

EAL Analytical Methodology and Instrumentation

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Analyte	Brief Methodology	Instrumentation
Alkalinity	Potentiometric titration to end point pH 4.5. EPA Method 310.1.	Acid-base titration device
BOD5	Biochemical Oxygen Demand (BOD) over 5-day incubation. APHA 5210 B.	Hach
Bulk Density*	Cylinder-Gravimetric (103-105C) method. ASTM D 2937 method.	Oven ($105 \pm 1C$) and Balance (1mg)
Cl	Ferricyanide colorimetry. EPA Method 325.2.	Lachat QuikChem 8500 (Loveland, CO)
COD	Potassium dichromate/sulfuric acid digestion-colorimetric analysis. EPA Method 410.4.	Hach
Conductivity	Electrical conductivity measurement. EPA 120.1.	
DOC	Combustion. APHA 5310 B.	Teledyne Tekmar Torch TOC Analyzer (Mason, OH)
Hardness	Calculation of equivalent CaCO ₃ using Ca and Mg contents from separated determination. APHA 2340B.	
Metals	HNO ₃ -HCl digestion(Soil/Solid wastes). Ash at 550C-HNO ₃ dissolution (Tissue). ICP-Atomic Emission spectroscopy. EPA 200.7.	ICPE-9820(Shimadzu, Kyoto, Japan)
NO ₂ N	Sulfanilamide/N-1 naphthylethylenediamine colorimetry. APHA 4500-NO ₃ -E or EPA Method 353.2.	Lachat QuikChem 8500 (Loveland, CO)
NO ₃ N/NO ₂ N	Cadmium reduction-sulfanilamide/N-1 naphthylethylenediamine colorimetry. APHA 4500-NO ₃ -E or EPA Method 353.2.	Lachat QuikChem 8500 (Loveland, CO)
Ortho-P	Ortho phosphate-molybdate-antimony-ascorbic acid colorimetry. APHA 4500-P F/G or EPA 365.1.	Lachat QuikChem 8500 (Loveland, CO)
pH	Glass electrode. APHA 4500-H ⁺ B or EPA 150.1.	FishSci pH Meter
Salinity	Electrical conductivity method. APHA 2520 B.	
Solid CHNS	Combustion at 1150C and then measurement by TCD.	Elementar UNICUBE Elemental Analyzer (Langensfeld, Germany)
SO ₄	Barium chloride-Turbidimetrics. EPA 375.4.	Hach
TAN(NH ₄ N)	Ammonia-salicylate-nitroprusside-hypochlorite colorimetry on	Lachat QuikChem 8500 (Loveland, CO)

	aAutoanalyzerSystem(QuikChem 8500, Lachat Instrument, Loveland, CO). Standard Methods 4500-NH3 G.	
TDN	K2SO4-CuSO4-Salicylic Acid digestion. Salicylate-nitroprusside-hypochlorite colorimetry. APHA 4500Norg B or EPA Method 351.2.	Lachat QuikChem 8500 (Loveland, CO)
TKN	K2SO4-CuSO4 digestion, Salicylate-nitroprusside-hypochlorite colorimetry. APHA 4500Norg B or EPA Method 351.2.	Lachat QuikChem 8500 (Loveland, CO)
TN	K2SO4-CuSO4-Salicylic Acid digestion. Salicylate-nitroprusside-hypochlorite colorimetry. APHA 4500Norg B.	Lachat QuikChem 8500 (Loveland, CO)
TOC	Combustion. APHA 5310 B.	Teledyne Tekmar Torch TOC Analyzer (Mason, OH)
TP	K2SO4-CuSO4 digestion. Molybdate-antimony-ascorbic acid colorimetry. APHA 4500-P F.	Lachat QuikChem 8500 (Loveland, CO)
TS	Gravimetric method. APHA 2540B or EPA 1684.	Oven (105 ± 1C) and Balance (0.1mg)
TSS	Gravimetric method. APHA 2540D or EPA 160.2.	Oven (105 ± 1C) and Balance (0.1mg)
VS	Ignition-Gravimetric method. APHA 2540E.	Oven (105 ± 1C) and Balance (0.1mg)
VSS	Ignition-Gravimetric method. APHA 2540E.	Oven (105 ± 1C) and Balance (0.1mg)
CH4/CO2	Gas Chromatography. EPA Method 3C.	Shimadzu GC-2014 (Kyoto, Japan)

Method Citation:

American Public Health Association(APHA), American Water Works Association, Water Environment Federation, 2012. *Standard Methods for the Examination of Water and Wastewater*. 22nd Edition. Washington, DC.

U.S. EPA. March 1983. *Methods of Chemical Analysis of Water and Waste* (MCAWW), Section 9.3, EPA/600/4-79/020, Cincinnati OH.

*ASTM International. ASTM Standards. www.astm.org.