



# Certificate of Analysis

## Nutrients in Soil

**Catalog Number:** SQCO-019

**Lot Number:** S1021

**Manufactured Date:** 10/18/21

**Certified Date:** 10/25/21

**Expiration:** 10/31/2023

**Matrix:** Solid Matrix

**Hazards:** Irritant

<u>Analyte</u>	<u>Study Mean</u> (mg/kg)	<u>Gravimetric Concentration</u> (mg/kg)	<u>Acceptance Limits</u> (mg/kg)
Ammonia as N	1954	2250 ± 20.9	1290 - 2620
Total Kjeldahl Nitrogen (TKN)	3799	2120 ± 19.7	1910 - 5420
Total Organic Carbon (TOC)	3160	10740 ± 100	2570 - 11800
Total Phosphorus	1963	2110 ± 19.6	571 - 3350

**All analytes are present in their acid (water soluble) form.**

This certified reference material (CRM) was manufactured by NSI Lab Solutions following quality procedures meeting the requirements of ISO 9001, ISO 17025, and ISO 17034. Acceptance limits are set at current NELAC standards. The study mean is set at the mean of an interlaboratory proficiency testing study with outlier rejection. This CRM is intended to be used to validate analytical methods, for detection limit studies, and analyst proficiency testing.

### Storage & Instructions For Use

**Required storage condition is 2-8°C.**

Mix well. Open and sub-sample in a fume hood.

No modification to the sample prior to sub-sampling is necessary.

The soil sample is to be extracted and analyzed using an appropriate extraction and analytical method for Ammonia as N, TKN, TOC, and Total Phosphorus.

### Traceability Information

**Analyte Source Materials:** The highest purity analyte source materials are used in the manufacture of this CRM. Analyte source material purity and associated uncertainty has been analytically verified against appropriate NIST SRMs,

**Balance:** All analytical balances are calibrated on a semiannual basis by an ISO 17025 accredited calibration laboratory and are traceable to NIST. Traceable Calibration Certificate available upon request.

All balances are checked daily by an in-house standard operating procedure. The weights used for this daily verification are calibrated annually by an ISO 17025 accredited calibration laboratory and are certified traceable to NIST. Certificate of Calibration and Traceability available upon request.

**Thermometer:** All thermometers are NIST traceable through thermometers that are calibrated annually by an ISO 17025 accredited calibration laboratory.





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**Glassware:** All glassware used in the manufacture of our CRMs is Class A. An in-house standard operating procedure is used to verify all glassware prior to it being placed into service. Volumetric pipetors are calibrated every four months by an ISO 17025 accredited calibration laboratory.

**Homogeneity/Stability/Expiration**

This CRM was thoroughly mixed in production. Batch homogeneity was established through analyses of samples chosen at random. The stability of this quality control sample is based on short-term and long-term monitoring of the certified concentration. The expiration date is guaranteed to be valid from the manufacture date and is based on results of long-term monitoring.

**Uncertainty**

The  $\pm$  uncertainty associated with the certified concentration is the expanded uncertainty at 95% confidence interval (CI) with K=2. This expanded uncertainty incorporates contributions from manufacturing, homogeneity, and stability.

*Ewart Morris*

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Ewart Morris, Inorganics Technical Manager

