

Analytical Chemistry methods

Conductivity, pH, total dissolved solids and redox potential

Measured in the field using a Myron L Ultrameter 6Pllfc. The instrument was calibrated prior to use using pH 4, 7, and 10 buffer solutions and conductivity standards traceable to national reference materials. The conductivity probe is calibrated prior to use to 1413 $\mu\text{S}/\text{cm}$, at room temperature, using a Hanna Instruments HI7031 conductivity calibration standard.

Suspended sediments

500 ml of sample filtered through a pre-dried Whatman GF/C filter paper. Pre and post weight of bottle and filter paper recorded to determine suspended sediment concentration.

Chlorophyll-*a*

500 ml of sample filtered through a Whatman GF/C filter paper. Filter paper submerged in 10 ml of 90% v/v acetone and refrigerated overnight in the dark. Chl-*a* concentration recorded using a Beckman 750 DU spectrophotometer (calculation using measured absorbance at wavelengths 630 nm, 645 nm, 665 nm, and 750 nm).

Soluble reactive phosphorus (SRP) and ammonium (NH₄)

Analysed calorimetrically using a dual channel Seal AutoAnalyser 3. SRP was determined using the molybdenum blue method at 880 nm, and ammonium by the salicylate method at 630 nm. A six-point calibration was used for both, with a range of 0-1.5 mg/L PO₄ and 0-0.2 mg/L NH₄. Known samples as part of the LGC Aquacheck scheme were also measured for QA/QC purposes.

Total phosphorus (TP) and total dissolved phosphorus (TDP)

Analysed using a Varian Cary 50 Bio spectrophotometer. The samples were digested with acidified potassium persulphate in an autoclave at 121°C. The TP/TDP was then determined by colorimetry using the molybdenum blue method at 880 nm. A ten-point calibration was used with a range of 0-700 $\mu\text{g}/\text{L}$ PO₄-P and the detection limit is 7.0 $\mu\text{g}/\text{L}$ PO₄-P. Known samples were also measured for QA/QC purposes.

Silicon

Analysed using a Seal AA3 colorimeter (exactly the same, but an additional instrument to the one above) using the molybdenum blue method at 660 nm. A six-point calibration was used, with a range of 0-10.0 mg/L Si. Known samples were also measured for QA/QC purposes.

Dissolved organic carbon (DOC) and total dissolved nitrogen (TDN)

Both analysed simultaneously using thermal oxidation, measured by an Elementar Vario Cube Select. A six-point calibration was used for both, with a range of 0-10.0 mg/L C and 0-10.0 mg/L N. Known samples were also measured for QA/QC purposes.

Fluoride, chloride, nitrite, nitrate, and sulphate

Analysed simultaneously using a Dionex AS50 ion chromatograph (IC), with a sodium bicarbonate/sodium carbonate eluent mix. Known samples were also measured for QA/QC purposes. A six-point calibration was used for each species, with ranges as follows:

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|-----------------|------------|
| F | 0-2.5 mg/L |
| Cl | 0-50 mg/L |
| NO ₂ | 0-5.0 mg/L |
| NO ₃ | 0-50 mg/L |
| SO ₄ | 0-150 mg/L |