

Small Town, Big Question:

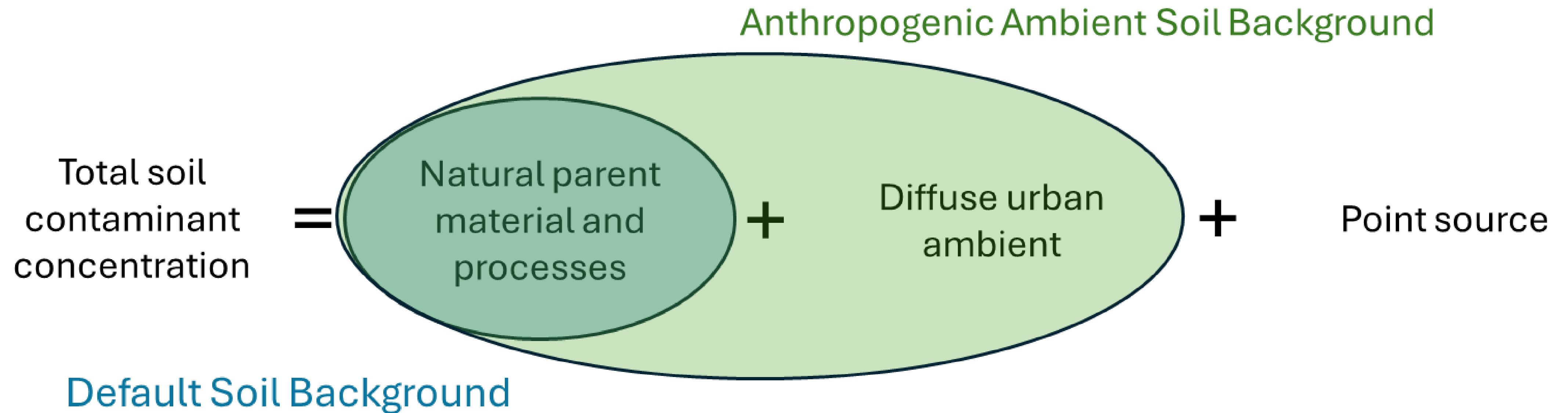
What's in the soil we're throwing away?

Michelle Begbie
Team Leader
Waikato Regional Council

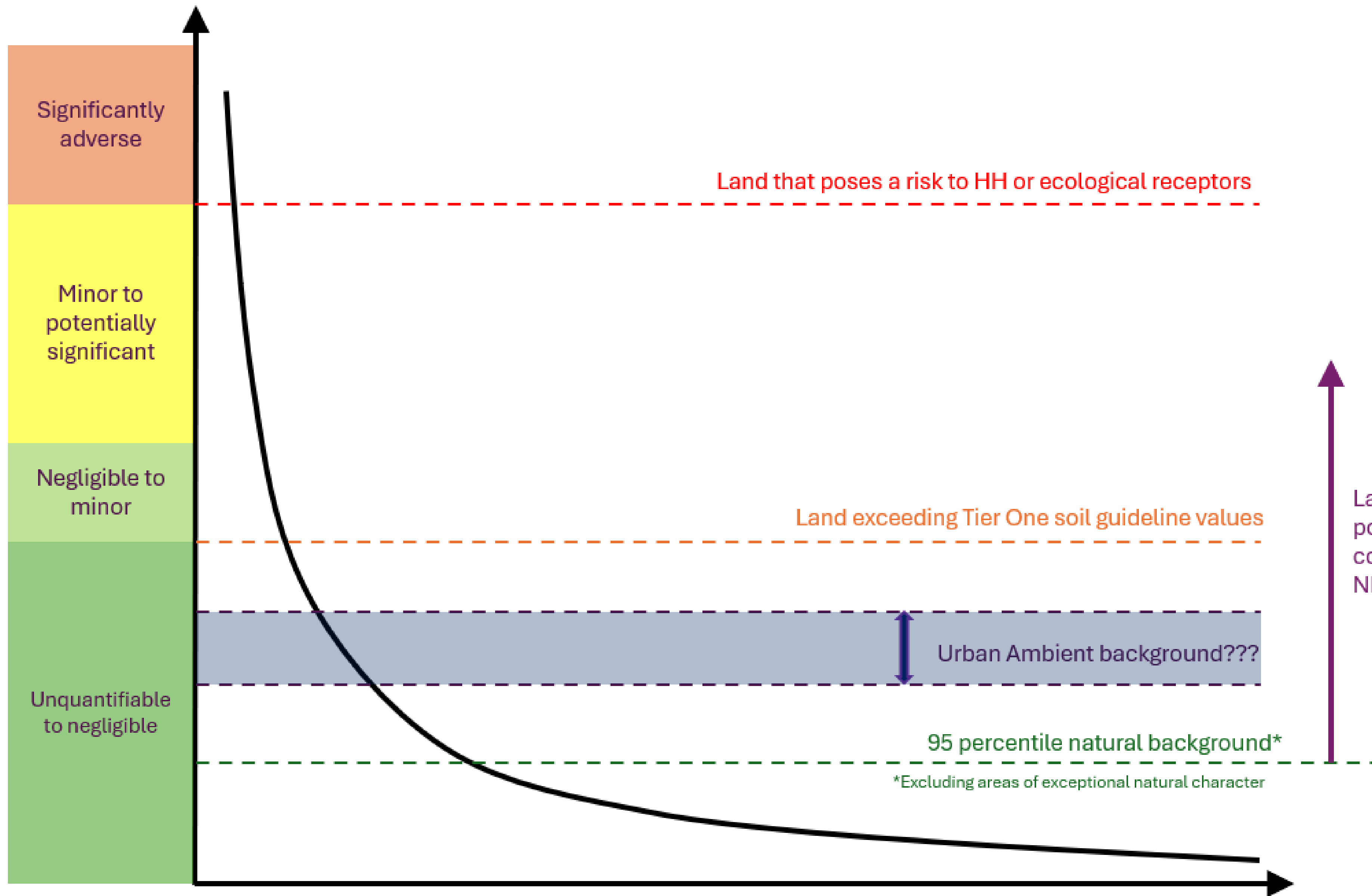
Joshua Evans
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Waikato Regional Council

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Ahhhhh...background. But what do you *mean*?



Risk



Land area

Land area potentially covered by the NESCS, 2011

The unintended consequence is that time, effort and money is spent for no real reduction in risk.



Previous studies

Background 'type'	What	Where	Who
Natural soil	OCPs, PCP, PCBs Trace elements Trace elements, PAH, DDT	NZ Auckland GWRC Canterbury Waikato Tasman/Nelson Otago & Southland NZ	Buckland et al., 1998 ARC, 2001 URS, 2003 T+T 2006-7 WRC (n.d.) Cavanagh, 2015 Cavanagh et al., 2025 Cavanagh et al., 2015 Rattenbury et al., 2018 Manaaki Whenua, 2019 Cavanagh et al., 2023
Anthropogenic	OCPs, PCP, PCBs PAHs	NZ Christchurch Dunedin Auckland Wellington Christchurch Waikato Urban	Buckland et al., 1998 ECan, T+T 2006-7 Turnbull et al, 2019 Martin et al., 2023 Rogers et al., 2025 ECan, T+T 2006-7 Kim, 2006-7 (unpub.)



What is the gap, and what does it represent?



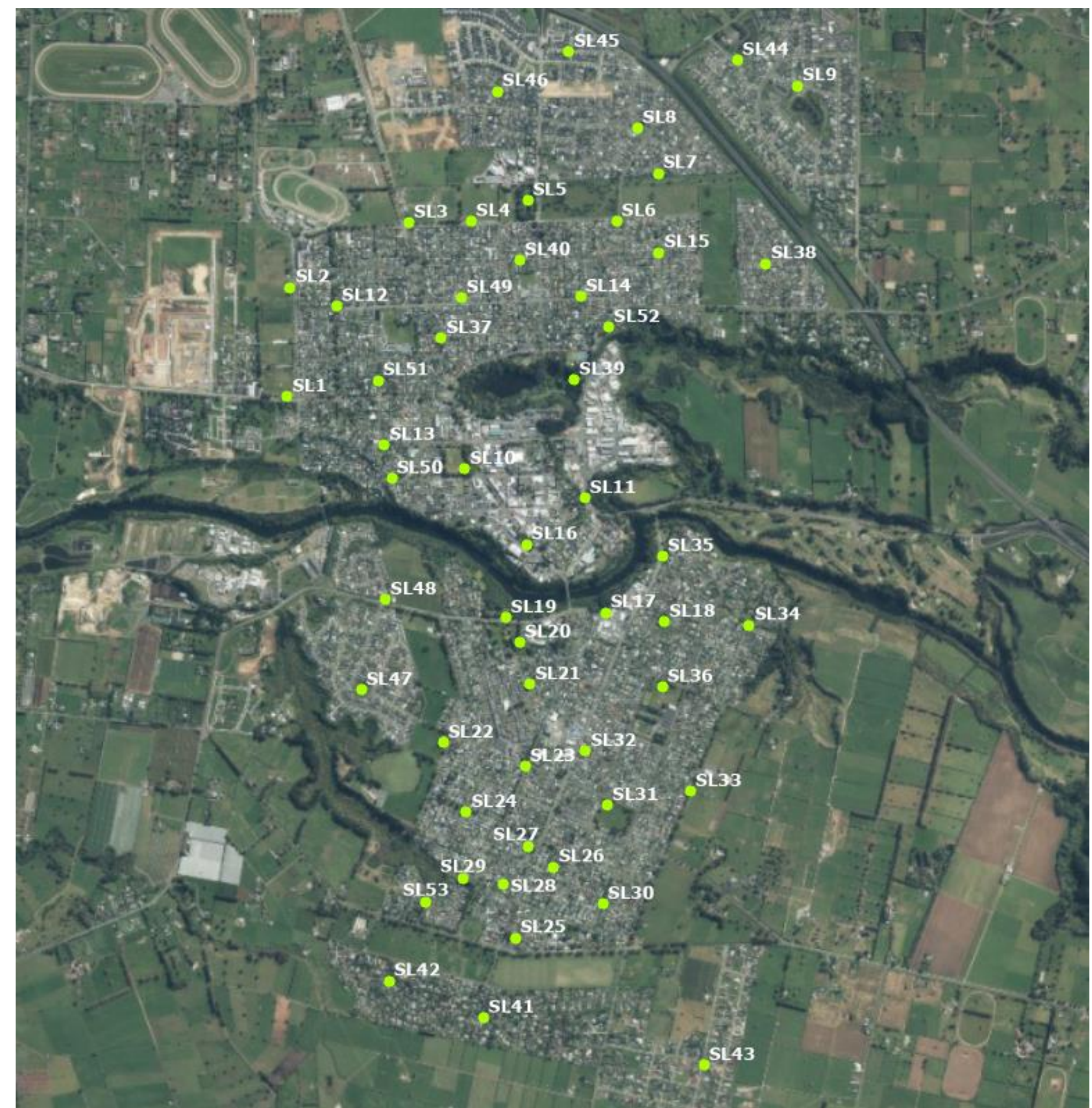
Small towns = rapid growth and development

Because they have fewer HAIL than cities, may represent a disproportionate part of the issue

We estimate that our small town may represent $>100,000\text{m}^3$ pa.

Sampling design

- USEPA Reg 4 = randomised selection, 7x7 mile grid
- Both needed to sample land in public ownership
- Our tiny towns mean grids are difficult to apply
- We chose judgemental design with:
 - Rough spatial distribution
 - Distributed distance to CBD
 - 50 sites for trace elements, asbestos, PAHs, OCPs, PCP
 - 50 depth samples for trace elements
 - Subset of 10 for less common contaminants (\$\$\$)



Site specific PSIs including walkovers

Memo

File No:	47 07 32
Date:	25 th June 2025
To:	Michelle Begbie
From:	Joshua Evans
Subject:	Memo - Corner of Consta



Figure 1. Corner of Constance Place and King Street

Year	Description
1939-1943	The site appears to be vacant. King Street is to the South. residential dwellings to the home gardens. The land to one dwelling and land to the small garden.
1953-1957	No significant changes have to the East appears to be undeveloped land use immediately to the site to medium density housing orchard to the NE is still present.
1967/1971	No significant changes have continued to the North, East block remains undeveloped established to the South of the site.
1979	Constance Place has now been residential dwellings now on the corner of the block. SL40 remains in the corner of Constance Place of the block has been disturbed in this area. The surrounding medium density residential available lots.
1995	There are no significant changes conversion to medium density surrounding land.

1. Introduction

Waikato Regional Council (WRC) approached [redacted] sampling in urban areas within the [redacted] concentrations of contaminants in soils.

The purpose and objective of these investigations concentration dataset that can be applied to develop under the NES-CS to avoid low level contaminants they are when the current regional specific background.

2. Site Description

The site (SL40) is located on the corner of Constance Place a road reserve on the [redacted] District Plan (see Figure 1) sampling is approximately 160 m².

It is situated in the Central-Northern portion of [redacted] density residential dwellings in all directions with [redacted].

The site is an unoccupied grassed area with the [redacted] the Eastern boundary is bound by a concrete foot [redacted].

Geology

The site is mapped as an area of Hinuera Form The Late Pleistocene River deposits are described as interbedded peat.

Site Topography and Drainage

The entire site is relatively flat with a minor slope the [redacted] stormwater network. No other [redacted] site.

3. Site History

Historical aerial photos

Historical aerial photos sourced from orthorectified below and provided in Appendix A (also available Imagery was also reviewed on Google Earth Pro From 1995, the site is assumed to have remained undisturbed based on available information.

Council Records

This site does not currently appear on the WRC any additional information or sampling reports.

Site Inspection

A Site inspection was undertaken by WRC on [redacted] of inclusion as sampling site for the urban area. [redacted] continued use as road reserve. No HAIL activities were noted during the visit to the site.

Risk Assessment

Based on the review of site o contaminant concentrations no HAIL activities have been [redacted].

The site remained to be utilized 1995 – 2006 at this time the [redacted] previously used for suspected [redacted] the site which is typical for the [redacted] imported during the earthwork [redacted].

Conclusions

It is not considered necessary [redacted] hotspots during sampling the [redacted] available information it appears [redacted] as pastoral land historically a [redacted].

Report Limitations

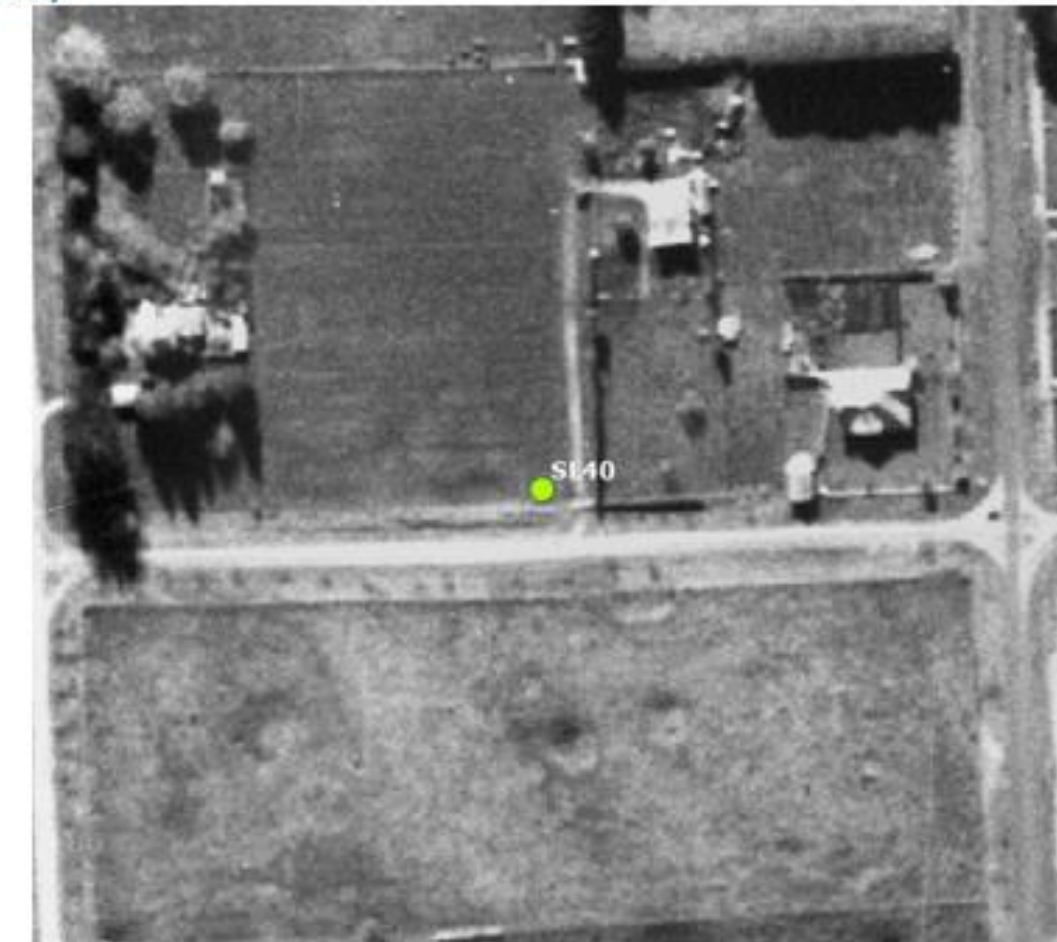
The risk assessment has been [redacted] this document. The discovery [redacted] date.

Appendix A – Historic Aerial Imagery

SN107 (1939)



SN266 (1943)



[redacted] that soil environment, as [redacted].

[redacted] until between [redacted] site being [redacted] may be elevated at [redacted] may have been [redacted].

[redacted] did potential [redacted] and. Based on [redacted] and only be used [redacted].

[redacted] r referenced in findings out of [redacted].

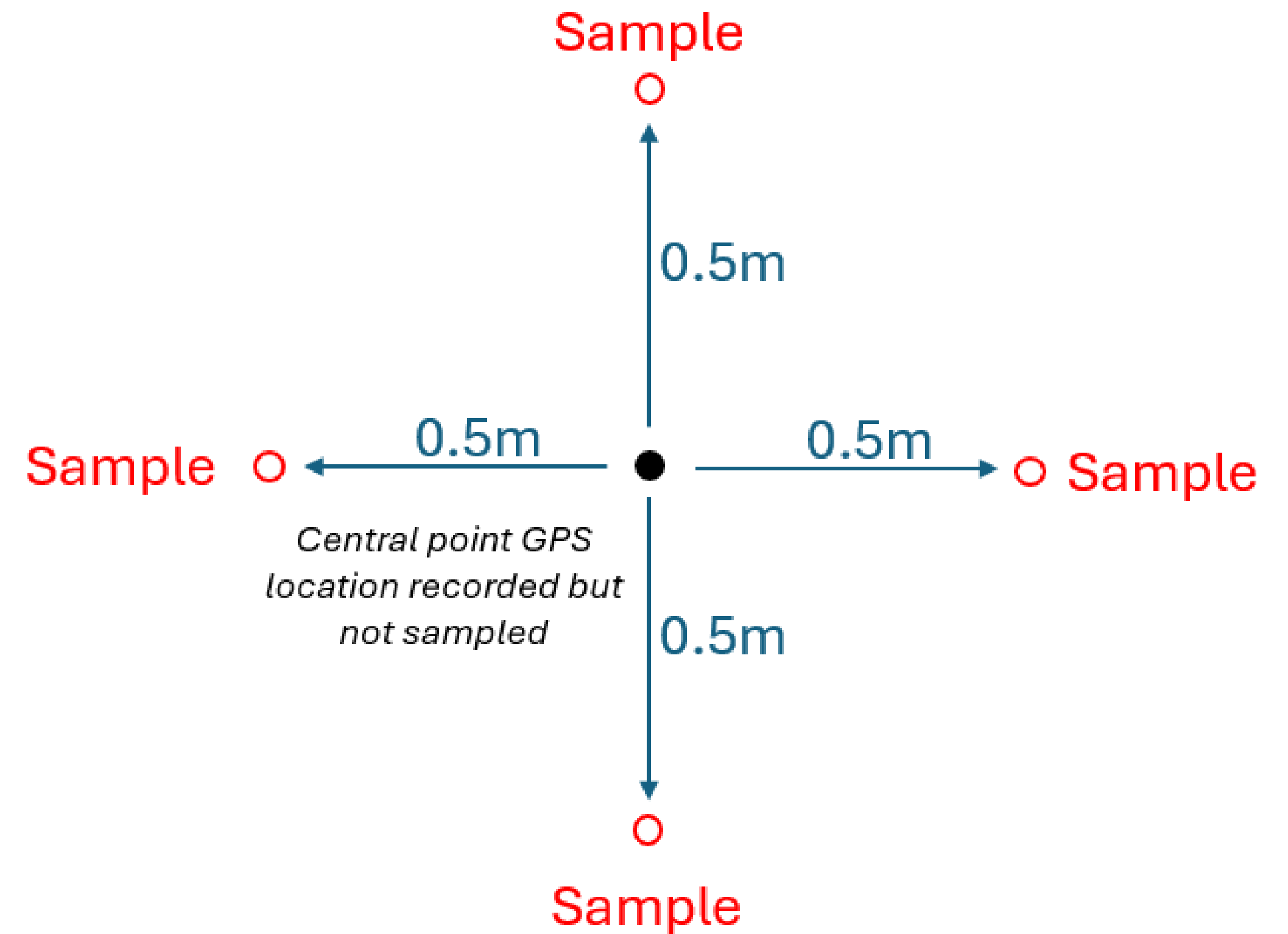


Sampling method

'Cardinal cluster sampling' layout

'Representative' rather than composite

Sampling at two depths (for metals)



Metadata

Duplicates

Time and date

Site photos

Soil descriptions

Chain of custody

Land use

Sampling method



COCs

Asbestos

Trace elements

PAHs

OCPs

PCP/TCP

Subset sampling to come:

PFAS

Dioxins/furans

Glyphosate/AMPA

Preliminary results - the juicy bit!

36 surface samples:

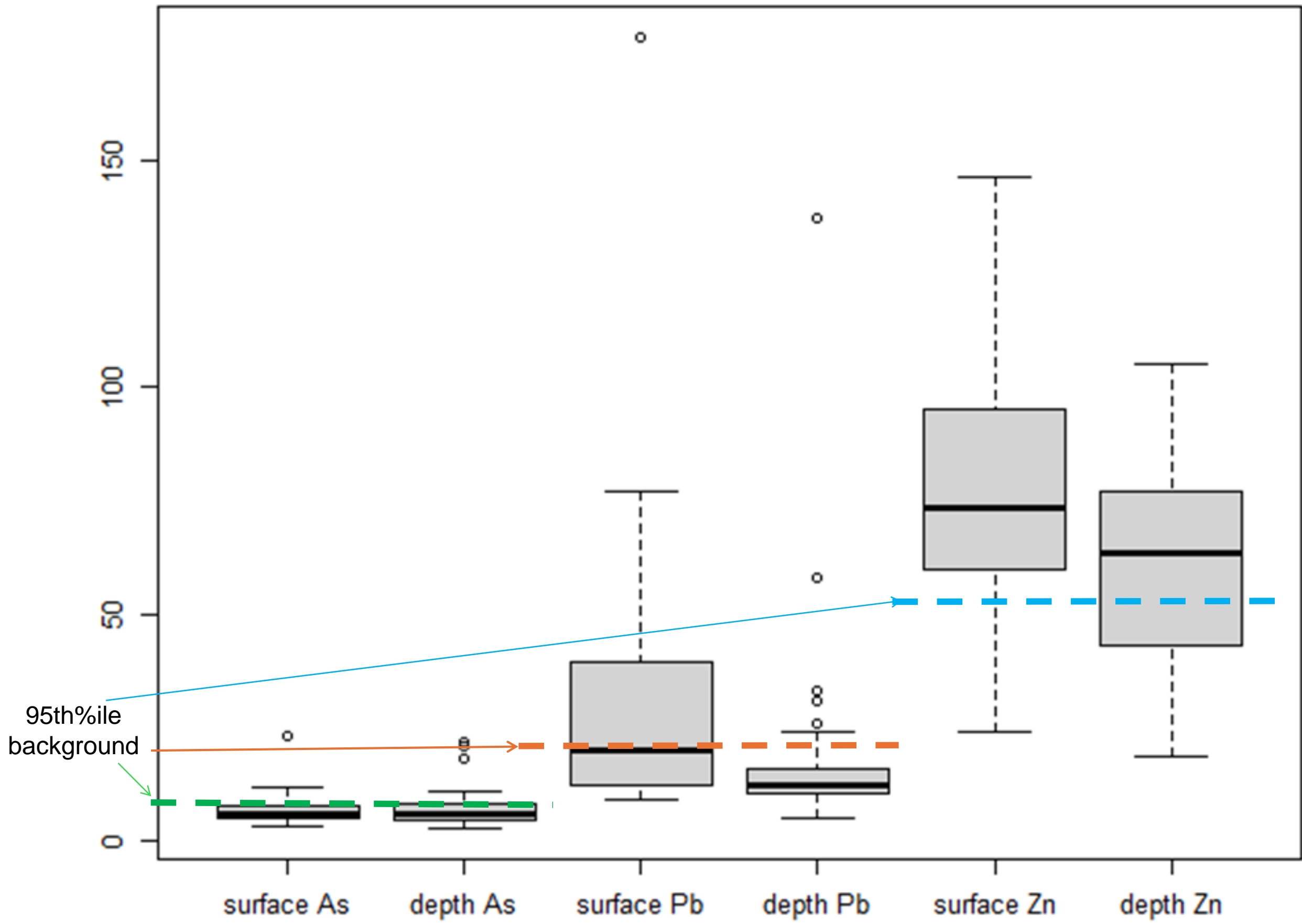
- **None** have detectable asbestos
- Only 14 (39%) have any detectable pesticides, and **none** above relevant guidelines
- Only 2 (6%) have BaP marginally above rural residential SGV

72 samples (surface & depth):

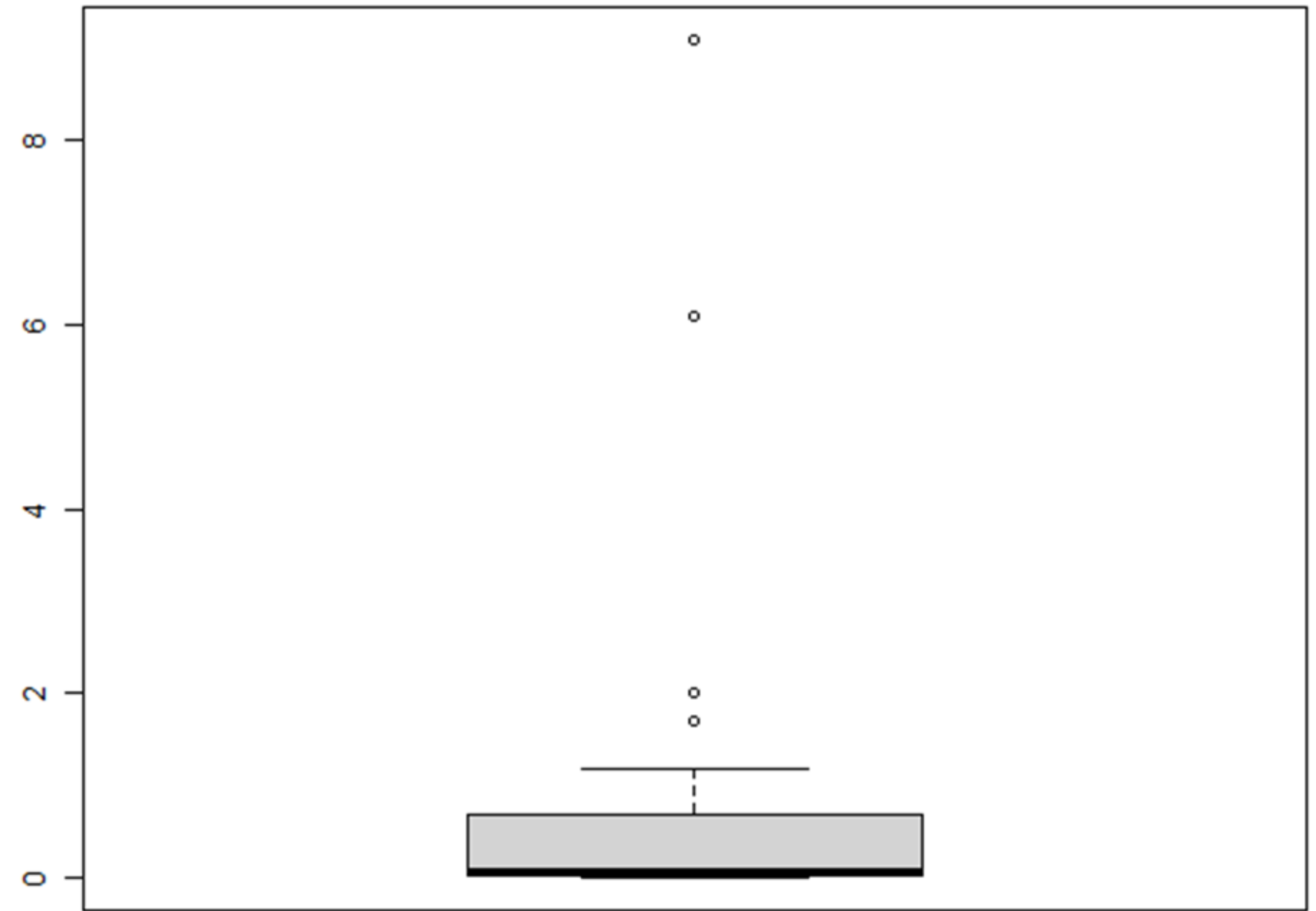
- Only 3 have arsenic slightly > R.Res SGV but 27 (40%) exceed WRC natural background for arsenic
- Only 1 had lead slightly > R.Res SGV but 21 (31%) exceed WRC natural background for lead
- Results for Cd, Cr, Cu, Hg, Ni and Zn **ALL** within HH and eco guidelines
- **BUT a whopping 51 samples (75%) exceeded WRC natural background for zinc**



Surface & Depth metals



Surface Benzo[a]pyrene



Sweeping generalisations



How does this compare to natural background?

Around 30-40% of samples exceed natural background for Pb and As

Around 75% of samples exceed natural background for zinc

How does this compare to city background (Auckland, Wellington, Dunedin)?

More As (likely geological)

Less lead and zinc

Surprises?

No asbestos

Little PAHs

Pb and Zn are higher in surface soils but not As

What next? Finish collating data, sample for the \$\$\$ contaminants, publish.

Take home message:

Sampling small town soil will likely trigger NESCS despite no risk.

Small Town soils-

“Innocent until proven guilty!”

