

Rafter Radiocarbon Laboratory

Sample Failure Charging Policy

While our skilled technicians will do their utmost to handle and process your samples with due care, 'failure' of the sample may sometimes occur. GNS Science reserves the right, under certain circumstances, to recover partial or full costs of the laboratory treatment up to the point of failure.

Before you send your samples, please feel free to ask about the suitability of the material for radiocarbon dating. We are always happy to discuss sample size or sample selection. After receipt of your submission, we will communicate with you during the process concerning any issues that arise which may affect a successful result.

The most common causes of sample failure during the radiocarbon dating process are:

Bone samples without collagen or in which the collagen is badly degraded

Depending upon burial context, bones may be heavily mineralized and have negligible organic content. At the first demineralization step, they may dissolve completely or yield insufficient insoluble residue to carry on to gelatinization. There may be insufficient 'protein' material which is recovered from the bone after the gelatinization step. And finally, gelatin which is submitted for C:N analysis may prove not to be collagen.

Samples that are too small or that contain insufficient carbon

While the amount of organic material required for AMS analysis is quite small, there are still occasions when the sample yields insufficient material for successful dating. If this is noted during the initial stages of pretreatment, we will notify the client of our observations and discuss alternatives. If, due to the nature of the sample itself, the CO₂ produced from combustion is too small to make graphite or the graphite yield is too tiny for successful measurement, we reserve the right to claim for costs of pretreatment up to the point of failure.

Samples which are too contaminated for successful dating

Examples of this category might be groundwater containing sulphur compounds which poison the graphite reaction or samples that exhibit elevated ¹⁴C levels through being exposed to "tracer" levels of radiocarbon in the submitter's laboratory.

Samples that fail due to laboratory error

If a sample fails due to staff or instrumental error, it will be repeated at no cost to the submitter. If the submitter is unable to supply additional sample material to repeat the analysis, they will receive a credit for the analysis of a new radiocarbon date on an alternative sample.

Contact us



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Charges for Sample Failure

For samples which fail due to the nature of the sample itself, and which are outside of the control of the laboratory, GNS Science reserves the right, under certain circumstances to apply the following charges:

Sample Failure	Price NZD
Bone samples which fail after demineralization	\$270
Bone samples which fail after gelatinization	\$325
Bone samples which fail C:N analysis	\$375
Organic samples which fail after chemical pretreatment	\$375
Organic samples which fail after combustion	\$430
Water samples which fail to yield sufficient carbon	\$375
Carbonate samples which fail after acid dissolution	\$430
Samples which fail to graphitize	\$480
Samples which fail during AMS measurement	80% of sample charge
Samples containing tracer or elevated levels of ¹⁴ C **	a minimum of \$10,000

** if elevated levels of ¹⁴C result in damage to GNS equipment or instruments requiring cleanup or replacement, greater costs will apply. Please refer to the GNS Terms & Conditions, section 8.8.

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