

# Preliminary Services Design Report

## 1379, 1401 & 1419 Tram Road (Block A), Swannanoa

Prepared for Andrew McAllister

15858



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Project number: 15858

## Quality Control Certificate

Survus Consultants

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<b>Status:</b>	Final		
<b>Release date:</b>	17 October 2023		
<b>Reference no:</b>	15858		
<b>Distributed to:</b>	Andrew McAllister Waimakariri District Council		

## Contents

<b>1. Introduction</b>	<b>1</b>
1.1. Purpose	1
1.2. Scope	1
<b>2. Site Description</b>	<b>2</b>
2.1. Location and Surrounds	2
2.2. Topography	2
2.3. Geology	3
2.4. Groundwater	3
2.5. Surface Water	5
2.6. Contamination	5
2.7. Flood Hazard	5
<b>3. Wastewater</b>	<b>5</b>
3.1. Existing Network	5
3.2. Wastewater Flows	6
3.3. Proposed Network	6
<b>4. Stormwater</b>	<b>7</b>
4.1. Existing Network	7
4.2. Proposed Stormwater Network	7
<b>5. Water Supply</b>	<b>8</b>
5.1. Existing Network	8
5.2. Water Supply Demand	8
5.3. Proposed Network	8
<b>6. Utility Services</b>	<b>9</b>
6.1. Power and Telecommunications	9
<b>7. Conclusion</b>	<b>9</b>
<b>Disclaimer</b>	<b>10</b>

## Appendices

**Appendix A. Proposed Subdivision Scheme Plan**

**Appendix B. Correspondence**

# 1. Introduction

## 1.1. Purpose

This Preliminary Services Design Report has been prepared in support of a submission by Andrew McAllister for the rezoning of an approximate 15.7341 ha area of land from rural to residential, located at 1379, 1401 & 1419 Tram Road, Swannanoa, as shown in Figure 1.



Figure 1. Plan Change Zone Boundary

## 1.2. Scope

This report addresses the servicing requirements for stormwater, wastewater, water supply and utility services (power and telecommunications).

The following information is provided within the Appendices.

**Appendix A:** Proposed Subdivision Scheme Plan.

**Appendix B:** Correspondence.

## 2. Site Description

### 2.1. Location and Surrounds

The proposed submission area is located at the addresses shown in Table 1.

**Table 1. Proposed Submission Area Addresses**

<b>Legal Description</b>	<b>Owner</b>	<b>Address</b>	<b>Area (ha)</b>
Lot 5 DP 321133	Andrew John McAllister	1401 Tram Road, Swannanoa	4.0007 (surveyed)
Lot 7 DP 321133	Andrew John McAllister	1419 Tram Road, Swannanoa	4.0224 (surveyed)
Lot 1 DP 323637	Andrew John McAllister	1379 Tram Road, Swannanoa	7.711 (surveyed)

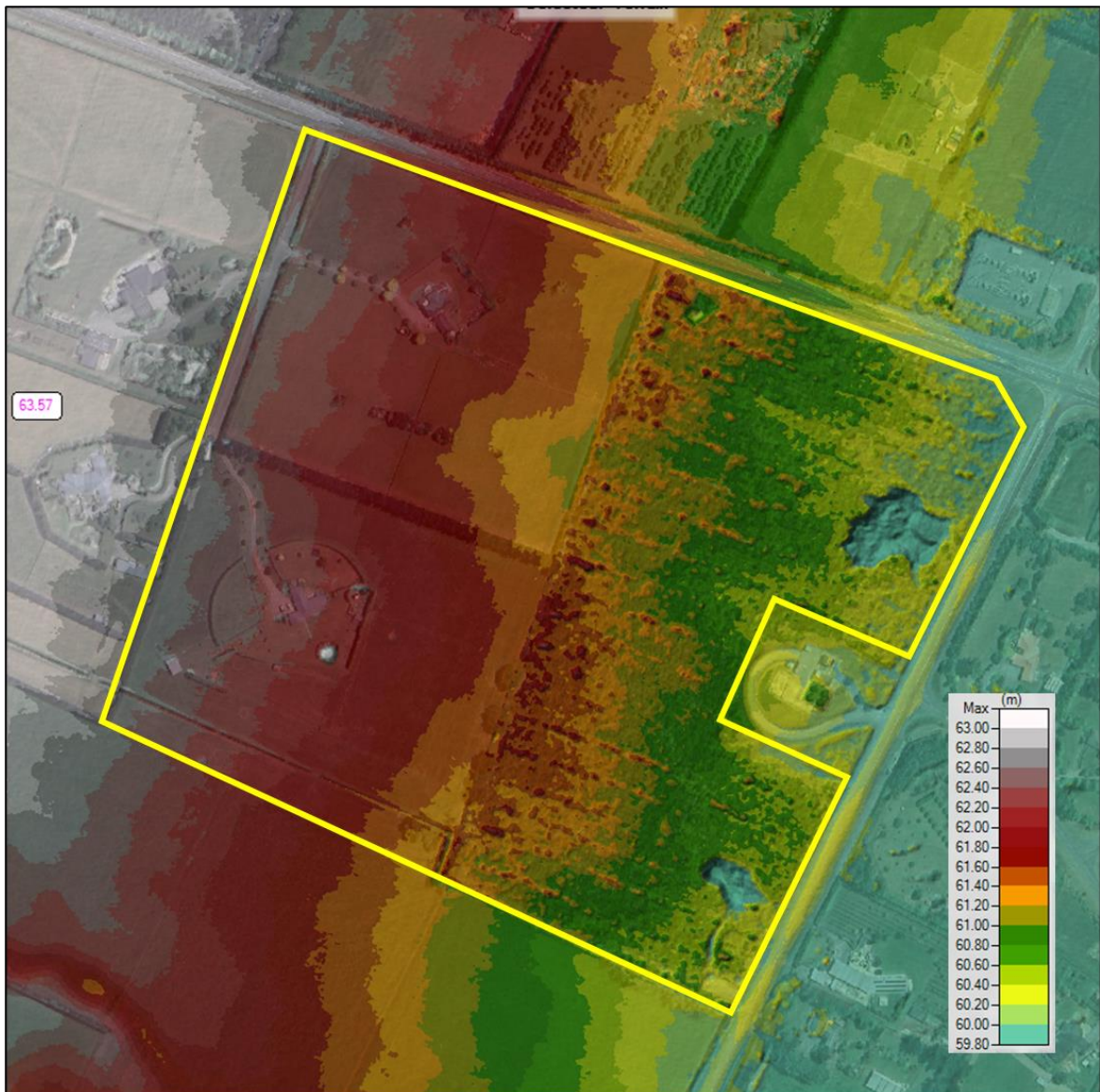
The site is located on the southwest corner of the Tram Road and Two Chain Road intersection.

There is an existing residential dwelling located within the centre of the 1401 and 1419 Tram Road properties. The 1379 Tram Road property is covered by a pine plantation. 937 Two Chain Road (Lot 2 DP 323637) is located along the 1379 Tram Road property boundary. 937 Two Chain Road is owned by WDC as a water supply pump station.

### 2.2. Topography

The site is generally flat with a naturally sloping topography towards the east-southeast at an approximate grade of 1 in 170.

Figure 2 shows the site topography.



**Figure 2. Site Topography (NZVD 2016)**

### 2.3. Geology

Landcare Research Soil Maps (2023) describe the soils as an imperfectly and moderately well drain silt with the classification of mottled argillic pallic and typic argillic pallic soil.

Bore logs from wells located within the site (Canterbury Maps, 2023) suggest a topsoil, overlying a sandy gravel and claybound gravel.

A geotechnical investigation would be required to confirm the exact soil types underlying the site.

### 2.4. Groundwater

#### 2.4.1. Aquifer Type

The plan change area is located above the unconfined/semiconfined aquifer and piezometric contours indicate that groundwater generally flows to the east-southeast (Canterbury Maps, 2023).

### 2.4.2. Springs

There are no springs within a 1.5 km radius of the site.

### 2.4.3. Community Drinking Water Protection Zones

Community Drinking water supply well M35/18638 is located within the southeast corner of the 1379 Tram Road property boundary and well M35/9021 within the neighbouring 937 Two Chain Road property, owned by WDC and used as a water supply pump station. Wells M35/18638 and M35/9021 have a depth of 77.03 m and 106.8 m respectively.

The 1419 and 1379 Tram Road properties are partially located within a community drinking water supply protection zone, as shown in Figure 3.



**Figure 3. Community Drinking Water Protection Zones (Canterbury Maps 2023)**

### 2.4.4. Groundwater Depth

Canterbury Maps (2023) shows the depth to groundwater within the plan change area is greater than 6 m below ground level (bgl).

There are no groundwater monitoring wells within close proximity to the site, the closest well is:

- Groundwater monitoring well M35/0222, located 1.85 km to the north has a recorded ground water level fluctuation of between 4.59 m to >12 m below ground level (bgl).

Other wells within close proximity to the site have the following groundwater level recordings:

- Well M35/9021, located within the plan change area has a recorded groundwater level of 7.58 m bgl (May 2011).

- Well M35/4775, located 130 m to the northeast, has a recorded groundwater level fluctuation of 6.5 m to 8.55 m bgl (Dec 2009 to 08 Jun 2016).

## 2.5. Surface Water

There is a water race located near the south side of the plan change area. This has recently been realigned with approval from WDC. This water race is now offset 1 m to 2 m from the south boundary of 1419 Tram Road and is located on/adjacent to the south side of the south boundary of 1379 Tram Road. Figure 4 shows the water race.



**Figure 4. Water Race (Photo taken by E2 Environmental)**

## 2.6. Contamination

The site is not registered on the Environment Canterbury (ECan) Listed Land Use Register (LLUR) as having historical HALL activities.

## 2.7. Flood Hazard

The site is shown in the Waimakariri District Council (WDC) Flood Hazard Maps as being subject to inundation during the 0.5% Annual Exceedance Probability (AEP). E2 Environmental have provided a Flood Risk Assessment as part of the plan change submission.

# 3. Wastewater

## 3.1. Existing Network

Swannanoa is within the Mandeville Area Wastewater Scheme which is a Septic Tank Effluent Pumping (STEP) system. Raw sewage is collected in private on-site septic tanks where it receives primary treatment and screening. The primary treated effluent is then pumped from the Bradley's Road pump station to the Rangiora Wastewater Treatment Plant for additional treatment and disinfection.



There is a 100 mm nominal diameter (DN) UPVC rising main within the eastern berm of Two Chain Road which connects into a 90 mm diameter MDPE (PE100) rising main at the corner of Two Chain Road and Tram road. The 90 mm diameter rising main discharges to a DN100 UPVC pressure main at the corner of Tram Road and No 10 Road (1.86 km to the southeast).

### 3.2. Wastewater Flows

The proposed wastewater network has undergone preliminary design calculations for confirmation of the discharge rate. Based on the WDC Engineering Code of Practice Part 6, the following discharge rates for the 27 Lot plan change area are expected.

- Average dry weather flow = 2.7 people/dwelling x 250 L/person/day x 27 dwellings = **0.211 L/s**
- Peak dry weather flow = 0.21 L/s x 2.5 = **0.528 L/s**
- Peak wet weather flow = 0.528 x 4 = **2.112 L/s**

### 3.3. Proposed Network

WDC will need to confirm that the existing wastewater network and treatment plant facility have capacity to cater for the additional wastewater flow that will be generated by a future subdivision, and this will have a bearing on the design of the internal sewer network (or any potential upgrades to the WDC external network).

It is considered there are four potential wastewater network design options as discussed in the following sections.

#### 3.3.1. Option 1: STEP

This option is in line with the existing wastewater management scheme. Each property would have a privately owned septic tank and pump which would discharge to a pressure sewer main located within the street berm. The pressure main network would discharge to the DN100 UPVC rising main within Two Chain Road. The STEP systems also include electrical controllers that can incorporate telemetry if required.

#### 3.3.2. Option 2: Low Pressure Sewer

Low Pressure Sewer (LPS) is a viable alternative network to a STEP system, as wastewater flows can be attenuated and discharged to the downstream network during off peak periods. LPS networks are similar to STEP, except do not provide primary treatment (solids settling). All wastewater passes through a grinder pump and discharges to the downstream network.

Residential dwellings would drain effluent via a gravity pipe to a pump unit (pump and chamber), located within each individual property boundary. Each pump unit would have at least 24 hours storage capacity and would be controlled by an IOTA OneBox control panel which allows for automation and external control of the pump. The pump unit would discharge effluent to a pressure sewer main located within the street berm.

At the time of subdivision construction, each residential dwelling would be provided with a boundary kit (containing valves and isolation points). The boundary kit would be located just outside the property boundary (within the road reserve services strip). A lateral (pipe) would extend from the boundary kit into each property for later connection of the pump unit.

### 3.3.3. Option 3: Gravity Sewer and Pump station

Potentially, each property could discharge to a gravity network within the future subdivision, which in turn would discharge to a pump station, prior to being pumped to the DN100 UPVC rising main within Two Chain Road.

Pump stations can also be used as an alternative to the LPS or STEP networks. Generally, the WDC Engineering Code of Practice requires that pump stations have 8 hours of storage for the average daily dry weather flow, the storage capacity also includes the upstream capacity of manholes and reticulation.

### 3.3.4. Option 4: Onsite Wastewater Disposal

Should the WDC reticulated network not have capacity to cater for a future subdivision, potentially onsite wastewater treatment and disposal could be utilised. This would require each site to have an advanced wastewater treatment unit and pressure compensating drip irrigation field. Due to the small Lot sizes and the community drinking water supply protection zone covering part of the plan change area a Resource Consent would need to be sought from Environment Canterbury. This option is the least favourable and would need to be discussed with Environment Canterbury. There is no guarantee that Environment Canterbury would grant consent due to the close proximity of the drinking water supply wells and that the area is mapped as being within a nutrient allocation zone where water quality outcomes are not met.

## 4. Stormwater

### 4.1. Existing Network

WDC service maps indicate there is no stormwater infrastructure within the vicinity of the proposed plan change area.

Well record data suggests the underlying soils types in the vicinity are possibly gravels and the highest seasonal groundwater is greater than 6 m bgl. Therefore, the existing properties in the area are most likely discharging all stormwater into land via soakage systems.

### 4.2. Proposed Stormwater Network

Due to the lack of stormwater infrastructure and surface waters within the vicinity it is considered that the only feasible method of stormwater disposal is via soakage pits. The water race that runs along the southern boundary is shallow and it is unlikely that stormwater can be discharged to it.

#### Roof Stormwater

All stormwater runoff generated by roof areas would discharge into privately owned soakage pits sized with sufficient capacity to detain and discharge all rainfall runoff from all storm events up to and including the 2% AEP (50 Year) critical duration.

#### Road and Driveway Stormwater

All stormwater runoff generated by roads and driveways would be conveyed by kerb and channel, sumps and pipe reticulation to soakage pits (located within the road reserve e.g. under berms). The soakage pits would be sized with sufficient capacity to detain and discharge all rainfall runoff from all storm events up to and including the 2% AEP critical duration.

All sumps would have submerged outlets to enhance the capture of sediment and hydrocarbons. The piped network would be sized to convey the 2% AEP critical duration stormwater runoff flow.

## 5. Water Supply

### 5.1. Existing Network

The plan change area is mapped as being located within the Mandeville-Fernside water supply scheme, which is a restricted supply. The supply is limited to each property by a restrictor unit and each connection is required to have a tank and pump to supply the property. Each property within the Mandeville Fernside scheme is limited to 2 m<sup>3</sup>/day.

The WDC water supply pump station is located within the neighbouring 937 Tram Road property.

Within the wester berm of Two Chain Road is a DN150 UPVC water supply main.

Within the northern berm of Tram Road is a 63 mm Outside Diameter (OD) PE water supply submain.

### 5.2. Water Supply Demand

The proposed water supply network has undergone preliminary design calculations for confirmation of the firefighting and potable water supply demands.

- Assuming 2 m<sup>3</sup> is supplied to each future dwelling at a rate of 0.023 L/s. The total daily demand for 27 Lots will be 0.62 L/s.
- Firefighting demand (FW2) = 12.5 L/s within 135 m of a dwelling and 12.5 L/s within 270 m of a dwelling (25 L/s total demand).

Should for any reason the supply be changed to on demand (rather than restricted); the following demand for the 27 Lot development is expected.

- Peak potable residential demand = 0.10 L/s/dwelling x 27 dwellings = 2.7 L/s
- Peak demand (firefighting + 60% of the peak potable demand) = 26.62 L/s.

### 5.3. Proposed Network

WDC will need to confirm whether the existing infrastructure has sufficient capacity to supply an additional 27 Lots on the restricted supply scheme.

The point of supply for the future subdivision would be the DN150 UPVC water supply main within Two Chain Road. A new DN100 UPVC water supply main could be run within the subdivision internal roading to allow for the installation of appropriately spaced fire hydrants, if preferred by WDC the DN100 water supply main could also connect into the 63 mm OD PE submain on the northern side of Tram Road (creating a ring main). A 63 OD PE submain would be run within the berm and would provide the restricted supply to each dwelling.

A 25 OD PE lateral connection would be taken of the submain up to a restrictor located within the road reserve services strip outside each property boundary. The restrictor unit limits the supply to each property and evenly distributes the supply over a 24 hour period.

Each property will be required to have an onsite potable water storage tank with sufficient capacity for 24 hours supply.

The potable water supply network would be designed in accordance with the WDC Engineering Codes of Practice and SNZ PAS 4509:2008 *New Zealand Fire Service Fire Fighting Water Supplies Code of Practice*. The firefighting water supply classification will be FW2 in keeping with a residential area and Fire hydrants would be placed at no more than 135 m intervals.

## 6. Utility Services

### 6.1. Power and Telecommunications

Power and telecommunications will be provided to service the site in accordance with utility company and industry standards at the time of development. All cables and ducts will be placed below ground, and kiosks will be placed within individual allotments.

MainPower and Chorus have provided confirmation that their networks have capacity to service the electrical and telecommunication needs of the plan change area. The capacity confirmation letters are located in **Appendix B**.

## 7. Conclusion

The site can be serviced for wastewater, stormwater, potable water, power, and telecommunications subject to preliminary and detailed design in conjunction with appropriate Council confirmations and consents being obtained. On this basis the submission for rezoning can be supported in respect of servicing capacity.

## Disclaimer

This report has been prepared by Survus Consultants Limited (Survus) only for the intended purpose as a Preliminary Services Design Report.

The report is based on:

- Subdivision Plan.
- WDC Services Maps.
- Canterbury Maps.
- LiDAR.
- Information provided by service suppliers.

Where data supplied by Andrew McAllister or other external sources, including previously issued drawings or reports have been relied upon, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Survus for incomplete or inaccurate data supplied by other parties.

Whilst every care has been taken during our investigation and interpretation of available data to ensure that the conclusions drawn, and the opinions and recommendations expressed, are correct at the time of reporting, Survus has not performed an assessment of all possible conditions or circumstances that may exist at the site. Variations in conditions may occur between data sources and Survus has provided conclusions in this report based on the best available information at the time of writing. Survus does not provide any warranty, either express or implied, that all conditions will conform exactly to the assessments contained in this report.

The exposure of conditions or materials that vary from those described in this report may require a review of our recommendations. Survus should be contacted to confirm the validity of this report should any of these occur.

This report has been prepared for the benefit of Andrew McAllister and the Waimakariri District Council for the purposes as stated above. No liability is accepted by Survus or any of their employees with respect to the use of this report, in whole or in part, for any other purpose or by any other party.

## Appendix A. Proposed Subdivision Scheme Plan



Environmental Canterbury, Waimakiri DC, LINZ, Environment Canterbury



4 Meadow Street, PO Box 5558, Papanui, Christchurch  
 P 03 352 5599 AMBERLEY 03 314 9200  
 F 03 352 5527 ASHBURTON 03 307 7021  
 TOLL FREE 0508 787 887 DARFIELD 03 318 8151

REV	DATE	REVISION DETAILS
A		

DRAFTED SRS	VERIFIED
APPROVED	
DATE	

PROJECT ANDREW McALLISTER - 1379, 1401 & 1419 TRAM ROAD, SWANNANOA
TITLE

INFORMATION ONLY	
PROJECT NO 15858	
SCALE 1 : 3000 (A3)	SIZE A3
DRAWING NO	REV A

## Appendix B. Correspondence



10/10/2023- via email

Network Reference: 00056811

C Mars  
Servus Consultants  
PO Box 5558  
Papanui 8542



**MainPower New Zealand Limited**  
172 Fernside Road, RD 1 Kaiapoi 7691  
PO Box 346, Rangiora 7440  
T. 0800 30 90 80

Dear Cameron,

**Re: Power Connection for Proposed Subdivision. Lot 1 DP 323637 1379 Tram Road Swannanoa**

MainPower confirms that the High voltage Network in the vicinity of 1379 Tram Road Swannanoa has the capacity to supply the proposed subdivision.

This letter is to advise you that MainPower's network has the capacity for the proposed subdivision. This does not mean that there is an electrical supply to the boundary of the proposed lots.

Please do not hesitate to contact the MainPower NZ Ltd NSR Team on 03 311 8311 or [NSR@mainPower.co.nz](mailto:NSR@mainPower.co.nz) if you have any questions.

Yours sincerely,

Matthew Bate  
**Network Services Representative**

If you have any concerns about MainPower's services please call MainPower on 0800 30 90 80 to access our free, Complaint Resolution Service. If we are unable to resolve your concern you can contact the free, independent Utilities Disputes Ltd on 0800 22 33 40 or visit [www.utilitiesdisputes.co.nz](http://www.utilitiesdisputes.co.nz)

[www.mainpower.co.nz](http://www.mainpower.co.nz)

## Cameron Mars

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**From:** Chorus Property Development Do Not Reply <npdnoreply@chorus.co.nz>  
**Sent:** Tuesday, 10 October 2023 3:55 pm  
**To:** npdnoreply@chorus.co.nz  
**Subject:** Chorus 10619298 : We can service your development



Hi

Development address: 1379 Tram Road , Swannanoa,  
Waimakariri District, 7475

This email is to confirm that Chorus can provide our fibre network to your development. An indicative cost for the work we would need to do (noting that this excludes costs for any work you may be required to do inside the site boundary) is presented in the below notes:

A high level estimate to extend our fibre network to your development is \$66,570.39 Incl. GST

If you would like this formalised into a quote, then please [log in to your account](#) and let us know. If you need to amend the connection numbers or provide updated plans, you can also do that via your account.

Chorus New Property Development Team

Please do not reply to this email as this inbox is not monitored. For any follow up queries please visit [www.chorus.co.nz/develop-with-chorus](http://www.chorus.co.nz/develop-with-chorus) or [log in to your account](#). If you do not yet have an account with us, you will need to [create an account](#) to view your job progress and documentation.

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