Methods List for Automated Ion Analyzers

Flow Injection Analysis • Ion Chromatography

May 26, 2016

QuikChem® Methods List

Use this list to:

- Identify and select analytical methods for your analyte, range, and matrix requirements.
- Locate all current Lachat methods for ion chromatography and flow injection analysis.
- Find methods accepted for USEPA compliance monitoring. These methods have symbols after the method number depending on whether the method is Accepted or Equivalent for NPDES and/or NPDWR reporting. Additional regulatory information can be found in the Regulatory Quick Reference section.
- Find methods with ERA or other external QC included in the support data. These methods have a * after the method number.

Performance Data Specifications

•**Range**: The range quoted in the Lachat methods list is based on the **actual, calibrated range.** The calibrated range is the lowest calibration standard to the highest calibration standard. (A blank is typically included in the calibration but is not included in the method range)

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•**MDL**: The MDL (method detection limit) is calculated by the following protocols:
The Student's T number for the number of replicates is multiplied by the standard deviation calculated from those replications.

If **7 replicates** are used: The Student's T value is 3.14.

If **21 replicates** are used: The Student's T value is 2.528.

Example for 21 replicates: 2.528 X 0.123 = 0.39 for an MDL

•**Quantitation Limit**: Quantitation limit is typically 3 to 5 times the calculated MDL or 10X the standard deviation of the MDL standard used. Typically, this is the lowest calibration standard in a given method.

•**Precision**: Stated in the methods as %RSD. %RSD is calculated as follows: %RSD = (SD /Mean) x 100

Part Numbers Versus Method Numbers

To convert Method Numbers to part numbers, place an **E** in front of the Method Number.

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•This is a list of the reaction modules presently available for use with QuikChem® instruments. The analytical capabilities of these instruments are not limited to these methods. The Lachat Applications group regularly adds new methods to this list. Requests for custom and proprietary methods development or consulting can be sent to Lachat Sales at 800-247-7613 ext 3580 or sales@lachatinstruments.com.

•Methods, other than those listed as EPA Accepted/equivalent, were developed to meet individual customer requirements. In order to ensure that Lachat methods exactly meet the requirements of your application, please contact your local Sales Representative or Distributor

•When you have purchased a manifold, a copy of the method will be sent with a manifold diagram. Copies of methods without manifold diagrams are available to Lachat customers upon request.

Lachat QuikChem® Method Number Key

XX	-	XXX	-	XX	-	X	-	X
matrix		analyte		form		chemistry		concentration

Matrix:

10	Waters, wastewaters	11	Seawater
12	Soil extracts	13	Plant or soil digests
14	Fertilizer digests	15	Feeds & forages
18	Aqueous formulations	19	Plating baths / mineral processing
20	Food stuffs	21	Beverages
22	Detergents	23	Bioreactor solutions
24	Extracts of air sampling filters	25	Chlor-Alkali (Caustic, brine)
26	Tobacco extracts	40	Non-aqueous
90	Multi-matrix method		

Analyte:

The first three numbers indicate the predominant chemical moiety.

Class (Ion Chromatography)

510	Anions	511	Rapid IC Anions
512	Rapid Sulfate	520	Cations
540	Oxyhalides		
550	Organic Acids		

Element

105	Boron	107	Nitrogen
109	Fluorine	111	Sodium
112	Magnesium	113	Aluminum
114	Silicate	115	Phosphorus
116	Sulfur	117	Chlorine
119	Potassium	120	Calcium
123	Molybdenum	124	Chromium (Hexavalent)
125	Uranium	126	Iron
127	Beryllium	128	Nickel
129	Copper	130	Zinc
131	Manganese	135	Bromine
136	Iodine	138	Mercury
140	Carbon	141	Chromium (Total)

Enzymes

401	Protease	402	Amylase
403	Lactate dehydrogenase (LDH)		

Molecules

201	Reducing sugars (Total)	202	Nicotine
203	Glucose	204	Cyanide
206	Urea	207	Lactic acid, D (-)
208	Lowry protein (albumin)	209	Hydrogen peroxide
210	Phenol	212	Glucan (beta-Glucan)
213	Citric acid	214	Ethanol
216	Carbon dioxide	217	Hydrazine
218	Total amino acids	219	Ascorbic acid
220	Riboflavin	221	Formaldehyde
223	Humic acid	224	Chlorate
225	Hydroxide	226	Hypochlorite
227	Creatinine	228	Sorbic acid
229	Thiocyanate	230	Pyruvate
231	Polyvinyl alcohol (PVA)	232	Glutamate
233	Glutamine	234	CMC
235	Glycerol	237	Free amino nitrogen
238	Methanol	239	Glycolate
241	Sulfur dioxide	243	Hydroxy-Proline
244	Amylose	245	Monochloramine
246	Reducing Substances		

Parameters

301	Hardness (Total)	302	Conductivity
303	Alkalinity	304	pH
305	Acidity	306	Surfactants
308	Color		

Form:

The method either determines this form of the analyte or converts the analyte to this form for determination.

00	Form given by previous three numbers	01	Phosphate (PO_4^{3-})
02	Calcium (Ca^{2+})	03	Potassium (K^+)
04	Nitrate (NO_3^-)	05	Nitrite (NO_2^-)
06	Ammonium (NH_4^+), Ammonia (NH_3)	07	Chloride (Cl^-)
08	Boric Acid (H_3BO_3)	09	Iodide (I^-)
10	Sulfate (SO_4^{2-})	11	Sulfite (SO_3^{2-})
12	Fluoride (F^-)	13	Chromium (VI) (Cr)
14	Chromium (Cr^{3+})	15	Cobalt (II) (Co^{2+})
16	Nickel (II) (Ni^{2+})	17	Copper (II) (Cu^{2+})
18	Total Iron (Fe^{2+} + Fe^{3+})	19	Iron (II) (Fe^{2+})
20	Iron (III), (Fe^{3+})	21	Bromide (Br^-)
23	Molybdenum (VI) (Mo)	24	Hydronium (H_3O^+, H^+)
25	Hydroxide (OH^-)	26	Magnesium (Mg^{2+})
27	Silicate (SiO_2)	29	Sulfide (S^{2-})
30	Acidity (volatile)	31	Calcium carbonate ($CaCO_3$)
32	Sodium cation (Na^+)	33	Aluminum (inorganic) (Al)
34	Aluminum (organic) (Al)	35	Chlorate (ClO_3^-)
36	Hypochlorite (OCl^-)	38	Sorbate
39	Carbon dioxide (CO_2)	40	Perchlorate
41	Iodate (IO_3^-)	42	Sulfur dioxide

Chemistry:

Some analytes have more than one chemistry.

Example:		
Ammonia	**10-107-06-**1	phenolate, phenate
	10-107-06-2	salicylate
	10-107-06-5	gas diffusion

Concentration:

Each range of concentrations for an analyte is given by a single letter. See the methods list for the ranges. Some methods cover more than one range.

Heaters:

Standard heater: Has a 175 cm section of 0.032" i.d. (0.8mm) and a 650 cm section of 0.032" i.d. tubing
Non-standard heater: Has a different type and/or length of tubing than that listed above. (Controller and heater block are the same; only the tubing is different).

New Methods:

The majority of new methods developed by Lachat Instruments are the result of customer requests. If you do not see the method you need, please contact us at sales@lachatinstruments.com, techhelp@hach.com, or intltech@hach.com

What's New December 2014 through May 2016

These 8 Lachat methods were introduced since the last Lachat method's list, from October, 2014 through April 2016. For more information on any of these methods, please contact Lachat Technical Support.

Method Number	*Analyte*	*Range (s)*	*Comments*
Water/Wastewater			
10-107-06-2-X	**Ammonia**	0.05-20 mg N/L as NH_3	**Sodium Salicylate method for MicroDist distillates.** Requires a standard heater, MicroDist block and tubes. Preserved or un-preserved samples. 660 nm**.** NPDES Equivalent (350.1).
10-216-00-1-B	**Carbonates (Total)**	1.0-50.0 mM CO_2/L	Gas diffusion cresol red method. 450 nm
10-204-00-1-J	**Cyanide**	25-1000 µg CN^-/L	**Pyridine/Pyrazolone method.** Wad or Total Cyanide. Distillation performed off-line prior to analysis. Based on Japanese method JIS0102. Requires a standard heater. 620 nm.
10-211-00-1-D	**Formaldehyde**	0.01-1.0 mg CHOH/L 0.25-10.0 CHOH/L	**Acetylacetone method.** Requires a standard heater. **410 nm.**
10-114-27-1-D	**Silicate**	2.5-250 µg SiO_2/L	**Molybdenum method. ANSA reductant**. Requires a standard heater, and 2 cm Detector module. For use with QC8500 only. 820nm.
10-116-10-2-E	**Sulfate**	2-40 mg SO_4^{2-}/L 5-100 mg SO_4^{2-}/L 50-300 mg SO_4^{2-}/L	Methylthymol blue method; 460 nm. NPDES Equivalent (375.2).
10-116-10-2-F	**Sulfate**	20-300 mg SO_4^{2-}/L	Methylthymol blue method; 460 nm. NPDES Equivalent (375.2).
Beverages			
21-116-11-2-E	**Sulfite**	0.5 to 20 mg SO_3^{2-} /L	Pararosaniline method for sulfite in coconut milk. Requires a high temperature heater. In-line gas diffusion method so color does not interfere. 560nm.

Regulatory Quick Reference

These QuikChem® methods are considered permitted reporting options for the National Pollutant Discharge Elimination (NPDES) and/or the National Primary Drinking Water Regulations (NPDWR) programs of the US Environmental Protection Agency (USEPA). Also listed are those QuikChem® methods that follow ISO standards.

The most recent MUR (Method Update Rule) was signed by the Administrator on April 17, 2012 and published at the CFR on May 18, 2012.

Standard Methods (Which are Lachat Methods) that were added to Table 1B:

Analyte	Lachat #*	SM #
Ammonia	10-107-06-1-J	4500-NH_3-H
Organic Nitrogen (Kjeldahl Nitrogen)	10-107-06-2-D 10-107-06-2-E	4500 N_{ORG} D-1997
Orthophosphorus	10-115-01-1-A	4500 P G 1999
Total phosphorus (manual digest)	10-115-01-1-E	4500 P H 1999
Silica	10-114-27-1-A	4500 SiO_2 F-1997
Sulfate	10-116-10-2-A	4500 SO_4 G-1997

(Please note that all of these methods, except for MTB sulfate, already had acceptable version letters).

Although information regarding approved and accepted methods is published in the CFR, states still have primacy. As a result, it is absolutely vital that labs discuss their plans to use **any** method (including promulgated, accepted, equivalent/modified methods) with their auditor **prior** to the method's implementation, to be sure the proposed change or modified method will be accepted. By doing so, the lab will also know in advance what validation will be required in their specific case for implementation.

Method Number	USEPA NPDES	USEPA NPDWR	USEPA Method	ISO
Alkalinity				
10-303-31-1-A	Accepted			
10-303-31-1-D	Equivalent		310.2	
Chloride				
10-117-07-1-A	Accepted	Accepted		15682
10-117-07-1-B	Accepted	Accepted		15682
10-117-07-1-C	Equivalent		USGS I2 187-85	
10-117-07-1-E	Equivalent		USGS I2 187-85	
10-117-07-1-H	Accepted			
10-117-07-1-I	Accepted			
10-117-07-1-K	Equivalent		USGS I2 187-85	
80-117-07-1-A	Equivalent		USGS I2 187-85	
Chromium				
10-124-13-1-A	Accepted			
10-124-13-1-B	Equivalent		SM (20^{th}) 3500 Cr-B USGS I-2030-85 ASTM D1687-92, 02	
10-141-13-2-A				23913

Method Number	USEPA NPDES	USEPA NPDWR	USEPA Method	ISO
Conductivity				
10-302-00-1-A	Accepted			
10-302-00-1-B	Accepted			
Cyanide				
10-204-00-1-A	Accepted	Accepted		
10-204-00-1-B	Equivalent		335.4	
10-204-00-1-F	Equivalent		335.4	
10-204-00-1-X	Approved	Approved	Promulgated method	
10-204-00-1-X2	Equivalent	Accepted	10-204-00-1-X	
10-204-00-2-C[1]	Equivalent		Kelada-01	
10-204-00-2-D[1]	Equivalent		Kelada-01	
10-204-00-2-E[1]	Equivalent		Kelada-01	
10-204-00-5-A	Equivalent	Accepted	ASTM Method D6888-04 DW; D6888-09 WW	
10-204-00-2-H				14403-1
10-204-00-5-C	Equivalent		ASTM Method D7237-10	
10-204-00-5-D	Equivalent		ASTM Method D7511-09	
10-204-00-5-C	Equivalent		ASTM Method D7237-10	
10-204-00-5-X	Equivalent		ASTM Method D7284-08	
80-204-00-1-A	Equivalent		335.4	
80-204-00-1-X	Equivalent		10-204-00-1-X	
Fluoride				
10-109-12-2-A	Accepted	Accepted		
10-109-12-2-B	Equivalent		SM (20th) 4500 F-B USGS I-4327-85 ASTM D1179-93, 99	
10-109-12-2-C	Equivalent		SM (20th) 4500 F-B USGS I-4327-85 ASTM D1179-93, 99	
10-109-12-2-D	Equivalent		SM (20th) 4500 F-B USGS I-4327-85 ASTM D1179-93, 99	
Hardness				
10-301-31-1-A	Accepted			
10-301-31-1-B	Accepted			
10-301-31-1-C	Equivalent		130.1	
Nitrogen – Ammonia				
10-107-06-1-B	Accepted			
10-107-06-1-C	Accepted			
10-107-06-1-F	Equivalent		350.1	
10-107-06-1-G	Equivalent		350.1	

Method Number	USEPA NPDES	USEPA NPDWR	USEPA Method	ISO
10-107-06-1-I	Accepted	Accepted		
10-107-06-1-J	Accepted	Accepted		
10-107-06-1-K	Accepted			
10-107-06-1-M	Equivalent		350.1	
10-107-06-1-X[1]	Equivalent		350.1	
10-107-06-2-A[2]	Equivalent		350.1	
10-107-06-2-L[2]	Equivalent		350.1	
10-107-06-2-O[2]	Equivalent		350.1	
10-107-06-2-X	Equivalent		350.1	
10-107-06-3-F	Equivalent		350.1	
10-107-06-5-B				11732
10-107-06-5-J[1,2]	Equivalent		350.1	
10-107-06-6-A[1,2]	Equivalent		350.1	
10-107-06-6-B[1]	Equivalent		350.1	
30-107-06-1-A	Accepted			
31-107-06-1-B	Equivalent		350.1	
31-107-06-1-F	Equivalent		350.1	
31-107-06-1-G	Equivalent		350.1	
31-107-06-1-H	Equivalent		350.1	
80-107-06-1-B	Equivalent		350.1	
80-107-06-1-C	Equivalent		350.1	
Nitrogen – Kjeldahl (TKN)				
10-107-06-2-D	Accepted			
10-107-06-2-E	Accepted			
10-107-06-2-H	Equivalent		351.2	
10-107-06-2-I	Equivalent		351.2	
10-107-06-2-K	Equivalent		351.2	
10-107-06-2-M	Equivalent		351.2	
10-107-06-2-N	Equivalent		351.2	
10-107-06-2-P	Equivalent		351.2	
10-107-06-2-Q	Equivalent		351.2	
10-107-06-5-F	Equivalent		PAI DK03	11732
10-107-06-6-C[1]	Equivalent		351.2	
10-107-06-6-D[1]	Equivalent		351.2	
Nitrogen – Nitrate + Nitrite				
10-107-04-1-A	Accepted	Accepted		
10-107-04-1-B	Accepted	Accepted		
10-107-04-1-C	Accepted	Accepted		
10-107-04-1-F	Equivalent		353.2	
10-107-04-1-H	Equivalent		353.2	
10-107-04-1-J	Accepted	Accepted		
10-107-04-1-K	Accepted	Accepted		
10-107-04-1-L	Accepted	Accepted		
10-107-04-1-O	Accepted	Accepted		

Method Number	USEPA NPDES	USEPA NPDWR	USEPA Method	ISO
10-107-04-1-Q	Equivalent		353.2	
10-107-04-1-R	Equivalent	Accepted	353.2	
10-107-04-2-A	Accepted	Accepted		
10-107-04-2-B	Accepted	Accepted		
30-107-04-1-A	Accepted			
30-107-04-1-C	Equivalent		353.2	
31-107-04-1-A	Equivalent		353.4	
31-107-04-1-C	Equivalent		353.4	
31-107-04-1-D	Equivalent		353.4	
31-107-04-1-E	Equivalent		353.4	
31-107-04-1-F	Equivalent		353.4	
31-107-04-1-G	Equivalent		353.4	
31-107-04-1-H	Equivalent		353.4	
80-107-04-1-A	Equivalent	Accepted	353.2	
Nitrogen – Nitrite				
10-107-05-1-A	Equivalent	Accepted	353.2	
10-107-05-1-B	Equivalent		353.2	
10-107-05-1-C	Equivalent		353.2	
10-107-05-1-O	Equivalent		353.2	
31-107-05-1-A	Equivalent		353.4	
31-107-05-1-B	Equivalent		353.4	
80-107-05-1-A	Equivalent	Accepted	353.2	
Phenol				
10-210-00-1-A	Accepted			
10-210-00-1-B	Accepted			
10-210-00-1-X[1]	Equivalent		420.1	
10-210-00-1-Y[1]	Equivalent		420.1	
10-210-00-3-C[1]	Equivalent		420.4	
Phosphate, Ortho				
10-115-01-1-A	Accepted	Accepted		
10-115-01-1-B	Accepted	Accepted		
10-115-01-1-M	Accepted	Accepted		
10-115-01-1-O	Equivalent		365.1	
10-115-01-1-P	Accepted	Accepted		
10-115-01-1-Q	Accepted	Accepted		
10-115-01-1-T	Accepted	Accepted		
10-115-01-1-V	Equivalent	Accepted	365.1	
10-115-01-1-W	Equivalent		365.1	
10-115-01-1-Y	Equivalent		365.1	
31-115-01-1-G	Equivalent		365.5	
31-115-01-1-H	Equivalent		365.5	
31-115-01-1-I	Equivalent		365.5	
31-115-01-1-J	Equivalent		365.5	
31-115-01-1-W	Equivalent		365.5	
31-115-01-1-Y	Equivalent		365.5	

Method Number	USEPA NPDES	USEPA NPDWR	USEPA Method	ISO
80-115-01-1-A	Equivalent	Accepted	365.1	
Phosphate, Total				
10-115-01-1-E	Accepted			
10-115-01-1-F	Accepted			
10-115-01-2-B	Equivalent		365.4	
10-115-01-3-A	Equivalent		365.3	
10-115-01-3-B	Equivalent		365.3	
10-115-01-3-C	Equivalent		365.3	
10-115-01-3-E	Equivalent		365.3	
10-115-01-3-F	Equivalent		365.3	
10-115-01-4-I	Equivalent		365.3	
10-115-01-4-S	Equivalent		365.3	
10-115-01-4-U	Equivalent		365.3	
Phosphate, Total Kjeldahl (TKP)				
10-115-01-1-C	Accepted			
10-115-01-1-D	Accepted			
10-115-01-1-I	Equivalent		365.4	
10-115-01-2-B	Equivalent		365.4	
10-115-01-2-C	Equivalent		365.4	
Silicate				
10-114-27-1-A	Accepted			
10-114-27-1-B	Equivalent		SM(20th)4500-SiO2C USGS I-2700-85 ASTM D859-94, 00	
10-114-27-1-C	Equivalent		SM(20th)4500-SiO2C USGS I-2700-85 ASTM D859-94, 00	
10-114-27-1-D	Equivalent		SM(20th)4500-SiO2C	
31-114-27-1-A	Equivalent		366.0	
31-114-27-1-B	Equivalent		366.0	
31-114-27-1-D	Equivalent		366.0	
31-114-27-1-E	Equivalent		366.0	
31-114-27-1-F	Equivalent		366.0	
Sodium				
10-111-32-1-A	Equivalent		SM(20th) 3500-Na-B	
Sulfate				
10-116-01-3-A	Equivalent		ASTM D516-02	
10-116-10-2-A	Equivalent		375.2	
10-116-10-2-B	Equivalent		375.2	
10-116-10-2-E	Equivalent		375.2	
10-116-10-2-F	Equivalent		375.2	

Method Number	USEPA NPDES	USEPA NPDWR	USEPA Method	ISO
Sulfide				
10-116-29-1-A	Equivalent		SM(20th) 4500-S-D	
10-116-29-1-B	Equivalent		SM(20th) 4500-S-D	
Anionic Surfactants (MBAS)				
10-306-00-1-D	Equivalent		SM(20th) 5540-C	
10-306-00-1-F	Equivalent		ASTM 2330-02/SM5440 C.	
Anions (Ion Chromatography)				
10-510-00-1-A	Equivalent	Accepted	300.0	
10-510-00-1-E	Equivalent	Accepted	300.0	
10-511-00-1-A	Equivalent	Accepted	300.0	
10-540-00-1-C		Accepted		

[1] EPA has revised the language at (b)(4)(T) be **more specific with respect to the use of gas diffusion across a hydrophobic semi-permeable membrane,** to separate the analyte of interest from the sample matrix in place of manual or automated distillation for the analysis of certain analytes. This is an acceptable change to an approved method for the following analytes: ammonia, cyanide, TKN, and Total Phenolics.

[2]Betholot-based method, uses salicylate. See Table 1B at 40 CFR 136

Comparison tables are available for all methods that are equivalent to NPDES methods.

In the list of methods that follows:

Designation in the methods list means the method is EPA accepted as equivalent for NPDWR, NPDES, or both (Check the table above)
^ Designation in the methods list means the method is equivalent for NPDES reporting under the MUR.

Ion Chromatography Methods

Method No	Range	MDL	Matrix, Units	Comments	Rev Date
Anions					
10-136-09-1-B			**Waters**		**11-Aug-09**
Iodide	0.05 – 5.0		mg I^-/L		
10-510-00-1-A #			**Waters and extracts of soil**	**USEPA method 300.0 (A); multi-range method (multiple ranges possible with different sample loops)**	**29-Nov-01**
10-510-00-1-A1					
Bromide	0.05 – 5.0	0.018	mg Br^-/L		
Chloride	0.5 – 50.0	0.004	mg Cl^-/L		
Fluoride	0.05 – 5.0	0.004	mg F^-/L		
Nitrate	0.05 – 5.0	0.004	mg NO_3^- - N/L		
Nitrite	0.05 – 5.0	0.008	mg NO_2^- - N/L		
Phosphorus	0.05 – 5.0	0.012	mg HPO_4^{2-} - P/L	Orthophosphate	
Sulfate	1.0 – 100	0.012	mg SO_4^{2-}/L		
10-510-00-1-A2					
Bromide	0.1 – 5		mg Br^-/L		
Chloride	2 – 100		mg Cl^-/L		
Fluoride	0.2 – 10		mg F^-/L		
Nitrate	0.2 – 10		mg NO_3^- - N/L		
Nitrite	0.1 – 5		mg NO_2^- - N/L		
Phosphorus	0.2 – 10		mg HPO_4^{2-} - P/L	Orthophosphate	
Sulfate	4 – 200		mg SO_4^{2-}/L		
10-510-00-1-A3					
Bromide	0.025 – 2.5	0.005	mg Br^-/L		
Chloride	0.25 – 25	0.012	mg Cl^-/L		
Fluoride	0.025 – 2.5	0.004	mg F^-/L		
Nitrate	0.025 – 2.5	0.002	mg NO_3^- - N/L		
Nitrite	0.025 – 2.5	0.005	mg NO_2^- - N/L		
Phosphorus	0.025 – 2.5	0.003	mg HPO_4^{2-} - P/L	Orthophosphate	
Sulfate	0.5 – 50	0.003	mg SO_4^{2-}/L		

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-510-00-1-A4						
Bromide	0.16 – 3.0	0.02	mg Br^-/L			
Chloride	32 – 600		mg Cl^-/L			
Fluoride	0.04 – 0.75	0.008	mg F^-/L			
Nitrate	0.04 – 0.75	0.005	mg NO_3^- - N/L			
Nitrite	0.04 – 0.75	0.02	mg NO_2^- - N/L			
Phosphorus	0.10 – 1.875	0.02	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	32 – 600		mg SO_4^{2-}/L			
10-510-00-1-C				**Waters**	**Common Inorganic Anions**	**8-Sep-03**
Bromide	0.06 – 6.0	0.02	mg Br^-/L			
Chloride	0.6 – 60	0.005	mg Cl^-/L			
Fluoride	0.04 – 4.0	0.006	mg F^-/L			
Nitrate	0.06 – 6.0	0.007	mg NO_3^- - N/L			
Nitrite	0.016 – 1.6	0.002	mg NO_2^- - N/L			
Phosphorus	0.06 – 6.0	0.015	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	2.0 – 200	0.03	mg SO_4^{2-}/L			
10-510-00-1-D				**Waters**		**9-Sep-03**
Bromide	40 – 400		µg Br^-/L			
Nitrate	20 – 200		µg NO_3^- - N/L			
Nitrite	20 – 200		µg NO_2^- - N/L			
10-510-00-1-E ^#				**Waters**	**Rapid anions method; Omnion 3.0 or higher; multi-range method (multiple ranges possible with different sample loops)**	**29-Oct-08**
10-510-00-1-E1						
Bromide	0.05 – 5.0	0.016	mg Br^-/L			
Chloride	0.5 – 50	0.029	mg Cl^-/L			
Fluoride	0.05 – 5.0	0.004	mg F^-/L			
Nitrate	0.05 – 5.0	0.008	mg NO_3^- - N/L			
Nitrite	0.05 – 5.0	0.033	mg NO_2^- - N/L			
Phosphorus	0.05 – 5.0	0.015	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	1.0 – 100	0.02	mg SO_4^{2-}/L			
10-510-00-1-E2						
Bromide	0.025 – 2.5	0.015	mg Br^-/L			
Chloride	0.015 – 2.5	0.006	mg Cl^-/L			
Fluoride	0.025 – 2.5	0.003	mg F^-/L			
Nitrate	0.025 – 2.5	0.0048	mg NO_3^- - N/L			
Nitrite	0.025 – 2.5	0.0048	mg NO_2^- - N/L			
Phosphorus	0.025 – 2.5	0.0098	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	0.5 – 50	0.02	mg SO_4^{2-}/L			

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-510-00-1-E3						
Bromide	0.1 – 5	0.038	mg Br^-/L			
Chloride	2 – 100	0.016	mg Cl^-/L			
Fluoride	0.2 – 10	0.016	mg F^-/L			
Nitrate	0.2 – 10	0.029	mg NO_3^- - N/L			
Nitrite	0.1 – 5.0	0.01	mg NO_2^- - N/L			
Phosphorus	0.2 – 10	0.034	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	4 – 200	0.144	mg SO_4^{2-}/L			
10-510-00-1-F				**Waters**	**Anions method; High Conductance samples (3µS/cm) Omnion 3.0 or higher**	**23-Aug-10**
Bromide	0.2 to 4.0	0.021	mg Br^-/L			
Chloride	50-1000	0.0102	mg Cl^-/L			
Fluoride	0.1 to 2.0	0.0075	mg F^-/L			
Nitrate	0.2 to5.0	0.0115	mg NO_3^- - N/L			
Nitrite	0.1-2.0	0.0075	mg NO_2^- - N/L			
Phosphorus	0.2 to 4.0	0.025	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	50 to 1000	0.144	mg SO_4^{2-}/L			
10-511-00-1-A #				**Waters**	**Rapid anions method; multi-range method (multiple ranges possible with different sample loops). Omnion 3.0 or higher.**	**16-Sep-03**
10-511-00-1-A1						
Chloride	1.0 – 100	0.004	mg Cl^-/L			
Nitrate	0.2 – 20.0	0.003	mg NO_3^- - N/L			
Phosphorus	0.05 – 5.0	0.006	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	1.0 – 100	0.014	mg SO_4^{2-}/L			
10-511-00-1-A2						
Chloride	1.5 – 150	0.01	mg Cl^-/L			
Nitrate	0.25 – 25	0.005	mg NO_3^- - N/L			
Phosphorus	0.1 – 10	0.016	mg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	2.5 – 250	0.04	mg SO_4^{2-}/L			
10-510-13-1-B				**Waters**	**USEPA method 218.6; (modified) Omnion 3.0 or higher**	**24-Nov-08**
Cr(VI)	0.05-10	0.02	µg CrO_4^-		IC with Post column derivatization; 2 cm flow cell; QC8500 ONLY.	

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-540-00-1-C #				**Waters**	USEPA method 300.1; determination of disinfection byproducts; Omnion 3.0 or higher	**24-Nov-08**
Bromate	5 – 50	1.15	µg BrO_3^-/L			
Bromide	10 – 100	2.01	µg Br^-/L			
Chlorate	20 – 200	5.00	µg ClO_3^-/L			
Chlorite	5 – 50	2.61	µg ClO_2^-/L			
70-510-00-1-C				**High Purity Waters**	**Omnion 3.0 or higher**	**17-Dec-08**
Bromide	2.0 – 40.0	0.67	µg Br^-/L			
Chloride	1.0 – 20.0	0.22	µg Cl^-/L			
Fluoride	1.0 – 20.0	0.39	µg F^-/L			
Nitrate	1.0 – 20.0	0.20	µg NO_3^- - N/L			
Nitrite	1.0 – 20.0	0.40	µg NO_2^- - N/L			
Phosphorus	3.0 – 60.0	0.60	µg HPO_4^{2-} - P/L		Orthophosphate	
Sulfate	1.5 – 30.0	0.45	µg SO_4^{2-}/L			

Cations

10-520-00-1-D				**Waters**	**Omnion 3.0 or higher; multi-range method (multiple ranges possible with different sample loops)**	**17-Feb-09**
10-520-00-1-D1						
Ammonium	0.8 – 32	0.16	mg NH_4^+/L			
Calcium	1.6 – 64	0.60	mg Ca^{2+}/L			
Lithium	0.25 – 10	0.05	mg Li^+/L			
Magnesium	0.8 – 32	0.16	mg Mg^{2+}/L			
Potassium	1.6 – 64	0.32	mg K^+/L			
Sodium	1.8 – 72	0.36	mg Na^+/L			
10-520-00-1-D2						
Ammonium	0.20 – 4.0	0.04	mg NH_4^+/L			
Calcium	0.25 – 5.0	0.053	mg Ca^{2+}/L			
Lithium	0.05 – 1.0	0.58	mg Li^+/L			
Magnesium	0.25 – 5.0	0.05	mg Mg^{2+}/L			
Potassium	0.20 – 4.0	0.04	mg K^+/L			
Sodium	0.20 – 4.0	0.04	mg Na^+/L			
10-520-00-1-D3						
Ammonium	0.005 – 0.250	0.00349	mg NH_4^+/L			
Calcium	0.025 – 1.250	0.00744	mg Ca^{2+}/L			
Lithium	0.008 – 0.4	0.00058	mg Li^+/L			
Magnesium	0.012 – 0.6	0.0026	mg Mg^{2+}/L			
Potassium	0.020 – 1.0	0.00574	mg K^+/L			
Sodium	0.010 – 0.5	0.00144	mg Na^+/L			

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-520-00-1-E			**Waters**		**Omnion 3.0 or higher; High Conductance samples (3µS/cm)**	**1-Sep-10**
Ammonium	1.0 to 20	0.14	mg NH_4^+/L			
Calcium	5.0 to 100	1.14	mg Ca^{2+}/L			
Lithium	0.5 to 10	0.06	mg Li^+/L			
Magnesium	5.0 to 100	1.47	mg Mg^{2+}/L			
Potassium	5.0 to 100	1.08	mg K^+/L			
Sodium	5.0 to 100	0.10	mg Na^+/L			
70-520-00-1-B			**Waters**		**Omnion 3.0 or higher; High Purity Waters**	**20-Feb-13**
Ammonium	0.5-25	0.09	µg Na^+/L		**Run time 9 minutes, for sodium and ammonium ONLY**. Run time requires extension for analysis of additional Cations.	
Sodium	0.5-25	0.11	µg NH_4^+/L			

Organic Acids

21-550-00-1-B			**Beverages**	**Omnion 3.0 or higher**	**31-Jan-09**
Acetic Acid	3 – 300	1.16	mg/L		
Adipic Acid	4.5 – 450	3.34	mg/L		
Citric Acid	3 – 300	0.45	mg/L		
Formic Acid	3 – 300	0.50	mg/L		
Fumaric Acid	3 – 300	0.45	mg/L		
Lactic Acid	3 – 300	0.90	mg/L		
Malic Acid	3 – 300	0.60	mg/L		
Malonic Acid	3 – 300	1.07	mg/L		
Oxalic Acid	3 – 300	0.71	mg/L		
Succinic Acid	3 – 300	0.77	mg/L		
Tartaric Acid	3 – 300	0.92	mg/L		

Method No	Range	MDL	Units	Matrix	Comments	Rev Date

Flow Injection Analysis

Acidity

10-305-31-1-A	30 – 500	4.0	mg $CaCO_3$/L	Waters	Thymol blue method. 600 nm	3-Sep-03
10-305-31-1-B	1.0 – 30.0	0.19	mg $CaCO_3$/L	Waters	Thymol blue method. 600 nm	3-Sep-03

Alkalinity

10-303-31-1-A #	10 – 500	2.3	mg $CaCO_3$/L	Waters	Methyl orange method; Total Alkalinity. 550 nm, NPDES Accepted.	23-Jan-01
10-303-31-1-D ^	1 – 50	0.27	mg $CaCO_3$/L	Waters	Methyl orange method; Total Alkalinity, 550 nm. NPDES Equivalent (310.2).	3-Sep-03
10-303-31-2-B	10 – 200	3.0	mg $CaCO_3$/L	Waters	Phenolphthalein method. p-alkalinity, 520 nm	3-Sep-03
10-303-31-3-A *	50 – 400	2.7	mg $CaCO_3$/L	Waters	Bromocresol green method. Total Alkalinity, 640 nm	3-Sep-03
10-303-31-4-A	50 – 500	1.1	mg $CaCO_3$/L	Waters	Bromocresol green / methyl red method; Total Alkalinity, low-flow method. 640 nm	3-Sep-03

Aluminum

10-113-33-1-B	0.1 – 5.0	0.02	mg Al/L	Waters	Total Reactive (monomeric) Al; pyrocatechol violet; determination in 0.15% HNO_3 matrix. 580 nm. **Inert Probe required**	27-Aug-03
10-113-33-1-C	10 – 300	1.0	µg Al/L	Waters	Total Reactive (monomeric) Al; pyrocatechol violet; Dilute HNO_3 preservation required. 580 nm. **Inert Probe required.**	14-Apr-08
10-113-34-1-B	0.01 – 0.3	0.0015	mg Al/L	Waters	Non-exchangeable (organically complexed) Al. pyrocatechol violet; Dilute HNO_3 preservation required. 580 nm. **Inert Probe required**	27-Aug-03
12-113-33-1-B	1.0 – 30	0.1	mg Al/L	Soil extracts	Total reactive (monomeric) Al; pyrocatechol violet; Determination in 1 M KCl extracts. 580nm . **Inert Probe required**	3-Sep-03
13-113-33-1-B	0.8 – 4.0	0.05	mg Al/L	Plant extracts	Total reactive (monomeric) Al. Low-flow method. 1M HCl final matrix. 580 nm **Inert Probe required**	3-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Amino Acids						
18-218-00-1-A	1.25 – 40	0.22	mM Leucine	Aqueous formulations	Ninhydrin. Determination in rumen fluid. 580 nm. **Requires a non-standard heater**.	3-Sep-03
Ammonia		***See also IC section***				
10-107-06-1-B # *	0.05 – 5.0	0.007	mg N/L as NH_3	Waters	Alkaline phenol-based method; determination in 0.2% H_2SO_4 preserved samples; 630 nm**. Requires a standard heater**. NPDES Accepted	27-Aug-01
10-107-06-1-C #	0.01 – 4.0	0.004	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. determination in non-preserved samples; **Requires a standard heater** NPDES Accepted	2-Nov-01
10-107-06-1-G ^	10 – 500	1.53	µg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. Preserved samples. Ultra High Throughput method (>100 samples/hr); **Requires a standard heater.** NPDES Equivalent (350.1)	14-Dec-07
10-107-06-1-I ^	0.1 – 30.0	0.01	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. Non-preserved samples. Preserved samples require pH adjustment prior to analysis. **Requires a standard heater** NPDES Equivalent	28 Aug 15
10-107-06-1-J #	0.01 – 2.0	0.002	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. Low-flow method; determination in preserved and non-preserved samples; **Requires a standard heater** NPDES/NPDWR Accepted	29-Nov-07
10-107-06-1-K #	0.2 – 20.0	0.01	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. **Requires a standard heater**. Low-flow method; NPDES Accepted	15-Mar-01
10-107-06-1-L	0.01 – 2.0	0.0028	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. Use w/ 10-245-00-1-A for monochloramine Non-preserved samples. **Requires a standard heater**	6-Nov-07
10-107-06-1-M ^	0.01 – 2.0 0.2 – 20.0	0.002 0.011	mg N/L as NH_3	Waters	Alkaline phenol-based method; determination in acid preserved or non-acid preserved samples; multi-range method; 630 nm. **Requires a standard heater** NPDES Equivalent (350.1)	9-Nov-07
10-107-06-1-O ^	2.0 – 500 0.25 – 10	0.56	µg N/L as NH_3 mg N/L as NH_3	Waters	Alkaline phenol-based method; multi-range method; 630 nm. Preserved samples. **Requires a standard heater** NPDES Equivalent (350.1)	22-Feb-08

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
	10-107-06-1-Q^	0.005- 2.0 0.25-20.0	0.0022 0.0038	mg N/L as NH_3	Waters	Alkaline phenol-based method, citrate buffer; multi-range method; 630 nm. Non-preserved samples. **Requires a standard heater** NPDES Equivalent (349.0)	17-Aug-10
	10-107-06-1-X ^	0.05 – 20.0	0.007	mg N/L as NH_3	Waters	**MicroDist method**; **requires MicroDist block and tubes**. Preserved or un-preserved samples. Alkaline phenol determination. 630 nm. **Requires a standard heater** NPDES Equivalent (350.1)	17-Sep-09
	10-107-06-2-A ^	0.10 – 5.0 1.0-20	0.005 0.10	mg N/L as NH_3	Waters	Sodium salicylate-based method; 660 nm. **Requires a standard heater** NPDES Equivalent (350.1)	15-Sept-15
	10-107-06-2-L * ^	0.05 – 20	0.01	mg N/L as NH_3	Waters	Sodium salicylate-based method; 660 nm Ultra High Throughput method (>120 samples/hr); **Requires a standard heater** NPDES Equivalent (350.1)	16-Aug-07
	10-107-06-2-O ^	10 – 500 0.25 – 30	1.1 0.011	µg N/L as NH_3 mg N as NH_3	Waters	Sodium salicylate-based method; 660 nm. **Requires a standard heater** multi-range method; NPDES Equivalent (350.1)	7-Dec-07
	10-107-06-2-R	0.02 – 5.00	0.004	mg N/L as NH_3	Waters	Sodium salicylate-based method; Determination in **10 mM H_3PO_4 matrix** 660 nm. **Requires a standard heater** .	18-Dec-09
NEW	10-107-06-2-X^	0.05-20	0.033	mg N/L as NH_3	Waters	Sodium Salicylate method for MicroDist distillates. **Requires a standard heater**. . Preserved or un-preserved samples. 660 nm. Requires MicroDist block and tubes. NPDES Equivalent (350.1)	17-Aug -15
	10-107-06-3-B	0.05 – 1.0	0.008	mg N/L as NH_3	Waters	Sodium salicylate-based method; Uses DClC instead of NaOCl 660 nm. **Requires a standard heater.**	26-Aug-03
	10-107-06-3-D	0.005 – 0.25	0.001	mg N/L as NH_3	Waters	Sodium salicylate-based method; uses DClC instead of NaOCl 660 nm. **Requires a standard heater**	26-Aug-03
	10-107-06-3-F ^	1.25 – 100	0.41	µg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. **Requires a non-standard heater** uses DClC; 2-cm detector method; for **QC8500 only**; NPDES Equivalent (350.1)	17-Feb-09
	10-107-06-5-B	0.10 – 1.0 1.0-10.0	0.01	mg N/L as NH_3	Waters	Gas diffusion method; low-flow method; ISO (11732) 590nm	19-Mar-04
	10-107-06-5-J	0.01-1.0 0.1-20	0.002 0.02	mg N/Las NH_3	Waters	Gas Diffusion method. Salicylate/DCIC. May be used for TKN as well as brackish/saline samples. 660 nm. **Requires a standard heater**.	16-Jan-15

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-06-6-A ^	0.25 – 20	0.13	mg N/L as NH_3	Waters	Sodium salicylate-based method; 660 nm. inline distillation method; **Requires a standard heater and in-line module for distillation step.** Samples w/ particulates not suitable. NPDES Equivalent (350.1);	24-Jul-08
10-107-06-6-B ^	0.25 – 10	0.066	mg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm. inline distillation method; low-flow method; **Requires a standard heater and an in-line module for the distillation.** Samples w/ particulates not suitable. NPDES Equivalent (350.1);	29-Jul-08
10-107-06-6-E^	10-250	5 (pres.) 1 (un-pres.)	µg N/L as NH_3	Waters	Alkaline phenol-based method; 630 nm inline distillation method; **Requires a standard heater and an in-line module for the distillation.** Low-flow method; samples w/ particulates not suitable NPDES Equivalent (350.1);	15-Apr-11
12-107-06-1-A	0.01 – 1.0	0.002	mg N/L as NH_3	Soil extracts	Alkaline phenol-based method; Determination in **2M KCl** soil extracts 630 nm. **Requires a standard heater.**	17-Sep-08
12-107-06-1-B	1.0 – 20.0	0.035	mg N/L as NH_3	Soil extracts	Alkaline phenol-based method; Determination in **2M KCl** soil extracts 630 nm. **Requires a standard heater.**	15-Sep-08
12-107-06-2-A	0.10 – 20.0	0.035	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **2M KCl** soil extracts 660 nm. **Requires a standard heater.**	3-Sep-03
12-107-06-2-E	0.05 – 10.0	0.016	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **0.5M K_2SO_4** soil extracts 660 nm. **Requires a standard heater.**	3-Sep-03
12-107-06-2-F	0.1 – 20	0.026	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **2M KCl** soil extracts; Ultra High Throughput method (>120 samples/hr) 660 nm. **Requires a standard heater.**	15-Aug-07
12-107-06-2-H	1-100	0.06	mg N/L as NH_3	Air monitoring (above soil) extracts	Sodium Salicylate. **0.029M glycerol/0.18M H_3PO_4 matrix.** 660 nm. **Requires a standard heater.**	18-Mar-13
12-107-06-3-A	2.0 – 40.0	0.11	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **0.0125M $CaCl_2$** soil extracts 660 nm. **Requires a standard heater.**	3-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
12-107-06-3-B	0.2 – 4.0	0.01	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; **2M KCl** soil extracts. 660 nm. **Requires a standard heater.**	3-Sep-03
12-107-06-3-C	0.2 – 4.0	0.03	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **0.0125M $CaCl_2$** soil extracts 660 nm. **Requires a standard heater.**	3-Sep-03
12-107-06-3-D	1.0-75	0.2	mg N/L as NH_3	Soil extracts	Sodium salicylate-based method; Determination in **1M KCl or water extracts** of soils 660 nm. **Requires a standard heater.**	14-Apr-14
12-107-06-5-A	0.1 – 20.0	0.02	mg N/L as NH_3	Soil extracts	Gas diffusion method; **2M KCl** soil extracts 590 nm.	23-Feb-10
14-107-06-1-A	1.75 – 7.0		% N/L as NH_3	Fertilizers	Alkaline phenol-based method. Liquid fertilizers. 630 nm. **Requires a standard heater**	3-Sep-03
14-107-06-1-B	5.0 – 180	0.5	mg N/L as NH_3	Fertilizers	Alkaline phenol-based method. HCl digest of solid fertilizers. 630 nm. **Requires a standard heater and inert probe.**	3-Sep-03
14-107-06-1-C	60 – 600	1.33	mg N/L as NH_4	Fertilizers	Salicylate/DCIC based method. 660 nm. **Requires a standard heater.**	21-Aug-03
14-107-06-1-D	1.5 – 150	0.05	mg N/L as NH_4	Fertilizers	Salicylate/DCIC based method. 660 nm. **Requires a standard heater.**	14-Nov-01
14-107-06-2-B	400 – 800		mg N/L as NH_4	Fertilizers	Sodium salicylate-based method. 660 nm. **Requires a standard heater and Internal Sample Loop Valve.**	3-Sep-03
14-107-06-2-C	75 – 600	1.0	mg N/L as NH_4	Fertilizers	Sodium salicylate-based method. 660 nm. Intended for use with method number 14-206-00-4-A, urea in fertilizers, but may be used alone. **Requires a standard heater and 1 mm path length flow cell.**	3-Sep-09
18-107-06-1-A	1.75 – 140	0.08	mg N/L as NH_3	Aqueous formulations	Alkaline phenol-based method; 0.10M HCl and Rumen fluid. 630 nm. **Requires a standard heater.**	10-Aug-09
18-107-06-5-A	0.1 – 10	0.025	mg N/L as NH_3	Aqueous formulations	Gas diffusion method; Determination of ammonia in **nitric acid (diluted to 1.59M)** 590 nm.	10-Sep-09
18-107-06-5-B	0.25-20	0.07	mg/kg H_2SO_4	Sulfuric acid	Gas diffusion method; Determination of ammonia in **sulfuric acid, diluted to 4.8%** 590 nm.	16-May-13
23-107-06-3-A	10 – 1000		mg N/L as NH_3	Bioreactor solutions	Sodium salicylate/DCIC method; Determination in fermentation beers 660 nm. **Requires a standard heater and Internal Sample Loop Valve.**	3-Sep-03
24-107-06-5-A	2.0 – 50 0.05 – 1.0	0.02 0.003	mg N/L as NH_3	Air sample filter extracts	Gas diffusion method; determination in**0.02M citric acid** extracts; multi-range method. 590nm	15-Dec-09

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
26-107-06-4-A	10 – 50.0	0.151	mg N/L as NH_3	Tobacco extracts	Sodium salicylate/DCIC method; **0.005M H_2SO_4** matrix. 660 nm; dialysis method; **Requires a standard heater**.	3-Sep-03
30-107-06-1-A #	0.1 – 20.0 **0.007-1.43**		mg N/L as NH_3 **mM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method; Macro distillation method; 630 nm. **Requires a standard heater.** NPDES Accepted (350.1)	14-Nov-01
31-107-06-1-B ^	5 – 600 **0.36-42.86**	0.7	µg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method; Can be used for determination of samples w/ 0 to 35 ppt salinity; 630 nm. **Requires a standard heater.** NPDES Equivalent (350.1)	18-Sep-08
31-107-06-1-F ^	0.005 – 2.0 **0.36-142.86**	0.002	mg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method; 630 nm. Can be used for determination of samples w/ 0 to 35 ppt salinity; **Requires a standard heater.** NPDES Equivalent (350.1)	12-Nov-07
31-107-06-1-G ^	1.25 – 100 **0.089-7.143**	0.41	µg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method; DCIC. 630 nm **2-cm detector method; QC8500 only;** Can used for determination of samples w/ 0 to 35 ppt salinity; **Requires a non-standard heater**. NPDES Equivalent (350.1)	26-Jan-10
31-107-06-1-H ^	0.25 – 30.0 **0.018-2.143**	0.025	mg N/L as NH_3 **mM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method; 630 nm. high range method; Can used for determination of samples w/ 0 to 35 ppt salinity; Ultra-High Throughput method (>120 samples/hr) **Requires a standard heater.**	31-Oct-08
31-107-06-1-I	5-500 **0.3571-35.71**	0.47	µg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method, citrate/tartrate buffer. 630 nm, **Requires a standard heater.**	21-Feb-12
31-107-06-1-Q^	0.005-2.0 **0.36-142.86**	0.0022	mg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Alkaline phenol-based method, citrate buffer. 630 nm, **Requires a standard heater.** NPDES Equivalent to 349.0	17-Aug-10
31-107-06-4-A5	1.0– 30.0 **0.071-2.143**	0.1	µg N/L as NH_3 **µM N/L as NH_3**	Brackish / Seawaters	Fluorescence method; OPA. **QC8500 only Fluorescence detector must be purchased separately Also requires a standard heater, Direct Voltage Module, and cable**.	22-May-07
80-107-06-1-A ^	0.25 – 20 0.1 – 5.0 0.01-1.0	0.05 0.015 0.0027	mg N/L as NH_3	Waters	Alkaline phenol-based method; **Ultra Low Flow** method (must be run alone or with other ULF methods,); 630 nm. NPDES Equivalent (350.1); multi-rangemethod; **non-preserved samples**. **Requires a standard heater.**	31-Jul-09

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
80-107-06-1-B ^	0.1 – 5.0 0.25 – 20	0.005 0.005	mg N/L as NH_3	Waters	Alkaline phenol-based method; **Ultra Low Flow** Method (must be run alone or with other ULF methods,); 630 nm. NPDES Equivalent (350.1); multi-range method **Requires a standard heater. Preserved samples**;	11-Aug-09
80-107-06-1-C ^	0.025 – 1.0	0.005	mg N/L as NH_3	Waters	Alkaline phenol-based method; **Ultra Low Flow** method (must be run alone or with other ULF methods); **preserved samples**,630 nm. NPDES Equivalent (350.1) **Requires a standard heater.**	11-Aug-09
90-107-06-3-A	0.1-6.0	0.02-0.06	mg N/L as NH_3	Water/Soils	Multiple matrix Method**. Water, 2M KCl, 0.5M K_2SO_4, 0.01 $CaCl_2$**. Salicylate/DCIC**.** Ultra High Throughput method. 120 samples per hour.660 nm. **Requires a standard heater**	08-Feb-11
Amylose						
20-244-00-1-A	1 – 500	0.044	mg Amylose/L	Food stuffs	Iodine / acetic acid. 600 nm. Determination in 0.1 N NaOH/ETOH digests of rice; low-flow method.	20-Jul-07
Boron						
10-105-08-1-B	0.5 – 10.0	0.02	mg B/L	Waters	Azomethine-H method. 430 nm	22-Aug-03
13-105-08-1-E	1.0 – 4.0	0.10	mg B/L	Plant extracts	Azomethine-H method. 430 nm Determination in 1 M HCl matrix; low-flow method.	3-Sep-03
31-105-08-1-A	0.1 – 5.0 **9.25-462.53**	0.047	mg B/L **µM B/L**	Brackish / Seawaters	Azomethine-H method. 430 nm Determination in 0 to 35 ppt salinity samples. **Requires a non-standard heater.**	3-Apr-08
70-105-08-2-A	0.25 – 10.0	0.035	µg BL	High purity waters	Fluorescence method, chromotropic acid. **Detector must be purchased separately**. **Also requires a standard heater, direct voltage module, and cable**.	3-Sep-03
Bromide			***See also IC section***			
10-135-21-2-B	0.5 – 10	0.075	mg Br^-/L	Waters	Phenol red method. 590 nm.	3-Sep-03
18-135-21-2-B	0.5 – 10	0.05	mg Br^-/L	Aqueous formulations	Phenol Red method. 590 nm. Determination in 0 to 30% w/v NaCl solutions	3-Sep-03
30-135-21-1-A	0.5 – 10.0 **0.0063-0.1252**	0.005	mg Br^-/L **mM Br^-/L**	Brackish / Seawaters	Phenol Red method. 590 nm. Low-flow method; follows Standard Methods (4500-Br-D)	3-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
30-135-21-1-B	5.0 – 60.0 **0.0625-0.751**	0.22	mg Br^-/L **mM Br^-/L**	Brackish / Seawaters	Phenol Red method. 590 nm. Follows Standard Methods (4500-Br-D) 590 nm.	3-Sep-03
Calcium			***See also IC section and Hardness***			
10-120-02-1-B	0.5 – 50.0	0.07	mg Ca/L	Waters	o-cresolphthalein complexone 600 nm.	24-Jul-08
10-120-02-1-C	20 – 500 5 – 125	1.1 0.2	mg Ca/L	Waters	o-cresolphthalein complexone 600nm Multi-range method	6-Jul-09
12-120-02-1-B	0.25-50 10-1000	0.05 0.7	mg Ca/L	Soil extracts	1M ammonium acetate extracts. 600 nm. o-cresolphthalein complexone Multi-range method.	16-May-12
14-120-02-1-B	5 – 120	0.5	mg Ca/L	Fertilizers	Determination in HCl digests (0.48M in digestate) o-cresolphthalein complexone . 600 nm.	4-Sep-03
14-120-02-1-C	750 – 2000		mg Ca/L	Fertilizers	6% v/v HCl in digestate. o-cresolphthalein complexone 600 nm. **Requires an internal sample loop valve.**	4-Sep-03
Carbon (Total Dissolved)						
12-140-39-5-A	5-400	0.7	mg C/L	Soil Extracts	0.5M K_2SO_4. Phenol red method; 440 nm. Can measure TN from the same digest using method 12-107-04-3-C. **Requires an in-line digestion module** (Only one module is needed for one or both methods).	19-Dec-11
Carbon (Total)						
12-140-39-2-A	1-10	0.2	% C	Soil Digests	Dichromate digest of soil (**off-line**) Walkley-Black carbon. Requires a digestion block.	24-Apr-14
Carbonate (Total)						
NEW 10-216-00-1-B	1-50	0.02	mM CO_2/L	Waters	Cresol red gas diffusion method. 450 nm	15-May-16

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Chlorate			***See also IC section***			
25-224-35-1-D	0.1-2.0	0.005	mg $NaClO_3$/L	Chlor-Alkali	Ferrozine. Determination in 50-200g NaOH/L. 500 nm. **Requires a standard heater.**	4-Sep-03
25-224-35-1-E	0.5 – 10		mg $NaClO_3$/L	Chlor-Alkali	Determination in membrane cell liquors; 29 to 34% NaOH matrix; ferrozine method 500 nm. **Requires a standard heater**.	4-Sep-03
25-224-35-1-F	1.0 – 20		mg $NaClO_3$/kg	Chlor-Alkali	Determination in membrane cell liquors; 6 to 36% NaOH and 1 to 6% NaCl matrix; ferrozine method 500 nm**. Requires a standard heater.**	4-Sep-03
25-224-35-1-G	0.1 – 2.0	0.005	g $NaClO_3$/L	Chlor-Alkali	Determination in diaphragm cell liquors; 50 to 200 g NaOH/L matrix; ferrozine method. 500 nm. **Requires a standard heater.**	4-Sep-03
25-224-35-1-H	0.25 – 3.0	0.005	mg $NaClO_3$/L	Chlor-Alkali	135 to 275 g NaCl/L sample matrix (no NaOH in matrix); ferrozine method; 500 nm**.** selective against hypochlorite. **Requires a standard heater.**	4-Sep-03
25-224-35-1-I	10 – 50	0.597	g $NaClO_3$/L	Chlor-Alkali	100 to 300 g NaCl/L sample matrix (no NaOH in matrix) ferrozine method. 500 nm. **Requires a standard heater.**	11-Sep-08
25-224-35-1-J	5 – 60	0.4	mg $NaClO_3$/L	Chlor-Alkali	250 to 500 g NaOH/L (25-50%) sample matrix**. 500 nm. Requires a standard heater.**	17-Sep-08
25-224-35-1-K	0.25-3.0	0.012	g $NaClO_3$/L	Chlor-Alkali	135 to 275 g NaCl/L Matrix, No NaOH. 500 nm. **Requires a standard heater.**	10-Jun-10
Chloride			***See also IC section***			
10-117-07-1-A # *	6 – 300	0.15	mg Cl^-/L	Waters	Mercuric thiocyanate, 480 nm. Low-flow method; NPDES/NPDWR Accepted; also follows ISO (15682)	29-Nov-07
10-117-07-1-B #	2.5 – 100	0.5	mg Cl^-/L	Waters	Mercuric thiocyanate, 480 nm. Low-flow method; NPDES/NPDWR Accepted; also follows ISO (15682)	29-Nov-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-117-07-1-C ^	0.1 – 10.0	0.017	mg Cl^-/L	Waters	Mercuric thiocyanate, 480 nm. Low-flow method; NPDES Equivalent. follows Standard Methods (4500-Cl-G; USGS I2187-85);	28-Aug-03
10-117-07-1-E ^	5.0 – 2000	0.6	mg Cl^-/L	Waters	Mercuric thiocyanate, 480 nm. NPDES Equivalent. also follows ISO (15682)	19-Sep-08
10-117-07-1-H #	2.5 – 100	0.2	mg Cl^-/L	Waters	Mercuric thiocyanate, 480 follows Standard Methods (4500-Cl-G; USGS I2187-85); 480nm. also follows ISO (15682) Low-flow method; NPDES Accepted	5-Apr-01
10-117-07-1-I #	50 – 1000	1.0	mg Cl^-/L	Waters	Mercuric thiocyanate, 480 nm. Low-flow method; NPDES Accepted also follows ISO (15682)	15-Aug-01
10-117-07-1-K ^	1.0 – 150	0.277	mg Cl^-/L	Waters	Mercuric thiocyanate, 480 nm .Ultra High Throughput method (120 samples/hr); NPDES Equivalent; follows Standard Methods (4500-Cl-G); USGS I2187-85); also follows ISO (15682)	27-May-09
12-117-07-1-B	0.25-30	0.05	mg Cl^-/L	Soil Extracts	0.01M $Ca(NO_3)_2.4\ H_2O$. Mercuric thiocyanate, 480 nm.	26-Aug-11
12-117-07-1-C	5-800	1	mg Cl^-/L	Soil Extracts	2M HNO_3 Mercuric thiocyanate, 480 nm.	05-Jun-12
12-117-07-1-D	0.1-30	0.05	mg Cl^-/L	Soil Extracts	0.014M $Ca(SO_4)_2$ Mercuric thiocyanate, 480 nm.	11-Jun-12
25-117-07-1-B	5 – 100		mg Cl^-/L	Chlor-Alkali	Determination in membrane cell liquors; 29 to 34% NaOH matrix. Mercuric thiocyanate, 480 nm.	4-Sep-03
25-117-07-1-D	120-200	3.3	g Cl^-/L	Chlor-Alkali	No NaOH in matrix Mercuric thiocyanate, 480 nm. **Requires 1 mm flow cell and Internal Sample Loop Valve**.	25-May-10
25-117-07-1-E	5-100	1.0	mg Cl^-/L	Chlor-Alkali	Mercuric thiocyanate, 480 nm. 29-34% w/w NaOH Matrix	21-Jun-10
25-117-07-1-F	10-250	N/A	g Cl^-/L	Chlor-Alkali	Mercuric thiocyanate, 480 nm. 70-200g naOH Matrix. **Requires 1 mm flow cell**	08-Nov-10
26-117-07-1-A	6-300	1.5	mg Cl^-/L	Tobacco Extracts	5% Acetic acid extracts of tobacco. Mercuric thiocyanate, 480 nm	30-Nov-10
26-117-07-2-A	10-225	3.0	mg Cl^-/L	Tobacco Extracts	5% Acetic acid extracts of tobacco. Mercuric thiocyanate, 480 nm Pre-valve dialysis to exclude color interference.	08-Dec-10

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
80-117-07-1-A ^	0.25 – 20 2.5 – 100 6 – 300	0.13 0.2 1.0	mg Cl^-/L	Waters	**Ultra Low Flow** method (must be run alone or with other ULF methods, pump speed is 10); Mercuric thiocyanate, 480 nm NPDES Equivalent; follows Standard Methods (4500-Cl-E); USGS I2187-85.; multi-range method	8-Jul-09
Chromium			***See also IC section***			
10-124-13-1-A #	5 – 400	0.35	µg Cr/L as Cr(VI)	Waters	Hexavalent chromium; Diphenylcarbazide; 540 nm. Has Omnion 3.0 support added. NPDES Accepted.	9-Oct-00
10-124-13-1-B ^	2 – 200	0.27	µg Cr/L as Cr(VI)	Waters	Hexavalent chromium; Diphenylcarbazide; 540 nm NPDES Equivalent; follows Standard Methods (3500 Cr-B) Diphenylcarbazide;	4-Apr-04
10-141-13-2-A	0.1 – 1.0 1.0 - 10	0.028 0.068	mg Cr/L mg Cr/L	Waters	Total or hexavalent chromium Diphenylcarbazide; 540 nm. (trivalent chromium can be measured by subtraction).; ISO (23913) **Requires a non-standard heater.**	18-May-04
31-124-13-1-A	2– 200 **0.038-3.85**	0.66 **0.0127**	µg Cr/L as Cr(VI) **µM Cr/L as Cr(VI)**	Brackish / Seawaters	Hexavalent chromium in seawater/brackish waters. Diphenylcarbazide; 540 nm.	24-Aug-09
Color						
10-308-00-1-B	25 – 250	0.49	Pt-Co Color Units	Waters	450 nm	2-Dec-08
10-308-00-1-C	2.5- 100	0.6	Pt-Co Color Units	Waters	450 nm	4-Nov-10
Conductivity						
10-302-00-1-A5 #	5.94 – 575	0.5	µS/cm	Waters	QC8500 method; NPDES Accepted **Dedicated channel required**	29-Nov-07
10-302-00-1-AS2 #					QC8500 Series 2 method; NPDES Accepted; **Dedicated channel required**	
10-302-00-1-B5 #	146.9 – 6667	0.599	µS/cm	Waters	QC8500 method; NPDES Accepted **Dedicated channel required**	29-Nov-07
10-302-00-1-BS2 #					QC8500 Series 2 method; NPDES Accepted; **Dedicated channel required**	
						26-Sep-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-302-00-1-E 10-302-00-1-ES2	1 – 5.0	0.01	µS/cm	Waters	QC8500 method; **Dedicated channel required** QC8500 Series 2 method;	

Copper

10-129-17-1-A	0.02 – 3.0	0.003	mg Cu/L	Waters	Bathocuprine method; 480 nm.	26-Sep-08

Cyanide

10-204-00-1-A #	0.005 – 0.5	0.0005	mg CN^-/L	Waters	**Total Cyanide** Macro distillation method; 0.25 M NaOH matrix following distillation; Pyridine/barbituric acid, 570 nm. NPDES / NPDWR Accepted; follows Standard Methods (4500-CN). . **Requires a standard heater.**	29-Nov-07
10-204-00-1-B ^	0.50 – 50.0		mg CN^-/L	Waters	**Total Cyanide** 0.25 M NaOH matrix following distillation; Pyridine/barbituric acid, 570 nm. Ultra High Throughput method (120 samples per hour) NPDES Equivalent (335.4) **Requires a standard heater.**	19-Sep-08
10-204-00-1-D	0.20 – 10.0	0.003	mg CN^-/L	Waters	**Total Cyanide** Acetate buffer; 0.25 M NaOH matrix following distillation. Pyridine/ barbituric acid, 570 nm. **Requires a standard heater.**	18-Sep-03
10-204-00-1-F ^	50 – 500		mg CN^-/L	Waters	**Free Cyanide**; low-flow method; 0.25 M NaOH matrix following distillation; Pyridine/barbituric acid, 570 nm. NPDES Equivalent (335.4). **Standard heater and internal sample loop valve required.**	16-Sep-03
10-204-00-1-G	2.0 – 500	0.5	µg CN^-/L	Waters	Macro distillation method; 0.25 M NaOH matrix following distillation; pyridine-free reagents (isonicotinic/barbituric acid). 600 nm. **Standard heater required.**	16-Sep-03
10-204-00-1-H	0.002 – 0.01 0.1 – 5.0	0.00047 0.0138	mg CN^-/L	Waters	**Free Cyanide**; isonicotinic/barbituric acid. 600 nm. pyridine-free reagents; can be used w/ 10-204-00-2-G for inline total CN; multi-range method; **Requires a standard heater.**	7-Jun-06
NEW 10-204-00-1-J	25-1000	1.4	µg CN-/L		Total or WAD CN; Off-line Distillation. Pyridine/pyrazolone method. JIS K0102	31-Oct -14

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-204-00-1-WX	5 – 500	1.48	µg CN^-/L	Waters	**WAD Cyanide**; MicroDIST® method 0.25M NaOH matrix following distillation; Pyridine/barbituric acid, 570 nm. **Requires a standard heater.**	1-Apr-09
10-204-00-1-X #	0.005 – 0.50	0.001	mg CN^-/L	Waters	**Total Cyanide**; MicroDIST® method; 0.25 M NaOH matrix following distillation; Pyridine/barbituric acid, 570 nm. NPDES/NPDWR approved method **Requires a standard heater.**	29-Nov-07
10-204-00-1-X2 #^	0.002 – 0.5	0.00038	mg CN^-/L	Waters	**Total Cyanide**; MicroDIST® method; 0.25 M NaOH matrix following distillation; Pyridine/barbituric acid, 570 nm. Ultra-High Throughput method (>125 samples/hr); NPDES Equivalent / NPDWR Accepted **Requires a standard heater.**	16-Apr-08
10-204-00-2-C ^	2 – 100	0.21	µg CN^-/L	Waters	**Total Cyanide**; inline method; low-flow method; NPDES Equivalent; Pyridine/barbituric acid, 570 nm**.** Samples w/ particulates not suitable **Inline module and Standard heater required.**	14-Sep-07
10-204-00-2-D ^	5 – 500	0.51	µg CN^-/L	Waters	**Total Cyanide**; inline method; low-flow method; Pyridine/barbituric acid, 570 nm**.** NPDES Equivalent; Samples w/ particulates not suitable **Inline module and Standard heater required.**	19-Sep-07
10-204-00-2-E ^	2 – 100	0.5	µg CN^-/L	Waters	**Total Cyanide**; inline method; low-flow method; lower recovery of ferricyanide; Pyridine/barbituric acid, 570 nm**.** NPDES Equivalent; **.** Samples w/ particulates not suitable **Inline module, Standard heater required**	3-Dec-08
10-204-00-2-G	0.002 – 0.01 0.1 – 5.0	0.00016 0.015	mg CN^-/L	Waters	**Total Cyanide**; inline method; pyridine-free reagents; can be used w/ 10-204-00-2-H for free cyanide; 600 nm multi-range method; Samples w/ particulates not suitable. **In-line module and standard heater required.**	22-Jun-07
10-204-00-2-H	2 – 200		µg CN^-/L	Waters	**Free or Total CN**. Free CN is measured by reducing the heater temperature in the in-line module and turning off the UV lamp. 1,3 dimethylbarbituric/Isonicotinic acid. 600 nm. ISO14403-1. Samples w/ particulates not suitable **In-line module, standard heater required.**	28-Jun-10

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-204-00-2-I	2 – 100	0.34	µg CN^-/L	Waters	**Total Cyanide**; inline method; 1,3-dimethyl barbituric acid; Isonicotinic acid 600 nm. pyridine-free reagents; Samples w/particulates not suitable. **In-line module and standard heater required.**	13-Aug-09
10-204-00-3-A	10 – 500	1.0	µg CN^-/L	Waters	**WAD Cyanide**; inline method; Pyridine/barbituric acid; 570 nm. samples w/ particulates not suitable. **In-line module and standard heater required**.	28-May-04
10-204-00-4-B	2.0 – 100	0.16	µg CN^-/L	Waters	**WAD Cyanide**; inline method; pyridine-free reagents; Isonicotinic/barbituric acid 600 nm. samples w/ particulates not suitable; **MANIFOLD ONLY**	27-Jul-07
10-204-00-4B51					DEDICATED 115V CHANNEL FOR QC8500. Pyridine free, Isonicotinic/barbituric acid 600 nm. samples w/ particulates not suitable **Requires 2 channels, two heaters, one detector and one valve)**	
10-204-00-4B52					DEDICATED 220V CHANNEL FOR QC8500 Isonicotinic/barbituric acid 600 nm. samples w/ particulates not suitable **Requires 2 channels, two heaters, one detector and one valve)**	
10-204-00-4-C	2.0 – 100	0.17	µg CN^-/L	Waters	**WAD Cyanide**; Low Flow Method. In line distillation method; pyridine-free reagents; Isonicotinic/barbituric acid 600 nm. Samples w/ particulates not suitable; **Requires an inline module and a standard heater.**	11-Mar-13
12-204-00-2-A	2 – 200	0.16	µg CN^-/L	Soil extracts	Inline method; determination in **1 M NaOH soil extracts**; pyridine-free reagents; 600 nm. Extracts must be filtered prior to analysis. **Requires an in-line sample preparation module and standard heater**.	25-Aug-08
26-204-00-1-A	1.0 – 15	0.024	mg CN^-/L	Tobacco extracts	Determination in mainstream tobacco smoke. Pyridine-pyrazolone; 600 nm. **Requires a standard heater**.	4-May-10

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
80-204-00-1-A ^	0.005 – 0.5	0.001	mg CN^-/L	Waters	**Total Cyanide**; Pyridine/barbituric acid; 570 nm. **Ultra Low Flow** method (must be run alone or with other ULF methods; macro-distillation method; NPDES Equivalent (335.4). **Requires a standard heater.**	25-Jun-09
80-204-00-1-X ^	0.005 – 0.5	0.001	mg CN^-/L	Waters	**Total Cyanide**; Pyridine/barbituric acid; 570 nm. **Ultra Low Flow** method (must be run alone or with other ULF methods); MicroDIST® method; NPDES Equivalent (MicroDist® method). **Requires a standard heater.**	24-Jun-09
Cyanide, Amperometric Detection						
10-204-00-5-A# ^	2.0 – 400	0.65	µg CN^-/L	Waters	**Available Cyanide**; Amperometric detection w/ Ligand Exchange; NPDES Equivalent (335.4/ASTM 6888-09). Samples w/ particulates not suitable. **Sold in North America . Requires an amperometric detector, direct voltage module, cable, and standard heater**	02-May-08
10-204-00-5-B^	2.0 – 500	0.914	µg CN^-/L	Waters	**Total Cyanide**; inline method; Amperometric detection; Samples w/ particulates not suitable. **Sold in North America**; **Requires an in-line digestion module, amperometric detector, direct voltage module, cable, and standard heater**.	29-May-08
10-204-00-5-C^	2.0 – 400	0.08	µg CN^-/L	Waters	**Free Cyanide**; Amperometric detection; Samples w/ particulates not suitable. NPDES equivalent (ASTM D7237-10). **Sold in North America. Requires an amperometric detector, direct voltage module, cable, and standard heater.**	12-Feb-10
10-204-00-5-D ^	1.0 – 500	0.13	µg CN^-/L	Waters	**Total Cyanide**. Amperometric detection;. Samples w/ particulates not suitable. **NPDES equivalent to ASTM D7511-09. Sold in North America. Requires an amperometric detector, direct voltage module, cable, In-line module and standard heater**	04-Feb-13

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-204-00-5-WX	5.0 – 400	0.56	µg CN^-/L	Waters	**WAD Cyanide**; Amperometric detection; MicroDIST® method; **Sold in North America. Requires MicroDist block and tubes, an amperometric detector, direct voltage module, cable, and standard heater**.	5-May-09
10-204-00-5-X^	5.0 – 400	0.975	µg CN^-/L	Waters	**Total Cyanide**; Amperometric detection; MicroDIST® method; **Requires MicroDist block and tubes, an amperometric detector, direct voltage module, cable, and standard heater**. NPDES Equivalent (ASTM D7284-08) **Sold in North America**	30-May-08
Fluoride			***See also IC section***			
10-109-12-2-A5 #	0.10 – 5.0	0.05	mg F^-/L	Waters	Ion Selective Electrode methods; QC8500 specific. NPDES / NPDWR Accepted; follows Standard Methods (4500-F-B); **Requires a fluoride detector module**.	23-Dec-09
10-109-12-2-AS2 #					QC8500 Series 2 specific. **Requires a fluoride detector module**	23-Dec-09
10-109-12-2-C5 ^	0.10 – 2.0	0.02	mg F^-/L	Waters	Ion Selective Electrode methods; NPDES Equivalent; QC8500 specific **Requires a fluoride detector module**	23-Dec-09
10-109-12-2-CS2 ^					QC8500 Series 2 specific **Requires a fluoride detector module**	23-Dec-09
10-109-12-3-A	0.1-5.0	0.02	mg F^-/L	Waters	**SPADNS-2 Colorimetric Method**. SPADNS-2 must be purchased from Hach Company. 580nm. Bellack Distillation required for NPDES	1-Jul-13
10-109-12-4-B	0.1-1.0 1.0-10		mg F^-/L	Waters	**Alizarin method**. Samples must be distilled off-line prior to analysis.	2-June-14
14-109-12-2-A5	0.5 – 20	0.1	mg F^-/L	Fertilizers	Ion Selective Electrode methods; QC8500 specific **.** HCL digests of fertilizer **Requires a fluoride detector module**	4-Sep-03
14-109-12-2-AS2					QC8500 Series 2 specific HCL digests of fertilizer. **Requires a fluoride detector module**	4-Sep-03

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
	Formaldehyde						
	10-221-00-1-B	0.05-5.0	0.01	mg HCHO/L	Waters	MBTH method. 630 nm. **Requires a standard heater.**	13-Apr-11
	10-221-00-1-C	0.01-1.0	0.002	mg HCHO/L	Waters	MBTH method. 630 nm MBTH method. 630 nm. **Requires a standard heater.**	19-Feb-14
NEW	10-221-00-1-D	0.01-1.0 0.25-10.0	0.002 0.05	mg HCHO/L	Waters	Acetylacetone method. 410 nm. **Requires a standard heater.**	07-Apr-15
	Free Amino Nitrogen (FAN)						
	21-237-00-1-A	10 – 120		mg N/L	Beer	Free Amino Nitrogen; determination in beer. Ninhydrin method; 570 nm. **Requires a non-standard heater.**	5-Sep-03
	Glucose (Reducing Sugars)						
	26-201-00-1-B	10 – 500	NA	mg glucose/L	Tobacco extracts	Ferricyanide method; 420 nm. 5% Acetic acid. **Requires a standard heater.**	18-Nov-08
	Hardness						
	10-301-31-1-A * #	5 – 300	0.331	mg $CaCO_3$/L	Waters	Total hardness; calmagite method630 nm; NPDES Accepted (130.1);	2-Jul-09
	10-301-31-1-B * #	30 – 800	5.4	mg $CaCO_3$/L	Waters	Total hardness; calmagite method 630 nm; NPDES Accepted (130.1);	18-Dec-00
	10-301-31-1-C ^	125 – 1500	17.0	mg $CaCO_3$/L	Waters	Total hardness; calmagite method; 630 nm NPDES Equivalent (130.1);	5-Sep-03
	Hydrazine						
	10-217-00-1-B	0.005 – 1.0	0.002	mg N_2H_4/L	Waters	4-dimethylaminobenzaldehyde; 460 nm. **Requires a standard heater.**	3-Mar-10

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Hydrogen Peroxide						
18-209-00-1-B	20-40		$\%H_2O_2$	Peroxide solutions	Iodine method. 500 nm, **0.15% RSD mid-range**. **Requires a non-standard heater, Internal Sample Loop Valve, and 1 mm pathlength flow cell.**	19-June-13
Hydroxide						
25-225-25-1-A	70 – 200	10	g NaOH/L	Chlor-Alkali	Determination in diaphragm or mercury cell liquors; EDA/copper sulfate method. 630 nm. **Internal Sample Loop Valve required.**	5-Sep-03
25-225-25-1-B	29 – 34		% w/w NaOH	Chlor-Alkali	Determination in membrane cell liquors; EDA/copper sulfate method. 630 nm. **Internal Sample Loop Valve required.**	5-Sep-03
25-225-25-1-E	29 – 34		% w/w NaOH	Chlor-Alkali	Determination in membrane cell liquors; EDA/copper sulfate method. 500 nm. **1 mm path length flow cell, NO internal sample loop valve**	10-Jul-10
25-225-25-1-F	29 – 34		% w/w NaOH	Chlor-Alkali	Determination in membrane cell liquors; EDA/copper sulfate method. 500 nm. **Internal Sample Loop Valve required.**	07-Jul-10
25-225-25-1-G	70 – 200		g NaOH/L	Chlor-Alkali	Determination in diaphragm or mercury cell liquors; EDA/copper sulfate method. 630 nm. **1 mm path length flow cell, NO internal sample loop valve**	03-Nov-10
Hydroxyproline						
20-243-00-1-A	0.1 – 5.0 1 – 40	0.007	mg/L	Food stuffs	Determination in acid digests of meat; Para dimethylaminobenzaldehyde; 550 nm. 0.0138 M H2SO4 final matrix. **QC8500 and QC8500 Series 2 only**; multi-range method. **Requires non-standard heater.**	5-Feb-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Hypochlorite						
18-226-36-1-A	0.05 – 2.0	0.0033	g NaOCl/L	Aqueous formulations	Methyl orange; 550 nm. Gas diffusion method; determination in commercial products.	16-Jan-09
25-226-36-1-B	1.25 – 10	0.20	mg NaOCl/L	Chlor-Alkali	Methyl-orange method; 550 nm. dialysis method	19-Oct-05
25-226-36-1-G	3-75	0.6	mg NaOCl/L	Chlor-Alkali	Determination in diaphragm cell liquors; potassium iodide method 410 nm.	25-Apr-13
Iodate						
18-136-41-1-A	0.25 – 8.0	0.014	mg IO_3^-/L	Aqueous formulations	DPD method. 550 nm. Determination in NaCl / H_2SO_4 solutions	12-Sep-03
Iodide			***See also IC section***			
10-136-09-1-A	0.50 – 10.0	0.3	µg I^-/L	waters	0.2M KOH 420 nm;. **Requires a standard heater**	12-Sep-03
Iron						
10-126-18-1-A	0.1 – 5.0	0.01	mg Fe/L	Waters	Total soluble iron as Fe (II and III); TPTZ indicator; 590 nm. **Inert sample probe required.**	12-Sep-03
10-126-18-1-B	0.05 – 0.5	0.002	mg Fe/L	Waters	Total soluble iron as Fe (II and III); TPTZ indicator 590 nm. **Inert sample probe required.**	12-Sep-03
10-126-18-1-D	0.1 – 5.0 0.05 – 5.0	0.01	mg Fe/L	Waters	Total soluble iron as Fe (II and III); Ferrozine indicator; 560 nm. Determination in 0.5% HNO_3 matrix (preservation); dual-range method **Inert sample probe required.**	6-Jul-09
10-126-18-2-A	2-100 0.1-0.500	0.4 0.002	µg Fe/L mg Fe/L	Waters	Total Soluble and soluble ferrous iron, ferric iron by subtraction. 2 manifold method. Ferrozine 560nm**. Inert sample probe required.**	07-Feb-13
10-126-18-3-A	0.1-5.0	0.04	mg Fe/L	Waters	Alkaline UV digestion, total iron. Can measure free iron on a second channel with method 10-126-18-1-D **Inline module and Inert sample probe required.**	22-Oct-10

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
31-126-18-1-A	0.5-30 mg Fe/L	0.024	mg Fe/L	Brackish / Seawaters	Total soluble iron as Fe (II and III); TPTZ indicator. 600 nm. **Inert sample probe required.**	15-Sep-03
31-126-18-1-B	0.05 – 0.500 0.895-8.95	0.004	mg Fe/L µg Fe/L	Brackish / Seawaters	Total soluble iron as Fe (II and III); TPTZ indicator. 600 nm. **Inert sample probe required.**	15-Sep-03
31-126-19-1-A	0.50 – 30.0 0.00895-0.537	0.23	mg Fe/L mM Fe/L	Brackish / Seawaters	Total soluble iron as Fe (II); TPTZ indicator 600 nm. **Inert sample probe required.**	26-Nov-08
Kjeldahl Nitrogen (TKN)						
10-107-06-2-D #	0.5 – 20	0.07	mg N/L	Waters	Kjeldahl digests; Salicylate/nitroprusside; 660 nm. mercury catalyst; NPDES Accepted. **Requires a standard heater.**	1-May-01
10-107-06-2-E #	0.1 – 5.0	0.018	mg N/L	Waters	Kjeldahl digests; Salicylate/nitroprusside; 660 nm. mercury catalyst; NPDES Accepted. **Requires a standard heater**.	5-Dec-07
10-107-06-2-H ^	0.1 – 5.0	0.034	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 copper catalyst; NPDES Equivalent (351.2); follows Standard Methods (4500-N_{ORG} D). nm. **Requires a standard heater.**	13-May-08
10-107-06-2-I ^	0.5 – 20.0	0.10	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 copper catalyst; NPDES Equivalent (351.2). **Requires a standard heater.**	14-May-08
10-107-06-2-K ^	0.1 – 20.0	0.0093	mg N/L	Waters	Kjeldahl digests; mercury catalyst; Salicylate/ nitroprusside; 660 low-flow method; NPDES Equivalent (351.2) **Requires a standard heater.**	15-May-08
10-107-06-2-M ^	0.25 – 25	0.05	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 nm, copper catalyst; NPDES Equivalent (351.2) **Requires a standard heater.**	27-Mar-06
10-107-06-2-N ^	0.5 – 20 0.1 – 5.0	0.02 0.04	mg N/L	Waters	Kjeldahl digests Salicylate/ nitroprusside; 660 nm; mercury catalyst; Ultra High Throughput method (>125 samples/hr.); multi-range method; NPDES Equivalent (351.2) **Requires a standard heater.**	12-Sep-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-06-2-P ^	0.25 – 25	0.056	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 nm. copper catalyst; Ultra High Throughput method (>125 samples/hr.); NPDES Equivalent (351.2). **Requires a standard heater.**	14-Apr-08
10-107-06-2-Q^	0.5 – 20.0 0.1 – 5.0	0.1 0.04	mg N/L	Waters	Kjeldahl digests; Salicylate/ nitroprusside; 660 nm mercury catalyst; low-flow method; multi-range method NPDES Equivalent (351.2). **Requires a standard heater.**	8-Dec-09
10-107-06-2-S	0.2-20	0.01	mg N/L	Waters	**Simplified TKN (s-TKN™).** 520 nm, cadmium reduction . Two channel method TN and NO_2+ NO_3. S-TKN by subtraction. **Requires an in-line module**	14-Jul-10
10-107-06-5-F^	0.1 – 10.0	0.01	mg N/L	Waters	Kjeldahl digests; 590 nm. Gas diffusion method; copper or mercury digests. Can also be used w/ brackish/seawater samples; ISO (11732). ***Equivalent to PAI -DK03***	26-Aug-03
10-107-06-5-J	0.1-5.0 0.25-20	0.02 0.05	mg N/L	Waters	Kjeldahl Digests, Salicylate/DCIC **660 nm. copper catalyst**. Gas diffusion method. Sea/brackish water . Can also be used for Ammonia	26-Sept-12
10-107-06-6-C ^	0.5 – 20	0.21	mg N/L	Waters	Kjeldahl digests; **mercury catalyst**; inline distillation method; NPDES Equivalent (351.2); samples w/ particulates not suitable. Can be used with brackish/ seawater digests. Salicylate/ nitroprusside; 660 nm. **Requires an in-line module and a standard heater, or two heated channels (with one heater non-standard)**	13-Aug-08
10-107-06-6-D ^	0.5 – 20	0.25	mg N/L	Waters	Kjeldahl digests; **copper catalyst**; inline distillation method; NPDES Equivalent (351.2); samples w/ particulates not suitable. 660 nm. Can be used with brackish/seawater digests. **Requires an in-line module and a standard heater or two heated channels (with one heater non-standard).**	31-Jul-09

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
13-107-06-1-A	1.0 – 25.0	0.1	mg N/L	Plant digests	Kjeldahl digests; selenium oxide catalyst Phenate; 630 nm. **Requires a standard heater.**	15-Sep-03
13-107-06-2-D *	10 – 150	0.5	mg N/L	Plant digests	Kjeldahl digests; copper catalyst; low-flow method Salicylate/ nitroprusside; 660 nm. **Requires a standard heater.**	29-Oct-07
13-107-06-2-G *	1 – 50	0.12	mg N/L	Plant digests	Kjeldahl digests; selenium oxide catalyst; requires 10% sulfuric acid digest Salicylate/ nitroprusside; 660 nm. **Requires a standard heater.**	15-Sep-03
14-107-06-2-A	5.0 – 200	0.04	mg N/L	Fertilizers	Kjeldahl digests; selenium oxide catalyst Salicylate/ nitroprusside; 660 nm. **Requires a standard heater.**	15-Sep-03

Kjeldahl Phosphorus (TKP)

10-115-01-1-C #	0.1 – 5.0	0.015	mg P/L	Waters	Total P; Kjeldahl digests; mercury catalyst; molybdate based method; 880 nm. NPDES Accepted. **Requires a standard heater.**	15-May-01
10-115-01-1-D #	0.05 – 0.5	0.002	mg P/L	Waters	Total P; Kjeldahl digests; mercury catalyst; molybdate based method; 880 nm **Requires a standard heater.** NPDES Accepted	26-Dec-00
10-115-01-1-I ^	0.1 – 5.0	0.007	mg P/L	Waters	Total P; Kjeldahl digests; mercury catalyst; molybdate based method; ; 880 nm **Requires a standard heater.** NPDES Equivalent (365.4); Ultra High Throughput method (>100 samples/hr)	28-Aug-07
10-115-01-2-B ^	0.10 – 10	0.010	mg P/L	Waters	Total P; Kjeldahl digests; copper catalyst; molybdate based method; ; 880 nm **Requires a standard heater.** NPDES Equivalent (365.4)	27-Mar-06
10-115-01-2-C ^	0.1 – 5.0	0.025	mg P/L	Waters	Total P; Kjeldahl digests; copper catalyst; molybdate based method; Ultra High Throughput method (>120 samples/hr) ; 880 nm . NPDES Equivalent (365.4);. **Requires a standard heater.**	4-Apr-08
13-115-01-1-B *	1.0 – 50.0	0.08	mg P/L	Plant extracts	Total P; Kjeldahl digests; copper catalyst; molybdate based method; 880 nm **Requires**	26-Oct-06

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
					a standard heater.	
Magnesium				***See also IC section and Hardness***		
10-112-26-1-A	5.0 – 200	0.51	mg Mg/L	Waters	Xylidyl blue-I method. 520 nm. **Requires an internal sample loop valve.**	27-Aug-03
12-112-26-1-A	5.0 – 200	1.26	mg Mg/L	Soil extracts	**Morgans** extract method; Xylidyl blue-I method. 520 nm. **Requires an internal sample loop valve.**	15-Sep-03
Manganese						
10-131-35-1-A	0.005 – 0.30	0.0008	mg Mn/L	Waters	Manganese II**; 0.13% HNO_3** matrix Formaldoxime, 460 nm.	27-Aug-08
10-131-35-1-B	0.2 – 10	0.005	mg Mn/L	Waters	Manganese II Formaldoxime, **0.15% HNO_3** matrix 460 nm.	15-Sep-03
10-131-35-1-D	12.5 – 250	5.0	µg Mn/L	Waters	Manganese II; **0.5% HNO_3** matrix. Formaldoxime, 460 nm.	15-Sep-03
12-131-35-1-A	0.5 – 2.0	0.01	mg Mn/L	Soil extracts	Low-flow method; **0.1N HCl.** Formaldoxime, 460 nm.	15-Sep-03
Molybdenum						
12-123-23-1-B	0.1 – 0.40	0.007	mg Mo/L	Soil extracts	Low-flow method. **0.1N HCl.** Iodine method, 420 nm. **Requires a standard heater.**	15-Sep-03
13-123-23-1-A	0.0625 – 0.25	0.0079	mg Mo/L	Plant extracts	Low-flow method Ashed samples, **1 M HCl** final matrix. Iodine method, 420 nm. **Requires a standard heater.**	15-Sep-03
Monochloramine						
10-245-00-1-A	0.01 – 2.0	0.0028	mg N/L as NH_4Cl	Waters	Alkaline phenol-based method; 630 nm; **requires a standard heater**. low-flow method; **Use w/ 10-107-06-1-L for free ammonia**	5-Nov-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Nitrate + Nitrite		***See also IC section***				
10-107-04-1-A # *	0.2 – 20.0	0.01	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. low-flow method; NPDES / NPDWR Accepted	29-Nov-07
10-107-04-1-B #	0.002 – 0.10	0.0003	mg N/L	Waters	Cd reduction method; Sulfanilamide/NED. 520 nm. NPDES / NPDWR Accepted. Omnion 3.0/4.0 data added July 10 2015. Can be run as Ultra High Throughput (120/hr)	29-Nov-07
10-107-04-1-C #	0.01 – 2.0 0.05-5.0	0.002 0.004	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. Ultra High Throughput method/120 samples per hour. NPDES / NPDWR Accepted; follows Standard Methods (4500-NO3-I) **Preserved or unpreserved samples with no pH adjustment needed for samples.**	14-Jul-08; High range support added 12-Apr-13
10-107-04-1-F ^	1 – 50.0	0.12	mg N/L	Waters	Cd reduction method; Sulfanilamide/NED. 520 nm. NPDES Equivalent (353.2). **Requires an internal sample loop valve.**	1-May-08
10-107-04-1-H ^	5 – 80.0	0.027	mg N/L	Waters	Sulfanilamide/NED Cd reduction method; 520 nm. dialysis method;NPDES Equivalent (353.2).	1-May-08
10-107-04-1-J #	0.10 – 10.0	0.012	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; dialysis method; 520 nm. dialysis method;. NPDES / NPDWR Accepted	29-Nov-07
10-107-04-1-K #	7-70 0.5 – 5.0	1.0 0.07	µg N/L µM N	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. low-flow method; NPDES / NPDWR Accepted Omnion 3.0/4.0 data added July 10 2015.	29-Nov-07
10-107-04-1-L #	0.02 – 2.0	0.002	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. low-flow method; NPDES / NPDWR Accepted	29-Nov-07
10-107-04-1-M	0.25 – 14	0.042	µg N/L	Waters	Sulfanilamide/NED Cd reduction method; 540 nm. **2-cm detector method; QC8500 only. Requires a standard heater.** PN 58112 allows replicate injections from a single sample tube.	25-Feb-09
10-107-04-1-O #	0.05 – 10.0	0.007	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. NPDES / NPDWR Accepted	29-Nov-07
10-107-04-1-Q ^	0.005 – 0.8 0.5 – 10	0.0005 0.022	mg N/L	Waters	Cd reduction method; low-flow method; Sulfanilamide/NED imidazole buffer; 520 nm. determination in non-preserved and acid preserved samples; multi-range method;. NPDES Equivalent (353.2)	10-Aug-06

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-107-04-1-R #^*	0.002 – 0.25 0.025 – 20	0.0005 0.0012	mg N/L	Waters	Sulfanilamide/NED. Cd reduction method; 520 nm. Ultra High Throughput method (>120 samples/hr.); multi-range method; NPDES Equivalent; NPDWR Accepted	16-Apr-08
10-107-04-2-A # *	2 – 100	0.1	mg N/L	Waters	Sulfanilamide/NED.Hydrazine reduction. 520 nm. NPDES/NPDWR Accepted; follows Standard Methods (4500-NO3-I). **Requires a standard heater.**	29-Nov-07
10-107-04-2-B #	0.05 – 1.0	0.002	mg N/L	Waters	Sulfanilamide/NED. Hydrazine reduction; 520 nm. NPDES/NPDWR Accepted; follows Standard Methods (4500-NO3-I) **Requires a standard heater.** Omnion 4.0 data added 8 10 2015	29-Nov-07
10-107-04-2-C	0.005 – 0.2	0.0018	mg N/L	Waters	Sulfanilamide/NED. Hydrazine reduction. 520 nm. **Requires a standard heater.** Omnion 4.0 data added 8 14 2015	25-Aug-03
10-107-04-2-D #	0.05 – 7	0.006	mg N/L	Waters	Sulfanilamide/NED. Hydrazine reduction; 520 nm. NPDES/NPDWR Accepted; follows Standard Methods (4500-NO3-I) **Requires a standard heater.** Omnion 4.0 data added 8 14 2015	14-Jan-02
10-107-04-5-A	0.02 – 5.0 0.2 – 20	0.009 0.023	mg N/L	Waters	Sulfanilamide/NED **Nitrate Reductase method**; 540 nm. Reagents must be purchased from NECi; multi-range method.	9-Feb-09
10-107-04-6-A	0.05 – 5.0 0.2 – 20	0.005 0.022	mg N/L	Waters	Sulfanilamide/NED UV Nitrate Reduction; PATENTED 540 nm. **In-line module with UV lamp required.** Multi-range method	4-Sep-09
12-107-04-1-A	0.2 – 40.0		mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm determination in **1mM $CaCl_2$** soil extracts	15-Sep-03
12-107-04-1-B	0.025 – 20.0	0.005	mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm determination in **2M KCl** soil extracts;	21-Aug-03
12-107-04-1-E	0.05 – 5.0		mg N/L	Soil extracts	Hydrazine reduction. Sulfanilamide/NED 520 nm **1M KCl** soil extracts.	15-Sep-03
12-107-04-1-F	0.01 – 2.0	0.0013	mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm determination in **2M KCl** soil extracts	30-Jan-15
12-107-04-1-G	1.0 – 20.0	0.01	mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm determination in **0.0125M $CaCl_2$** soil extracts	15-Sep-03
12-107-04-1-H	0.05 – 10.0	0.011	mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm; determination in **0.5M K_2SO_4** soil extracts	15-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
12-107-04-1-I	0.3 – 10	0.013	mg N/L	Soil extracts	Sulfanilamide/NED Cd reduction method; 520 nm imidazole buffer method determination in **2M KCl** soil extracts;	06-Dec-06
12-107-04-1-J	0.025-20	0.003	Mg N/L	Soil Extracts	Sulfanilamide.NED Cd Reduction Method. 520 nm. Ultra High Throughout method; 120 samples per hour. **2M KCl** extracts of soils.	15-Aug-07
12-107-04-5-A	0.2 – 20	0.028	mg N/L	Soil extracts	Sulfanilamide/NED **Nitrate Reductase** method; 540 nm. reagents must be purchased from NECi **2M KCl**	28-Jan-09
12-107-04-6-A	0.2 – 20	0.015	mg N/L	Soil extracts	UV Nitrate Reduction; PATENTED Sulfanilamide/NED 520 nm.**2M KCl. Requires an in-line module with UV lamp.**	24-Jun-09
13-107-04-1-A	0.2 – 20.0		mg N/L	Plant extracts	Sulfanilamide/NED Cd reduction method; 520 nm . Determination in **2% acetic acid** extracts of plants.	15-Sep-03
13-107-04-1-B	0.02 – 2.0	0.003	mg N/L	Plant extracts	Sulfanilamide/NED Cd reduction method; 520 nm. Determination in **water extracts of plants**	15-Sep-03
14-107-04-1-A	1790 – 7140		mg N/kg	Fertilizers	Sulfanilamide/NED Cd reduction method; dialysis method 520 nm. Diluted liquid fertilizer.	15-Sep-03
14-107-04-1-B	30 – 300	0.38	mg N/L	Fertilizers	Sulfanilamide/NED Cd reduction method; 520 nm. Dialysis method	15-Sep-03
20-107-04-1-B	0.025 – 0.5 0.25 – 5.0	 0.018	mg NO_2^-/L mg NO_3^-/L	Food stuffs	Sulfanilamide/NED Cd reduction method; 540 nm. Dialysis method; determination in **dairy products**; ISO (14673-3)	16-Sep-03
20-107-04-1-C	0.025 – 1.0	0.002	mg NO_2^-/L	Food stuffs	Sulfanilamide/NED Cd reduction method; 540 nm. Dialysis method; determination	25-Mar-08
20-107-04-1-D	0.5-30 mg NO_3/L 0.2-10.0 mg NO_2/L	0.1 0.04	mg NO_3^{2-}/L mg NO_2^-/L	Food stuffs	Sulfanilamide/NED Cd reduction method; 540 nm Dialysis method; determination in dairy products; 2 channel method	24-Oct-13
26-107-04-1-A	10 – 50.0	0.103	mg N/L	Tobacco extracts	Sulfanilamide/NED Sulfanilamide/NED Cd reduction method; 520 nm. Determination in **0.005 M sulfuric acid**	16-Sep-03
26-107-04-1-B	0.05-20 mg NO_2/L 0.5-100 mg NO_3/L	0.005 0.05	mg NO_2^-/L mg NO_3^{2-}/L	Tobacco Extracts	Sulfanilamide/NED Sulfanilamide/NED Cd reduction method; 540 nm. Determination water extracts of tobacco. Color subtracted manually (no dialysis)	4-Apr-14
26-107-04-2-A	10 – 100	0.25	mg N/L	Tobacco extracts	Sulfanilamide/NED Cd reduction method; 520 nm determination in **0.05 M sulfuric acid**. **Requires a standard heater.**	16-Sep-03
30-107-04-1-A ^	0.05 – 1.00 **3.57-71.43**	0.0029	mg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 520 nm. NPDES Equivalent. (353.2); follows Standard Methods	20-Nov-08

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
					(4500-NO3-I).	
30-107-04-1-C ^	0.05 – 2.0 **3.57-142.86** 0.1 – 10 **0.0071-0.713**	0.0029 0.0049	mg N/L **µM N/L** mg N/L **mM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 520 nm multi-range method; NPDES Equivalent (353.2).	20-Nov-08
31-107-04-1-A ^	17.5 – 70 **1.25-5.0**	0.126	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 520 nm. NPDES Equivalent (353.2)	2-May-08
31-107-04-1-C ^	0.07 – 0.70 **5.0-50.0**	0.00168	mg N/L **µM N/L**	Brackish/ Seawaters	Sulfanilamide/NED Cd reduction method; 520 nm.NPDES Equivalent (353.2)	2-May-08
31-107-04-1-D ^	0.5 – 14 **0.036-1.0**	0.2	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm NPDES Equivalent (353.2). .**Requires a standard heater**.	2-May-08
31-107-04-1-E ^	5 – 400 **0.36-28.57**	0.51	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm NPDES Equivalent (353.2).	19-Aug-03
31-107-04-1-F ^	0.25 – 14 **0.018-1.0**	0.042	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED. Cd reduction method; 540 nm. 2-cm detector method; **QC8500 only**; NPDES Equivalent (353.2). **Requires a standard heater.**	8-Jul-08
31-107-04-1-G ^	0.25 – 10 **0.018-0.714** 0.01– 1.0 **0.714-71.43**	0.05 0.002	mg N/L **mM N/L** mg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm Ultra High Throughput method . (>120 samples/hr); multi-range; NPDES Equivalent (353.2)	24-Apr-08
31-107-04-1-H ^	0.25 – 30 **0.18-2.143**	0.025	mg N/L **mM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm can also use w/ non-saline matrix; NPDES Equivalent (353.2)	28-Oct-08
31-107-04-1-I	5 – 500 **0.357-35.71**	0.025	mg N/L **mM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 540 nm. Ultra high level, inline dialysis method	12-Jul-09
31-107-04-1-J^	1-100 **0.071-7.143**	0.2	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cd reduction method; 520 nm. NPDES Equivalent (353.2)	30-Jun-10
31-107-04-1-K	1-100 **0.071-7.143**	0.2	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED, Cd reduction method. **Imidazole buffer**. 540 nm. NPDES Equivalent (353.2)	20-May-11
31-107-04-5-A	0.01 – 5.0 **1.43-357.14**	0.009	mg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED **Nitrate Reductase method**; 540 nm. Enzymatic reagents must be purchased from NECi.	11-Feb-09

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
31-107-04-6-A	0.05 – 5.0 **0.0036-0.357** 0.2-20.0 **0.0143-1.43**	0.006	mg N/L **mM N/L** mg N/L **mM N/L**	Brackish / Seawaters	**UV Nitrate Reduction**; Sulfanilamide/NED 540 nm. Multi-range method PATENTED. **Requires an in-line module with UV lamp.**	19-Jun-09
80-107-04-1-A #^	0.001 – 0.10 0.01 – 1.0 0.10 – 10.0	0.0002 0.001 0.002	mg N/L	Waters	Sulfamilamide/NED Cd reduction method; 520 nm. **Ultra Low Flow** method (must be run alone or with other ULF methods, pump speed is 10); NPDES Equivalent (353.2); multi-range method.	10-Jun-09
90-107-04-2-A	0.1-6.0		mg N/L	Water/Soils	Sulfanilamide/NED Hydrazine Reduction. 520 nm. Multiple Matrix Method. **Water, 2M KCl, 0.5M K_2SO_4, 0.01M $CaCl_2$.**	27-Jan-11

Nitrite

See also IC section

10-107-05-1-A # ^	0.01 – 10.0	0.005	mg N/L as NO_2^-	Waters	Nitrite only; Sulfanilamide/NED 520 nm. NPDES Equivalent / NPDWR Accepted (353.2)	29-Nov-07
10-107-05-1-B ^	0.014 – 0.07	0.0004	mg N/L as NO_2^-	Waters	Nitrite only; Sulfanilamide/NED 520 nm. low-flow method; NPDES Equivalent (353.2)	12-May-08
10-107-05-1-C ^	0.02 – 2.0	0.0016	mg N/L as NO_2^-	Waters	Nitrite only; Sulfaniliamide/NED 520 nm. low-flow method; NPDES Equivalent (353.2)	21-Aug-03
10-107-05-1-E	0.05 – 5.0 0.2 – 20	0.03 0.0008	mg N/L as NO_2^-	Waters	Nitrite only**;** Sulfanilamide/NED 540 nm. **companion method for UV reduction method**	9-Sep-09
10-107-05-1-F	4 – 400	0.46	µg N/L as NO_2^-	Waters	Nitrite only. Sulfanilamide/NED 520 nm.	22-Feb-10
10-107-05-1-M	0.25-14	0.01	µg N/L as NO_2^-		Nitrite only. Sulfanilamide/NED 540 nm. **Requires a standard heater. 2 cm flow cell QC8500 Only.** PN 58112 allows replicate injections	5-Aug-10
10-107-05-1-O ^	10 – 1000	4.0	µg N/L as NO_2^-	Waters	Nitrite only; low-flow method; NPDES Equivalent (353.2)	13-May-08
31-107-05-1-A ^	17.5 – 70 **1.25-5.0**	**0.01**	µg N/L as NO_2^- **µM N/L as NO_2^-**	Brackish / Seawaters	Nitrite only; Sulfanilamide/NED 540 nm. NPDES Equivalent (353.2)	13-May-08
31-107-05-1-B ^	0.1 – 15 **0.007-1.07**	0.01	mg N/L as NO_2^- **mM N/L as NO_2^-**	Brackish / Seawaters	Nitrite only; Sulfanilamide/NED 540 nm. NPDES Equivalent (353.2)	29-Oct-08

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
31-107-05-1-F^	0.25-14 **0.0018-1.0**	0.01	µg N/L as NO_2^- **µM N/L as NO_2^-**	Brackish / Seawaters	Nitrite only. Sulfanilamide/NED 540 nm. **Requires a standard heater. 2 cm flow cell QC8500 Only.** PN 58112 allows replicate injections	5-Aug-10
80-107-05-1-A# ^	0.01 – 1.0 0.1 – 10.0	0.002 0.02	mg N/L as NO_2^-	Waters	Nitrite only; Sulfanilamide/NED 520 nm. **Ultra Low Flow** method (must be run alone or with other ULF methods); NPDES Equivalent (353.2); multi-range method	5-Jun-09

Nitrogen - Total Nitrogen

10-107-04-3-A *	200 – 2000	5.6	µg N/L	Waters	Sulfanilamide/NED Cadmium Reduction;540 nm. Total N; inline method; alkaline persulfate digestion; samples w/ particulates not suitable. **In-line sample prep module required. Nitrate/Nitrite support added**.	16-Nov-09
10-107-04-3-B *	0.5 – 30.0	0.1	mg N/L	Waters	Sulfanilamide/NED imidazole buffer; Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion method; samples w/ particulates not suitable. **In-line sample prep module required. Nitrate/Nitrite support added**.	16-Nov-09
10-107-04-3-C	0.5 – 10.0	0.011	mg N/L	Waters	Sulfanilamide/NED Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion method; samples w/ particulates not suitable **In-line sample prep module required.**	29-Jun-07
10-107-04-3-D	0.05 – 5.0 0.2 – 20.0	0.003 0.008	mg N/L	Waters	Sulfanilamide/NED Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion; samples w/ particulates not suitable. **In-line sample prep module required. Nitrate/Nitrite support added**.	2-Dec-12
10-107-04-3-E	0.05 – 10	0.005	mg N/L	Waters	Sulfanilamide/NED; Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion; samples w/ particulates not suitable **In-line sample prep module required.**	12-Nov-10
10-107-04-3-P	0.2 – 10.0	0.05	mg N/L	Waters	Sulfanilamide/NED; Cadmium Reduction; 540 nm. Total N; inline method; alkaline persulfate digestion; follows Standard	29-Jun-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
					Methods (4500-N-B); samples w/ particulates not suitable.	
10-107-04-4-A	0.5 – 10	0.02	mg N/L	Waters	Sulfanilamide/NED Cadmium reduction. 520nm. Total N; **manual** alkaline persulfate digestion; low-flow method.	11-Jan-10
10-107-04-4-B	0.02 – 5.0 1.00 – 40.0	0.006 0.024	mg N/L	Waters	Sulfanilamide/NED Cadmium Reduction;520 nm. Based upon Standard Method 4500-N_{org} (proposed)Total N; dual **manual** persulfate digest; **total phosphorus can be measured from same digest (10-115-01-4-B);** multi-range method**. Nitrate/Nitrite support added**.	22-Jun-07
10-107-04-4-C	0.05-5.0	0.00055	mg N/L	Waters	Sulfanilamide/NED. cadmium reduction. Imidazole buffer 540nm. **Single-step**, off-line (autoclave) digestion method. **TP can be measured from the same digestate.**	18-Jun-13
12-107-04-3-B	0.2 – 30.0	0.04	mg N/L	Soil extracts	Sulfanilamide/NED Cadmium reduction ,. 540 nm. Total N; alkaline persulfate digestion; **0.5M K_2SO_4** extracts of soils; **inline module required**; samples w/ particulates not suitable.	13-Nov-09
12-107-04-3-C	0.375-30	0.05	mg N/L	Soil extracts	Sulfanilamide/NED Cadmium reduction ,. 540 nm. Total N; **0.5M K_2SO_4** extracts of soils; **inline module required**;; persulfate digestion; samples w/ particulates not suitable. Dissolved Organic Carbon may be measured in the same digest using 12-140-39-5-A	
31-107-04-3-A	25 – 1000 **1.79-71.43**	4.90	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cadmium reduction ,. 540 nm. Total N; alkaline persulfate inline digestion method; samples w/ particulates not suitable.	3-Feb-10
31-107-04-3-B	500 – 5000 **35.71-357.14**	78	µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cadmium reduction ,. 540 nm. Total N; alkaline persulfate inline digestion method samples w/ particulates not suitable.	2-Jul-07
31-107-04-4-B	0.02– 5.00 **1.43-357.14**	0.0068	mg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cadmium reduction , 520 nm. Total N; **manual persulfate** digestion	16-Jun-08

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
	1.0– 40.0 **0.071-2.86**	0.111	mg N/L **mM N/L**		w/ Cd reduction; low-flow method; **total phosphorus can be measured from same digest (31-115-01-4-B);** multi-range method.	
31-107-04-4-C	0.02– 5.00 **1.43-357.14** 1.0– 40.0 **0.071-2.86** **NO_2 + NO_3-N:** **2.5-500** **NO_2- N:** **1-125**	0.0068 0.111 0.44 0.2	mg N/L **µM N/L** mg N/L **mM N/L** µg N/L **µM N/L** µg N/L **µM N/L**	Brackish / Seawaters	Sulfanilamide/NED Cadmium reduction , 520 nm. Total N; **manual dual persulfate digestion** Imidazole buffer; low-flow method; total phosphorus can be measured from same digest (31-115-01-4-B**);** Support for NO_2 + NO_3 and NO_2 included.	21-Feb-12

Orthophosphate

See also IC section

10-115-01-1-A #	0.01 – 2.0	0.002	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. NPDES/NPDWR Accepted; follows Standard Methods (4500-P-G). **Requires a standard heater.**	29-Nov-07
10-115-01-1-B #	0.01 – 0.20	0.0007	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. NPDES/NPDWR Accepted. **Requires a standard heater.**	29-Nov-07
10-115-01-1-M #	1 – 100	0.1	µg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. NPDES/NPDWR Accepted. **Requires a standard heater.** Omnion 4 data added June 22 2015	29-Nov-07
10-115-01-1-O * ^	1.0 – 20	0.045	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; NPDES Equivalent (365.1); Ultra High Throughput method (>120 samples/hr). 880 nm. **Requires a standard heater.**	16-Dec-07
10-115-01-1-P #	0.05 – 2.00	0.005	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. low-flow method; NPDES/NPDWR Accepted. **Requires a standard heater.**	29-Nov-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-115-01-1-Q #	0.010 – 0.20	0.0003	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. low-flow method; NPDES/NPDWR Accepted. 880 nm. **Requires a standard heater.**	29-Nov-07
10-115-01-1-T #	0.025 – 2.5	0.005	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. NPDES/NPDWR Accepted. **Requires a standard heater.** Omnion 4.0 data added 23 June 2015	29-Nov-07
10-115-01-1-V # *	0.01 – 2.0 0.2 – 20.0	0.0012 0.0046	mg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. multi-range method; NPDES Equivalent / NPDWR Accepted; Ultra High Throughput method (>125 samples/hr) PN 58112 allows replicate injections from single sample tubes. **Requires a standard heater**	16-Apr-08
10-115-01-1-W * ^	0.25 – 20	0.046	µg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm . 2-cm detector method; QC8500 only; **for samples with very low or no silicate**; NPDES Equivalent (365.1). PN 58112 allows replicate injections from single sample tubes. **Requires a non-standard heater.**	22-Feb-08
10-115-01-1-Y * ^	0.5 – 100	0.164	µg P/L as PO_4^{2-}	Waters	Orthophosphate; molybdate based method; 880 nm. 2-cm detector method; QC8500 only; **for samples with high silicate**; NPDES Equiv-alent (365.1) **Requires a non-standard heater.**	21-Jul-08
12-115-01-1-A	0.25 – 10.0		mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **Mehlich III** soil extracts. **Requires a standard heater.**	17-Sep-03
12-115-01-1-B	0.01 – 1.0	0.006	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **0.5 M bicarbonate** (Olsens) soil extracts. **Requires a standard heater**	17-Sep-03
12-115-01-1-E	0.25 – 10.0	0.02	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **0.5 M acetic acid, 0.5 M ammonium acetate** soil extracts. **Requires a standard heater**	17-Sep-03
12-115-01-1-K	1.0 – 30.0		mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **Morgans** soil extracts. **Requires a standard heater**	17-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
12-115-01-1-L	0.05 – 6.0	0.01	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; .880 nm. determination in **Morgans** soil extracts. **Requires a standard heater**	17-Sep-03
12-115-01-1-M	0.25 – 10	0.04	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; determination in **Mehlich III** soil extracts. 880 nm. **Requires a standard heater**	21-Jun-06
12-115-01-1-N	0.4 – 20	0.07	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **Bray 1, Bray 2, Mehlich I**, **Mehlich III** soil extracts Ultra High Throughput method (>120 samples/hr) **Requires a standard heater**	04-Sep-07
12-115-01-1-O	0.1-5.0	0.002	mg P/L as PO_4^{2-}	Soil extracts	Orthophosphate; molybdate based method; 880 nm. determination in **0.1N HCl** soil extracts. **Requires a standard heater**	15-Dec-10
12-115-01-1-Q	0.1-10 0.01-1.0	0.004 0.02	mg P/L as PO_4^{2-}	Soil Extracts	Orthophosphate; molybdate based method; 880 nm. determination in **0.5 M bicarbon-ate** (Olsen's) soil extracts. Improved throughput - no gas diffusion block needed. **Requires a standard heater.**	02Feb-15
18-115-01-1-B	0.25 – 10	0.01	mg P/L as PO_4^{2-}	Aqueous formulations	Orthophosphate; molybdate based method; determination in **up to 10% NaCl** solutions. 880 nm. **Requires a standard heater and 1 mm path length flow cell.**	17-Sep-03
20-115-01-2-B	100 – 1500	0.71	mg P/L as PO_4^{2-}	Food stuffs	Orthophosphate; Vanadate based method. 470 nm. Ashed samples; final matrix 1.2M HCl.	16-Apr-08
23-115-01-1-B			mg P/L as PO_4^{2}	Bioreactor solutions	Orthophosphate; molybdate based method; 880 nm Requires an **internal sample loop valve and 1 mm flow cell**.	
31-115-01-1-G ^	62 – 310 **2.0-10.0**		µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880 nm. NPDES Equivalent (365.5). **Requires a standard heater**	13-May-08
31-115-01-1-H ^	5 – 400 **0.16-12.9**	1.0	µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880 nm. NPDES Equivalent (365.5). **Requires a standard heater**	13-May-08
31-115-01-1-I ^	1-100 **0.032-3.23**	0.25	µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880 nm. NPDES Equivalent (365.5) **Requires a standard heater**	13-May-08

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
31-115-01-1-J ^	0.01 – 2.0 **0.323-64.52** 0.5-20 0.016-0.645	0.002 0.01	mg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}** mg P/L as PO_4^{2-} **mM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880 nm. NPDES Equivalent (365.5) **Requires a standard heater**	30-Nov-07
31-115-01-1-W ^	0.25 – 20 **0.008-0.645**	0.007	µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880nm 2-cm detector method; **QC8500 only**; **for samples with very low or no silicate**; NPDES Equivalent (365.5). **Requires a non-standard Heater** PN 58112 allows replicates from a single sample tube.	22-Feb-08
31-115-01-1-Y * ^	0.5 – 100 **0.016-3.23**	0.164	µg P/L as PO_4^{2-} **µM P/L as PO_4^{2-}**	Brackish / Seawaters	Orthophosphate; molybdate based method; 880nm 2-cm detector method**; QC8500 only**; for samples with high silicate; NPDES Eq. (365.5) **Requires a non-standard heater** PN 58112 allows replicates from a single sample tube.	29-Feb-08
80-115-01-1-A# ^	0.05 – 2.0	0.005	mg P/L as PO_4^{2-}	Waters	Orthophosphate; Molybdate method. 880 nm Ultra Low Flow method must be run alone or with other ultra low flow methods. NPDWR accepted. **Requires a standard heater**.	5-Jun-09

pH

10-304-24-2-E	3.0 – 12.0		pH units	Waters	Not for low-conductivity samples**. Requires a pH detector module.**	18-Sep-03

Phenol

10-210-00-1-A #	5 – 200	0.6	µg phenol/L	Waters	Total recoverable phenol; 4-amino antipyrene method; 500 nm.macro distillation method; NPDES Accepted.	14-Dec-01
10-210-00-1-B #	0.05 – 2.0	0.0013	mg phenol/L	Waters	4-amino antipyrene method; 500 nm. macro distillation method; NPDES Accepted.	18-Oct-07
10-210-00-1-E^	0.5-100	0.25	µg phenol/L	Waters	Total recoverable phenol; 4-aminoantipyrene method; 500 nm. Macro or Midi (glass) distillation method; 2 cm flow cell **QC8500 only**.	10-Oct-10

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-210-00-1-X ^	0.005 – 0.2	0.000856	mg phenol/L	Waters	Total recoverable phenolics; MicroDIST® method; 4-aminoantipyrene method; 500 nm. multi-range method; NPDES Equivalent (420.1) .	3-Sep-09
	0.05 – 2.0	0.0013				
10-210-00-1-Y ^	0.5 – 50	0.4	mg phenol/L	Waters	MicroDIST® method; . 4-aminoantipyrene method; 500 nm. NPDES Equivalent (420.1)	13-May-08
10-210-00-3-A	2 – 200	0.28	µg phenol/L	Waters	Volatile phenol; 4-amino antipyrene method; 500 nm. inline method; samples w/ particulates not suitable; This PN **manifold only**	20-Dec-06
10-210-00-3A51					QC8500 115V dedicated channel	
10-210-00-3A52					QC8500 220V dedicated channel	
10-210-00-3AU1					QC8500 115V dedicated channel; upgrade module	
10-210-00-3AU2					QC8500 220V dedicated channel; upgrade module	
10-210-00-3-B	5 – 500	0.80	µg phenol/L	Waters	Volatile phenol; 4-amino antipyrene method; 500 nm. inline method; multi-range method; samples w/	27-Mar-08
	10 – 1000	2.15			particulates not suitable;. This PN **manifold only**	
10-210-00-3B51					QC8500 115V **dedicated channel**	
10-210-00-3B52					QC8500 220V **dedicated channel**	
10-210-00-3-C *^	2 – 200	0.61	µg phenol/L	Waters	Volatile phenol; 4-aminoantipyrene method; 500 nm. inline method; NPDES Equivalent (420.4); samples w/ particulates not suitable. This PN **manifold only**	15-Oct-08
10-210-00-3C51 *^					QC8500 115V dedicated channel	
10-210-00-3C52 *^					QC8500 220V dedicated channel	
10-210-00-3-D	1-100	0.2	mg phenol/L	Waters	Volatile phenol ; 4-aminoantipyrene method; 500 nm. inline method;; samples w/ particulates not suitable; This PN **manifold only**	08-Mar-13
10-210-00-3-D51					QC8500 115V dedicated channel	
10-210-00-3D52					QC8500 220V dedicated channel	

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Phosphorus (Other)						
13-115-01-2-A	1.0 – 80	0.095	mg P/L	Plants	**Total P** in ashed plant material (**1M HCl matrix**); Vanadate based method 420 nm.	6-Feb-95
13-115-01-2-B	20 – 100	0.2	mg P/L	Plants	**Total P** in ashed plant material (**1M HCl** final **matrix**); Vanadate based method 420 nm	17-Sep-03
14-115-01-2-A	10 – 180	0.2	mg P/L	Fertilizers	**Total P in solid fertilizers**; Vanadate based method; **HCl digest.** 420 nm.	17-Sep-03
14-115-01-2-B	400 – 1600	0.2	mg P_2O_5/L	Fertilizers	**Total P in solid fertilizers**; Vanadate based method; 420 nm. **HCl/HNO_3** digest; AOAC method for Total P in fertilizers and phosphate rock. **Requires an internal sample loop valve.**	17-Sep-03
14-115-01-2-C	16.25 – 260	0.47	mg P_2O_5/L	Fertilizers	**Total P in fertilizers**; Vanadate based method; 420 nm. **HCl/HNO_3** digests; Assoc. of Florida Phosphate Chemists method.	17-Jul-08
14-115-01-2-E	72 – 180	0.02	mg P/L	Fertilizers	**Total P in fertilizers**; Vanadate based method. 420 nm.	17-Sep-03
14-115-01-2-F	1200 – 2400		mg P_2O_5/L	Fertilizers	**Total P in fertilizers;** Vanadate based method; 420 nm. digest in **6% HCl. Requires an internal sample loop valve.**	17-Sep-03
14-115-01-2-H	20 – 600		mg P_2O_5/L	Fertilizers	**Available phosphate** Vanadate based method; 420 nm. based on AOAC Method #993.31 and Magruder Method 41.60; determination in **ammonium citrate** extracts. **Requires a standard heater.**	29-Jan-10
15-115-01-3-A	5.0 – 400	1.2	mg P_2O_5/L	Feeds	**Available phosphate**; Vanadate based method; 420 nm. determination in **ammonium citrate** extracts. **Requires a standard heater.**	17-Sep-03
15-115-01-3-B	20 – 800	1	mg P_2O_5/L	Feeds	**Available phosphate**; Vanadate based method; 420 nm. determination in **ammonium citrate** extracts. 420 nm. **Requires a standard heater.**	28-Mar-05
15-115-01-3-C	20.0-2,500	5	mg P_2O_5/L	Fertilizers /Feeds	**Available phosphate**; Vanadate based method; 420 nm. determination in **ammonium citrate or EDTA-citrate** extracts. Based on AOAC Method #993.31 and Magruder Method 41.60. (pump speed 20). **Requires a non-standard heater.**	18-May-11
21-115-01-1-A	15 – 70	0.05	mg H_3PO_4/dL	Beverages	Orthophosphate; molybdate based method; 880nm. Cola Beverages. **Requires a standard**	17-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
					heater and Internal Sample loop Valve.	
30-115-01-4-A	0.01 – 0.50 **0.32-1.61**		mg P/L **µM P/L**	Brackish / Seawaters	**Total P**; molybdate based method; 880 nm. **alkaline** persulfate manual digests. **Requires a standard heater.**	17-Sep-03
Phosphorus, Total (Acidic Persulfate)						
10-115-01-1-E #	0.2 – 10.0 0.025-5.0	0.1 0.013	mg P/L	Waters	Total P; **manual acidic persulfate digests**; molybdate based method; 880 nm; **requires a standard heater**. NPDES Accepted. 0.025-5.0 mg P/L range added 22 March 2016 (MDL 0.013)	8-Nov-01
10-115-01-1-F #	0.003 – 0.2	0.0009	mg P/L	Waters	Total P; **manual acidic persulfate digests**; molybdate based method; 880 nm; **requires a standard heater**. NPDES Accepted	5-Dec-07
10-115-01-3-A ^	0.1 – 10.0	0.007	mg P/L	Waters	Total P; acidic persulfate digests; molybdate method, 880 nm. NPDES Equivalent (365.3); follows Standard Methods (4500-P-I); samples w/ particulates not suitable. **Requires an in-line sample prep module**. Can also use for orthophosphorus over the same range.	18-Nov-09
10-115-01-3-B * ^	0.1 – 4.0	0.01	mg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm; NPDES Equivalent (365.3); samples w/ particulates not suitable **Requires an in-line sample prep module.** Can also use for orthophosphorus over the same range.	18-Nov-09
10-115-01-3-C * ^	0.05 – 1.0	0.0011	mg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm. NPDES Equivalent (365.3); samples w/ particulates not suitable **Requires an in-line sample prep module.** Can also use for orthophosphorus over the same range.	18-Nov-09
10-115-01-3-E ^	10 – 500	1.4	µg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm. NPDES Equivalent (365.3); samples w/ particulates not suitable **Requires an in-line sample prep module and standard heater.** Can also use for orthophosphorus over the same range.	5-Jul-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-115-01-3-F ^	2 – 100	0.42	µg P/L	Waters	Total P; acidic persulfate digests; molybdate method; 880 nm method; NPDES Equivalent (365.3); samples w/ particulates not suitable **Requires an in-line sample prep module and non-standard heater.**	13-Nov-06
10-115-01-4-B	0.005 – 1.0 0.25 - 10	0.0006 0.024	mg P/L	Waters	Total P; **manual persulfate** digests; Molybdate method; 880 nm. Dual digest- **total nitrogen can be measured from same digest (10-107-04-4-B)**; Requires a block digester and glassware for the digestion; glass calibration vials. **Requires a standard heater.** Multi range method.	22-Jun-07
10-115-01-4-C	0.01-1.0	0.002	mg P/L	Waters	Single step, off-line (autoclave) digestion method. Molybdate method. 880nm. **TN can be measured from the same digestate.(10-107-04-4-C) Requires a standard heater.**	26-Jun-13
10-115-01-4-I ^	0.2 – 20.0	0.026	mg P/L	Waters	Total P; **manual persulfate** digests; Molybdate method; 880 nm. Ultra High Throughput method (120 samples /hour) NPDES Equivalent (365.3) **Requires a standard heater.**	11-Nov-08
10-115-01-4-J *	0.2 – 10	0.0033	mg P/L	Waters	Total P; **manual persulfate** digests; Molybdate chemistry; 880 nm. Ultra High Throughput method (>125 samples/hr) **Requires a standard heater.**	27-Aug-07
10-115-01-4-S ^	0.2 – 10	0.002	mg P/L	Waters	Total P; manual potassium persulfate manual digests; Molybdate chemistry; 880 nm. low-flow method; NPDES Equivalent (365.3). **Requires a standard heater.**	27-Aug-03
10-115-01-4-U ^	0.01 – 0.2	0.0008	mg P/L	Waters	Total P; **manual persulfate** digests; low-flow method; Molybdate chemistry; 880 nm. NPDES Equivalent (365.3). glass calibration vials. **Requires a standard heater.**	28-Aug-03
31-115-01-3-D	0.050 – 1.0 **1.63-32.36**	0.002	mg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate method; 880 nm. inline persulfate digestion; samples w/ particulates not suitable. glass calibration vials. **Requires an in-line sample prep module.**	5-Jul-07

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
31-115-01-3-F	2-100 **0.065-3.23**	0.59	µg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate based method; 880nm, inline persulfate digestion; samples w/ particulates not suitable **Requires glass standard and sample vials an in-line sample prep module, and non-standard heater.**	13-Oct-08
31-115-01-4-A ^	12.5 – 400 **0.40-12.9**	1.66	µg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate based method; 880 nm. **manual persulfate** digestion; **Requires a standard heater and autoclave** for the digestion. NPDES Equivalent (365.3)	17-Sep-03
31-115-01-4-B	0.005 – 1.0 **0.16-32.23**	0.0038	mg P/L **µM P/L**	Brackish / Seawaters	Total P; molybdate based method;880nm, **manual persulfate** digestion; low-flow method; dual-	12-Dec-09
	0.25 – 10 **0.008-0.323**	0.0358	mg P/L **mM P/L**		Digest . **Total N Can be measured simultaneously using 31-107-04-4-B;** multi-range method Can also analyze particulate phosphorus and	
OP:	5 – 1000 **0.16-32.23**	0.7	µg P/L		orthophosphorus with this method. **Requires a standard heater and block digester for the digestion.**	
	0.25 – 10 **0.008-0.323**	0.013	mg P/L			
pP:	0.1-5.0	0.015	mg P/L			

Potassium

See also IC section

10-119-03-1-A	2.0 – 100	0.33	mg K/L	Waters	Flame emission method. **Flame A.A. and direct voltage module required.**	2-Aug-01
12-119-03-1-A	0.20 – 10.0	0.01	mg K/L	Soil extracts	Flame emission method. Ammonium acetate extracts of soils **Flame A.A. and direct voltage module required.**	17-Sep-03
12-119-03-1-B	1.0 – 50.0	0.2	mg K_2O/L	Soil extracts	Flame emission method. Calcium Lactate extracts of soils. **Flame A.A. and direct voltage module required.**	17-Sep-03
12-119-03-1-D	5 – 200	0.126	mg K/L	Soil extracts	Flame emission method; determination in Morgan's soil extracts. **Flame A.A. and direct voltage module required.**	17-Sep-03

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
13-119-03-1-B	100 – 400	0.14	mg K/L	Plant extracts	Flame emission method. Digested ash. **Flame A.A. and direct voltage module required.**	17-Sep-03
14-119-03-1-A	80 – 320		g K_2O/g	Fertilizers	Flame emission method. Diluted liquid fertilizer. **Flame A.A. and direct voltage module required.**	17-Sep-03
14-119-03-1-B	5 – 250	0.4	mg K/L	Fertilizers	Flame emission method. HCl digests of solid fertilizer. **Inert probe, Flame A.A. and direct voltage module required.**	17-Sep-03
14-119-03-1-C	100 – 250		mg K/L	Fertilizers	Flame emission method. Diluted fertilizers **Flame A.A. and direct voltage module required.**	17-Sep-03
Reducing Substances						
26-246-00-1-A	200 – 2500	20	mg glucose/L	Tobacco Extracts	As glucose. Ferricyanide method, 420 nm. 5% Acetic acid extract. Based upon ISO method 15153:2003(E). May not give identical results to ISO 15154 (Which uses water extracts). 420 nm. **Requires a standard heater.**	18-May-10
Reducing Sugars						
26-201-01-2-A	20 – 2500	6.5	mg glucose/L	Tobacco Extracts	Ferricyanide method, 420 nm. This method is sensitive to reducing substances other than sugars that are present in tobacco. Pre-valve dialysis to exclude color. **Requires a standard heater**.	18-May-10
Silicate						
10-114-27-1-A #	0.2 – 20	0.04	mg SiO_2/L	Waters	Molybdate reactive method; 820 nm. ANSA reduction NPDES Accepted . Omnion ¾ support added 22 March 2016.	13-Sep-00
10-114-27-1-B ^	10 – 100	0.58	µg SiO_2/L	Waters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Plastic sample and standard vials and standard heater required.** Ultra High Throughput method (>120 samples/hr); NPDES Equivalent; follows Standard Methods (4500-SiO2-C)	30-Oct-07

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
	10-114-27-1-C	2.5 – 100	0.61	µg SiO_2/L	Waters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Plastic sample and standard vials and standard heater required. 2cm detector method; QC8500 only**; NPDES Equivalent; follows Standard Methods (4500-SiO2-C)	17-Feb-09
NEW	10-114-27-1-D^	2.5 - 250	0.49	µg SiO_2/L	Waters	Molybdate reactive method; 820 nm. ANSA reductant. **Plastic sample and standard vials and standard heater required. 2cm detector method; QC8500 only**; NPDES Equivalent; follows Standard Methods (4500-SiO2-D)	31-Mar-16
	31-114-27-1-A ^	1,202-6,009 **20 – 100**	**0.2**	µg SiO_2/L **µM SiO_2/L**	Brackish / Seawaters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Requires a standard heater.** NPDES Equivalent (USGS I-2700-85)	17-Sep-03
	31-114-27-1-B ^	75.0-300.45 **1.25 – 5.0**	**0.01**	µg SiO_2/L **µM SiO_2/L**	Brackish/ Seawaters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Requires a standard heater and plastic sample vials.** NPDES Equivalent (USGS I-2700-85)	17-Sep-03
	31-114-27-1-D ^	10 – 1700 **0.166-28.29**	1.43	µg SiO_2/L **µM SiO_2/L**	Brackish/ Seawaters	Molybdate reactive method; Stannous chloride reductant. 820 nm. **Requires a standard heater.** NPDES Equivalent (USGS I-2700-85)	17-Sep-03
	31-114-27-1-E ^	2.5 – 100 **0.042-1.66**	0.606	µg SiO_2/L **µM SiO_2/L**	Brackish / Seawaters	Molybdate reactive method; 820 nm, **2cm detector method; QC8500 only; Requires a standard heater and plastic sample and standard vials.** NPDES Equivalent (USGS I-2700-85)	28-Feb-08
	31-114-27-1-F ^	0.5 – 30 **0.0083-0.499**	0.05 **0.00083**	mg SiO_2/L **mM SiO_2/L**	Brackish / Seawaters	Molybdate reactive method; Stannous chloride reductant 820 nm, NPDES Equivalent. (USGS I-2700-85) . **Requires a standard heater**.	23-Oct-08
	31-114-27-2-A	60.09-6009 **1-100**	0.6 **0.1**	µg SiO_2/L **µM SiO_2/L**	Brackish / Seawaters	Molybdate reactive method; **Ascorbic acid** reductant 820 nm. NPDES Equivalent (366.0) **Requires a standard heater and plastic sample and standard vials**.	23-Nov-10

Sodium

See also IC section

10-111-32-1-A ^	5.0 – 300	1.2	mg Na/L	Waters	Flame emission method; NPDES Equivalent; follows Standard Methods (3500 Na-B) **Flame A.A. and direct voltage module required.**	27-Aug-03

Sorbic Acid

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
	26-228-38-1-A	2.0 – 10.0	0.18	mg sorbic acid/L	Tobacco extracts	2-thiobarbituric acid 530 nm. Dialysis method. 0.1N H_2SO_4 extractant. **Requires a standard heater.**	17-Sep-03
	Sulfate			***See also IC section***			
	10-116-10-1-A	3.0 – 300	0.95	mg SO_4^{2-}/L	Waters	Turbidimetric method; 420 nm.	28-Aug-03
	10-116-10-1-C	0.5 – 10.0	0.2	mg SO_4^{2-}/L	Waters	Turbidimetric method; 420 nm	28-Aug-03
	10-116-10-1-E	10 – 100	0.6	mg SO_4^{2-}/L	Waters	Turbidimetric method; 420 nm	29-Aug-03
	10-116-10-1-G	50 – 2000		mg SO_4^{2-}/L	Waters	Turbidimetric method; low-flow method; 420 nm.	17-May-08
	10-116-10-2-A ^	5.0 – 100	1.8	mg SO_4^{2-}/L	Waters	Methylthymol blue method; 460 nm. NPDES Equivalent (375.2); follows Standard Methods (4500-SO4-G)	28-Aug-03
	10-116-10-2-B#^	50 – 300	7.2	mg SO_4^{2-}/L	Waters	Methylthymol blue method; 460 nm. NPDES Equivalent / NPDWR Accepted Omnion 4 Support added June 2015	28-Aug-03
NEW	10-116-10-2-E ^	2 – 40 5- 100 50-300	0.36 1.22 10.0	mg SO_4^{2-}/L	Waters	Methylthymol blue method; 460 nm. NPDES Equivalent (375.2). **Multi range method**. Omnion 3 or higher support. June 2015	22-Jun-15
NEW	10-116-10-2-F^	20-300	4.0	mg SO_4^{2-}/L	Waters	Methylthymol blue method; 460 nm. NPDES Equivalent (375.2). Omnion 3 or higher support.	11-Mar-16
	10-116-10-3-A^	10 – 300	3.0	mg SO_4^{2-}/L	Waters	Turbidimetric method; 420 nm. based on ASTM method. NPDES Equivalent. 90 injections per hour.	18-Mar-10
	12-116-10-1-D	1 – 20	0.67	mg SO_4^{2-}/L	Soil extracts	Turbidimetric method; 420 nm. determination in 8M monobasic calcium phosphate soil extracts.	16-Sep-03
	14-116-10-1-A	10 – 360		mg SO_4^{2-}/L	Fertilizers	Turbidimetric method; 420 nm. HCl digest	16-Sep-03
	25-116-10-3-B	1-25 12.5-150	0.44 2.5	g Na_2SO_4/L	Brine	Turbidimetric method. 420 nm. Multi Range method. Very high range samples (g/L). **Requires a 1 mm flowcell**	08-May-12
	25-116-10-3-C	1-25	0.6	g Na_2SO_4/L	50% Caustic	Turbidimetric method. 420 nm. Samples are diluted 1:2 (to 25% NaOH) prior to the analysis.	08-May-12
	29-116-10-3-A	12.5-500	4.0	mg SO_4^{2-}/L	Produced/ Fracturing water	Turbidimetric method. 420 nm.	03-Mar-11

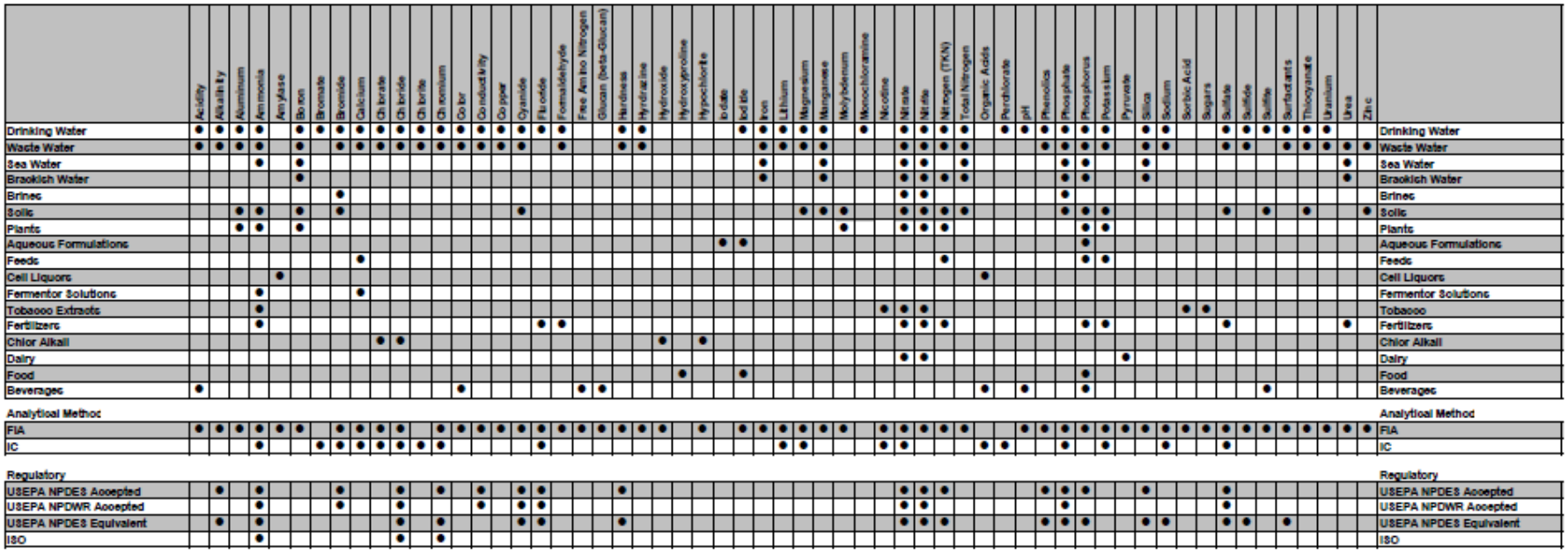
Sulfide

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
10-116-29-1-A ^	0.02 – 2.0	0.005	mg S/L	Waters	Methylene blue method; . 660 nm. MicroDIST® method; 0.25 M NaOH final matrix **Requires a MicroDist block and tubes and standard heater.** Distillation required; NPDES Equivalent; follows Standard Methods (4500-S-I)	24-May-08
10-116-29-1-C ^	25 – 100	0.58	mg S/L	Waters	Methylene blue method; . 660 nm. 0.25 M NaOH distillation required; **Requires MicroDist block and tubes and standard heater.** Distillation required; NPDES Equivalent; follows Standard Methods (4500-S-I) NPDES Equivalent; follows Standard Methods (4500-S-I)	24-May-08
10-116-29-1-D^	0.01-1.0	0.001	mg S/L	Waters	Methylene blue method. 660 nm. Samples preserved with NaOH (0.025M) and zinc acetate. **No distillation. Requires a standard heater**.	1-Dec-10
10-116-29-1-X	0.02 – 2.00 1 – 100	0.005 0.023	mg S/L	Waters	Methylene blue method; 660 nm. MicroDIST® method; multi-range method **Requires a MicroDist block and tubes and standard heater if** Distillation required (Must have final matrix of 0.25M NaOH)	23-Mar-10
10-116-29-3-A 10-116-29-3A51 10-116-29-3A52	0.01 – 2.0	0.006	mg S/L	Waters	In line distillation method; 660 nm. **Requires two dedicated channels with one standard and one non-standard heater**; samples w/ particulates not suitable manifold only Dedicated channels; QC8500 115V Dedicated channels; QC8500 220V	4-Oct-07
10-116-29-3-B 10-116-29-3B51 10-116-29-3B52	1.0 – 10.0	0.2	mg S/L	Waters	In line distillation method; 660 nm. requires two dedicated channels; **Requires two dedicated channels with one standard and one non-standard heater** samples w/ particulates not suitable; manifold only Dedicated channels; QC8500 115V Dedicated channels; QC8500 220V	5-Jul-07

	Method No	Range	MDL	Units	Matrix	Comments	Rev Date
	Sulfite						
	10-116-11-1-A	0.25 – 2.0	0.03	mg SO_3^{2-}/L	Waters	Pararosanaline method; 560 nm. Ultra High Throughput method. **Requires a standard heater.**	4-Apr-08
	21-116-11-2-D	0.5 – 30	0.25	mg SO_3^{2-}/L	Beverages	Pararosanaline method 560 nm. Determination in beers and wines. **Requires a standard heater.**	30-Jan-15
NEW	21-116-11-2-E	0.5-20	0.05	mg SO_3^{2-}/L	Beverages	Pararosanaline method 560 nm. Determination in coconut water. **Requires a standard heater.**	30-Jan-15
	Sulfur Dioxide						
	24-116-42-1-A	0.08 – 2.4	0.008	mg SO_2/L	Air sample filter extracts	Pararosanaline method 560 nm. Determination of air extracts in 0.04M potassium tetra chloro mercurate (TCM) solutions. **Requires a standard heater.**	18-Sep-03
	Surfactants (MBAS)						
	10-306-00-1-C	0.025 – 2.0 0.010 – 1.0	0.004 0.0056	mg/L as LAS mg/L as SDS	Waters	Methylene blue method; 650 nm. dual extraction method. SDS or LAS. Glass calibration and standard vials must be used.	19-Dec-08
	10-306-00-1-D ^	0.010 – 1.0	0.0024	mg SDS/L	Waters	Methylene blue method; 650 nm.single extraction method; NPDES Equivalent; follows Standard Methods (5540-C). SDS. Glass calibration and standard vials must be used.	25-Mar-08
	10-306-00-1-E	0.1 – 20.0	0.05	mg SDS/L	Waters	Methylene blue method; 650 nm. dual extraction method (SDS only) Glass calibration and standards vials must be used.	29-Sep-05
	10-306-00-1-F	0.06-2.4	0.009	mg LAS/L	Waters	Methylene blue method; 650 nm. dual extraction method (LAS only) Glass calibration and standards vials must be used. SM5540C/ASTM2330-02	9-Apr-14

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Thiocyanate						
10-229-00-1-A	0.1 – 2.0	0.02	mg SCN^-/L	Waters	Ferric thiocyanate method. 460 nm.	16-Sep-03
12-229-00-1-A	0.05 – 2.0	0.008	mg SCN^-/L	Soil extracts	Ferric thiocyanate method. 460 nm Determination in **1 M NaOH soil extracts. Extracts must be filtered prior to analysis.**	1-Sep-08
Urea						
10-206-00-1-A	0.1 – 20	0.007	mg N/L as Urea	Waters	Diacetyl monoxime/thiosemicarbazide. 530 nm. **Cannot be run simultaneously w/ other methods** as uses 0.84 M NaCl wash solution. **Requires non-standard heater and 60 position sample racks**.	17-Apr-08
10-206-00-1-B	15 – 500	3.3	µg N/L as Urea	Waters	Diacetyl monoxime/thiosemicarbazide. 530 nm. **Cannot be run simultaneously w/ other methods** as uses 0.84 M NaCl wash solution. **Requires non-standard heater and 60 position sample racks**.	15-Apr-08
12-206-00-1-A	0.1-20	0.027	mg N/L as Urea	Soil Extracts	Diacetyl monoxime/thiosemicarbazide. 530 nm. 2M KCl /5 mg PMA extracts of soil. . **Requires non-standard heater**	15-Mar-13
14-206-00-2-A	75 – 600	1.0	mg N/L as Urea	Fertilizers	Sodium salicylate-based method. 660 nm. Urease enzymatic method; **must be run w/ ammonia method 14-107-06-2-C Requires a standard heater and 1 mm pathlength flow cell**.	16-Sep-03
14-206-00-3-B	4500 – 18000	NA	mg N/L as Urea	Fertilizers	DMAB method. 440 nm.	16-Sep-03
14-206-00-3-C	60 – 600	0.97	mg N/L as Urea	Fertilizers	DMAB method. 440 nm	16-Sep-03
31-206-00-1-A	10 – 400 **0.714-28.57**	2.9	µg N/L as Urea **µM N/L as Urea**	Brackish / Seawaters	Diacetyl monoxime/thiosemicarbazide method. 530 nm. **Requires non-standard heater and 60 position sample racks**.	16-Sep-03
31-206-00-1-B	0.025 – 5.00 **1.79-357.14**	0.004	mg N/L as Urea **µM N/L as Urea**	Brackish / Seawaters	Multi-range method. Diacetyl monoxime/thiosemicarbazide. 530 nm. **Requires non-standard heater and 60 position sample racks**.	7-Dec-07
	0.2 – 20 **0.0143-1.429**	0.026	mg N/L **mM N/L as Urea**			

Method No	Range	MDL	Units	Matrix	Comments	Rev Date
Zinc						
10-130-18-2-A	0.1 – 5.0	0.007	mg Zn/L	Waters	Zincon method. 620 nm.	16-Sep-03
12-130-18-2-A	1.25 – 5.0	0.004	mg Zn/L	Soil extracts	Zincon method; 620 nm. 3low-flow method. **0.1M HCl**.	17-Sep-03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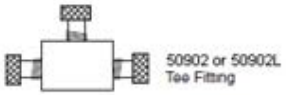
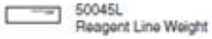
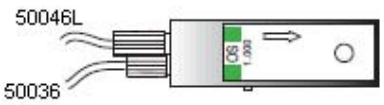
Alkalinity
Aluminium
Ammonia
Amylase
Boron
Bromate
Bromide
Calcium
Chlorate
Chloride
Chlorite
Chromium
Color
Conductivity
Copper
Cyanide
Fluoride
Formaldehyde
Free Amino Nitrogen
Glucan (beta-Glucan)
Hardness
Hydrazine
Hydroxide
Hydroxyproline
Hypochlorite
Iodate
Iodide
Iron
Lithium
Magnesium
Manganese
Molybdenum
Monochloramine
Nicotine
Nitrate
Nitrite
Nitrogen (TKN)
Total Nitrogen
Organic Acids
Perchlorate
pH
Phenolics
Phosphate
Phosphorus
Potassium
Pyruvate
Silica
Sodium
Sorbic Acid
Sugars
Sulfate
Sulfide
Sulfite
Surfactants
Thiocyanate
Uranium
Urea
Zinc
Drinking Water
Waste Water
Sea Water
Brackish Water
Brines
Solids
Plants
Aqueous Formulations
Feeds
Cell Liquors
Fermentor Solutions
Tobacco Extracts
Fertilizers
Chlor Alkali
Dairy
Food
Beverages
Analytical Method
FIA
IC
Regulatory
USEPA NPDES Accepted
USEPA NPDWR Accepted
USEPA NPDES Equivalent
ISO

Selected Parts. Please note this is NOT a complete listing








50237A Cadmium Column


50254 Cadmium Column Maintainence kit

50065 Flow cell flare, 13 cm
50067 Flow cell flare, 35 cm
31933 Flow cell, 10mm

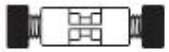
Nipples
50015 Large
50015A Small
50014L Reducing
50019 Stainless Steel

Interference Filters
89### ### indicates the wavelength

24927 Switching Valve
50962 Flare Kit for Nitrate
50963 Flare Kit for Sulfate
24012 Connector, Amber
24015 Washer

Union Fitting


50913

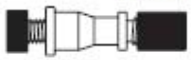

50901

Small Pump Tube Adapter


50906


85287 for QC8500

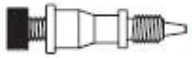
Large Pump Tube Adapter


85293 for QC8500


50907

PumpTube Adapter

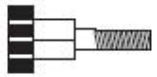

50905


85269 for QC8500

50009
Tube Connector, Amber

31077 for QC8000 Valve
Valve Connector, White

85245
One-piece fitting
for QC8500 valve



28051L
Rheodyne Nut & Ferrule

28058 Rheodyne Ferrule

28057
Upchurch Nut & Ferrule

50913 Teflon
Union Fitting
(ultem nuts)


50007 or 85258 for QC8500
Large Collar, Black

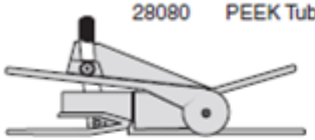

50006 or 85257 for QC8500
Small Collar, White


50060
O-ring Probe


50100L
Degassing Tube


50031
Scalpel

28081
Blades for PEEK Tubing Cutter



28080 PEEK Tubing Cutter

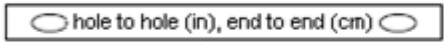
50021
Transmission Tubing, PVC, 0.030" ID

50029
Transmission Tubing, PVC, 0.060" ID

Teflon Tubing

50927 Manifold, 0.022" ID, Green
50928 Manifold, 0.032" ID
41300L Tefzel Tubing, 0.040" ID x 0.060" OD
30928 Zeus Tubing, 0.032" ID

50091 Microloop Tubing, Teflon, 16 cm
50092 Microloop Tubing, Teflon, 12.5 cm



Coils

Size	Coil Support Only	Wrapped, Teflon 0.022" ID	Wrapped, Teflon 0.032" ID
1" or 4.5 cm	50016L	50981	50916
2" or 7cm	50018L	50982	50918
2.5" or 8 cm	50017	50983	50917
4" or 12cm	50020	50984	50920
8" or 22 cm	50022L	N/A	50922

Alternating Coils 12 cm

Coil Support Only	Wrapped, Teflon 0.022" ID	Wrapped, Teflon 0.032" ID
50039	50985	50921

Pump Tubing

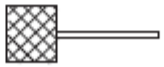
534XX PVC
544XX Duraprene
494XX Silicone
654XX Acidflex

XX is the number that specifies the pump tube color:

05 Orange-Yellow, 0.020" ID
06 Orange-White, 0.025" ID
07 Black-Black, 0.030" ID
08 Orange-Orange, 0.035" ID
09 White-White, 0.040" ID
10 Red-Red, 0.045" ID
11 Gray-Gray, 0.051" ID
12 Yellow-Yellow, 0.056" ID
13 Blue-Blue, 0.065" ID
14 Green-Green, 0.073" ID
15 Purple-Purple, 0.081" ID
16 Purple-Black, 0.090" ID
17 Purple-Orange, 0.100" ID
18 Purple-White, 0.110" ID
19 Yellow-Blue, 0.060" ID

Bottles

28193L Glass Bottle, 1000 mL
35102 Glass Bottle, 2000 mL
43915 Glass Bottle, 100 mL (includes cap)



50012
O-ring Remover

50062
Drill Bit

28101L
End Plug

LL022 Rev 9 May 2016

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