

Background concentrations of trace elements in the major Canterbury soil groups - user guide

ECan has been working on a project to establish background concentrations of selected trace elements in the major Canterbury soil groups. The key outcome of the project is the establishment of background levels for 10 trace elements in the major Canterbury soil groups. A copy of the full report (ECan 2007¹) can be obtained from ECan's Customer Services.

What major soil groups were assessed?

The following Canterbury soil groups were sampled during the study:

- Yellow Brown Earth (YBE)
- Yellow Grey Earth (YGE/YG)
- Yellow Brown Stony (YBST)
- Recent Soils (RE)
- Intergrade Yellow Brown- Yellow Grey (IYGYB)
- Brown Granular Loam/Brown Granular Clay (BGC/BGL)
- Gley (GY)
- Rendzina (REND)
- Yellow Brown Sand (YBS)
- Saline Gley Recent (SAGYRE)
- Organic (OR)

Which trace elements were analysed for?

Each soil sample was analysed (using total recoverable analysis) for the following 10 trace elements:

- Arsenic
- Boron
- Cadmium
- Chromium
- Copper
- Lead
- Manganese
- Mercury
- Nickel
- Zinc

How will Environment Canterbury use the data?

Environment Canterbury maintains the Listed Land Use Register (LLUR) to manage information it holds about sites that have accommodated industries or activities that have the potential to cause contamination. Depending on the information held about the site, they are placed in one of the following three categories:

- Contaminated
- Managed/remediated
- Not contaminated

In order for a site to be classified in the LLUR as 'not contaminated', site investigation

¹ Background concentrations of selected trace elements in Canterbury soils. Addendum 1: Additional samples and Timaru specific background levels. Environment Canterbury 2007. Report R07/1/2

results must demonstrate that there are no hazardous substances present, or contaminants have been completely removed from the site.

ECan will use these background concentrations to aid in their assessment and categorization of sites. Please note that our site category names and definitions will be updated in the near future, but the fundamentals outlined here will not change.

How do I compare my site investigation results with the background concentrations?

To compare your site results with the background levels, adequate soil samples will need to be collected. The number of samples and how they are collected needs to be in accordance with recommendations in MfE Contaminated Land Guideline No.5². The collected samples need to be analysed by an accredited laboratory using the analytical methods described in Appendix E of the technical report¹.

The results from each sample can then be compared against the background concentrations set by ECan. The Level One data represent the maximum concentration measured during the study, and the Level Two data represent the maximum level plus a buffer (half of the inter-quartile range). Both Level One and Level Two concentrations can be obtained using ECan's online GIS system. The Level One data are for information purposes only. **Site results should be compared against the Level Two data.**

If your site lies in the Christchurch Urban area (as defined by the Christchurch Urban Area on ECan's online GIS) you should use the 'CHCH' data.

Depending on your results, your site will fall into one of the following two categories:

1. If all of your data are below the Level Two concentrations, and the investigation is satisfactory, your site can be classed as 'not contaminated'.
2. If some of your data are above the Level Two concentrations, your site will be classed as 'Managed/Remediated' or 'contaminated' for a specific land use, depending on the results.

Sample results from a site investigation exceed the background concentrations, but I think it is due to natural variation, what can I do?

As the study was undertaken over a large area, even with the buffer added to the maximum results, they may still not have accounted for the full range of natural variation in trace element concentrations in a soil group. If you think your site has high naturally occurring concentrations of trace elements, you may establish your own local background concentration or provide statistical or other evidence to support your claim. A separate fact sheet has been produced to help with this³.

¹ Background concentrations of selected trace elements in Canterbury soils. Addendum 1: Additional samples and Timaru specific background levels. Environment Canterbury 2007. Report R07/1/2.

² Contaminated Land Management Guidelines No 5 - Site Investigation and Analysis of Soils. Ministry for the Environment 2004.

³ Establishing a local background concentration for your site. Environment Canterbury fact sheet