

# Low-level radioactivity measurements

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## ESR's National Centre for Radiation Science (NCRS)

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ESR maintains a specialised environmental radiochemistry laboratory with over 50 years of experience in measuring low-levels of naturally occurring and man-made radionuclides in a wide range of materials, such as:

- Food
- Drinking water
- Consumer and other manufactured goods
- Soils, sediments and non-biological solids
- Biological solids
- Waste and groundwater samples
- Petrochemical and fertiliser industry samples
- Atmospheric particulates

### Quality assurance

We are accredited to international standard ISO/ IEC 17025 by International Accreditation New Zealand (IANZ). The scope of accreditation includes test methods based on alpha spectrometry, gamma spectrometry and low-background liquid scintillation counting.

We ensure our quality by regular participation in proficiency test exercises organised by the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO), the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), the US Department of Energy (DoE), and the International Atomic Energy Agency (IAEA).

## Our radioanalysis team

- Certifies radioactivity levels in food to meet international import requirements or to monitor imported food products
- Designs tailored radioactivity measurement solutions to cater for specific needs
- Provides advice on matters concerning radioactivity in the environment
- Performs radiation surveys and monitors environmental radioactivity
- Provides Wipe Test Kits to determine and quantify the presence of potential radioactive contamination

## Radioanalysis food overview

- Food testing
- Food export certification

Radioanalysis	Turn-around time	Sample size
Gamma Spectrometry (Caesium-137)	5 working days	500g
Gamma Spectrometry (Iodine-131, Caesium-134, Caesium-137, etc.)	5 working days	500g
Strontium-90	10 working days	100g
Americium-241 Plutonium-238 Plutonium-239 Plutonium-240	10 working days	100g

## Drinking Water

- Testing against Drinking Water Standards for New Zealand (DWSNZ)
- Testing against overseas drinking water standards (including bottled water regulations)

Radioanalysis	Turn-around time	Sample size
Drinking Water Standards for NZ (DWSNZ)	15 working days	1L
Tritium	30 working days	0.5L
Gross alpha & beta	10 working days	0.5L
Radon-222	10 working days	0.5L
Gamma Spectrometry (23 hour counting time)	5 working days	0.5L
Strontium-90	10 working days	0.1L
Lead-210	35 days	0.1L
Polonium-210	10 working days	0.1L
Radium-226, Radium-228	35 days	1L
Thorium Isotopes (Thorium-227, Thorium-228, Thorium-230, Thorium-232.)	10 working days	0.1L
Uranium Isotopes (Uranium-234, Uranium-235, Uranium-238.)	10 working days	0.1L



## Environmental

### Soil erosion studies

Radioanalysis	Turn-around time	Sample size
Gamma Spectrometry (Caesium-137, detection limit 0.2 Bq/kg)	50 days (for 100 samples)	700g

### Sedimentation studies

Radioanalysis	Turn-around time	Sample size
Gamma Spectrometry Lead-210, Radium-226, Radium-228, etc. (23 hour counting time)	70–90 days (for 100 samples)	20g
Alpha Spectrometry Polonium-210	60 days (for 100 samples)	2g
Alpha Spectrometry Plutonium-239 and -240 combined	60 days	2g

### Other environmental samples

*(Mineral sands, biological materials, industrial process samples, environmental waters, process waters, air filter samples, etc.)*

Radioanalysis	Turn-around time	Sample size
Gamma Spectrometry	10 days	20–500g
Strontium-90	10 days	100ml / 2g
Lead-210	10 days	100ml / 2g
Polonium-210	10 days	100ml / 2g
Radium-226, Radium-228	35 days	1000ml / 20g
Thorium Isotopes (Thorium-227, Thorium-228, Thorium-230, Thorium-232.)	10 days	100ml / 2g
Uranium Isotopes (Uranium-234, Uranium-235, Uranium-238.)	10 days	100ml / 2 g

*Turn Around Time (TAT) is provided in working days based on single sample. For larger lots please contact laboratory.*

## Industrial

### Wipe tests

- Wipe test kit for owners of sealed sources
- Testing of wipe samples for radioactivity content
- Testing of wipe samples for tritium

Radioanalysis	Turn-around time
ESR wipe test kit	5 working days
Analysis of non-ESR kit swipe	5 working days

### Other radionuclides

We can test for a wide spectrum of radionuclides, including those that are not listed above. Please enquire for details.

### New Zealand Biosecurity

New Zealand imposes import restrictions on samples which pose biosecurity risks such as biota, waters or soil. The New Zealand Ministry for Primary Industries has approved ESR's radioanalysis laboratory as a transitional facility for biological material, which enables us to import and store your samples (import and handling fees may apply – please enquire before shipping).

### For more information

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**Ka tiaki, ka whakapiki hoki a ESR  
i te oranga o te tangata e noho ana  
ki Aotearoa.**

ESR protects and enhances the wellbeing  
of people living in New Zealand.

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