regimes in Ohoka Stream. Such restrictions are likely to occur in the summer months when the soil moisture deficit is the highest and crops/plants are at peak consumptive water use.
- The land is currently used for pasture production and is not intensely farmed. Under the CLWRP there are several policies and rules that limit intensive farming. This means any future production intensification would be constrained by the baseline nitrogen loss rates.
- Advances in technology and farming techniques over the years have been such that the removal of any productive soils is unlikely to result in any significant loss in production as this can be made up for elsewhere in the district and even on soils of lower LUC classes.
- The proposed plan change to residential and commercial will halt the current nutrient discharges into surface water and groundwater. Discharges associated with residential subdivision will have less impact on the receiving environment as treatment of stormwater will be required prior to discharge into the receiving environments.

ATTACHMENT 1 – OVERSEER FM MODELLING

SHERRAINE HOLSTEINS LTD - SHERRIFF P & R

347 Whites Rd, Ohoka 7692, New Zealand

Year ending 2020

Analysis type	Year end
Is publication	No
Application version	3.5.1.4
Printed date	12 Jul 2021, 8:10PM
Model version	6.3.5

Farm details

N 16 kg/ha | 2,416 kg P 0.5 kg/ha | 85 kg GHG 8,677 kg/ha | 1,336.3 tonnes NCE: 27 v6.3

Total area	**Not entered**
Productive block area	**146.20 ha**
Nitrogen conversion efficiency (NCE)	**27%**
N Surplus	**136 kg/ha**
Region	**Canterbury**

Total liveweight brought (kg/ha grazed)	**83**
Total liveweight reared (kg/ha grazed)	**146**
Total liveweight sold (kg/ha grazed)	**199**
Default calving date	**06 August**
Milk production per cow (kg milk solids / cow)	**663.3**
Milk solids (kg/ha grazed)	**681**
Milking herd size (peak cows/ha grazed)	**1.0**
Percent male beef animals	**100**
Beef / dairy grazing stock rate (RSU)	**75**
Dairy stock rate (RSU)	**2114**
Dairy replacements stock rate (RSU)	**765**

Analysis comments

DATE	BY	COMMENT
14 Sep 2020,	Sarah	Fertiliser added as per Fert rep. Submaintenance min +KSN,

12:54PM	Brunton	the only N was from Flexi N in the mix so have used this only (163.64kg x 10.98T). Maintenance paddocks mix, only the Cropmaster DAP in the mix has N so used this information only (488.89kg x 18.48). Maize si9de dressing, i have just used N protect as unsure what N protect pink is(625kg x 3.2T)
10 Sep 2020, 9:49AM	Sarah Brunton	Support Block included, same as previous years. Only given one number in stock rec so have assumed this is peak number all year round. Calving is year round and replacements permanently on farm. Have updated irrigation as per FDR and used %PAW of 95 default.

Blocks

NAME	TYPE	AREA (HA)	N LOSS	N LOSS/HA	N SURPLUS/HA	P LOSS	P LOSS/HA
Effluent Gun Block	Pasture	38.7	623	18	181	11	0.3
Gun	Pasture	64	913	16	115	20	0.3
Gun Support	Pasture	41.1	675	16	130	13	0.3
K line	Pasture	2.4	39	16	139	1	0.4
Maize silage	Fodder crop	10	70	7	-125	1	0.1
House & sheds	House	6	22	4	0	2	0.3
Other sources	Other	-	74	-	-	38	-

Farm soils

S-MAP REF/NAME	GROUP/ORDER	DRAINAGE CLASS	MODIFIED	TOTAL AREA (HA)	% OF PROD. BLOCKS	BL
Ayre_2a.1	Sedimentary/Gley	Poor	No	146.2	100	

Crops

CROP/PASTURE	AREA (HA)	YIELD	GROWN (T/DM/YR)	INTAKE (T/DM/YR)	SUPPLEMENTS (T/DM/YR)
Ryegrass/white clover	146.2	-	1614	1165	194
Maize silage	10.0	220 T dry matter	-	-	-

Fertiliser

MANUFACTURER/MATERIAL	NAME	TOTAL APPLIED (KG)	N	P	K	S	CA	MG	NA
Ravensdown	Ammo 31	10,000	3,040	-	-	1,380	-	-	-
Ravensdown	N-Protect	12,000	5,508	-	-	-	-	-	-

Ravensdown	Nitrophoska Select	3,200	480	211	400	80	106	-	-
Custom fertiliser product	Sub Maintenance + KSN 41.4% N	1,800	745	-	-	-	-	-	-
Custom fertiliser product	Maintenance Paddocks Mix 17.6% N	9,035	1,590	1,807	-	-	-	-	-
TOTAL		**36,035**	**11,363**	**2,018**	**400**	**1,460**	**106**	**-**	**-**

Farm nutrient budget

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	2,416	16
Phosphorus	85	0.5

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Fertiliser, lime and other	74	13	3	9	1	0	0
Irrigation	8	0	5	8	30	7	30
Supplements	20	5	5	1	1	1	0
Rain/clover fixation	85	0	2	4	2	4	17

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leached from root zone	16	0.5	7	30	33	1	5
As product	51	9	12	3	12	1	3
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	65	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	45	8	-3	-11	-3	-2	-1
Inorganic mineral	0	3	-25	0	-1	-2	-2
Inorganic soil pool	17	-2	34	0	-7	14	42

Appendix B

Geotechnical Assessment

TETRA TECH COFFEY

535 Mill Road, Ohoka

Geotechnical Assessment Report

Rolleston Industrial Developments Ltd

Reference: 773-CHCGE288040

1 June 2021

535 MILL ROAD, OHOKA

Geotechnical Assessment Report

Report reference number: 773-CHCGE288040
1 June 2021

PREPARED FOR

Rolleston Industrial Developments Ltd
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QUALITY INFORMATION

Revision history

Revision	Description	Date	Author	Reviewer	Approver
V1	GAR	01/06/21	CT	KWH	CT
V0	GAR	26/05/21	CT	KWH	CT

Distribution

Report Status	No. of copies	Format	Distributed to	Date
Final	1	PDF	Bruce Van Duyn	01/06/21

EXECUTIVE SUMMARY[1]

Rolleston Industrial Developments Ltd has engaged Tetra Tech Coffey (NZ) Limited to carry out a geotechnical investigation and assessment of suitability for the proposed Plan Change and future subdivision of 535 Mill Road in Ohoka, Canterbury. The purpose of this report is to support a Plan Change application for the construction of residential Lots at the site.

The site investigations and preliminary liquefaction assessment indicates that the site is TC1-like. Other geotechnical hazards (erosion, slippage and inundation) are considered low to very low risk with appropriate future engineering design.

Our assessment has considered the items required by Section 106 of the RMA and in our opinion the site is considered geotechnically suitable for Plan Change and future subdivision. Further investigations and design will need to be carried out at the subdivision consent stage.

[1] This executive summary must be read in the context of the full report and the attached limitations.

CONTENTS

LIST OF TABLES

APPENDICES

1. INTRODUCTION

Rolleston Industrial Developments Ltd has engaged Tetra Tech Coffey (NZ) Limited to carry out a geotechnical investigation and assessment of suitability for the proposed Plan Change and future subdivision of 535 Mill Road in Ohoka, Canterbury. The purpose of this report is to support a Plan Change application for the construction of residential Lots at the site.

Our assessment has considered the items required by Section 106 of the RMA and in our opinion the site is considered geotechnically suitable for Plan Change and future subdivision. Further investigations and design will need to be carried out at the subdivision consent stage.

2. SCOPE

A scope of assessment work for the approximately 152 Ha total area of the site was developed and carried out by Tetra Tech Coffey, as outlined below:

- Review of previous geotechnical investigations including previous work on the site and surrounding area.
- Site walkover to assess geotechnical hazards.
- Assessment of the geotechnical hazards at the site per Section 106 of the RMA.
- Geotechnical analyses and reporting.

Tetra Tech Coffey have considered the following in the preparation of this report:

- Existing geotechnical investigation data available from the New Zealand Geotechnical Database (NZGD) and Environment Canterbury well database.
- Our existing information for the site.
- Project correspondence with the wider Plan Change consultants engaged by Rolleston Industrial Developments Ltd.

Reference has also been made to the MBIE Guidance Part D: Subdivisions, to confirm that the requirements outlined in these documents have been incorporated in this report.

3. PROPOSED DEVELOPMENT

The proposed Plan Change area comprises five land parcels totalling approximately 152 Ha located to the southwest of Ohoka. The Plan Change area bordered by Bradleys Road, Whites Road, Mill Road, and to the south by rural residential and farmland.

The site is predominantly flat with the Ohoka Stream traversing the northern portion of the site. The site is currently used for farming and appears to have had the land usage for at least 100 years. An historic rail alignment is located near the northern boundary close to the intersection of Bradleys and Mill Roads.

4. SITE INVESTIGATION

The location of the geotechnical investigations carried out on the site to develop the ground models are provided in Figure 1 (in Appendix A) and are summarised below. Investigation logs are presented in Appendix B.

Table 1: 535 Mill Road investigation data

Reference	Depth of test (metres below ground level)	Termination criteria	Reference	Depth of test (metres below ground level)	Termination criteria
TP1	1.7	Target depth	TP18	1.2	Target depth
TP2	1.9	Target depth	TP19	1.4	Target depth
TP3	2.0	Target depth	TP20	1.4	Target depth
TP4	0.6	Target depth	TP21	1.6	Target depth
TP5	1.0	Target depth	TP22	1.4	Target depth
TP6	1.6	Target depth	BH1	16.5	Target depth
TP7	1.6	Target depth	BW24/0297	18.0	Target depth
TP8	1.7	Target depth	M35/0300	114.0	Target depth
TP9	1.8	Target depth	BW24/0520	11.2	Target depth
TP10	1.4	Target depth	M35/0595	9.8	Target depth
TP11	1.2	Target depth	M35/4428	20.3	Target depth
TP12	1.6	Target depth	M35/4795	13.0	Target depth
TP13	1.25	Target depth	M35/5609	18.8	Target depth
TP14	1.5	Target depth	M35/6483	20.0	Target depth
TP15	1.5	Target depth	M35/6688	18.0	Target depth
TP16	1.7	Target depth	M35/6773	24.0	Target depth
TP17	1.0	Target depth	M35/10517	23.2	Target depth

BH1 was drilled (in 2011) under the supervision of Coffey for a Vodafone tower located on the site and the ECan well logs have been sourced from https://www.ecan.govt.nz/data/well-search/.

5. SITE PERFORMANCE

5.1 GROUND MOTION

The site is not in an area mapped for ground damage effects as part of the Canterbury Earthquake Sequence response. A report commissioned by ECan[2] mapped the site as being in an area where 'damaging liquefaction is unlikely'. An extract from the ECan report is shown in Figure 1 below with the site location indicated.

[2] ECan (2012), Review of liquefaction hazard information in Eastern Canterbury, including Christchurch City, and parts of Selwyn, Waimakariri and Hurunui Districts, ref. R12/83

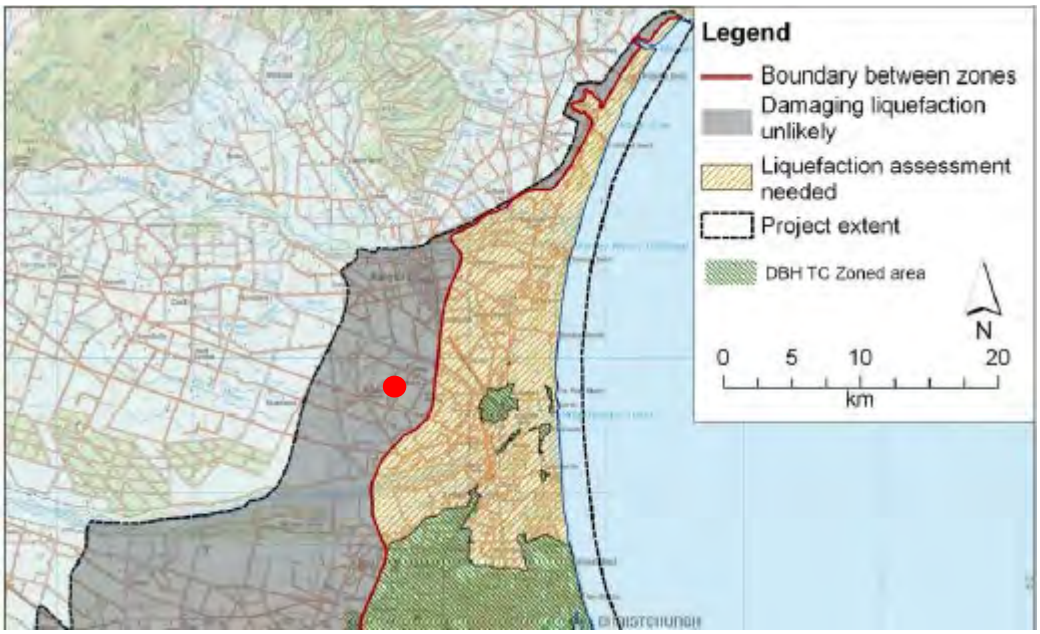


Figure 1: Extract from ECan liquefaction report (site location marked with red dot)

6. GROUND MODEL

6.1 GEOLOGY

The geological map[3] of the area indicates that the site is underlain by "Brownish-grey river alluvium (Q2a)."

6.2 GROUNDWATER

Based on the geotechnical investigations carried out on site, groundwater was encountered between 0.9m and 1.5mbgl. We consider these groundwater levels to be relatively consistent and representative of the general area.

6.3 SUBSURFACE PROFILE

A summary of the ground model for the site is provided below:

Table 2: 535 Mill Road ground profile

Description	Strength/ consistency	Thickness (m)	Depth to top of layer (mbgl)
Silt (topsoil)	N/A	0.25 to 0.35	0.0
Clayey Silt	Stiff to hard	0.5 to 1.2	0.25 to 0.35
Sandy Gravel, with minor silt lenses	Dense to very dense	>30	0.6 to 1.5

Fill was encountered along the alignment of the historic railway line, typically this comprised a sandy gravel and was up to 0.3m thick.

[3] Forsyth, P.J.; Barrell, D.J.A.; Jongens, R. (compilers) 2008: Geology of the Christchurch area: scale 1:250,000. Lower Hutt: GNS Science. Institute of Geological & Nuclear Sciences 1:250,000 geological map 16. 67 p. + 1 folded map

6.4 SITE SUB-SOIL CLASS

In accordance with NZS1170.5, Section 3.1.3, a subsoil classification of “Class D – Deep or soft soil sites” can be assumed for the site.

7. GEOTECHNICAL HAZARD ASSESSMENT

7.1 EROSION

The site has relatively flat topography and is bounded by newly developed residential areas as well as grassed paddock land. Provided appropriate stormwater systems are installed as part of the development, there will be few viable sources of erosion at this site.

7.2 FALLING DEBRIS

As there are no slopes or exposed hills or rock faces surrounding the site, there are no sources of falling debris at the site, or for the surrounding area.

7.3 SUBSIDENCE

7.3.1 Liquefaction induced settlement

Saturated, loose, uniform fine grained alluvial soils are subject to seismic (liquefaction-induced) settlement during a significant earthquake. Liquefaction typically affects saturated, loose granular soils ranging from sandy silts to sands, but seismic shaking can also result in strength losses in fine-grained, cohesive soils. Liquefaction does not occur in dense, well-graded alluvial gravel soils that are present at this site.

Due to the dense nature of the gravel encountered, liquefaction risk is considered to be negligible for this project.

7.3.2 Static settlement

Settlement is a crucial factor that can cause structure serviceability issues. Static load-induced settlement typically occurs in low-lying areas underlain by soft, compressible soils as a result of increased overburden loads. As the site is underlain by stiff to hard clayey silts and then dense river gravels, static settlement is not deemed a hazard for the site provided any earthworks are carried out to the relevant standards.

7.4 SLIPPAGE

We have not observed any sources of land instability on the site and due to the flat site topography, we consider the risk of slope failure to be very low. The appropriate design of batter slopes near waterways will mitigate this risk further.

7.5 INUNDATION

In relation to stormwater inundation, we recommend that drainage design and management at the site be addressed by specialist consultants as it is beyond the scope of this report. We expect that with appropriate stormwater and flood control systems, the risk of inundation will be low.

8. CONCLUSIONS

We consider that the site is suitable for development subject to further investigation and design at the subdivision consent stage. Based on the mapped geology and on-site testing carried out to date, the site is considered TC1-like.

Additional geotechnical investigation will be required to refine the ground model and address any geotechnical risks for the proposed Lots once a subdivision plan has been further developed.

9. LIMITATIONS

This report has been prepared solely for the use of our client, Rolleston Industrial Developments Ltd, their professional advisers and Waimakariri District Council (WDC) in relation to the specific project described herein. No liability is accepted in respect of its use for any other purpose or by any other person or entity.

It is recommended that all other parties seek professional geotechnical advice to satisfy themselves as to its on-going suitability for their intended use.

As subsurface information has been obtained from discrete investigation locations, which by their nature only provide information about a relatively small volume of subsoils, there may be special conditions pertaining to this site which have not been disclosed by the investigation and which have not been taken into account in the report. If variations in the subsoils occur from those described or assumed to exist, then the matter should be referred to us immediately.

Please also refer to the enclosed *Important Information about Your Tetra Tech Coffey Report*.

10. CLOSURE

If you have queries or require further clarification regarding aspects of this report, please contact the undersigned.

For and on behalf of Tetra Tech Coffey

Prepared by

Chris Thompson
BSc (Tech)
Associate Engineering Geologist

Reviewed by

Kah-Weng Ho
BE(Civil) CMEngNZ
Senior Principal

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY REPORT

As a client of Tetra Tech Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Tetra Tech Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Tetra Tech Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Tetra Tech Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Tetra Tech Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Tetra Tech Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Tetra Tech Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Tetra Tech Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Tetra Tech Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Tetra Tech Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Tetra Tech Coffey to work with other project design professionals who are affected by the report. Have Tetra Tech Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Tetra Tech Coffey for information relating to geoenvironmental issues.

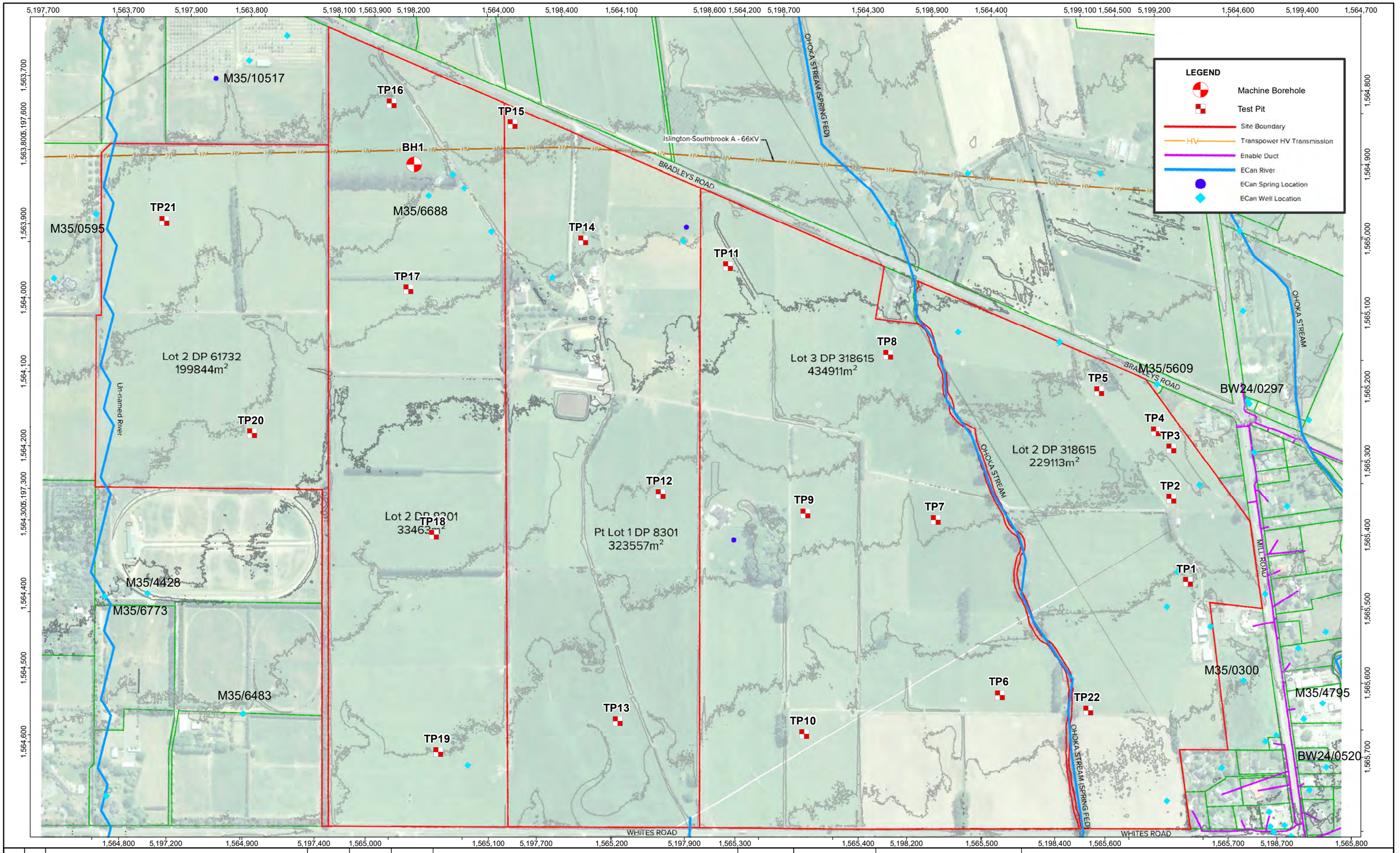
Rely on Tetra Tech Coffey for additional assistance

Tetra Tech Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Tetra Tech Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Tetra Tech Coffey to other parties but are included to identify where Tetra Tech Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Tetra Tech Coffey closely and do not hesitate to ask any questions you may have.

APPENDIX A: SITE PLAN



revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	RZ	CT	14.05.21

0 60 120 180 240
SCALE 1:5,500 (A3) METRES

Projection: NZGD 2000 New Zealand Transverse Mercator

drawn	RZ
approved	CT
date	14.05.2021
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client: ROLLESTON INDUSTRIAL DEVELOPMENT LTD.

project: 535 MILL ROAD, OHOKA

title: SITE PLAN

project no: 288040 | figure no: 01 | rev: A

MXD ref: 288040_01_GIS001_1

APPENDIX B: INVESTIGATION DATA

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP01***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.: -

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N					0		ML	**SILT**: low plasticity, brown, with trace of rootlets.	D				**TOPSOIL**
					0.5		ML	**SILT**: low plasticity, brown-grey with orange mottling.		St - VSt			**QUATERNARY ALLUVIUM**
		▶			1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey with orange mottling.	W	MD - D			
					1.5				S				
					2.0			Excavation TP01 terminated at 1.7 m Target depth					
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP02***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N		▶			0		ML	**SILT**: low plasticity, brown.	D				**FILL**
					0.5		ML	**Clayey SILT**: low - medium plasticity, pale brown with orange mottling.					**QUATERNARY ALLUVIUM**
					1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey-brown.	W				
					1.5				S				
					2.0			Excavation TP02 terminated at 1.9 m Target depth					
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- * bit shown by suffix
- e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP03***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (kPa) ⊕ remoulded ⊙ peak (50 100 150 200)	DCP (blows/ 100 mm) (2 4 6 8 10)	structure and additional observations
E N					0.0		ML	**SILT**: low plasticity, brown.	D				**FILL**
							GP	**Sandy GRAVEL**: brown-grey.					
							ML	**Clayey SILT**: medium plasticity, grey with orange mottling.					
			VS 150/ 40 kPa		0.5		ML	**Clayey SILT**: low to medium plasticity, grey-brown with orange mottling.		VSt	⊕ ⊙		**QUATERNARY ALLUVIUM**
			VS 120/ 21 kPa		1.0				W - S		⊕ ⊙		
		▶			1.5		GW	**Sandy GRAVEL**: medium to coarse grained, grey-brown, with trace of cobbles.	S				
					2.0			Excavation TP03 terminated at 2.0 m Target depth					
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP04***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded ⊕ / peak ⊙) (kPa) 50 100 150 200	DCP (blows/100 mm) 2 4 6 8 10	structure and additional observations
E N		Not Encountered	VS 203/ 53 kPa		0.5		GP	**SILTY GRAVEL**: medium to coarse grained, pale brown, with trace of cobbles.	M				**FILL**
							GW	**SILTY GRAVEL**: medium to coarse grained, pale brown.					
							ML	**Clayey SILT**: low to medium plasticity, grey-brown with orange mottling.		VSt - H	⊕ ⊙		**QUATERNARY ALLUVIUM**
					1.0			Excavation TP04 terminated at 0.6 m Target depth					
					1.5								
					2.0								
					2.5								
					3.0								
					3.5								

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration (1 2 3) — no resistance ranging to refusal

water — 10-Oct-12 water level on date shown; water inflow; water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP05***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.: -

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N					0.0		ML	**SILT**: low plasticity, pale brown.	D				**TOPSOIL**
			VS 81/ 33 kPa		0.5		ML	**Clayey SILT**: medium plasticity, grey-brown with orange mottling.		St	⊕ ⊙		**QUATERNARY ALLUVIUM**
							ML	**SILTY GRAVEL**: medium to coarse grained, grey with orange staining.		D			
					1.0			Excavation TP05 terminated at 1.0 m Target depth					DCP 1.0 - 1.1m: Refusal
					1.5								
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration

1 2 3 — no resistance ranging to refusal

water

10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP06***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.: -

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (kPa) ⊕ remoulded ⊙ peak (50 100 150 200)	DCP (blows/ 100 mm) (2 4 6 8 10)	structure and additional observations
E N		Not Encountered			0.0		ML	**SILT**: low plasticity, brown, with trace of rootlets.	D				**TOPSOIL**
			VS 156/ 42 kPa		0.5		ML	**Clayey SILT**: medium plasticity, pale grey with orange mottling.		VSt	⊕ ⊙		**QUATERNARY ALLUVIUM**
					1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey-brown with orange staining.	M D	D			DCP 0.8 - 0.9m: Refusal
					1.5			Excavation TP06 terminated at 1.6 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration (1 2 3) — no resistance ranging to refusal

water — 10-Oct-12 water level on date shown; water inflow; water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP07***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

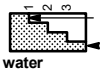
method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N					0		ML	**SILT**: low plasticity, pale brown, with trace of rootlets.	D				**TOPSOIL**
			VS UTP		0.5		ML	**Clayey SILT**: pale grey-brown with orange mottling.	M	VSt - H	VS UTP		**QUATERNARY ALLUVIUM**
		▶			1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey, with trace of cobbles.	W S				
					1.5								
					2.0			Excavation TP07 terminated at 1.6 m Target depth					
					2.5								
					3.0								
					3.5								

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

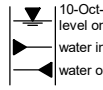
support
- M mud
- C casing
- N nil

penetration



no resistance ranging to refusal

water


10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP08***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.: -

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E, N		Not Encountered			0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
			VS 75/ 30 kPa		0.5		ML	**Clayey SILT**: medium plasticity, grey with orange mottling.	W	St - VSt	⊕ ⊙		**QUATERNARY ALLUVIUM**
			VS 165/ 33 kPa		1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey-brown, with trace of cobbles.	S	D	⊕ ⊙		DCP: 1.0 - 1.1m: Refusal
					1.5								
					2.0			Excavation TP08 terminated at 1.7 m Target depth					
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP09***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N					0.0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
			VS 114/ 31 kPa		0.5		ML	**Clayey SILT**: medium plasticity, pale grey-brown with orange staining.		St - VSt	⊕ ⊙		**QUATERNARY ALLUVIUM**
			VS 141/ 42 kPa		1.0				W		⊕ ⊙		
		▶			1.5		GW	**Sandy GRAVEL**: medium to coarse grained, grey.	S				
					2.0			Excavation TP09 terminated at 1.8 m Target depth					
					2.5								
					3.0								
					3.5								

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP10***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration (1 2 3)	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (remoulded / peak) (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E, N					0.0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
			VS 90/ 28 kPa		0.5		ML	**Clayey SILT**: medium plasticity, grey with orange mottling.		St - VSt	⊕ ⊙		**QUATERNARY ALLUVIUM**
			VS 132/ 15 kPa		1.0				W		⊕ ⊙		
		▶					GW	**Sandy GRAVEL**: medium to coarse grained, grey with orange mottling.	S				
					1.5			Excavation TP10 terminated at 1.4 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP11***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N					0.0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
			VS 156/ 39 kPa		0.5		ML	**Clayey SILT**: medium plasticity, grey-brown with orange mottling.		VSt	⊕ ⊙		**QUATERNARY ALLUVIUM**
		▶			1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey with orange staining.	W / S				
					1.2			Excavation TP11 terminated at 1.2 m Target depth					
					1.5								
					2.0								
					2.5								
					3.0								
					3.5								

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- * bit shown by suffix
- e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP12***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.: -

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N					0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
			VS 124/ 43 kPa		0.5		ML	**Clayey SILT**: medium plasticity, brown-grey with orange staining.		VSt	⊕ ⊙		**QUATERNARY ALLUVIUM**
			VS 113/ 18 kPa		1.0						⊕ ⊙		DCP 1.0 - 1.1: Refusal
		▶					GW	**Sandy GRAVEL**: medium to coarse grained, grey with orange staining.	W				
					1.5				S				
								Excavation TP12 terminated at 1.6 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP13***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N		Not Encountered			0.0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
			VS UTP		0.5		ML	**Clayey SILT**: low to medium plasticity, grey with orange mottling.		VSt - H	VS UTP		**QUATERNARY ALLUVIUM**
			VS UTP								VS UTP		
					1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey with orange staining, and trace of cobbles.	W				
					1.5			Excavation TP13 terminated at 1.25 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP14***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***05 May 2021***
principal:	***-***
date completed:	***05 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (kPa) ⊕ remouded ⊙ peak 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N		Not Encountered	VS UTP		0.0		ML	**SILT**: low plasticity, brown.	D				**TOPSOIL**
					0.5		ML	**Clayey SILT**: low to medium plasticity, grey-brown with orange mottling.	W - M	VSt - H	VS UTP		**QUATERNARY ALLUVIUM**
					1.0		SP	**SILTY SAND**: medium grained, yellow-brown with orange staining.	S				
							GW	**Sandy GRAVEL**: medium to coarse grained, brown-grey.					
					1.5			Excavation TP14 terminated at 1.5 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP15***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***06 May 2021***
principal:	***-***
date completed:	***06 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N		Not Encountered	VS 209/ 62 kPa		0.0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
					0.5		ML	**Clayey SILT**: medium plasticity, grey with orange mottling.		VSt - H	⊕ ⊙		**QUATERNARY ALLUVIUM**
					1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey with orange staining, and trace of cobbles.	M / S				
					1.5			Excavation TP15 terminated at 1.5 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP16***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***06 May 2021***
principal:	***-***
date completed:	***06 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.: -

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear (kPa) ⊕ remouded ⊙ peak	DCP (blows/ 100 mm)	structure and additional observations
E N					0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
			VS 166/ 67 kPa		0.5		ML	**Clayey SILT**: low to medium plasticity, pale grey with orange mottling.		VSt			**QUATERNARY ALLUVIUM**
			VS 106/ 60 kPa		1.0					F			
			VS 54/ 21 kPa		1.5		GW	**Sandy GRAVEL**: medium to coarse grained, grey with orange staining, and trace of cobbles.	W / S				
					2.0			Excavation TP16 terminated at 1.7 m Target depth					
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP17***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***06 May 2021***
principal:	***-***
date completed:	***06 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N		Not Encountered	VS 209/ 33 kPa		0.0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
					0.5		ML	**Clayey SILT**: low to medium plasticity, grey with orange mottling.		VSt - H	⊕ ⊙		**QUATERNARY ALLUVIUM**
							GW	**Sandy GRAVEL**: medium to coarse grained, grey with orange staining, and trace of cobbles.					
					1.0			Excavation TP17 terminated at 1.0 m Target depth					
					1.5								
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP18***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***06 May 2021***
principal:	***-***
date completed:	***06 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

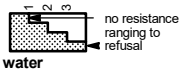
method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N		Not Encountered	VS 70/ 34 kPa		0.0		ML	**SILT**: low plasticity, brown.	M				
					0.5		ML	**Clayey SILT**: medium plasticity, grey with orange mottling.		St	⊕⊙		
					1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey with orange staining.					
								Excavation TP18 terminated at 1.2 m Target depth					
					1.5								
					2.0								
					2.5								
					3.0								
					3.5								

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

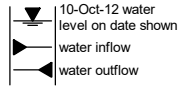
support
- M mud
- C casing
- N nil

penetration



no resistance ranging to refusal

water


10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP19***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***06 May 2021***
principal:	***-***
date completed:	***06 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.: -

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E, N					0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
		Not Encountered	VS UTP		0.5		ML	**Clayey SILT**: low to medium plasticity, grey with orange staining.		VSt - H	VS UTP		**QUATERNARY ALLUVIUM**
			VS UTP		1.0		GW	**Sandy GRAVEL**: medium to coarse grained, brown-grey with orange staining.		D	VS UTP		
					1.5			Excavation TP19 terminated at 1.4 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP20***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***06 May 2021***
principal:	***-***
date completed:	***06 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.: -

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E, N		Not Encountered			0.0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
			VS 171/ 36 kPa		0.5		ML	**Clayey SILT**: medium plasticity, brown-grey with orange mottling.		VSt	⊕ ⊙		**QUATERNARY ALLUVIUM**
			VS 203/ 46 kPa		1.0		GW	**Sandy GRAVEL**: medium to coarse grained, brown-grey with orange staining.		D	⊕ ⊙		
					1.5			Excavation TP20 terminated at 1.4 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description
based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP21***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***06 May 2021***
principal:	***-***
date completed:	***06 May 2021***
project:	***535 Mill Road***
logged by:	***B. Chau***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.:

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E N		Not Encountered	VS 151/ 60 kPa		0.0		ML	**SILT**: low plasticity, brown.	M				
					0.5		ML	**Clayey SILT**: low to medium plasticity, grey-brown with orange mottling.		VSt	⊕ ⊙		
					1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey-brown with orange staining, and trace of cobbles.					
					1.5			Excavation TP21 terminated at 1.6 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TETRA TECH COFFEY

Engineering Log - Excavation

Borehole ID.	***TP22***
sheet:	1 of 1
project no.	***773-CHCGE288040***
client:	***Rolleston Industrial Developments Limited***
date started:	***06 May 2021***
principal:	***-***
date completed:	***06 May 2021***
project:	***535 Mill Road***
logged by:	***C. Thompson***
location:	***Ohoka, Christchurch 7676***
checked by:	***C. Thompson***

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90° | DCP id.: -

drill model: Hitachi 14t, Track mounted | drilling fluid: Swamp Bucket | hole diameter : | vane id.: 1508

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description (**SOIL NAME**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	vane shear ⊕ remoulded ⊙ peak (kPa) 50 100 150 200	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
E, N		▶			0		ML	**SILT**: low plasticity, brown.	M				**TOPSOIL**
					0.5		ML	**Clayey SILT**: medium plasticity, grey with orange mottling.		St - VSt			**QUATERNARY ALLUVIUM**
					1.0		GW	**Sandy GRAVEL**: medium to coarse grained, grey-brown with orange staining.	W	D			DCP 1.0 - 1.1m: Refusal
									S				
					1.5			Excavation TP22 terminated at 1.4 m Target depth					
					2.0								
					2.5								
					3.0								
					3.5								

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

soil group symbol & soil description based on AS 1726:2017

moisture condition
- D dry
- M moist
- W wet
- S saturated
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey geotechnics

Machine Borehole No. **BH01**

Engineering Log - Machine Borehole

Sheet 1 of 3

Project No: **GENZCHRI15188**

Client: ***Vodafone NZ***

Date started: ***7.7.2011***

Principal:

Date completed: ***7.7.2011***

Project: ***236 Bradleys Road, Ohoka***

Logged by: ***SKK***

Machine Borehole Location: ***Refer to site plan***

Checked by: ***NH***

Drill model & mounting: VTR9700-Track 70mm (DT) | Easting: 2474175 m | Slope: -90° | R.L. Surface: m | Vane No:

Hole diameter: mm | Drilling fluid: | Northing: 5759723 m | Bearing: | Datum: Ground

drilling information							material substance									rock mass defects			
stratigraphy	method	support	water	notes samples, tests, etc	RL	depth metres	graphic log core recovery	classification symbol	material: Soil - Soil type; colour, structure. Grading; bedding; plasticity, sensitivity. Secondary and minor components. Rock - Colour, fabric, rock type; discontinuities, additional information.	moisture condition	consistency/ density index	weathering alteration	estimated strength EW VW W MS S VS ES	vane shear (remoulded /peak) kPa 25 50 75 100 125 150 175	recovery %	RQD %	defect spacing mm 30 100 300 1000 3000	defect description: number, type, orientation, shape, roughness, aperture, infill description (refer to defect description explanation sheet) particular / general
Topsoil									TOPSOIL; No core from 0.00 to 0.40m	M	F							
									TOPSOIL; dark grey friable topsoil with roots									
Springston Fm (sps)			▼	SPT 11,15,21 N*=36		1		ML	SILT with traces of rootlets; brownish grey (mottled), firm, low plasticity, homogeneous						73			
								SP GW	SAND wity traces of rootlets; bluesh grey, friable		D							
						2			Sandy fine to coarse GRAVEL; grey coloured, sub-rounded to rounded, loose to medium dense, homogeneous						87			
				SPT 50 N*=R		3		GW	Sandy silty fine to coarse GRAVEL; brownish, sub-rounded to rounded, loose to medium dense, traces of silt		VD							
Burnham Formation (nh) of Quaternary Age								GP	Medium to coarse GRAVEL; greyish colour, sub-rounded to rounded, very loose, bedded						100			
						4		GW	Sandy fine to medium GRAVEL; greyish, sub-angular to rounded, loose to medium dense, homogeneous									
				SPT 37,13 N*=R		5									100			
				SPT 50 N*=R		6		GP	Sandy fine to medium GRAVEL; greyish, sub-angular to rounded, loose to medium dense, homogeneous, more sandy						100			
						7		GW	Sandy fine to coarse GRAVEL; greyish, sub-rounded to rounded, loose to medium dense, homogeneous						100			
				SPT 50 N*=R				SP	Medium to coarse SAND; greyish, loose, homogeneous									
						8		GW							100			

method
- **AD** auger drilling
- **OB** open barrel
- **TT** triple tube
- **W** washbore

support
- N nil
- C casing

vane shear (kPa)
- ● remoulded
- × peak
- >>× peak greater than 200kPa
- **UTP** unable to penetrate

classification symbols and soil description
based on Field Description of Soil and Rock, New Zealand Geotechnical Society Inc 2005

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- N* SPT - sample recovered
- Nc SPT with solid cone
- Bs bulk sample
- E environmental sample

water
- ▼ 10/1/98 water level on date shown
- ► water inflow
- ◁ partial drill fluid loss
- ◄ complete drill fluid loss

moisture
- D dry
- M moist
- W wet
- S saturated

consistency/ density index
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

weathering
- UW unweathered
- SW slightly weathered
- MW moderately weathered
- HW highly weathered
- CW completely weathered
- RS residual soil

rock mass strength
- EW extremely weak
- VW very weak
- W weak
- MS moderately strong
- S strong
- VS very strong
- ES extremely strong

coffey geotechnics

Machine Borehole No. **BH01**

Engineering Log - Machine Borehole

Sheet 2 of 3

Project No: **GENZCHRI15188**

Client: **Vodafone NZ**

Date started: **7.7.2011**

Principal:

Date completed: **7.7.2011**

Project: **236 Bradleys Road, Ohoka**

Logged by: **SKK**

Machine Borehole Location: **Refer to site plan**

Checked by: **NH**

Drill model & mounting: VTR9700-Track 70mm (DT) | Easting: 2474175 m | Slope: -90° | R.L. Surface: m | Vane No:

Hole diameter: mm | Drilling fluid: | Northing: 5759723 m | Bearing: | Datum: Ground

drilling information | **material substance** | **rock mass defects**

stratigraphy	method	support	water	notes samples, tests, etc	RL	depth metres	graphic log core recovery	classification symbol	material: Soil - Soil type; colour, structure. Grading; bedding; plasticity, sensitivity. Secondary and minor components. Rock - Colour, fabric, rock type; discontinuities, additional information.	moisture condition	consistency/ density index	weathering alteration	estimated strength EW VW W MS S VS ES	vane shear (remoulded /peak) kPa 25 50 75 100 125 150 175	recovery %	RQD %	defect spacing mm 30 100 300 1000 3000	defect description: number, type, orientation, shape, roughness, aperture, infill description (refer to defect description explanation sheet) particular / general
Burnham Formation (nh) of Quaternary Age						9		GW (cont)	Sandy fine to coarse GRAVEL; greyish, sub-angular to sub-rounded, loose to medium dense, homogeneous *(continued)*	M	VD				100		
								GP									
								GW	Fine GRAVEL; greyish, sub-rounded to rounded, loose to medium dense, laminated								
				SPT 50 N*=R				GP	Sandy fine to coarse GRAVEL; greyish, sub-angular to sub-rounded, medium dense, homogeneous	D							
										M							
						10		GW	Medium to coarse GRAVEL; greyish, sub-angular to sub-rounded, very loose, homogeneous						80		
									Sandy fine to coarse GRAVEL; greyish, sub-angular to sub-rounded, medium dense, homogeneous								
				SPT 50 N*=R				GW	Sandy fine to coarse GRAVEL; greyish, sub-angular to sub-rounded, medium dense, homogeneous								
						11									86		
				SPT 39,11 N*=R		12											
								GW	Sandy fine to coarse GRAVEL; greyish, sub-rounded to rounded, medium dense, homogeneous, fine to medium sand						93		
						13											
				SPT 5,19,18 N*=37				SP	Fine SAND; brownish colour, medium dense, lensoidal		D						
								GW	Sandy fine to coarse GRAVEL; greyish colour, sub-rounded to rounded, medium dense, homogeneous - minor silt						100		
						14											
						15											
				SPT 50 N*=R				GW	Sandy silty fine to coarse GRAVEL; grey, sub-rounded to rounded, very loose.	W	VD						
									Core collected in a sample bag								
						16											

method
- **AD** auger drilling
- **OB** open barrel
- **TT** triple tube
- **W** washbore

support
- N nil
- C casing

vane shear (kPa)
- ● remoulded
- × peak
- >>× peak greater than 200kPa
- **UTP** unable to penetrate

classification symbols and soil description
based on Field Description of Soil and Rock, New Zealand Geotechnical Society Inc 2005

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- N* SPT - sample recovered
- Nc SPT with solid cone
- Bs bulk sample
- E environmental sample

water
- 10/1/98 water level on date shown
- water inflow
- partial drill fluid loss
- complete drill fluid loss

moisture
- D dry
- M moist
- W wet
- S saturated

consistency/ density index
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

weathering
- UW unweathered
- SW slightly weathered
- MW moderately weathered
- HW highly weathered
- CW completely weathered
- RS residual soil

rock mass strength
- EW extremely weak
- VW very weak
- W weak
- MS moderately strong
- S strong
- VS very strong
- ES extremely strong

coffey geotechnics

Engineering Log - Machine Borehole

Machine Borehole No. **BH01**

Sheet 3 of 3

Project No: **GENZCHRI15188**

Client:	*Vodafone NZ*	Date started:	*7.7.2011*
Principal:		Date completed:	*7.7.2011*
Project:	*236 Bradleys Road, Ohoka*	Logged by:	*SKK*
Machine Borehole Location:	*Refer to site plan*	Checked by:	*NH*

Drill model & mounting: VTR9700-Track 70mm (DT) | Easting: 2474175 m | Slope: -90° | R.L. Surface: m | Vane No:

Hole diameter: mm | Drilling fluid: | Northing: 5759723 m | Bearing: | Datum: Ground

stratigraphy	method	support	water	notes samples, tests, etc	RL	depth metres	graphic log core recovery	classification symbol	material (Soil - Soil type; colour, structure. Grading; bedding; plasticity, sensitivity. Secondary and minor components. Rock - Colour, fabric, rock type; discontinuities, additional information.)	moisture condition	consistency/ density index	weathering alteration	estimated strength (EW VW W MS S VS ES)	vane shear (remoulded /peak) kPa (25 50 75 100 125 150 175)	recovery %	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description (number, type, orientation, shape, roughness, aperture, infill description (refer to defect description explanation sheet)) particular / general
								GW *(cont)*		W	VD							
									BH01 terminated at 16.5 metres.									
						17												
						18												
						19												
						20												
						21												
						22												
						23												
						24												

method
- AD auger drilling
- OB open barrel
- TT triple tube
- W washbore

support
- N nil
- C casing

vane shear (kPa)
- ● remoulded
- × peak
- >>× peak greater than 200kPa
- UTP unable to penetrate

classification symbols and soil description
based on Field Description of Soil and Rock, New Zealand Geotechnical Society Inc 2005

notes, samples, tests
- U_{50} undisturbed sample 50mm diameter
- U_{63} undisturbed sample 63mm diameter
- D disturbed sample
- N* SPT - sample recovered
- Nc SPT with solid cone
- Bs bulk sample
- E environmental sample

water
- 10/1/98 water level on date shown
- water inflow
- partial drill fluid loss
- complete drill fluid loss

moisture
- D dry
- M moist
- W wet
- S saturated

consistency/ density index
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

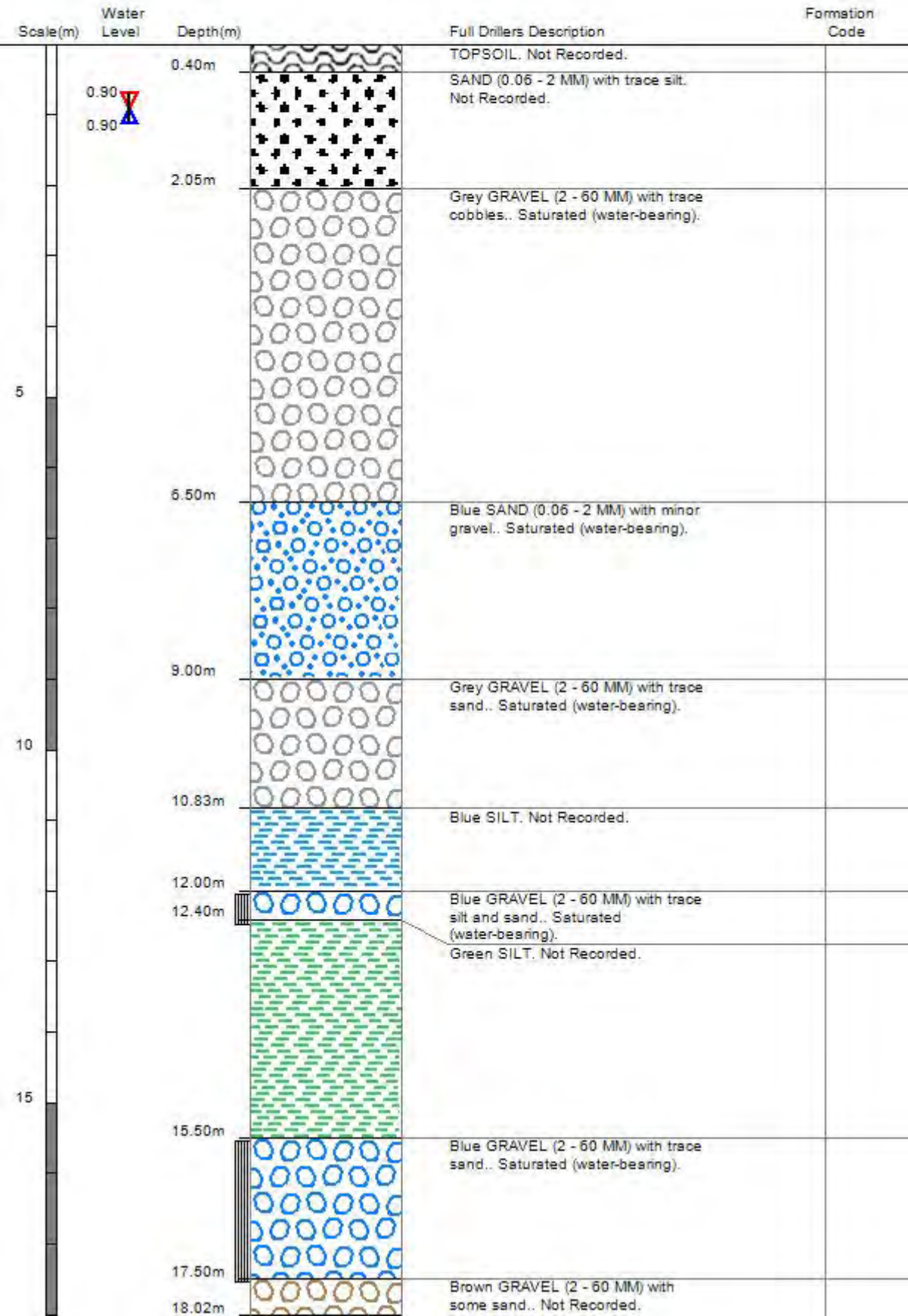
weathering
- UW unweathered
- SW slightly weathered
- MW moderately weathered
- HW highly weathered
- CW completely weathered
- RS residual soil

rock mass strength
- EW extremely weak
- VW very weak
- W weak
- MS moderately strong
- S strong
- VS very strong
- ES extremely strong

Borelog for well BW24/0297

Grid Reference (NZTM): 1576754 mE, 5210602 mN
Location Accuracy: 10 - 50m
Ground Level Altitude: m +MSD Accuracy:
Driller: McMillan Drilling Ltd
Drill Method: Cable Tool
Borelog Depth: 18.0 m Drill Date: 21-Oct-2015

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well M35/0300

Grid Reference (NZTM): 1565501 mE, 5198781 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 23.9 m +MSD Accuracy: < 0.5 m
Driller: Job Osborne (& Co/Ltd)
Drill Method: Unknown
Borelog Depth: 114.0 m Drill Date: 07-Dec-1894

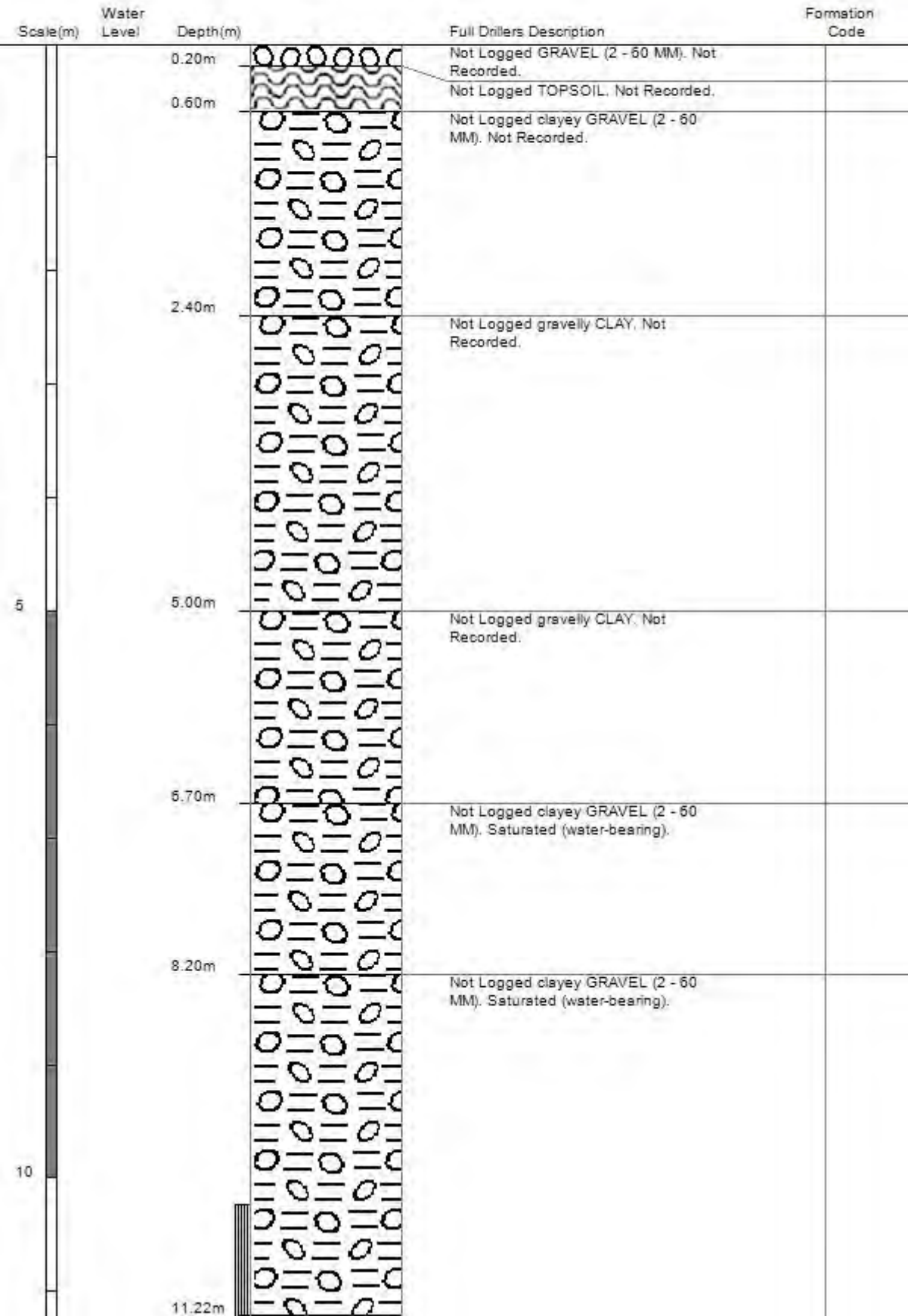
Environment Canterbury Regional Council

Scale(m)	Water Level	Depth (m)	Driller's Description	Formation Code
		0.30m	Topsoil	
		0.30m	Topsoil	
			Loose shingle	
		18.29m	Loose shingle	
		18.29m	Hard shingle	
		24.40m	Hard shingle	
		24.40m	Close shingle	
		59.70m	Close shingle	
		59.70m	Hard shingle	
		79.09m	Hard shingle	
		79.09m	Loose shingle	
		86.19m	Loose shingle	
		86.19m	Hard shingle	
		93.00m	Hard shingle	
		93.00m	Loose shingle	
		97.50m	Loose shingle	
		97.50m	Hard shingle	
		106.70m	Hard shingle	
		106.70m	Loose shingle	
		114.00m		

Borelog for well BW24/0520

Grid Reference (NZTM): 1565685 mE, 5198823 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: m +MSD Accuracy:
Driller: Clemence Drilling Contractors
Drill Method: Rotary/Percussion
Borelog Depth: 11.2 m Drill Date: 05-Mar-2019

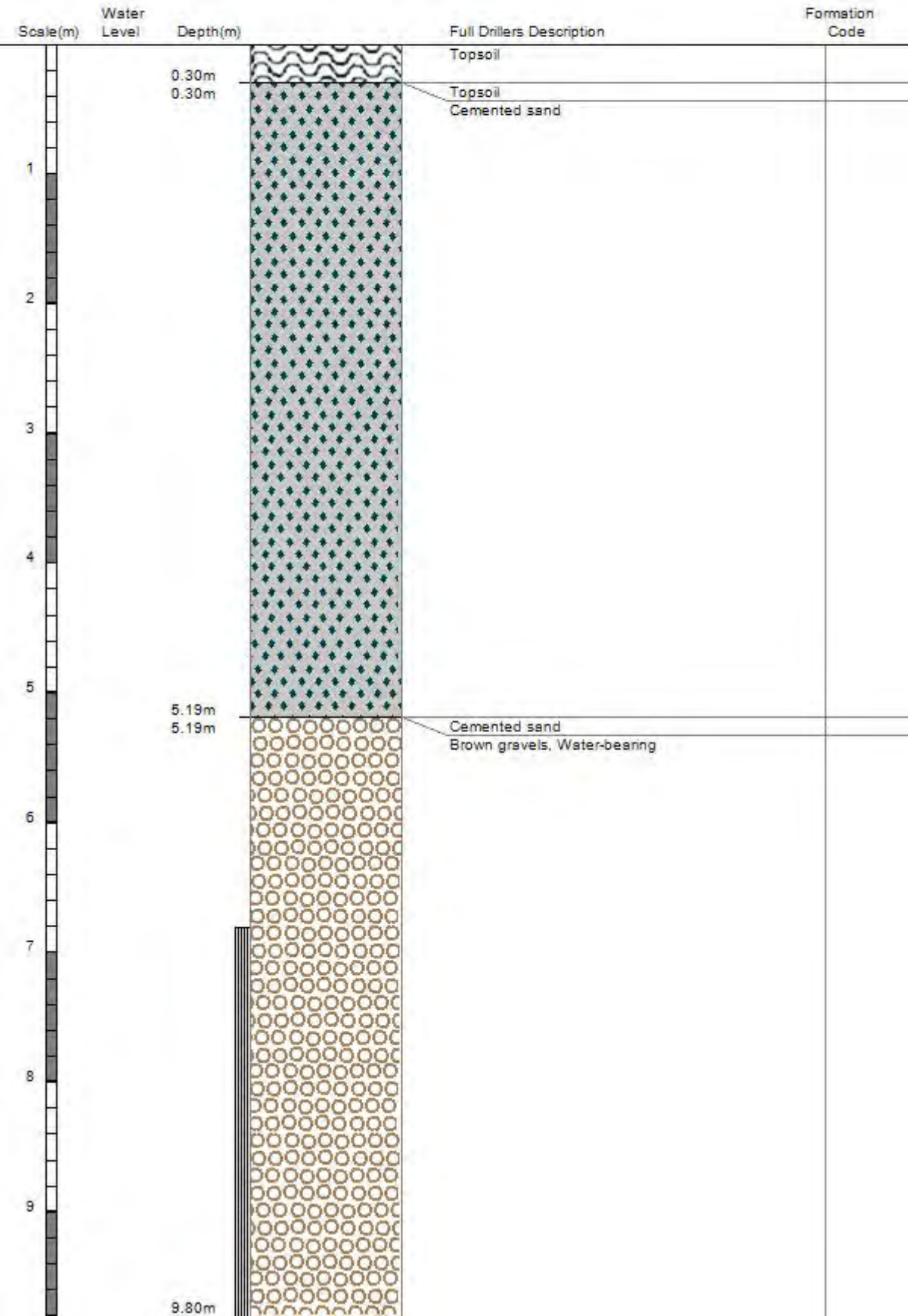
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well M35/0595

Grid Reference (NZTM): 1563949 mE, 5197621 mN
Location Accuracy: 2 - 15m
Ground Level Altitude: 30.8 m +MSD Accuracy: < 0.5 m
Driller: A M Bisley & Co
Drill Method: Auger Rig
Borelog Depth: 9.8 m Drill Date: 09-Aug-1967

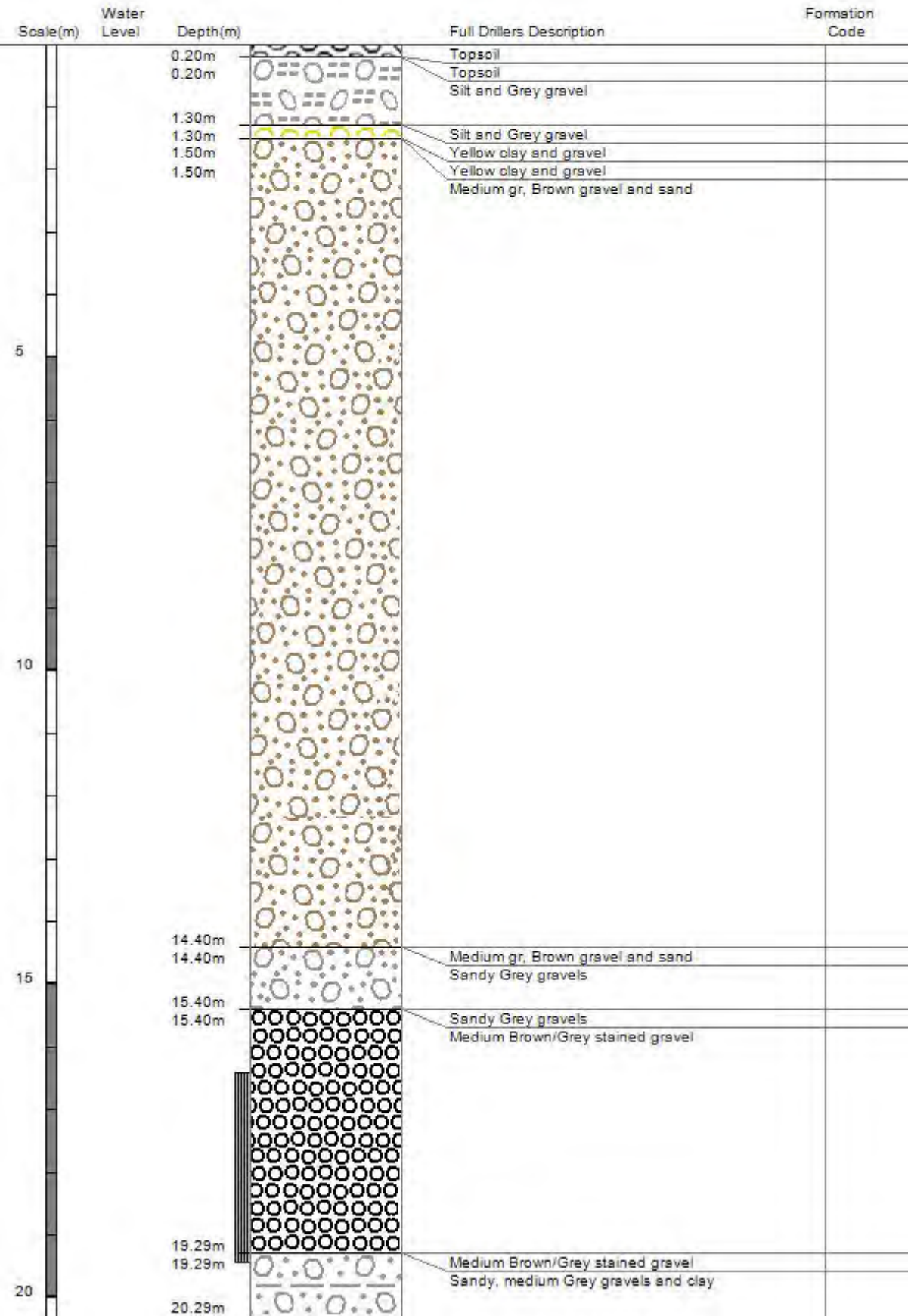
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well M35/4428

Grid Reference (NZTM): 1564502 mE, 5197382 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 28.1 m +MSD Accuracy: < 0.5 m
Driller: A M Bisley & Co
Drill Method: Cable Tool
Borelog Depth: 20.3 m Drill Date:

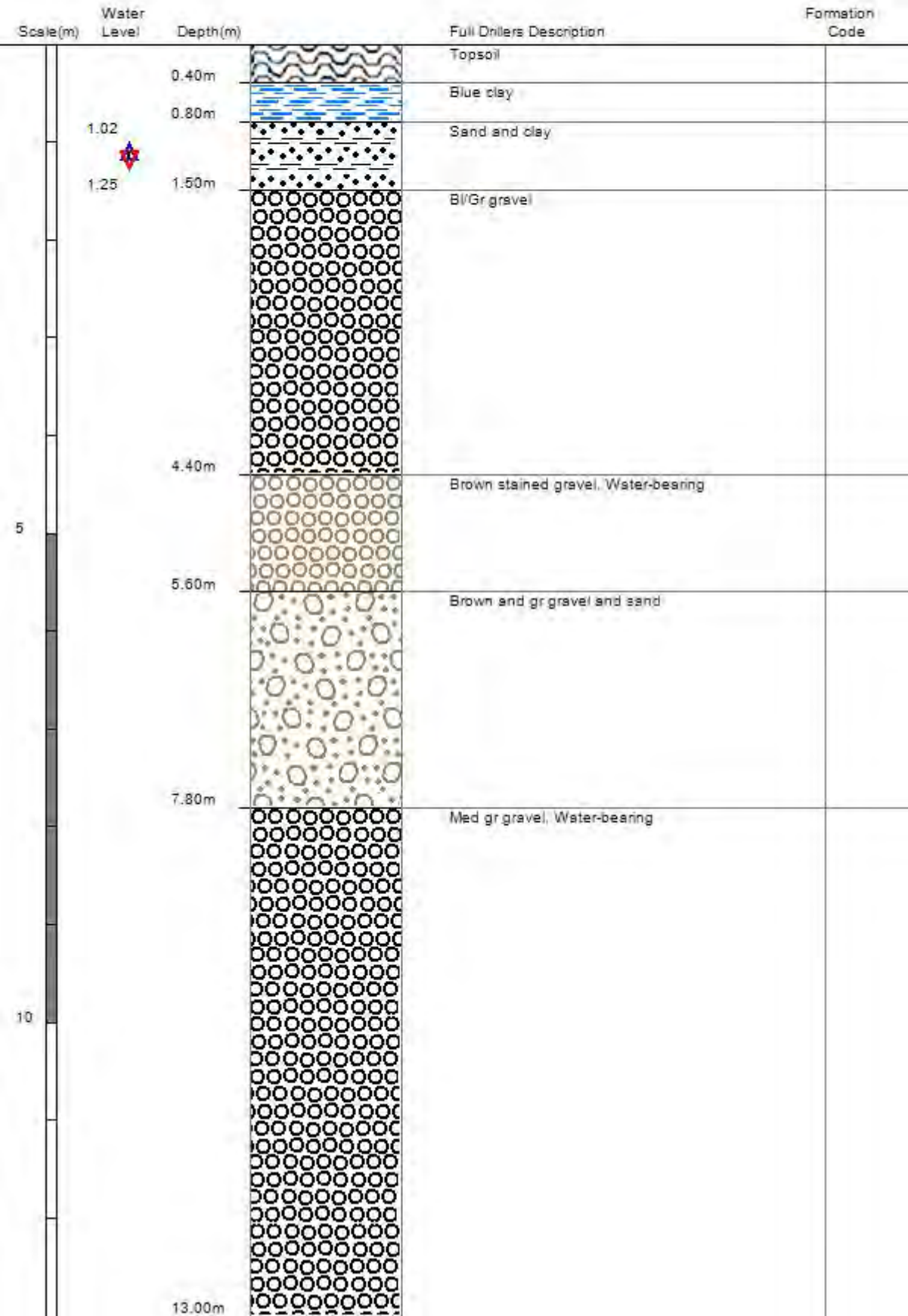
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well M35/4795

Grid Reference (NZTM): 1565596 mE, 5198870 mN
Location Accuracy: 1 - 2m
Ground Level Altitude: 21.1 m +MSD Accuracy: < 0.1 m
Driller: A M Bisley & Co
Drill Method: Driven Pipe
Borelog Depth: 13.0 m Drill Date: 01-Jul-1983

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well M35/5609

Grid Reference (NZTM): 1565032 mE, 5198906 mN
Location Accuracy: 2 - 15m
Ground Level Altitude: 26.4 m +MSD Accuracy: < 0.5 m
Driller: McMillan Drilling Ltd
Drill Method: Cable Tool
Borelog Depth: 18.8 m Drill Date: 26-Jan-1989

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
			Topsoil	
		0.30m		
		0.30m	Topsoil	
			Brown silt, Black/Brown small to medium sandy gravels	
		1.20m		
		1.20m	Brown silt, Black/Brown small to medium sandy gravels	
			Black stained small to medium sandy gravels	
		3.50m		
		3.50m	Black stained small to medium sandy gravels	
			Medium Brown stained sandy gravels, trace Brown/Yellow clay, wl 2.4	
		4.19m		
		4.19m	Medium Brown stained sandy gravels, trace Brown/Yellow clay, wl 2.4	
			Grey/Brown small to medium sandy gravel, odd large stone. Water-bearing, wl 2.4 to end of well	
		4.80m		
		4.80m	Grey/Brown small to medium sandy gravel, odd large stone. Water-bearing, wl 2.4 to end of well	
5			Very sandy Grey/Brown gravels nb	
		5.40m		
		5.40m	Very sandy Grey/Brown gravels nb	
			Brown and Black stained small to medium sandy gravels, Water-bearing	
		9.10m		
		9.10m	Brown and Black stained small to medium sandy gravels, Water-bearing	
			Grey/Brown sandy gravels, trace Brown clay, Water-bearing	
		9.60m		
		9.60m	Grey/Brown sandy gravels, trace Brown clay, Water-bearing	
			Grey/Brown sandy gravels, Water-bearing	
10		10.70m		
		10.70m	Grey/Brown sandy gravels, Water-bearing	
			Grey/Brown sandy gravels, trace Brown clay, Water-bearing	
		11.80m		
		11.80m	Grey/Brown sandy gravels, trace Brown clay, Water-bearing	
			Grey/Brown sandy gravels, trace Brown clay, Water-bearing, very loose	
		13.20m		
		13.20m	Grey/Brown sandy gravels, trace Brown clay, Water-bearing, very loose	
			Grey/Brown sandy gravels, sticky Brown clay, Water-bearing	
		14.50m		
		14.50m	Grey/Brown sandy gravels, sticky Brown clay, Water-bearing	
15			Grey/Brown sandy gravels, trace Brown clay, Water-bearing	
		15.60m		
		15.60m	Grey/Brown sandy gravels, trace Brown clay, Water-bearing	
			Small to medium Brown polished gravels, sandy large lumps, sticky Brown clay	
		16.10m		
		16.10m	Small to medium Brown polished gravels, sandy large lumps, sticky Brown clay	
			Grey/Brown small to medium sandy gravels, trace Black stained	
		16.79m		
		16.79m	Grey/Brown small to medium sandy gravels, trace Black stained	
			Pea gravels, Grey/Brown and sandy, trace Brown clay, free flowing	
		17.60m		
		17.60m	Pea gravels, Grey/Brown and sandy, trace Brown clay, free flowing	
			Small to medium Grey/Brown sandy gravels, trace Brown clay, Water-bearing	
		18.00m		
		18.00m	Small to medium Grey/Brown sandy gravels, trace Brown clay, Water-bearing	
			Small to medium Grey/Brown sandy gravels, trace Brown clay, Water-bearing, tighter	
		18.79m		

Borelog for well M35/6483

Grid Reference (NZTM): 1564742 mE, 5197412 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 27.1 m +MSD Accuracy: < 0.5 m
Driller: Clemence Drilling Contractors
Drill Method: Cable Tool
Borelog Depth: 20.0 m Drill Date: 29-Nov-1990

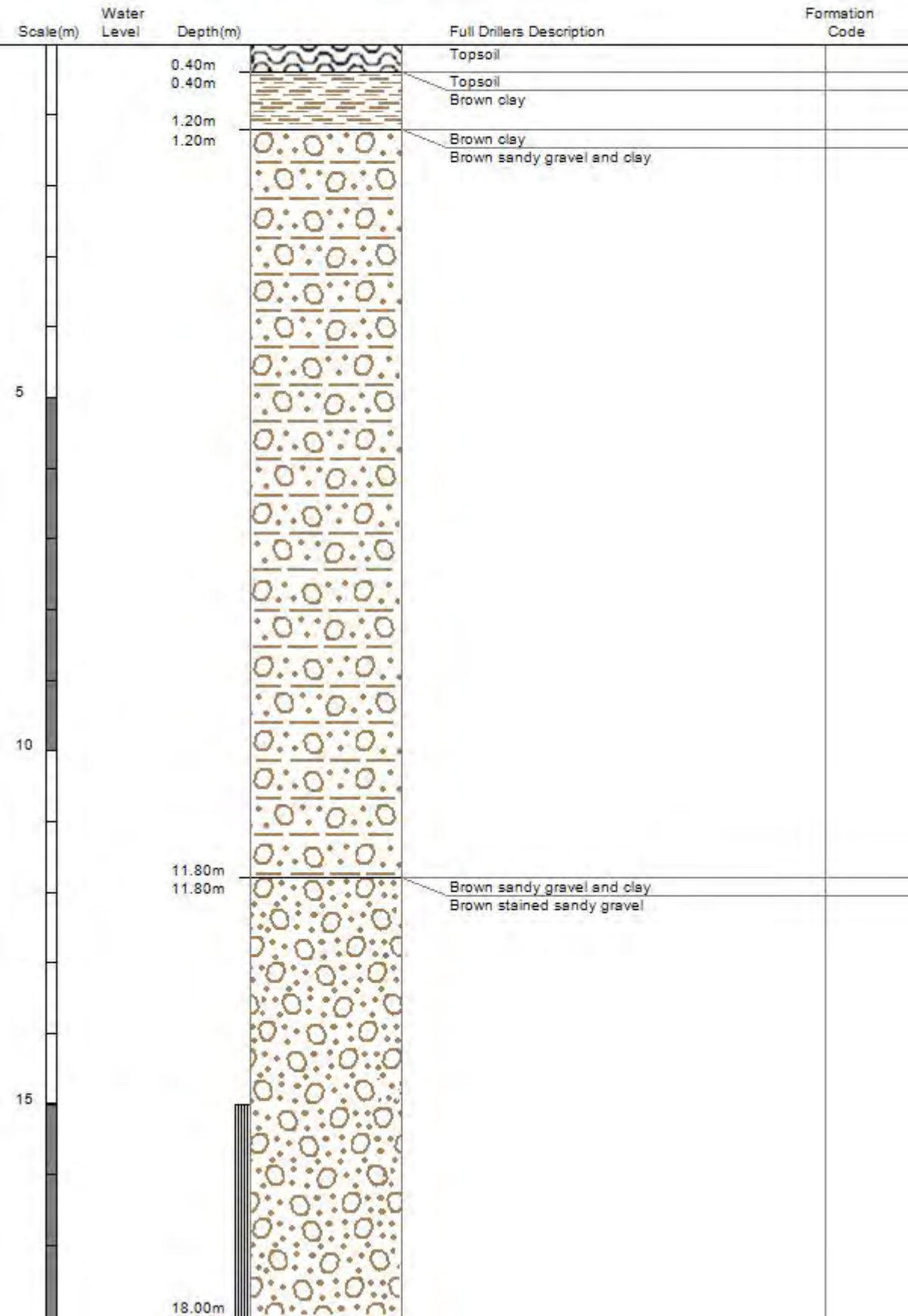
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
			Clay and topsoil	
		0.89m		
		0.89m	Clay and topsoil	
			Tight, compact gravel	
		3.00m		
		3.00m	Tight, compact gravel	
			Loose gravel	
5		5.09m		
		5.09m	Loose gravel	
			Tight claybound gravel	
		5.40m		
		5.40m	Tight claybound gravel	
			Sandy Water-bearing gravel	
		9.69m		
10		9.69m	Sandy Water-bearing gravel	
			Tight claywashed gravel	
		11.30m		
		11.30m	Tight claywashed gravel	
			Loose Water-bearing claywashed gravel	
		14.60m		
		14.60m	Loose Water-bearing claywashed gravel	
15			Tight claybound gravel	
		18.00m		
		18.00m	Tight claybound gravel	
			Good loose Water-bearing gravel	
		20.00m		

Borelog for well M35/6688

Grid Reference (NZTM): 1564192 mE, 5198081 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 31.0 m +MSD Accuracy: < 0.5 m
Driller: McMillan Drilling Ltd
Drill Method: Cable Tool
Borelog Depth: 18.0 m Drill Date: 04-May-1992

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Borelog for well M35/6773

Grid Reference (NZTM): 1564472 mE, 5197322 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 28.1 m +MSD Accuracy: < 0.5 m
Driller: Clemence Drilling Contractors
Drill Method: Cable Tool
Borelog Depth: 24.0 m Drill Date: 10-Sep-1993

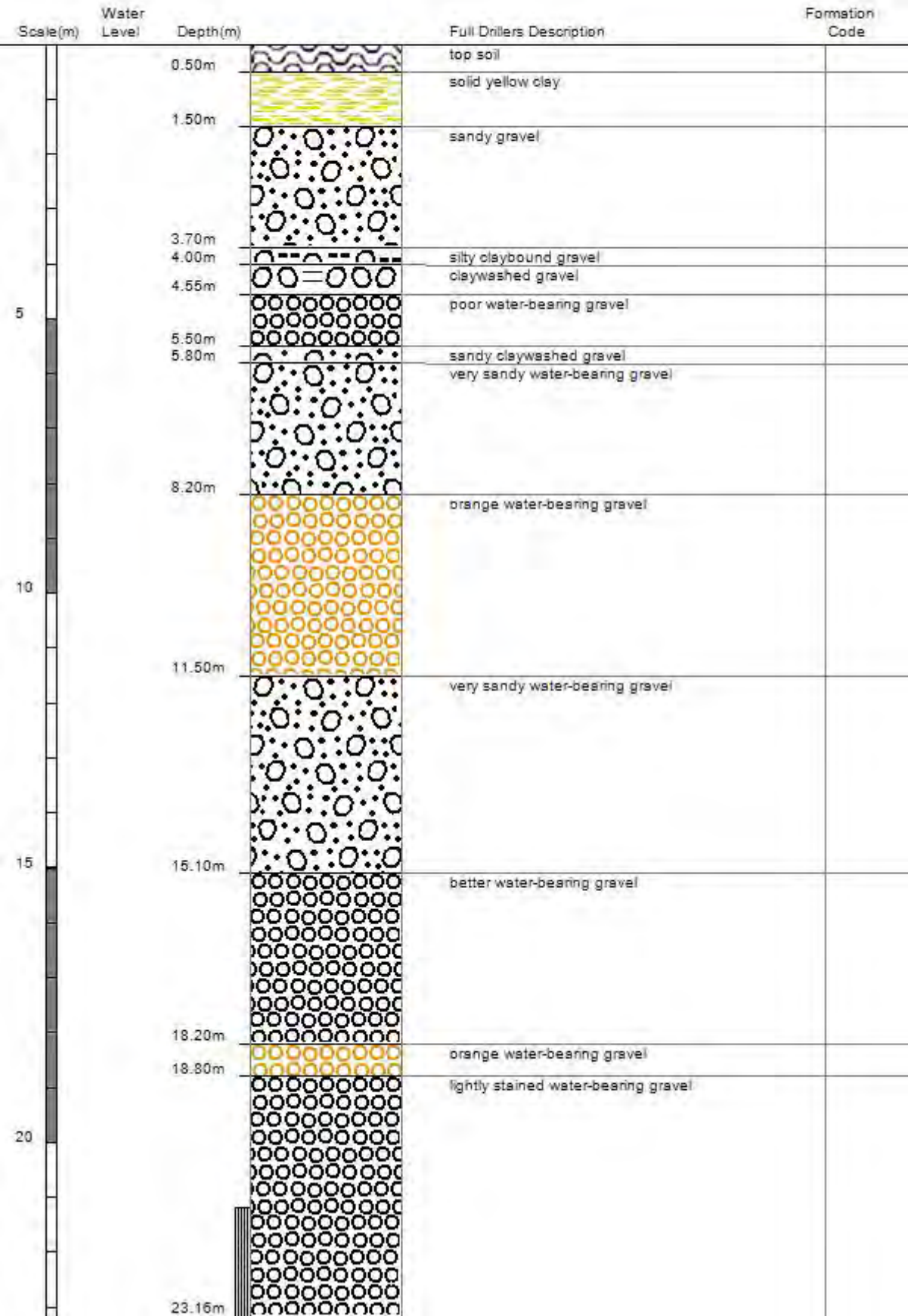
Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
		0.30m	Topsoil	
		0.30m	Topsoil Yellow clay	
		1.00m		
		1.00m	Yellow clay Heavy claywashed gravel	
		3.09m		
		3.09m	Heavy claywashed gravel Good loose Water-bearing gravel	
5				
		5.90m		
		5.90m	Good loose Water-bearing gravel Tight sandy claybound gravel	
		7.00m		
		7.00m	Tight sandy claybound gravel Water-bearing gravel	
		7.90m		
		7.90m	Water-bearing gravel Tight silty claywashed gravel	
10				
		12.90m		
		12.90m	Tight silty claywashed gravel Good loose well sorted gravel	
		14.00m		
		14.00m	Good loose well sorted gravel Tighter silty heavy claywashed gravel	
15				
20				
		22.40m		
		22.40m	Tighter silty heavy claywashed gravel Good Water-bearing claywashed gravel	
		24.00m		

Borelog for well M35/10517

Grid Reference (NZTM): 1563865 mE, 5197951 mN
Location Accuracy: 50 - 300m
Ground Level Altitude: 32.0 m +MSD Accuracy: < 2.5 m
Driller: Clemence Drilling Contractors
Drill Method: Rotary/Percussion
Borelog Depth: 23.2 m Drill Date: 08-Feb-2005

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha



Appendix C

Preliminary Site Investigation

TETRA TECH COFFEY

535 Mill Road, Ohoka

Preliminary Site Investigation

Rolleston Industrial Developments Limited

Reference: 773-CHCGE288040

31 May 2021

535 MILL ROAD

Preliminary Site Investigation

Report reference number: 773-CHCGE288040
31 May 2021

PREPARED FOR

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QUALITY INFORMATION

Revision history

Revision	Description	Date	Author	Reviewer	Approver
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Distribution

Report Status	No. of copies	Format	Distributed to	Date
Final	1	PDF	Rolleston Industrial Developments Limited C/- Carter Group	14 May 2021
Revised Final	1	PDF	Rolleston Industrial Developments Limited C/- Carter Group	31 May 2021

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APPENDICES

1. INTRODUCTION

Tetra Tech Coffey (NZ) Limited (Coffey) (formerly Coffey Services (NZ) Limited) has been commissioned by Rolleston Industrial Development Limited ('the client') to conduct a Preliminary Site Investigation (PSI) to support proposed works within 535 Mill Road, Ohoka ('the site') (Figure 1).

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) (NESCS) Regulations apply to selected activities on sites where an activity or industry on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) is, has, or is more likely than not to have occurred. The purpose of this PSI was to assess the potential for contaminants to have been deposited at the site as a result of current and/or historical activities undertaken within or in the immediate vicinity of the site and accordingly determine if any further investigation work is required under the NES.

This PSI report has been reviewed by a Suitably Qualified and Experienced Practitioner (SQEP), as required by the NESCS.

1.1 OBJECTIVES

The objectives of this PSI were to:

- Identify potentially contaminating (HAIL) activities or potential sources of contamination that might have occurred or exist at the site.
- Confirm the suitability of the land for subdivision and provide recommendations regarding additional works required prior to any future development.

1.2 SCOPE OF WORKS

The scope of work was undertaken in general accordance with the staged process defined by the Ministry for Environment (MfE) Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils (revised 2011) and the findings are presented in accordance with the MfE Contaminated Land Management Guideline No.1: Reporting on Contaminated Sites in New Zealand (revised 2011). Both the above documents are incorporated by reference into the NESCS.

In summary, the following scope of works was undertaken:

- Review of Environment Canterbury's Listed Land-Use Register (LLUR) for the site.
- Review of published geological maps and the Coffey database to appraise likely soil and groundwater conditions at the site.
- Review of selected publicly available aerial photographs or other accessible historical photographs.
- Site walkover, focussed on areas with structures or visible land disturbance to consider land contamination indicators (e.g. visual evidence of waste dumping/material spills, chemical storage and/or usage areas, anomalous die-back in vegetation, ground staining).
- Preparation of this PSI report. As required by the NESCS, this report was reviewed and approved by a suitably qualified and experienced practitioner (SQEP).

2. SITE INFORMATION

2.1 SITE DESCRIPTION

The site is approximately rectangular in shape with predominately flat topography, situated approximately 6.5 km west of Kaiapoi and approximately 20 km north of Christchurch's central business district. Details of the site are listed in Table 1 and the site location is shown on Figure 1.

The site is primarily bordered by agricultural land-use in all directions with mixed residential use within the agricultural areas.

Table 1: Site information

Address	Legal Description	Property Area (Hectares)
347 Whites Road (535 Mill Road)	LOTS 2 3 DP 318615 LOT 2 DP 61732 LOT 2 PT LOT 1 DP 8301	152.56

2.2 GEOLOGY AND HYDROGEOLOGY

The geology of the site is shown on the Institute of Geological and Nuclear Sciences (GNS) geological map sheet 21: Christchurch, scale 1:250,000. The map indicates the site is underlain by the OIS2 (Late Pleistocene) river deposits which is comprised of unweathered, brownish-grey, variable mix of gravels/sand/silt/clay in low river terraces; locally up to 2m silt (loess) cap.

The nearest surface water body to the site is the Ohoka Stream which runs west to east through the northern section of the site. This flows in an easterly direction feeding into the Waimakariri River and Pegasus Bay approximately 12 km east of the site.

2.3 SITE HISTORY

The following sections summarise the historical activities undertaken within or in the immediate vicinity of the site, as determined from the information sources reviewed during this PSI.

2.3.1 Listed land-use register

Environment Canterbury's LLUR was accessed on 11 May 2021, and it was noted that the LLUR currently states that a section of Lot 2 DP 318615 in the northern section of the site contains a not investigated HAIL activity (G3 – Landfill site). The results of the LLUR have been attached as Appendix A and indicated that the area of activity was defined from aerial photographs from 1984 to 2000.

2.3.2 Historical aerial photographs

Historical aerial photographs of the site and the surrounding area taken between 1940 and 2019 were sourced from the Canterbury Maps Viewer. A summary of observations made from the review of these photographs is provided in Table 2 below. Copies of selected aerial photographs reviewed are included in Appendix B.

Table 2: Summary of Historical aerial photographs

Year	Description
1940-44	The site is in use as agricultural land and a series of building structures can be seen in the northern section of the site with additional building structures present within the central section of the site and a single structure on the central-western boundary of the site. The remainder of the site appeared to be in various stages of agricultural use with some sections of the site appearing to have been stripped and the remainder in use as grazing land. Three streams appear to run west to east through the site. Offsite land-use surrounding the site appears to be primarily agricultural with more intensified residential land-use to the north of the site (across Mill Road).
1955-59	Two of the structures in the northern section of the site have been removed from the site with the remainder of the site appearing similar to the previous historical aerial image. Offsite land-use remained similar to the previous historical aerial image with residential land-uses gradually intensifying around the site.
1960-64	Additional structures had been constructed within the central section of the site with the stream running through the centre of the site now channelised. The structure located on the central-western boundary of the site had been removed. The remainder of the site appeared similar to the previous historical aerial image. Offsite land-use remained similar to the previous historical aerial image with residential land-uses gradually intensifying around the site.
1970-74	Additional structures had been constructed on the northern boundary of the site around the remaining northern structure. Offsite land-use remained similar to the previous historical aerial image with residential land-uses gradually intensifying around the site.
1980-84	Further intensification of the site has occurred with additional structures constructed in the central and northern sections of the site. Several square features in the northern section of the site can now be seen to be being used for alternative land-use, however, the exact use is unclear from this image. These features appear to coincide with the possible landfill sites identified in the LLUR (see Section 2.3.1) Offsite land-use had remained similar to the previous historical aerial image with residential land-uses gradually intensifying around the site.
1995-99	On-site land-use remained similar to the previous historical aerial image. Offsite land-use had remained similar to the previous historical aerial image.
2004-10	On-site land-use remained similar to the previous historical aerial image with the works within the northern section of the site having been covered and re-grassed. Offsite land-use had remained similar to the previous historical aerial image with residential land-uses gradually intensifying around the site.
2010-15	A pond has been installed to the east of the existing central structures as well as construction of a new residential structure east of the existing central structures. Offsite land-use had remained similar to the previous historical aerial image with residential land-uses gradually intensifying around the site.
2019	On-site land-use remained similar to the previous historical aerial image. Offsite land-use had remained similar to the previous historical aerial image.

The aerial imagery indicated that the site appears to have been used for agricultural purposes since 1940 and may be impacted by HAIL category A10 (persistent pesticide bulk storage or use). Square features in the northern section of the site are apparent on the 1980-84 and 1995-99 images, the exact use of which is unclear. These features appear to coincide with the possible landfill sites identified in the LLUR (see Section 2.3.1) as HAIL category G3 (landfill sites).

2.3.3 Site walkover

Coffey staff conducted a site walkover of the site on 6 May 2021. Selected site photographs taken during the walkover have been attached as Appendix C. On-site observations made during the site walkover of the site indicated the following:

- Some areas of unnatural plant die-off were observed across the site.
- No major staining was observed during the walkover.
- Multiple potentially contaminating activities were noted within the area of main farm infrastructure, these included:
  - An above ground fuel tank,
  - Chemical storage within buildings and outside on natural surfaces,
  - A drenching and effluent settlement area.
- A farm dump was observed within the central section of the site which appeared to contain scrap concrete, plastic, bones, wire and other refuse.
- A burn area was noted in the central-northern section of the site.
- Agrichemicals have been used across the site over the years e.g. Glyphosate to kill off weeds in paddocks between plantings.
- Rubbish and metal scraps were observed across sections of the site. No major staining was observed during the walkover.

3. POTENTIAL HAIL ACTIVITIES

The potential HAIL activities noted during this PSI include:

- Persistent pesticide bulk storage or use (HAIL category A10).
- Storage tanks or drums for fuel, chemicals or liquid waste (HAIL category A17).
- Landfill sites (HAIL category G3).

All potentially contaminating activities have been noted on Figure 2.

4. SUMMARY

Coffey was contracted by the client to conduct a PSI for the property located at 535 Mill Road, Ohoka (the 'site', Figure 1). This investigation has been undertaken to confirm the suitability of the site for subdivision.

Coffey completed a review of Environment Canterbury's LLUR, published geological maps, publicly available historical aerial photographs and completed a site walkover of the site on the 6 May 2021.

On the basis of the information reviewed and collected, Coffey has identified actual or potential HAIL activities likely to have occurred on-site as summarised in Table 2 below:

Table 3: Identified actual or potential HAIL activities

Actual/Potential HAIL Activities	Land Use	Information Source	Considered Risk Potential for Contamination to Surrounding Environment
Persistent pesticide bulk storage or use	Use of pesticide and other agrochemicals in	Site walkover observations,	The risk potential to the underlying soil and groundwater is considered **low to medium** due to:

(HAIL Category A10)	agricultural activities.	historical aerial photographs.	• Relatively long period of use (since prior to 1940). • Likely use of non-environmentally persistent chemicals in the paddocks. • No current results from sampling of soils.
Storage tanks or drums for fuel, chemicals or liquid waste (HAIL category A17)	Onsite above ground fuel storage tank. Chemical storage.	Site walkover observations.	The risk potential to the underlying soil and groundwater is considered **medium** due to: • No visible staining on site around storage areas. • Chemicals generally stored within building structures.
Landfill site (HAIL category G3)	Filling of a section of the site.	Environment Canterbury's LLUR.	The risk potential to the underlying soil and groundwater is considered **medium to high** due to: • Unknown fill material or source. • No sampling results to confirm contamination presence. • Continued and prior use of potentially contaminated area as paddocks.
	Farm Dump	Site walkover	The risk potential to the underlying soil and groundwater is considered **medium to high** due to: • Unknown extent of farm dump. • Unable to confirm exact contents of farm dump.

The site walkover and review of site history information indicates the following key potential receptors that may be relevant to the site:

- Earthworks contractors who may come into contact with potentially contaminated soil during any proposed future development works.
- Future occupiers of the properties within the site.
- Ecosystems within Ohoka Stream.

5. RECOMMENDATIONS

Due to the likely presence of HAIL activities on the site, the NESCS regulations are considered to apply to the site. Subdividing or changing land use is a permitted activity under section 8(4)(b) of the NESCS if the report on the site states that it is highly unlikely that there will be a risk to human health if the activity is done to the piece of land.

The potential of contamination to soil associated with the identified potential sources of contamination are considered low to high (refer to Table 3 above), depending on the activity identified. However, it is considered unlikely that there will be a risk to human health with the proposed subdivision providing that the potential contaminant source areas listed in Table 3 are assessed and associated risks to human health and/or the environment are mitigated.

The site is considered to be suitable for subdivision, however, Coffey recommends soil characterisation samples are taken from targeted locations of concern and from across the site to create a detailed site investigation (DSI) prior to earthworks consent being granted to ensure elevated contaminates and excessive use of pesticides are not present and to confirm the applicability of the NESCS to the site.

6. LIMITATIONS

The findings of this report should be read together with “Important Information ‘About Your Coffey Environmental Report’ (attached).

7. BIBLIOGRAPHY

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IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY ENVIRONMENTAL REPORT

Introduction

This report has been prepared by Tetra Tech Coffey for you, as Tetra Tech Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Tetra Tech Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Tetra Tech Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Tetra Tech Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Tetra Tech Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Tetra Tech Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Tetra Tech Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Tetra Tech Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Tetra Tech Coffey prepared the report and has familiarity with the site, Tetra Tech Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Tetra Tech Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

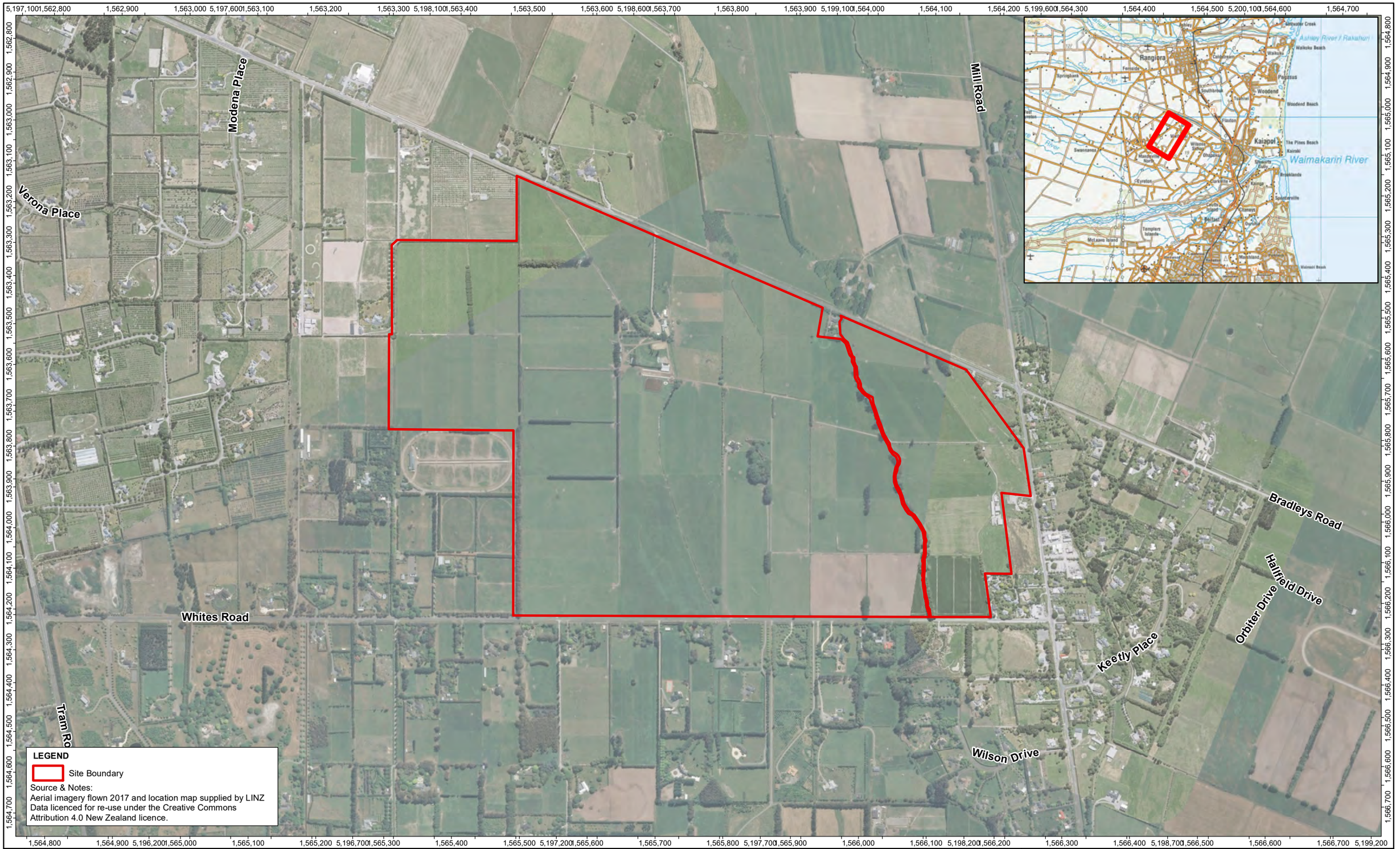
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

FIGURES



revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	RZ	RM	11.05.21

0 100 200 300 400
SCALE 1:10,000 (A3) METRES

Projection: NZGD 2000 New Zealand Transverse Mercator

drawn	RZ
approved	RM
date	11.05.2021
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

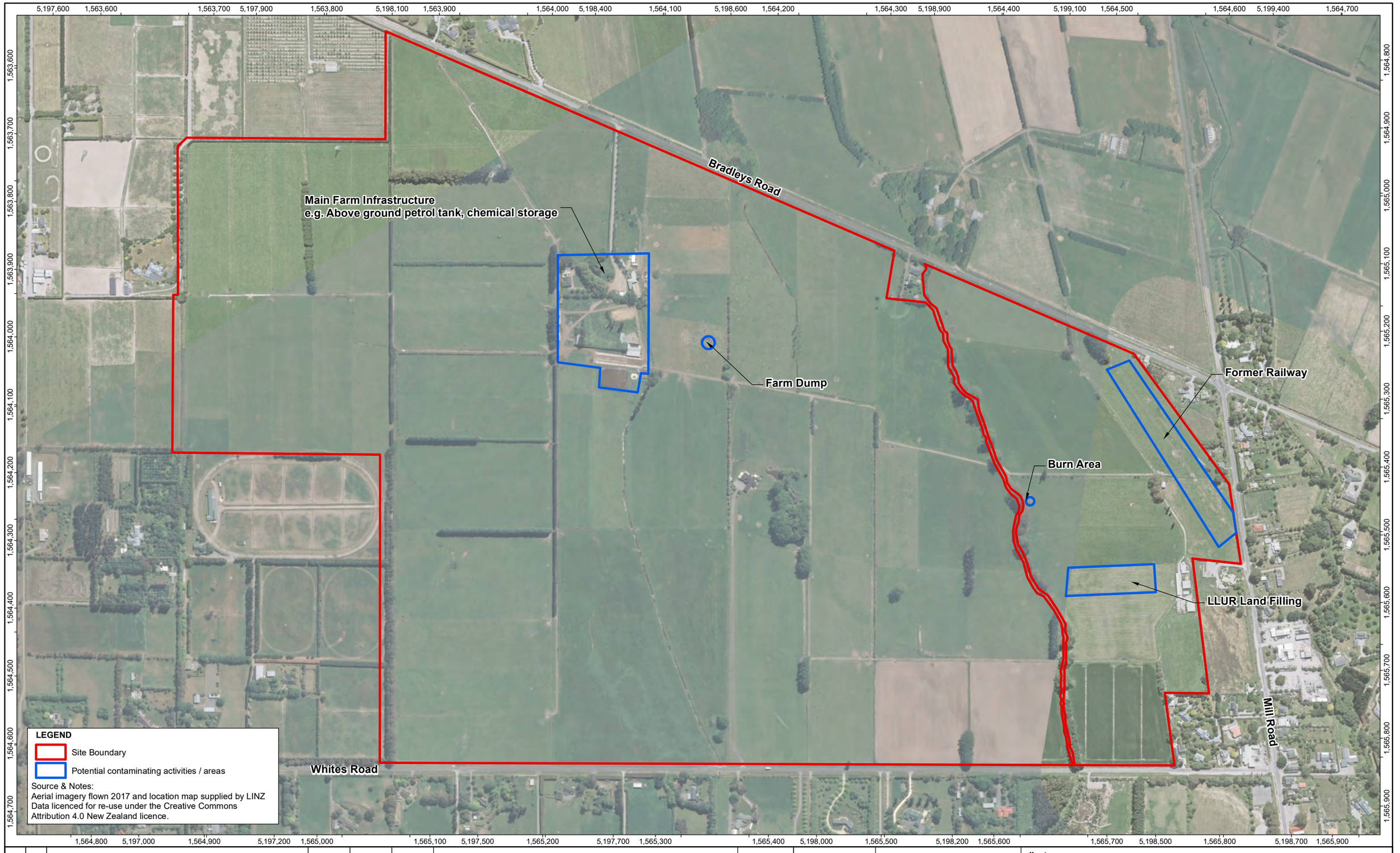
client: ROLLESTON INDUSTRIAL DEVELOPMENT LTD.

project: 535 MILL ROAD, OHOKA

title: SITE LOCATION PLAN

project no: CHCGE288040 | figure no: 01 | rev: A

MXD ref: 288040_EN_GIS01_1



revision					
no.	description	drawn	approved	date	
A	ORIGINAL ISSUE	RZ	RM	12.05.21	

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SCALE 1:6,000 (A3) METRES

Projection: NZGD 2000 New Zealand Transverse Mercator

drawn	RZ
approved	RM
date	12.05.2021
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client: ROLLESTON INDUSTRIAL DEVELOPMENT LTD.

project: 535 MILL ROAD, OHOKA

title: SITE LAYOUT PLAN

project no: CHCGE288040 | figure no: 02 | rev: A

MXD ref: 288040_EN_GIS002_1

APPENDIX A: LLUR ENQUIRY

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

Dear Sir/Madam

Thank you for submitting your property enquiry in regards to our Listed Land Use Register (LLUR) which holds information about sites that have been used, or are currently used for activities which have the potential to have caused contamination.

The LLUR statement provided indicates the location of the land parcel(s) you enquired about and provides information regarding any LLUR sites within a radius specified in the statement of this land.

Please note that if a property is not currently entered on the LLUR, it does not mean that an activity with the potential to cause contamination has never occurred, or is not currently occurring there. The LLUR is not complete, and new sites are regularly being added as we receive information and conduct our own investigations into current and historic land uses.

The LLUR only contains information held by Environment Canterbury in relation to contaminated or potentially contaminated land; other information relevant to potential contamination may be held in other files (for example consent and enforcement files).

If your enquiry relates to a farm property, please note that many current and past activities undertaken on farms may not be listed on the LLUR. Activities such as the storage, formulation and disposal of pesticides, offal pits, foot rot troughs, animal dips and underground or above ground fuel tanks have the potential to cause contamination.

Please contact and Environment Canterbury Contaminated Sites Officer if you wish to discuss the contents of the LLUR statement, or if you require additional information.
For any other information regarding this land please contact Environment Canterbury Customer Services.

Yours sincerely

Contaminated Sites Team

Property Statement
from the Listed Land Use Register

Visit www.ecan.govt.nz/HAIL for more information about land uses.

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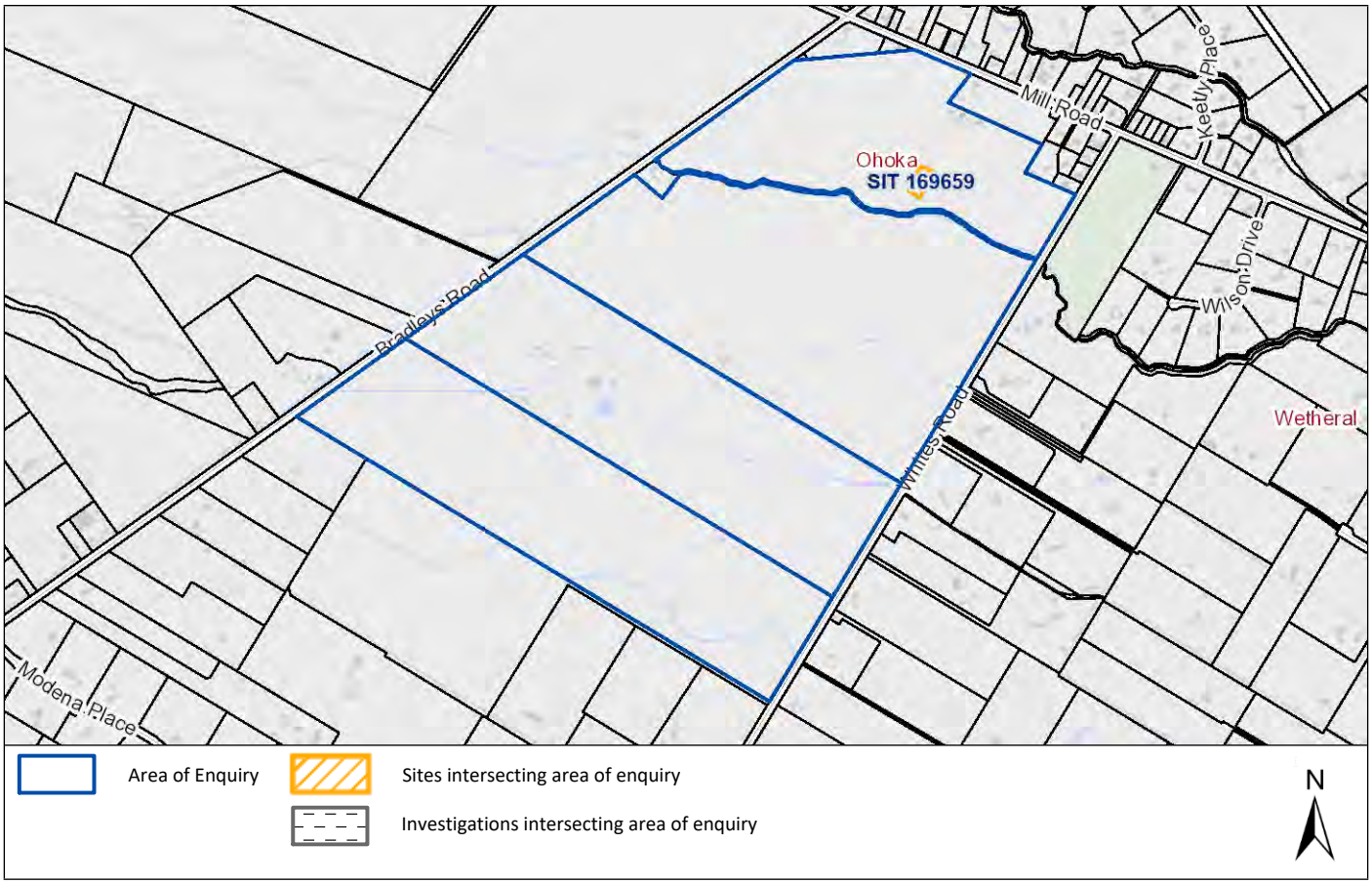
Date:	11 May 2021	
Land Parcels:	Part Lot 1 DP 8301	Valuation No(s): 2174024700
	Lot 2 DP 8301	Valuation No(s): 2174024700
	Lot 2 DP 318615	Valuation No(s): 2174024700
	Lot 3 DP 318615	Valuation No(s): 2174024700
	Part RS 2220	Valuation No(s): 2174024700



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.

Summary of sites:

Site ID	Site Name	Location	HAIL Activity(s)	Category
169659	Lot 2 DP 318615, Ohoka	Lot 2 DP 318615, Ohoka	G3 - Landfill sites;	Not Investigated

Please note that the above table represents a summary of sites and HAILs intersecting the area of enquiry only.

Information held about the sites on the Listed Land Use Register

Site 169659: Lot 2 DP 318615, Ohoka (Intersects enquiry area.)

Site Address:	Lot 2 DP 318615, Ohoka
Legal Description(s):	Lot 2 DP 318615

Site Category:	Not Investigated
Definition:	Verified HAIL has not been investigated.

Land Uses (from HAIL):

Period From	Period To	HAIL land use
1984	2000	Landfill sites

Notes:

1 Dec 2016	This record was created as part of the Waimakariri District Council 2016 HAIL identification project.
7 Jul 2017	Area defined from 1984 to 2000 aerial photographs. G3 - Landfill sites was noted in aerial photographs reviewed.

Investigations:

There are no investigations associated with this site.

Information held about other investigations on the Listed Land Use Register

For further information from Environment Canterbury, contact Customer Services and refer to enquiry number ENQ283106.

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Listed Land Use Register

What you need to know

Everything is connected

What is the Listed Land Use Register (LLUR)?

The LLUR is a database that Environment Canterbury uses to manage information about land that is, or has been, associated with the use, storage or disposal of hazardous substances.

Why do we need the LLUR?

Some activities and industries are hazardous and can potentially contaminate land or water. We need the LLUR to help us manage information about land which could pose a risk to your health and the environment because of its current or former land use.

Section 30 of the Resource Management Act (RMA, 1991) requires Environment Canterbury to investigate, identify and monitor contaminated land. To do this we follow national guidelines and use the LLUR to help us manage the information.

The information we collect also helps your local district or city council to fulfil its functions under the RMA. One of these is implementing the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil, which came into effect on 1 January 2012.

For information on the NES, contact your city or district council.

How does Environment Canterbury identify sites to be included on the LLUR?

We identify sites to be included on the LLUR based on a list of land uses produced by the Ministry for the Environment (MfE). This is called the Hazardous Activities and Industries List (HAIL)[1]. The HAIL has 53 different activities, and includes land uses such as fuel storage sites, orchards, timber treatment yards, landfills, sheep dips and any other activities where hazardous substances could cause land and water contamination.

We have two main ways of identifying HAIL sites:

- We are actively identifying sites in each district using historic records and aerial photographs. This project started in 2008 and is ongoing.
- We also receive information from other sources, such as environmental site investigation reports submitted to us as a requirement of the Regional Plan, and in resource consent applications.

[1] The Hazardous Activities and Industries List (HAIL) can be downloaded from MfE's website www.mfe.govt.nz, keyword search HAIL

How does Environment Canterbury classify sites on the LLUR?

Where we have identified a HAIL land use, we review all the available information, which may include investigation reports if we have them. We then assign the site a category on the LLUR. The category is intended to best describe what we know about the land use and potential contamination at the site and is signed off by a senior staff member.

Please refer to the Site Categories and Definitions factsheet for further information.

What does Environment Canterbury do with the information on the LLUR?

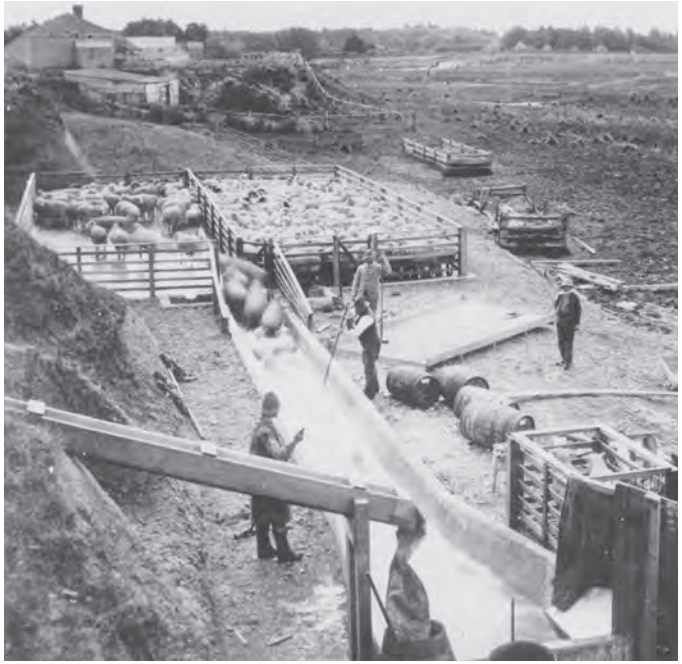
The LLUR is available online at www.llur.ecan.govt.nz. We mainly receive enquiries from potential property buyers and environmental consultants or engineers working on sites. An inquirer would typically receive a summary of any information we hold, including the category assigned to the site and a list of any investigation reports.

We may also use the information to prioritise sites for further investigation, remediation and management, to aid with planning, and to help assess resource consent applications. These are some of our other responsibilities under the RMA.

If you are conducting an environmental investigation or removing an underground storage tank at your property, you will need to comply with the rules in the Regional Plan and send us a copy of the report. This means we can keep our records accurate and up-to-date, and we can assign your property an appropriate category on the LLUR. To find out more, visit www.ecan.govt.nz/HAIL.

IMPORTANT!

The LLUR is an online database which we are continually updating. A property may not currently be registered on the LLUR, but this does not necessarily mean that it hasn't had a HAIL use in the past.



Sheep dipping (ABOVE) and gas works (TOP) are among the former land uses that have been identified as potentially hazardous. (Photo above by Wheeler & Son in 1987, courtesy of Canterbury Museum.)

My land is on the LLUR – what should I do now?

IMPORTANT! Just because your property has a land use that is deemed hazardous or is on the LLUR, it doesn't necessarily mean it's contaminated. The only way to know if land is contaminated is by carrying out a detailed site investigation, which involves collecting and testing soil samples.

You do not need to do anything if your land is on the LLUR and you have no plans to alter it in any way. It is important that you let a tenant or buyer know your land is on the Listed Land Use Register if you intend to rent or sell your property. If you are not sure what you need to tell the other party, you should seek legal advice.

You may choose to have your property further investigated for your own peace of mind, or because you want to do one of the activities covered by the National Environmental Standard for Assessing and Managing Contaminants in Soil. Your district or city council will provide further information.

If you wish to engage a suitably qualified experienced practitioner to undertake a detailed site investigation, there are criteria for choosing a practitioner on www.ecan.govt.nz/HAIL.

I think my site category is incorrect – how can I change it?

If you have an environmental investigation undertaken at your site, you must send us the report and we will review the LLUR category based on the information you provide. Similarly, if you have information that clearly shows your site has not been associated with HAIL activities (eg. a preliminary site investigation), or if other HAIL activities have occurred which we have not listed, we need to know about it so that our records are accurate.

If we have incorrectly identified that a HAIL activity has occurred at a site, it will be not be removed from the LLUR but categorised as Verified Non-HAIL. This helps us to ensure that the same site is not re-identified in the future.

Contact us

Property owners have the right to look at all the information Environment Canterbury holds about their properties.

It is free to check the information on the LLUR, online at www.llur.ecan.govt.nz.

If you don't have access to the internet, you can enquire about a specific site by phoning us on (03) 353 9007 or toll free on 0800 EC INFO (32 4636) during business hours.

Contact Environment Canterbury:

Email: ecinfo@ecan.govt.nz

Phone:
Calling from Christchurch: (03) 353 9007
Calling from any other area: 0800 EC INFO (32 4636)

Environment Canterbury Regional Council
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Everything is connected

Promoting quality of life through balanced resource management.

www.ecan.govt.nz E13/101

Listed Land Use Register

Site categories and definitions

When Environment Canterbury identifies a Hazardous Activities and Industries List (HAIL) land use, we review the available information and assign the site a category on the Listed Land Use Register. The category is intended to best describe what we know about the land use.

If a site is categorised as **Unverified** it means it has been reported or identified as one that appears on the HAIL, but the land use has not been confirmed with the property owner.

If the land use has been confirmed but analytical information from the collection of samples is not available, and the presence or absence of contamination has therefore not been determined, the site is registered as:

Not investigated:

- A site whose past or present use has been reported and verified as one that appears on the HAIL.
- The site has not been investigated, which might typically include sampling and analysis of site soil, water and/or ambient air, and assessment of the associated analytical data.
- There is insufficient information to characterise any risks to human health or the environment from those activities undertaken on the site. Contamination may have occurred, but should not be assumed to have occurred.

If analytical information from the collection of samples is available, the site can be registered in one of six ways:

At or below background concentrations:

The site has been investigated or remediated. The investigation or post remediation validation results confirm there are no hazardous substances above local background concentrations other than those that occur naturally in the area. The investigation or validation sampling has been sufficiently detailed to characterise the site.

Below guideline values for:

The site has been investigated. Results show that there are hazardous substances present at the site but indicate that any adverse effects or risks to people and/or the environment are considered to be so low as to be acceptable. The site may have been remediated to reduce contamination to this level, and samples taken after remediation confirm this.

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Managed for:

The site has been investigated. Results show that there are hazardous substances present at the site in concentrations that have the potential to cause adverse effects or risks to people and/or the environment. However, those risks are considered managed because:

- the nature of the use of the site prevents human and/or ecological exposure to the risks; and/or
- the land has been altered in some way and/or restrictions have been placed on the way it is used which prevent human and/or ecological exposure to the risks.

Partially investigated:

The site has been partially investigated. Results:

- demonstrate there are hazardous substances present at the site; however, there is insufficient information to quantify any adverse effects or risks to people or the environment; or
- do not adequately verify the presence or absence of contamination associated with all HAIL activities that are and/or have been undertaken on the site.

Significant adverse environmental effects:

The site has been investigated. Results show that sediment, groundwater or surface water contains hazardous substances that:

- have significant adverse effects on the environment; or
- are reasonably likely to have significant adverse effects on the environment.

Contaminated:

The site has been investigated. Results show that the land has a hazardous substance in or on it that:

- has significant adverse effects on human health and/or the environment; and/or
- is reasonably likely to have significant adverse effects on human health and/or the environment.

If a site has been included incorrectly on the Listed Land Use Register as having a HAIL, it will not be removed but will be registered as:

Verified non-HAIL:

Information shows that this site has never been associated with any of the specific activities or industries on the HAIL.

Please contact Environment Canterbury for further information:

(03) 353 9007 or toll free
on 0800 EC INFO (32 4636)
email ecinfo@ecan.govt.nz

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

E13/102

Environment Canterbury
Regional Council
Kaunihera Taiao ki Waitaha

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Yours sincerely

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Property Statement
from the Listed Land Use Register

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E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Date:	31 May 2021	
Land Parcels:	Lot 2 DP 61732	Valuation No(s): 2174024700

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.

Summary of sites:

There are no sites associated with the area of enquiry.

Information held about the sites on the Listed Land Use Register

There are no sites associated with the area of enquiry.

Information held about other investigations on the Listed Land Use Register

For further information from Environment Canterbury, contact Customer Services and refer to enquiry number ENQ284707.

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 and Environment Canterbury's Contaminated Land Information Management Strategy (ECan 2009).

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.

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Listed Land Use Register

What you need to know

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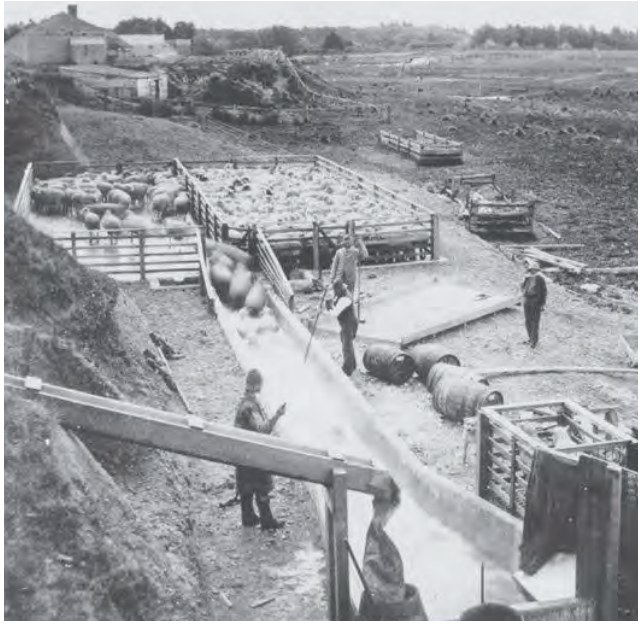

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My land is on the LLUR – what should I do now?

IMPORTANT! Just because your property has a land use that is deemed hazardous or is on the LLUR, it doesn't necessarily mean it's contaminated. The only way to know if land is contaminated is by carrying out a detailed site investigation, which involves collecting and testing soil samples.

You do not need to do anything if your land is on the LLUR and you have no plans to alter it in any way. It is important that you let a tenant or buyer know your land is on the Listed Land Use Register if you intend to rent or sell your property. If you are not sure what you need to tell the other party, you should seek legal advice.

You may choose to have your property further investigated for your own peace of mind, or because you want to do one of the activities covered by the National Environmental Standard for Assessing and Managing Contaminants in Soil. Your district or city council will provide further information.

If you wish to engage a suitably qualified experienced practitioner to undertake a detailed site investigation, there are criteria for choosing a practitioner on www.ecan.govt.nz/HAIL.

I think my site category is incorrect – how can I change it?

If you have an environmental investigation undertaken at your site, you must send us the report and we will review the LLUR category based on the information you provide. Similarly, if you have information that clearly shows your site has not been associated with HAIL activities (eg. a preliminary site investigation), or if other HAIL activities have occurred which we have not listed, we need to know about it so that our records are accurate.

If we have incorrectly identified that a HAIL activity has occurred at a site, it will be not be removed from the LLUR but categorised as Verified Non-HAIL. This helps us to ensure that the same site is not re-identified in the future.

Contact us

Property owners have the right to look at all the information Environment Canterbury holds about their properties.

It is free to check the information on the LLUR, online at www.llur.ecan.govt.nz.

If you don't have access to the internet, you can enquire about a specific site by phoning us on (03) 353 9007 or toll free on 0800 EC INFO (32 4636) during business hours.

Contact Environment Canterbury:

Email: ecinfo@ecan.govt.nz

Phone:
Calling from Christchurch: (03) 353 9007
Calling from any other area: 0800 EC INFO (32 4636)

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Everything is connected

Promoting quality of life through balanced resource management.

www.ecan.govt.nz E13/101