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# Private Water Supplies – Where are they and what are the risks?



**water**  
NEW ZEALAND  
CONFERENCE & EXPO  
17-19 OCTOBER 2023  
Tākina, Te Whanganui-a-Tara Wellington

# What this paper covers

- What's the story with private water suppliers ?
- How private suppliers in Christchurch District were identified
- How risks were assessed
- Risk assessment findings
- Service option scenarios
- On the ground assessments of suppliers
- Conclusions

# What is the story with private suppliers ?

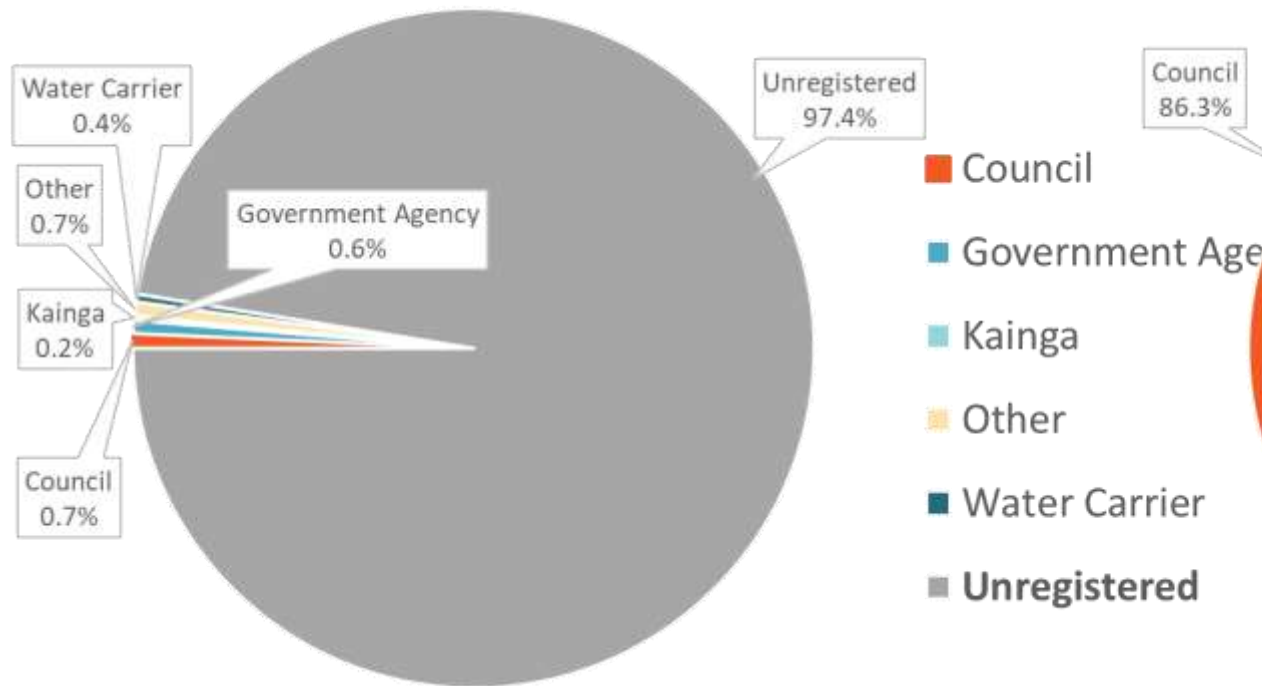
- “There’s a huge number of water suppliers not registered and nobody really knows much about who they are, where they are, and what their circumstances are” and
- “we’re engaged with a process that’s just beginning to find out.. who operates them and how best to provide some rules.... that’s a big job and we’re just beginning it “

Jim Graham, Principal Advisor Taumata Arowai - “Making our Water Safe”

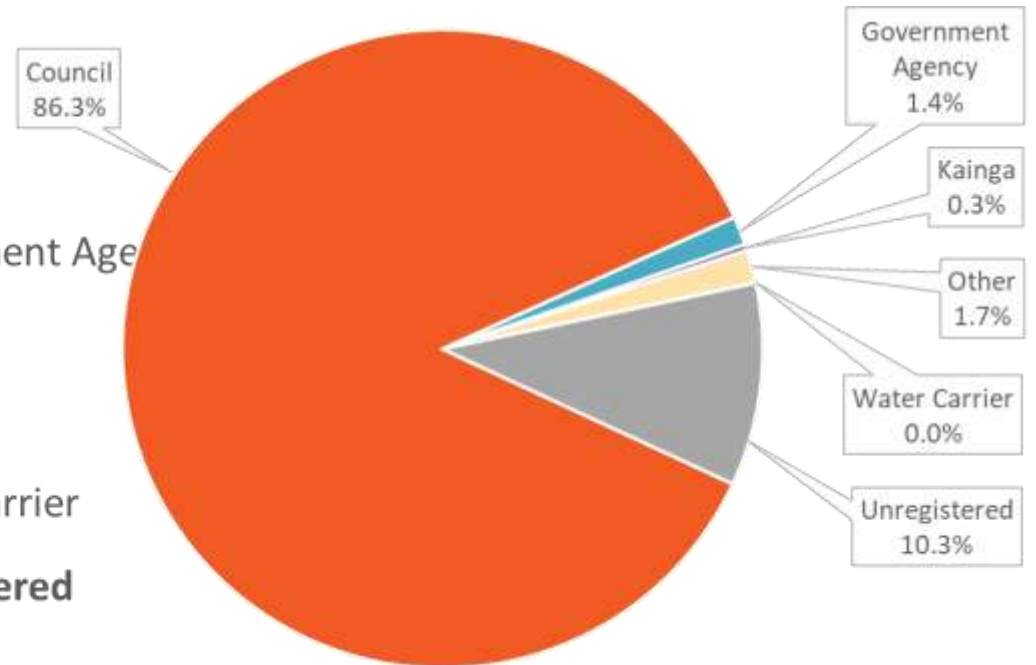
Radio NZ The Detail Podcast 27/9/23

# "Unregistered pose our biggest challenge"

Who manages supplies?  
(including unregistered)



Population served by supplies  
(including unregistered)



Slide from Bill Bayfield Keynote at Water NZ 26th May 2022

# Water Services Act 2021

- ✓ Requires Councils to identify private water suppliers
- ✓ Suppliers must ensure drinking water is “safe and compliant”
- ✓ Councils have “step-in responsibilities if a supplier is unable to meet standards”
- ✓ All councils in NZ have similar obligations

**Version as at 31 August 2023**



## **Water Services Act 2021**

Public Act 2021 No 36

Date of assent 4 October 2021

Commencement see section 2

# Definition of a 'private supplier'



Single domestic supplies excluded (e.g., rainwater or private bore)



Two or more dwellings



Crown owned supplies excluded

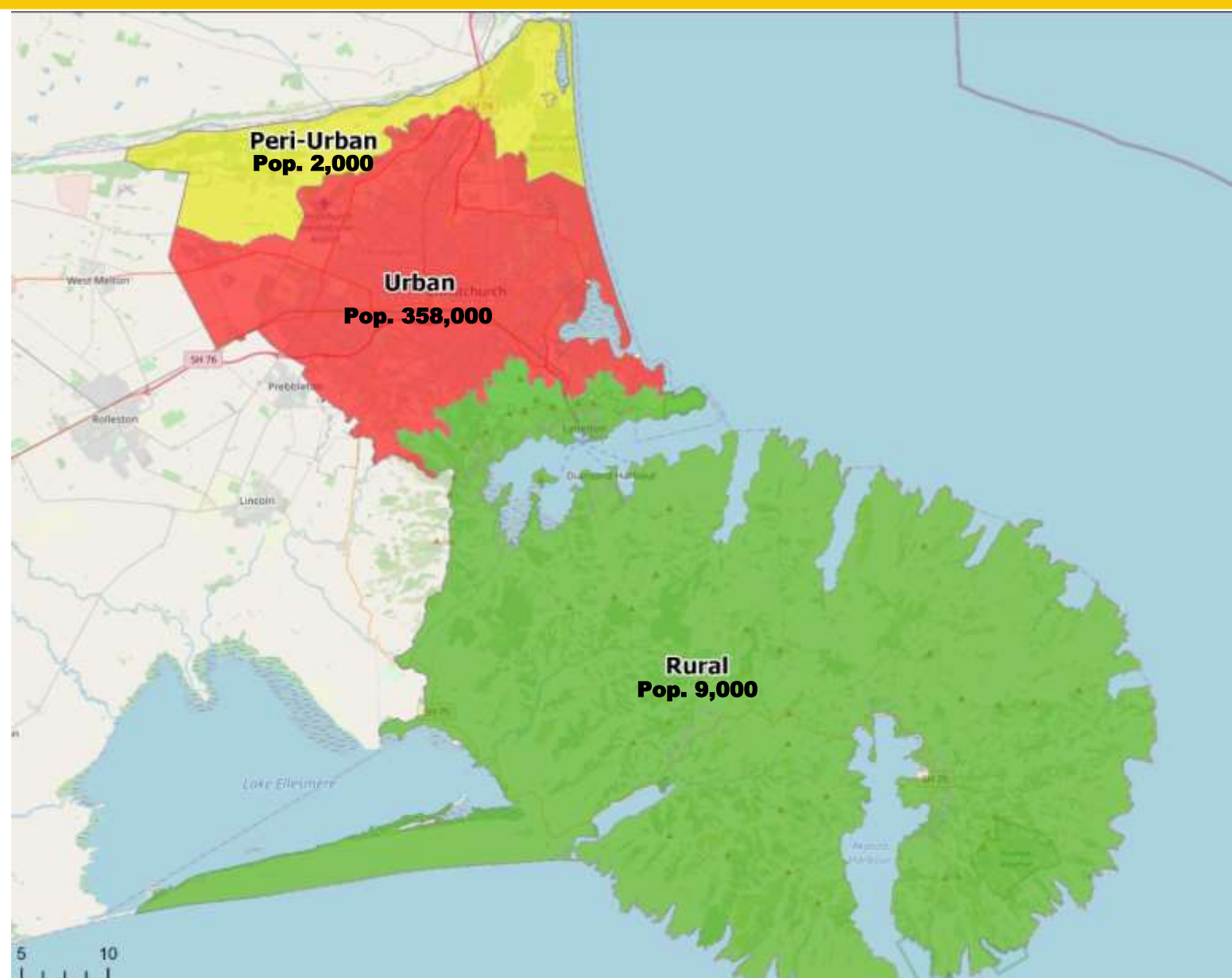
# Private Water Supplies - Work Stages





# Identify suppliers

- Split Christchurch into zones – different criteria needed for each

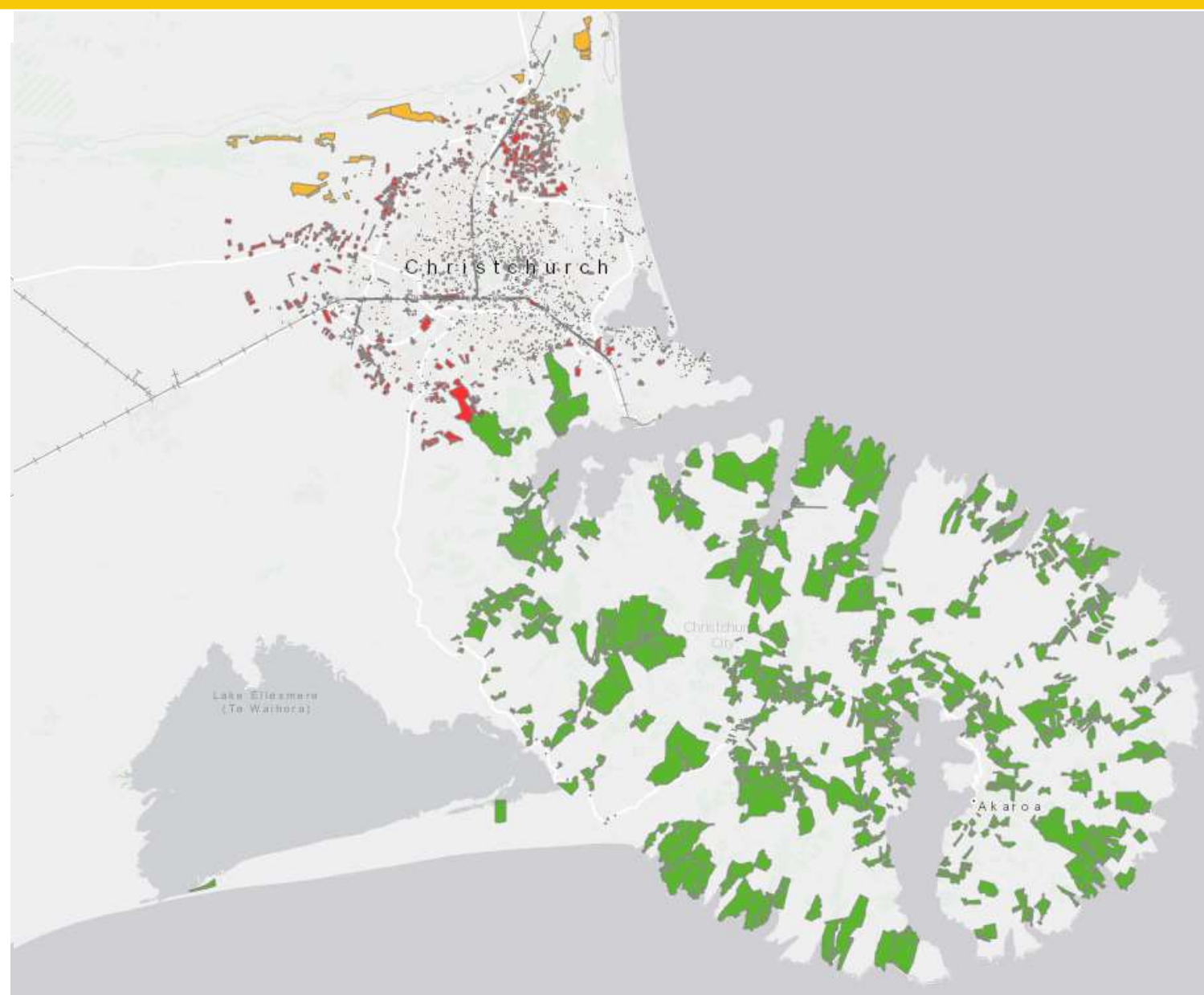




# Identify suppliers

Properties excluded:

- Crown land
- No building >40m<sup>2</sup>
- Within water supply zone
- Pay water rates
- Have a single private well



# Comparative Risk Assessment

- Risk assessment is based on Taumata Arowai water safety plan guidance
- Looks spatially at comparative risks
- Weighted attribute method



# Example Risk Factors

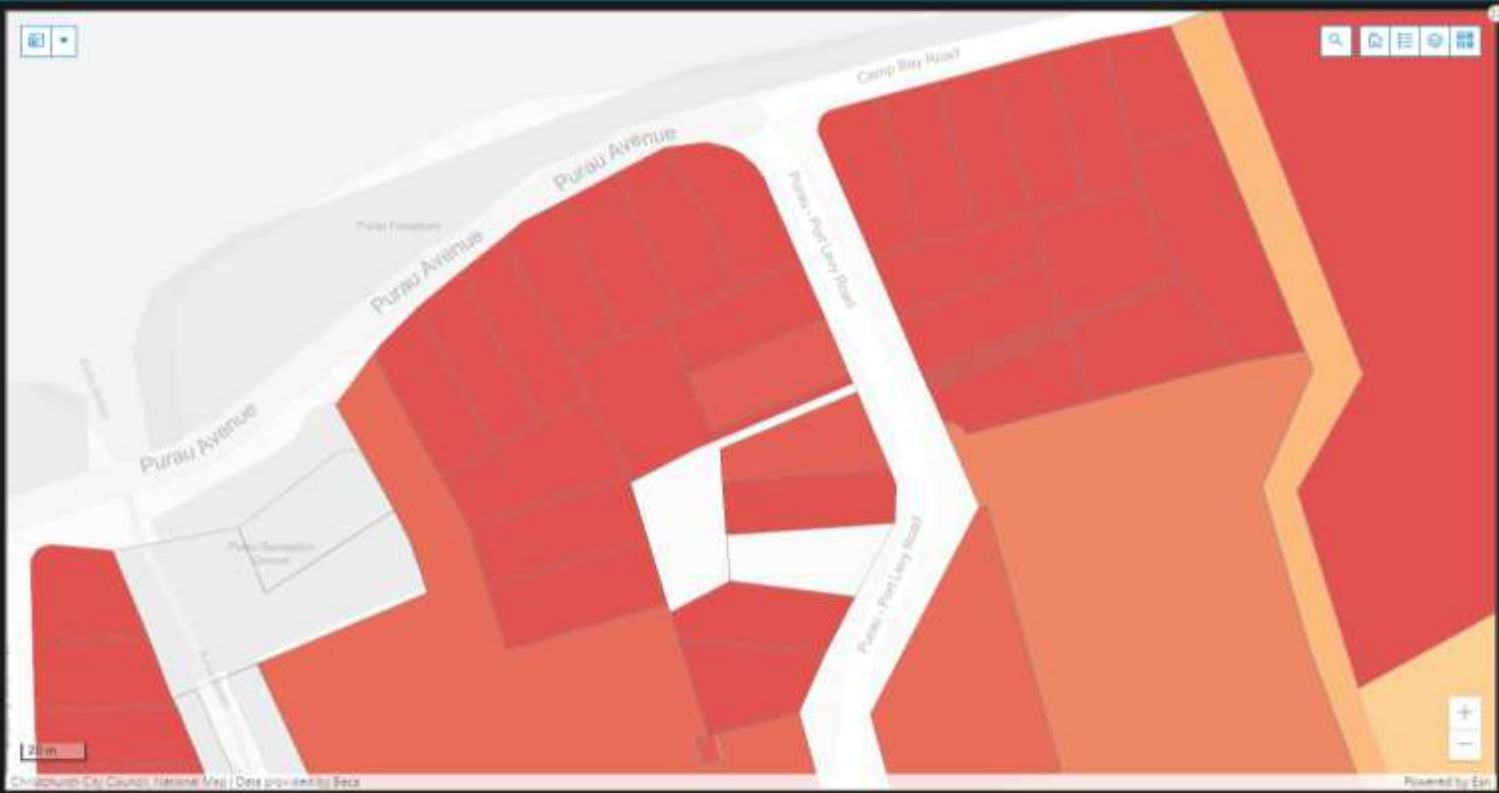
Shallower bores pose higher risks

Water take description 20% weight	Risk score
Bore depth > 90m	1
Bore depth 50 – 90 m	2
Bore depth 20 - 50m	3
Bore depth 5 - 20m	4
Surface water or groundwater < 5m depth	5



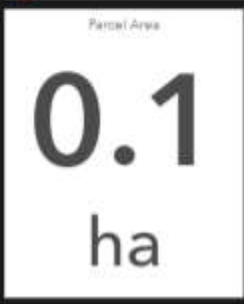
Higher nitrate level poses higher risk

Nitrate conc. mg/l 20% weight	Risk score
0 - 1	1
1- 3	2
3 – 5.65 (half MAV)	3
5.65 - 11.3	4
>11.3	5



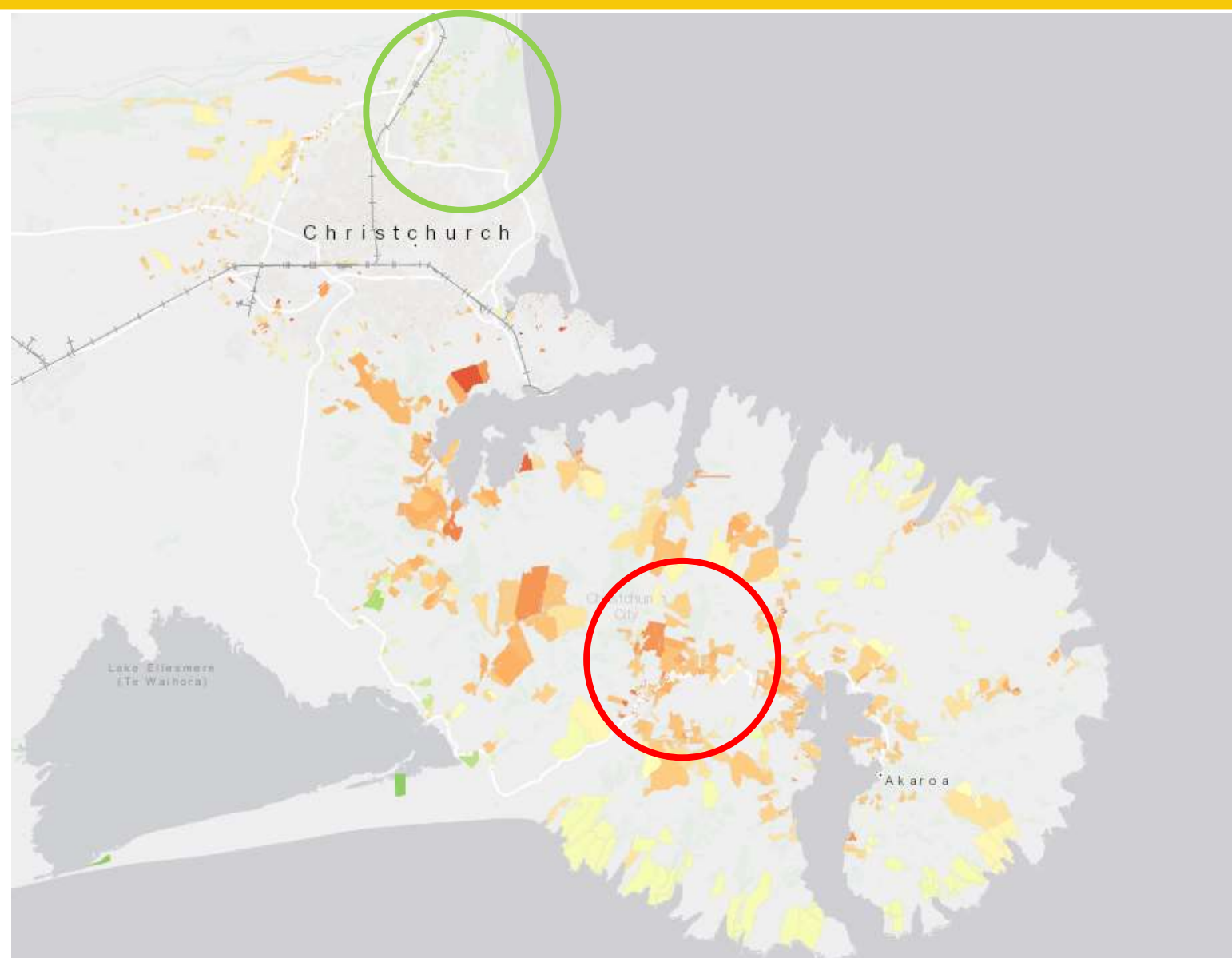
Parcel Information

Address Label	210 Marshland Road
Crown Land	No
Drinking Water Protection Zone	No
Papakeings	No
Private SCE	No
Private Schools	No
EW Abstraction Point	No
Water Supply Zone	No
WS Private Pipes	No
Wells Bore	No
Water Race	No
No. Buildings >40m2	1
Building > 40m2	Yes
Adjoining Land Owner	No
Needs Assessment Category	Per-Urban
Closest DWAP	908.45
Closest Well	31.40
WS Rural Status	
WS Per-Urban Status	
WS Urban Status	
Sewer Race	No
Human Effluent Consent	No
WW Private Pipes	No
Usual Resident Population	201
Rated Rule Reason Charged Sewer	
Rated Rule Reason Charged Water	
WS Status Model Output	Include
WW Status Model Output	Include
Location	Rest of Chirchirchir

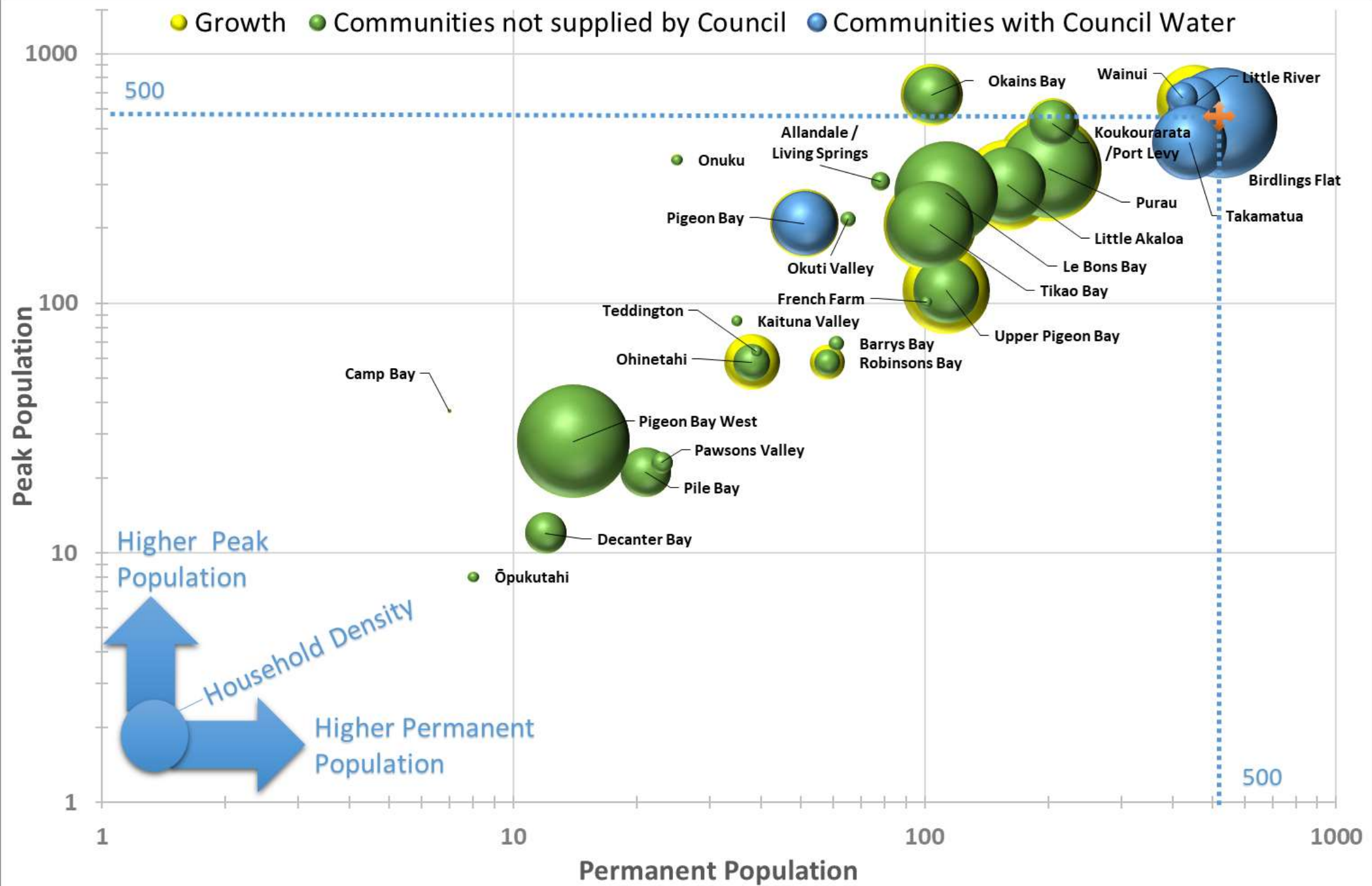


# Comparative Risk by Land Parcel

- Rural properties assessed as higher risk than urban and peri-urban properties





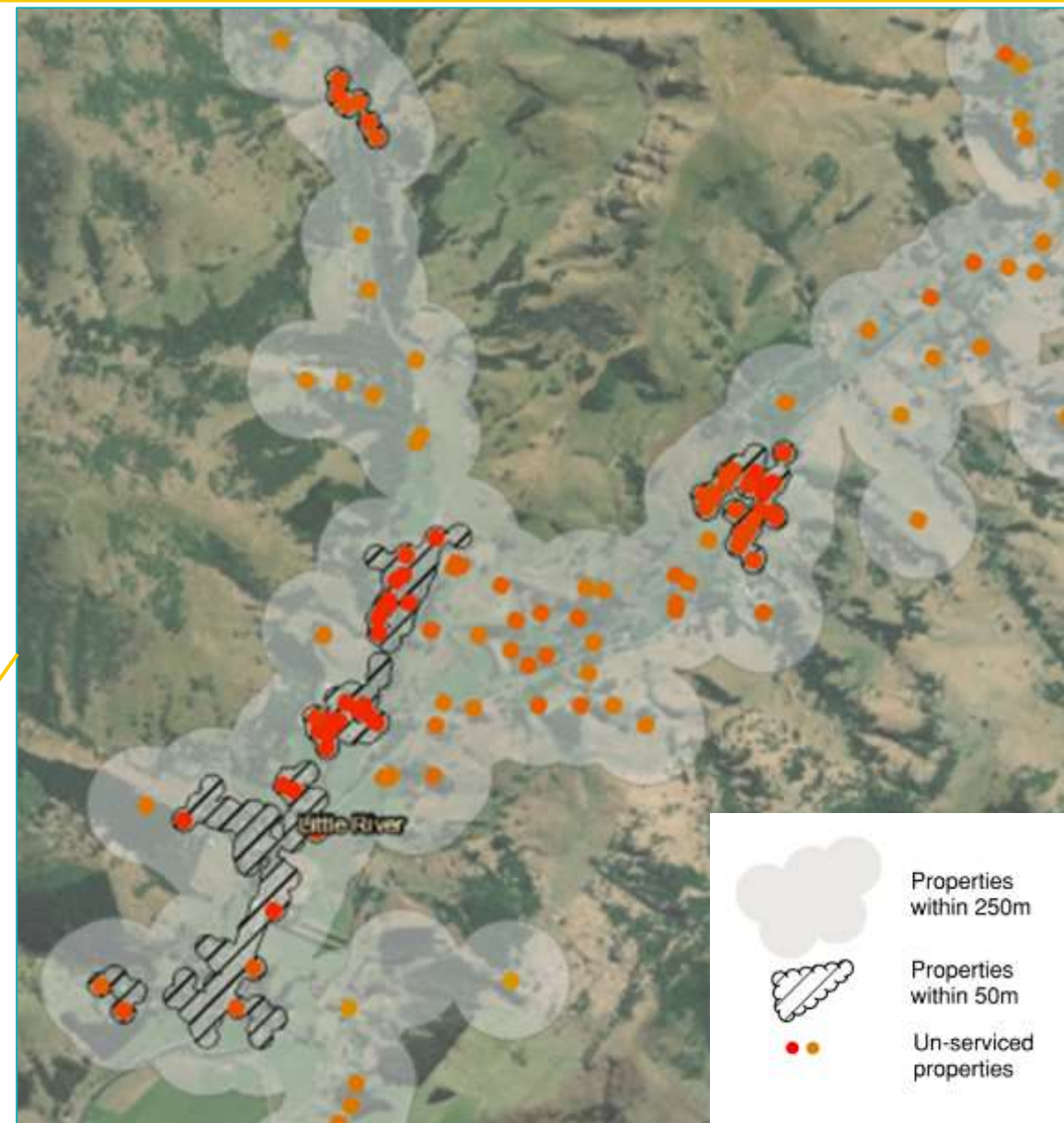


# Little River Community

## The “donut growth” effect

### Little River

- 152 un-serviced properties surrounding a serviced area
- Township has a council supply
- Service is available, but not taken up by all residents

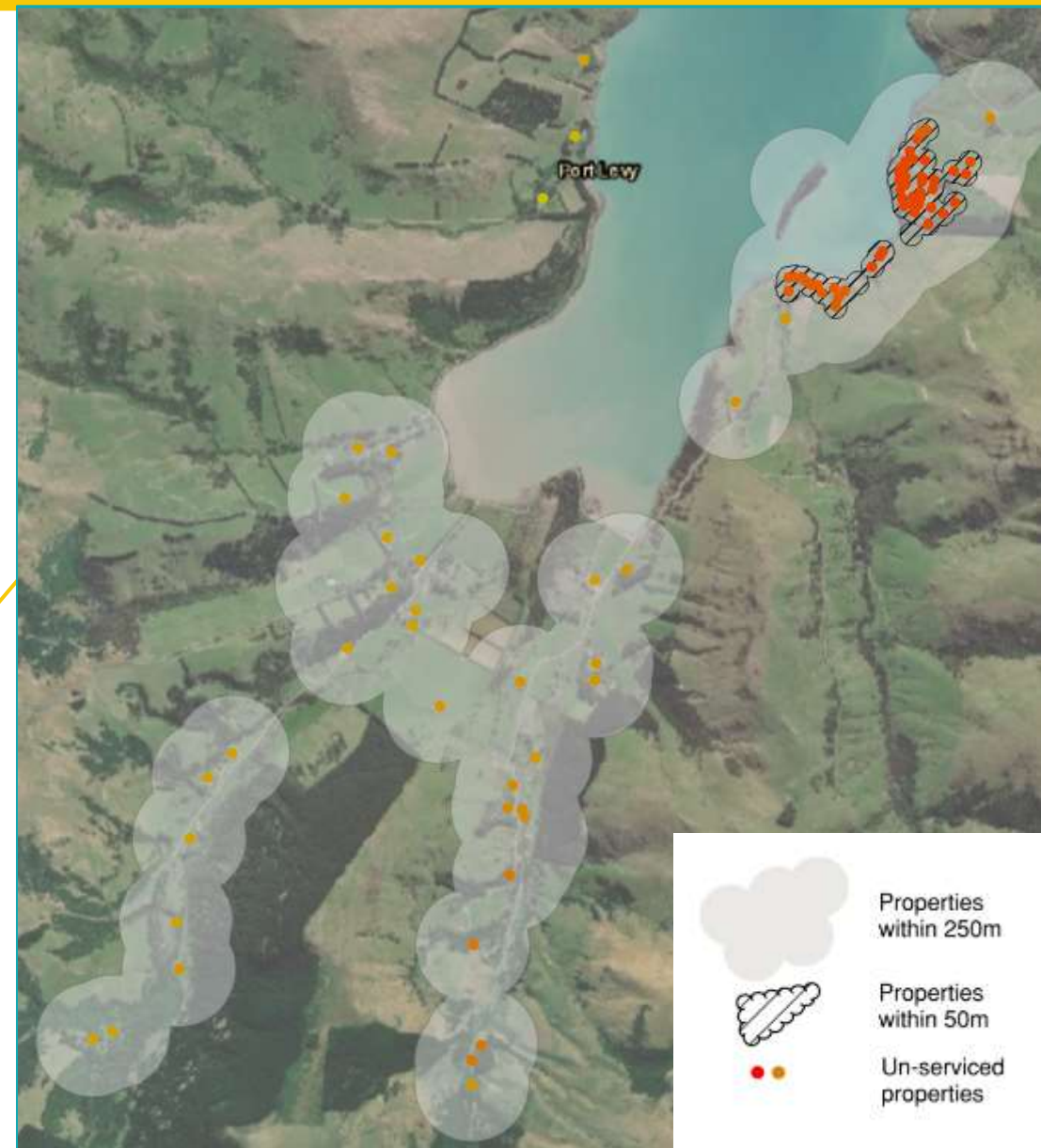




# Koukourārata Community

Small un-serviced settlement  
with large peak population

- Koukourārata / Port Levy
  - No community water or wastewater system



# Case Study at Koukourārata

- Comparatively dense population bubble in an otherwise sparsely populated area.
- Marae means large population for cultural events.
- Existing water supply from rainwater harvesting supplemented by stream takes and tankering.



# Koukourārata Service Options Matrix

Source Water

Rainwater
River / stream
Spring / shallow bore
Local deep groundwater bore
Existing Christchurch supply
Seawater

# Koukourārata Service Options Matrix

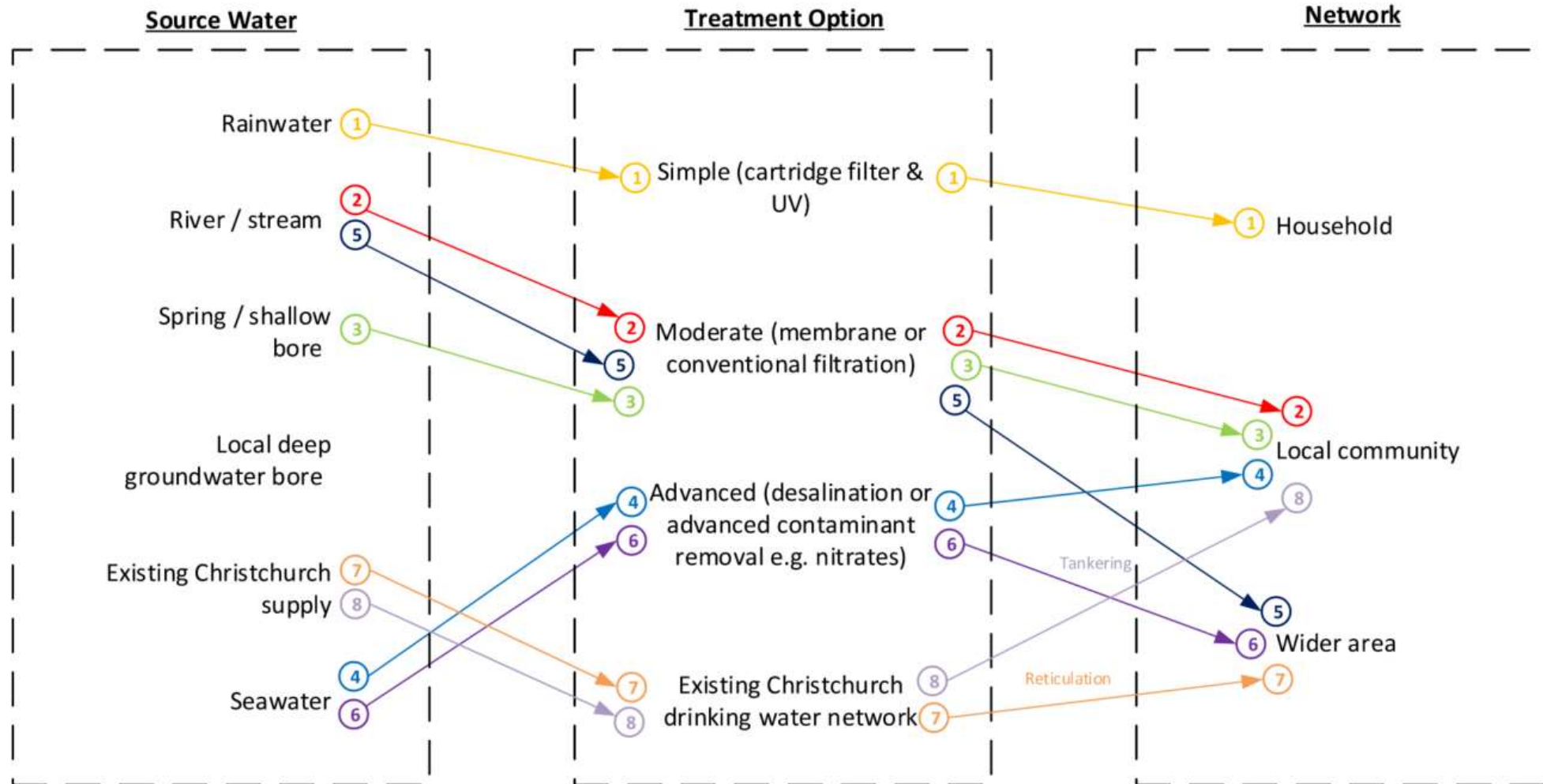
<u>Source Water</u>	<u>Treatment Option</u>
Rainwater	Simple (cartridge filter & UV)
River / stream	
Spring / shallow bore	Moderate (membrane or conventional filtration)
Local deep groundwater bore	
Existing Christchurch supply	Advanced (desalination or advanced contaminant removal e.g. nitrates)
Seawater	Existing Christchurch drinking water network



# Koukourārata Service Options Matrix

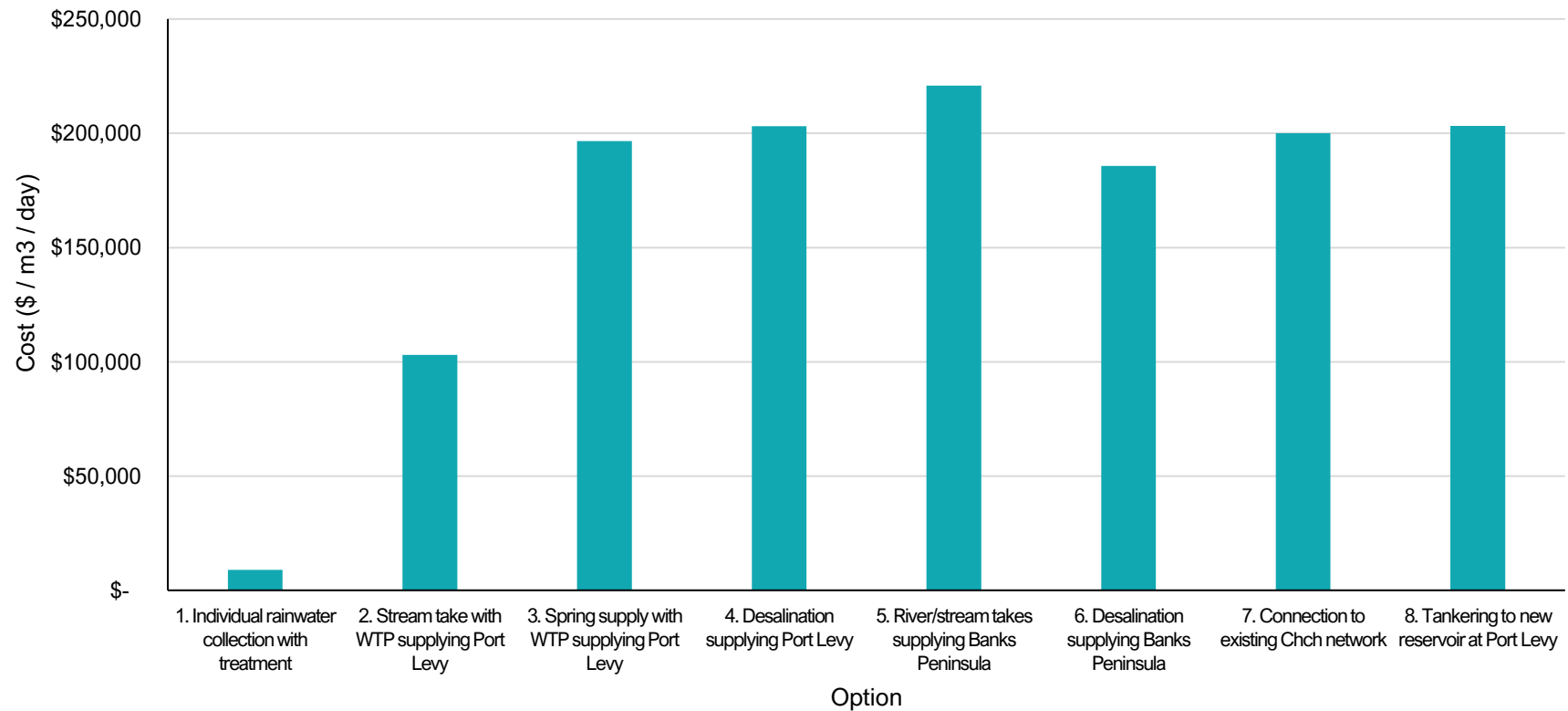
<u>Source Water</u>	<u>Treatment Option</u>	<u>Network</u>
Rainwater	Simple (cartridge filter & UV)	Household
River / stream		
Spring / shallow bore	Moderate (membrane or conventional filtration)	
Local deep groundwater bore		Local community
Existing Christchurch supply	Advanced (desalination or advanced contaminant removal e.g. nitrates)	
Seawater	Existing Christchurch drinking water network	Wider area

# Koukourārata Service Options Matrix



# Level of service options for Koukourārata

It is extremely difficult to supply everyone, everywhere, all of the time



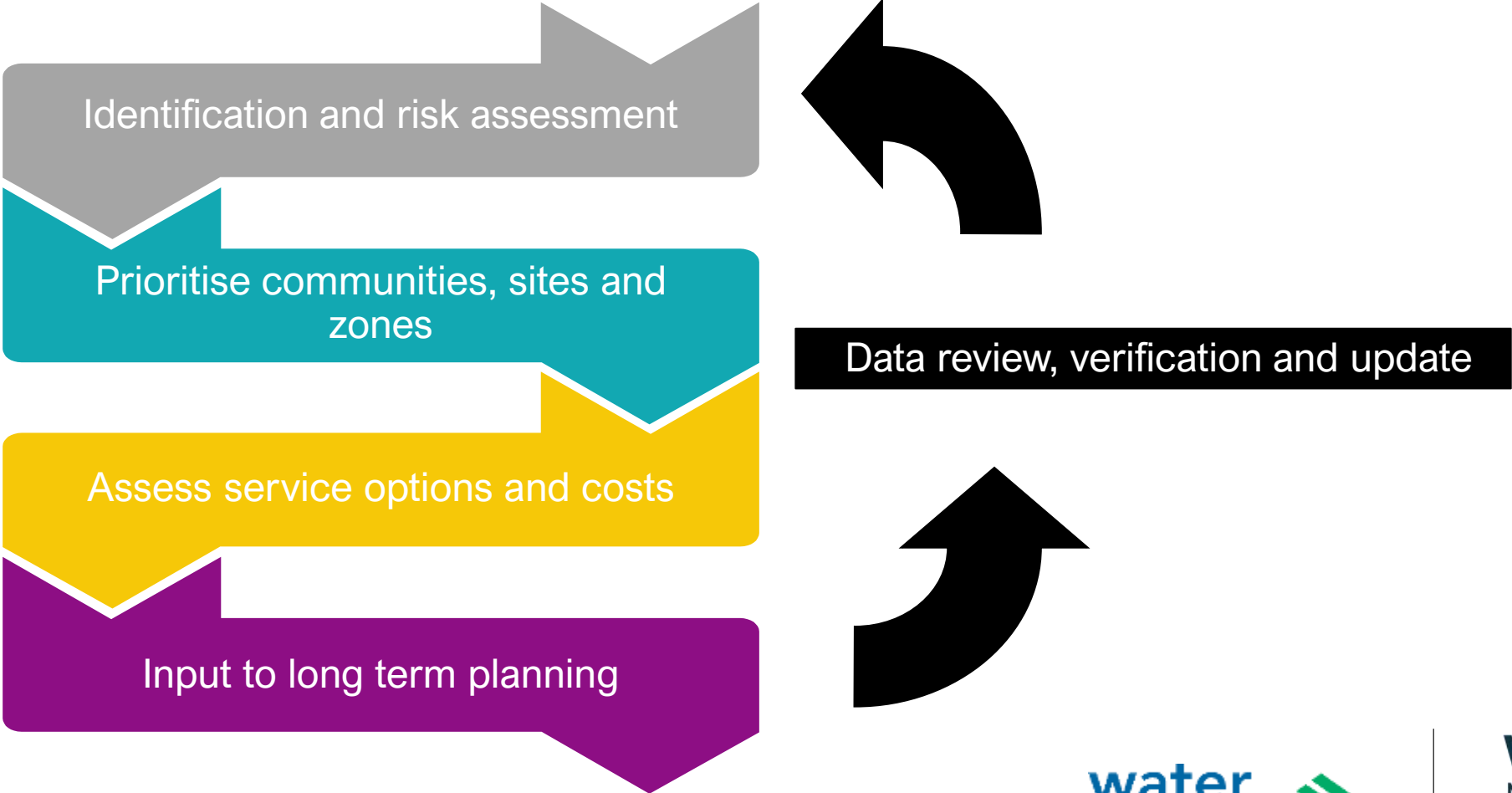


# Assessment of Known Private Networks



- Contacted registered and unregistered (but known) networks. Not all were willing to participate...
- None were 'ready to comply'
- Even registered suppliers aren't ready. And they're the good ones!!

# Summary of Process



GIS is a useful tool to identify priorities, and can use 'live' data sources

Networks in "Donut" growth zones can be extended

Peak and permanent populations pose different risks

Lack of supply to marae has both cultural and safety impacts

Ground truthing is required. Most won't be ready to comply.

# Conclusions

# How is this useful?

- Use GIS to identify potential private supplies
- Identify comparatively higher risk communities or zones
- Undertake level of service optioneering
- Ground truth
- Prioritise investment planning and inform Long Term Plans





# Questions?

