ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 136 and 141

[FRL–5848–3]

RIN 2040–AC93

Guidelines Establishing Test Procedures for the Analysis of Pollutants and National Primary Drinking Water Regulations; Flexibility in Existing Test Procedures and Streamlined Proposal of New Test Procedures; Correction, Announcement of Meetings, and Extension of Comment Period

AGENCY: Environmental Protection Agency (EPA).

ACTION: Correction, Announcement of Meetings, and Extension of Comment Period.

SUMMARY: EPA is correcting minor errors in the preamble and regulatory language of its proposed rule to streamline EPA's water methods approval program, which appeared in the **Federal Register** on March 28, 1997 (62 FR 14976).

EPA also announces two public meetings on the proposed rule and extends the comment period from March 28, 1997 to August 1, 1997.

DATES: EPA will conduct two public meetings on streamlining EPA's water methods approval programs. The first of these meetings will be held on Thursday, July 17, 1997, in Chicago, Illinois, from 9:00 a.m. to 12:30 p.m. The second of the two meetings will be held on August 1, 1997, in Dallas, Texas, from 9:00 a.m. to 1:00 p.m. Registration for the meetings will begin at 8:00 a.m. Public comments regarding the streamlining proposed rule will be accepted until August 1, 1997.

ADDRESSES: Send written comments to the Streamlining Methods Docket Clerk, Ben J. Honaker, Water Docket (MC–4101), USEPA, 401 M Street SW, Washington, DC 20460. The July 17, 1997, meeting will be held at the Hotel Inter-Continental Chicago located at 505 North Michigan Avenue, Chicago, Illinois. The August 1, 1997, meeting will be held at the Wyndham Anatole Hotel-Dallas located at 2201 Stemmons Freeway, Dallas, Texas.

FOR FURTHER INFORMATION CONTACT: Questions concerning this comment can be directed to Marion Thompson by phone at (202)260–7117 or by facsimile at (202)260–7185.

SUPPLEMENTARY INFORMATION:

Background

On March 28, 1997, EPA proposed an initiative to streamline its water methods approval program (62 FR 14976) (Streamlining Initiative). The purpose of the Streamlining Initiative is to expand method flexibility and expedite the method approval process for wastewater and drinking water methods approved at 40 Code of Federal Regulations (CFR) parts 136 and 141. This initiative would support a performance-based approach to environmental measurements under the Clean Water Act and Safe Drinking Water Act through use of quality control criteria in EPA-designated reference methods as the baseline standards of method performance. The initiative would encourage introduction of innovative technologies and involvement of stakeholders in the method development process by expediting Agency processes when external organizations develop and submit for approval new analytical methods. The goal of streamlining is to facilitate early introduction of new and innovative technologies that may reduce costs, overcome analytical difficulties, improve laboratory safety, and enhance data quality, while reducing the regulatory burden imposed by prescriptive methods.

The Streamlining Initiative was first outlined in a notice in 60 FR 47325 (September 12, 1995). Between September 1995 and July 1996, EPA held four public meetings to gather input on the Streamlining Initiative. The suggestions from these meetings were used in refining the Streamlining Initiative prior to its proposal. The Streamlining Initiative includes the following elements: standardized quality control tests in all methods, designation of reference methods that contain QC acceptance criteria for all standard QC tests, increased flexibility to modify reference methods without seeking prior EPA approval provided that the applicant demonstrates method equivalency, a tiered strategy for validating methods based on their intended use, a standard method format, suggested standard data elements for reporting, an amended process for non-EPA organizations to submit new methods for approval, and more rapid approval procedures.

Extension of Comment Period

EPA is extending the time for receipt of comments until August 1, 1997 to accommodate the two public meetings announced in this notice. Verbal comments will be accepted at these two public meetings only. All other comments must be written.

All comments received by August 1, 1997 and submitted in accordance with these instructions and the instructions in the Notice of Proposed Rulemaking will be entered into the public record and considered by EPA before promulgation of the final rule.

Corrections to Proposed Rule Tables

This document corrects three tables that appeared in the Identification of Test Procedures section of the proposed rule. Several of the values in the ''Recovery,'' ''Precision,'' ''Spiking Conc,'' ''IPR Recovery-Low,'' ''IPR Recovery-High,'' ''OPR Recovery-Low,'' ''OPR Recovery-High,'' ''MS/MSD Recovery-Low,'' ''MS/MSD Recovery-High,'' ''ML Value,'' and ''ML Calc'' columns of Table 1F that appears on page 15011 of the proposed rule are incorrect. Several of the values in the ''Recovery,'' ''Precision,'' ''Spiking Conc,'' ''IPR Recovery-Low,'' ''IPR Recovery-High,'' ''OPR Recovery-Low,'' ''OPR Recovery-High,'' ''MS/MSD Recovery-Low,'' and ''MS/MSD Recovery-High'' columns of the table titled, ''Standardized QC and QC Acceptance Criteria for Methods in 40 CFR 141.23(k)(1),'' that appears on page 15046 of the proposed rule also are incorrect. This notice provides end notes to Table 1F that appears on page 15011 of the proposed rule, and the table titled, ''Standardized QC and QC Acceptance Criteria for Methods in 40 CFR 141.23(k)(1),'' that appears on page 15046 of the proposed rule. These end notes, which were inadvertently omitted in the proposed rule, clarify the source of the quality control (QC) criteria that appear in these tables.

Entries 8 through 11 were inadvertently omitted from the version of Table 141.40(n)(11) that appears on page 15049 of the proposed rule.

Meeting Arrangements

Arrangements for the public meetings on the streamlining proposed rule are being coordinated by DynCorp, Inc. For information on registration, contact Cindy Simbanin, 300 N. Lee Street, Suite 500, Alexandria, VA 22314. Phone: 703/519–1386; facsimile: 703/684–0610.

Hotel reservations for the meeting on July 17,1997, may be made by contacting the Hotel Inter-Continental Chicago at 312/944–4100. The hotel address is 505 North Michigan Avenue, Chicago, Illinois 60611. When making reservations, specify that you are affiliated with the ''EPA PFPR Workshop'' (the EPA Pesticide Formulating, Packaging and Repackaging Workshop). Hotel reservations for the meeting on August 1, 1997, may be made by contacting the Wyndham Anatole Hotel-Dallas at 214/748–1200. The hotel address is 2201

Stemmons Freeway, Dallas, Texas 75207. Guest rates are $84.00, including tax. Reservations must be made by June 30, 1997. When making reservations, you must specify that you are affiliated with ''NELAC'' (the National Environmental Laboratory Accreditation Committee) to qualify for the quoted rate. Accommodations are limited for both meetings, so please make your reservations early.

Agenda Topics

The purpose of the public meetings in Chicago and Dallas is to present and discuss EPA's proposed approach to streamlining its water methods approval program. Each meeting will consist of a brief overview of the Streamlining Initiative, followed by comments and questions.

The following topics will be addressed at the public meetings:

- Increasing flexibility to modify approved methods to facilitate use of innovative technologies.
- Designating reference methods that contain QC acceptance criteria to support determination of method equivalency when method modifications are used.
- Tiered strategy for validating new methods and method modifications based on intended use of the method.
- Streamlining the method proposal and promulgation process in order to take advantage of emerging analytical technologies in a timely manner.

Dated: June 20, 1997.

Robert Perciasepe,

Assistant Administrator for Water.

The following corrections are made in FRL–5800–2, Guidelines Establishing Test Procedures for the Analysis of Pollutants and National Primary Drinking Water Regulations; Flexibility in Existing Test Procedures and Streamlined Proposal of New Test Procedures, which was published in the **Federal Register** on March 28, 1997 (62 FR 14976).

1. On page 15011, Table 1F is corrected to read as follows:

BILLING CODE 6560–50–P

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications													
										IPR			OPR		MS/MSD					
		Reference		Prec-					Spike	Recovery		Prec-	Recovery		Recovery				ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	CAL points	CAL lin	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
1.	Acidity (CaCO3)	305.1	---	1.00	Multi	MCAW	2	---	---	---	---	3.6	---	---	---	---	3.6		10 mg/L	Range
						W														
2.	Alkalinity "	310.1	---	2.00	Multi	"	2	---	---	---	---	7.2	---	---	---	---	7.2		10 mg/L	310.2
	"	310.2	99.50	0.50	Single	"	2	---	100 mg/L	96.0	103.0	1.5	96.0	103.0	96.0	103.0	1.8		10 mg/L	Range
3.	Aluminum - Flame	202.1	99.13	31.60	Multi	Apx D	5	25 %	100 ug/L	35.0	163.0	64.0	29.0	169.0	29.0	169.0	64.0		15 ug/L	Data
	" - Furnace	202.2	103.69	42.74	Multi	Apx D	5	25 %	100 ug/L	18.0	190.0	86.0	9.0	198.0	9.0	198.0	86.0		20 ug/L	Range
	" - ICP	200.7	96.33	24.19	Multi	Apx C	5	25 %	100 ug/L	47.0	145.0	49.0	43.0	150.0	43.0	150.0	49.0	20 ug/L	50 ug/L	3.18 x MDL
	" - DCP	---																		
	" - Color	---																		
4.	Ammonia - distill																			
	" - Nessler	350.2	100.46	14.27	Multi	MCAW	3	10 %	2.0 mg/L	71.0	129.0	29.0	69.0	132.0	69.0	132.0	29.0		50 ug/L	Range
						W														
	" - Titr	350.2	100.46	14.27	Multi	MCAW	3	10 %	2.0 mg/L	71.0	129.0	29.0	69.0	132.0	69.0	132.0	29.0		1.0 mg/L	Range
						W														
	" - ISE	350.3	91.00	2.31	Single	MCAW	3	10 %	130 ug/L	78.0	104.0	6.9	77.0	105.0	77.0	105.0	8.4		30 ug/L	Range
						W														
	" - Phenate	350.1	103.00	1.16	Single	MCAW	1	---	0.5 mg/L	96.0	110.0	3.5	96.0	110.0	96.0	110.0	4.2		10 ug/L	Range
						W														
	" - Auto elec	---																		
5.	Antimony - Flame	204.1	96.50	1.13	Single	MCAW	1	---	10 mg/L	90.0	103.0	3.4	89.0	104.0	89.0	104.0	4.1		1.0 mg/L	Range
						W														
	Antimony - Furnace	204.2	71.20	38.17	Multi	Apx D	5	25 %	100 ug/L	d	148.0	77.0	d	156.0	d	156.0	77.0		20 ug/L	Range
	Antimony - ICP	200.7	76.00	15.44	Multi	Apx C	3	10 %	500 ug/L	45.0	107.0	31.0	42.0	110.0	42.0	110.0	31.0	8 ug/L	20 ug/L	3.18 x MDL
6.	Arsenic	206.5	Digestion - no specs																	

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
		Reference		Prec-					Spike	Recovery		Prec-	Recovery		Recovery			ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	CAL points	CAL lin	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
	" - Hydride	206.3	98.38	8.19	Single	3114 B	3	10 %	200 ug/L	54.0	142.0	24.6	49.0	148.0	49.0	148.0	30.0		2.0 ug/L	Range
	" - Furnace	206.2	98.63	15.98	Multi	Apx D	3	10 %	100 ug/L	66.0	131.0	32.0	63.0	134.0	63.0	134.0	32.0		5.0 ug/L	Range
	" - ICP	200.7	92.17	14.79	Multi	Apx C	3	10 %	100 ug/L	62.0	122.0	30.0	59.0	125.0	59.0	125.0	30.0	8 ug/L	20 ug/L	3.18 x MDL
	" - Color (SDDC)	206.4	100.00	13.80	Multi	MCAW	3	10 %	40 ug/L	72.0	128.0	28.0	69.0	131.0	69.0	131.0	28.0		10 ug/L	Method
7.	Barium - Flame	208.1	103.50	8.63	Single	MCAW	3	10 %	1 mg/L	57.0	150.0	25.9	51.0	156.0	51.0	156.0	32.0		1.0 mg/L	Range
	" - Furnace	208.2	142.14	31.10	Multi	Apx D	5	25 %	100 ug/L	79.0	205.0	63.0	73.0	211.0	73.0	211.0	63.0		10 ug/L	Range
	" - ICP	200.7	77.30	20.97	Multi	Apx C	3	10 %	100 ug/L	35.0	120.0	42.0	31.0	124.0	31.0	124.0	42.0	1 ug/L	2 ug/L	3.18 x MDL
	" - DCP	---																		
8.	Beryllium - Flame	210.1	98.33	4.27	Single	MCAW	3	10 %	50 ug/L	75.0	121.0	12.8	72.0	124.0	72.0	124.0	16.0		50 ug/L	Range
	" - Furnace	210.2	106.66	21.76	Multi	Apx D	5	25 %	100 ug/L	63.0	151.0	44.0	58.0	155.0	58.0	155.0	44.0		1.0 ug/L	Range
	" - ICP	200.7	96.34	2.31	Multi	Apx C	3	10 %	100 ug/L	91.0	101.0	4.7	91.0	102.0	91.0	102.0	4.7	0.3 ug/L	1.0 ug/L	3.18 x MDL
	" - DCP	---																		
	" - Color	---																		
9.	BOD	405.1		24.10	Multi	MCAW	---	---	100 mg/L			49.0					49.0		N/A	
10.	Boron - Color	212.3	100.00	22.80	Multi	MCAW	5	25 %	240 ug/L	54.0	146.0	46.0	49.0	151.0	49.0	151.0	46.0		100 ug/L	Range
	" - ICP	200.7	97.07	25.60	Multi	Apx C	5	25 %	100 ug/L	45.0	149.0	52.0	40.0	154.0	40.0	154.0	52.0	3 ug/L	10 ug/L	3.18 x MDL
	" - DCP	---																		
11.	Bromide	320.1	93.75	7.17	Single	MCAW	3	10 %	5 mg/L	55.0	132.0	21.5	50.0	137.0	50.0	137.0	26.0		2 mg/L	Range
12.	Cadmium - Flame	213.1	94.87	15.88	Multi	Apx D	3	10 %	100 ug/L	63.0	127.0	32.0	59.0	130.0	59.0	130.0	32.0		50 ug/L	Range

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR Recovery			OPR Recovery		MS/MSD Recovery				
No.	Analyte	Reference Method	Recovery	Precision	Labs	Source	CAL points	CAL lin	Spike conc	Low	High	Precision	Low	High	Low	High	RPD	MDL	ML Value	ML Calc
	Cadmium - Furnace	213.2	98.43	23.05	Multi	Apx D	5	25 %	100 ug/L	52.0	145.0	47.0	47.0	150.0	47.0	150.0	47.0		0.5 ug/L	Range
	Cadmium - ICP	200.7	98.56	7.59	Multi	Apx C	3	10 %	100 ug/L	83.0	114.0	16.0	81.0	116.0	81.0	116.0	16.0	1 ug/L	2 ug/L	3.18 x MDL
	Cadmium - DCP	---																		
	Cadmium - Volt	---																		
	Cadmium - Color	---																		
13.	Calcium - Flame	215.1	99.00	3.33	Single	MCAW	3	10 %	10 mg/L	81.351	116.65	10.0	79.02	118.98	79.02	118.98	12.0		200 ug/L	Range
						W														
	Calcium - ICP	200.7	89.22	22.38	Multi	Apx C	5	25 %	100 ug/L	44.0	134.0	45.0	39.0	139.0	39.0	139.0	45.0	10 ug/L	20 ug/L	3.18 x MDL
	Calcium - DCP	---																		
	Calcium - Titr	215.2	98.10	9.20	Multi	MCAW	3	10 %	100 mg/L	79.7	116.5	34.0	77.86	118.34	77.86	118.34	34.0		2 mg/L	3.18 x LDL
						W														
14.	CBOD5	---																		
15.	COD - Titr	410.1	95.30	17.76	Multi	MCAW	3	10 %	250 mg/L	59.0	131.0	36.0	56.0	135.0	56.0	135.0	36.0		50 mg/L	Method
						W														
	COD - Titr	410.2	100.30	4.15	Multi	MCAW	3	10 %	10 mg/L	92.0	109.0	8.3	91.0	110.0	91.0	110.0	8.3		5 mg/L	Range
						W														
	COD - Titr	410.3	100.00	10.00	No data	Default	3	10 %	10 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0			
	COD - Spectro	410.4	100.00	10.00	No data	Default	3	10 %	10 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0			
16.	Chloride - Titr/Ag	---																		
	Chloride - Titr/Hg	325.3	97.10	3.30	Multi	MCAW	3	10 %	250 mg/L	90.0	104.0	6.6	89.0	105.0	89.0	105.0	6.6		---	
						W														
	Chloride - Color	---																		

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
		Reference		Prec-					Spike	Recovery		Prec-	Recovery		Recovery			ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	CAL points	CAL lin	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
	Chloride - Auto	325.1	100.50	3.00	Single	MCAW	3	10 %	10 mg/L	84.0	117.0	9.0	82.0	119.0	82.0	119.0	11.0		1 mg/L	Range
						W														
	Chloride - Auto	325.2	100.00	10.00	No data	Default	3	10 %	10 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		1 mg/L	Range
17.	Chlorine - Ampere	330.1	91.20	12.50	Multi	MCAW	3	10 %	250 mg/L	66.0	117.0	25.0	63.0	119.0	63.0	119.0	25.0		---	
						W														
	Chlorine - Iodo	330.3	81.50	32.40	Multi	MCAW	5	25 %	1.0 mg/L	16.0	147.0	65.0	10.0	153.0	10.0	153.0	65.0		0.1 mg/L	Method
						W														
	Chlorine - Back titr	330.2	98.80	4.30	Single	MCAW	3	10 %	1.0 mg/L	76.0	122.0	12.9	73.0	125.0	73.0	125.0	16.0		---	
						W														
	Chlorine - DPD-FAS	330.4	91.90	19.20	Multi	MCAW	3	10 %	1.0 mg/L	53.0	131.0	39.0	49.0	135.0	49.0	135.0	39.0		0.1 mg/L	Method
						W														
	Chlorine - Spectro	330.5	84.40	27.60	Multi	MCAW	5	25 %	1.0 mg/L	29.0	140.0	56.0	23.0	146.0	23.0	146.0	56.0		0.2 mg/L	Method
						W														
	Chlorine - Electrode	---																		
18.	Chromium VI - AA	218.4	98.49	6.96	Multi	MCAW	3	10 %	100 ug/L	84.0	113.0	14.0	83.0	114.0	83.0	114.0	14.0		10 ug/L	Range
						W														
	Chromium VI - Color	---																		
19.	Chromium - Flame	218.1	101.54	17.36	Multi	Apx D	3	10 %	100 ug/L	66.0	137.0	35.0	63.0	140.0	63.0	140.0	35.0		15 ug/L	Data
	Chromium - Chelate	218.3	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		1 ug/L	Method

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
		Reference		Prec-					Spike	Recovery		Prec-	Recovery		Recovery				ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	CAL points	CAL lin	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
	Chromium - Furnace	218.2	91.43	17.69	Multi	Apx D	3	10 %	100 ug/L	56.0	127.0	36.0	52.0	131.0	52.0	131.0	36.0		5 ug/L	Range
	Chromium - ICP	200.7	98.54	9.39	Multi	Apx C	3	10 %	100 ug/L	79.0	118.0	19.0	77.0	120.0	77.0	120.0	19.0	4 ug/L	10 ug/L	3.18 x MDL
	Chromium - DCP	---																		
	Chromium - Color	---																		
20.	Cobalt - Flame	219.1	98.00	1.00	Single	MCAW	3	10 %	1.0 mg/L	92.0	104.0	3.0	92.0	104.0	92.0	104.0	3.6		500 ug/L	Range
	Cobalt - Furnace	219.2	89.38	22.27	Multi	Apx D	5	25 %	100 ug/L	44.0	134.0	45.0	40.0	139.0	40.0	139.0	45.0		5 ug/L	Range
	Cobalt - ICP	200.7	87.59	8.16	Multi	Apx C	3	10 %	100 ug/L	71.0	104.0	17.0	69.0	106.0	69.0	106.0	17.0	2 ug/L	5 ug/L	3.18 x MDL
	Cobalt - DCP	---																		
21.	Color - ADMI	110.1	100.00	10.00	No data	Default	1	---	100 C.U.	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		25 C.U.	Range
	Color - Pt/Co	110.2	100.00	10.00	No data	Default	3	---	100 C.U.	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		---	No data
	Color - Spectro	110.3	100.00	10.00	No data	Default	3	---	100 C.U.	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0			
22.	Copper - Flame	220.1	99.79	17.00	Multi	MCAW	3	10 %	100 ug/L	65.0	134.0	34.0	62.0	138.0	62.0	138.0	34.0		100 ug/L	Method
	Copper - Furnace	220.2	92.54	27.29	Multi	Apx D	5	25 %	100 ug/L	37.0	148.0	55.0	32.0	153.0	32.0	153.0	55.0		5 ug/L	Range
	Copper - ICP	200.7	95.82	7.07	Multi	Apx C	3	10 %	100 ug/L	81.0	110.0	15.0	80.0	112.0	80.0	112.0	15.0	3 ug/L	10 ug/L	3.18 x MDL
	Copper - DCP	---																		
	Copper - Color/Neo	---																		
	Copper - Color/Bicin	---																		

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR Recovery			OPR Recovery			MS/MSD Recovery					
No.	Analyte	Reference Method	Recovery	Precision	Labs	Source	CAL points	CAL lin	Spike conc	Low	High	Precision	Low	High	Precision	Low	High	RPD	MDL	ML Value	ML Calc
23.	Cyanide - Distill	---																			
	Cyanide - Titr	---																			
	Cyanide - Spectro	335.2	85.00	11.07	Single	MCAW	3	10 %	250 ug/L	26.0	144.0	33.2	18.0	152.0	18.0	152.0	40.0		60 ug/L	Data	
						W															
	Cyanide - Auto	335.3	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		5 ug/L	Range	
24.	CATC - Titr	335.1	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0				
	CATC - Spectro	335.1	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	140.0	36.0				
25.	Fluoride - Distill	---																			
	Fluoride - Elec/man	340.2	98.82	3.53	Multi	MCAW	3	10 %	1.0 mg/L	91.0	106.0	7.1	91.0	107.0	91.0	107.0	7.1		100 ug/L	Range	
						W															
	Fluoride - Elec/auto	---																			
	Fluoride - SPADNS	340.1	97.59	10.72	Multi	MCAW	3	10 %	1.0 mg/L	76.0	120.0	22.0	74.0	122.0	74.0	122.0	22.0		100 ug/L	Range	
						W															
	Fluoride - Auto	340.3	89.00	12.00	Single	MCAW	3	10 %	150 ug/L	25.0	153.0	36.0	17.0	161.0	17.0	161.0	44.0		50 ug/L	Range	
						W															
26.	Gold - Flame	231.1	100.00	10.00	No data	Default	3	10 %	1.0 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		500 ug/L	Range	
	Gold - Furnace	231.2	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		5 ug/L	Range	
	Gold - DCP	---																			

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
		Reference		Prec-					Spike	Recovery		Prec-	Recovery		Recovery			ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	CAL points	CAL lin	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
27.	Hardness - Color/auto	130.1	89.00	7.89	Single	MCAW	3	10 %	50 mg/L	47.0	131.0	23.7	41.0	137.0	41.0	137.0	29.0		10 mg/L	Range
	Hardness - Titr/EDTA	130.2	99.81	4.87	Multi	MCAW	3	10 %	100 mg/L	90.0	110.0	19.0	89.0	111.0	89.0	111.0	19.0		30 mg/L	Data
28.	pH - Electrode	150.1	N/A	1.30	Multi	MCAW	2	—	N/A			2.6					2.6		N/A	
	pH - Auto	—																		
29.	Iridium - Flame	235.1	100.00	10.00	No data	Default	3	10 %	100 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		20 mg/L	Range
	Iridium - Furnace	235.2	100.00	10.00	No data	Default	3	10 %	200 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		100 ug/L	Range
30.	Iron - Flame	236.1	99.62	6.24	Multi	Apx D	3	10 %	800 ug/L	87.0	113.0	34.0	85.0	114.0	85.0	114.0	34.0		300 ug/L	Range
	Iron - Furnace	236.2	144.71	36.03	Multi	Apx D	5	25 %	100 ug/L	72.0	217.0	73.0	65.0	224.0	65.0	224.0	73.0		5 ug/L	Range
	Iron - ICP	200.7	99.44	10.16	Multi	Apx C	3	10 %	500 ug/L	79.0	120.0	37.0	77.0	122.0	77.0	122.0	37.0	30 ug/L	100 ug/L	3.18 x MDL
	Iron - DCP	—																		
	Iron - Color	—																		
31.	TKN - Digest	351.3	101.03	25.76	Multi	MCAW	5	25 %	2 mg/L	49.0	153.0	52.0	44.0	158.0	44.0	158.0	52.0		50 ug/L	Range
	TKN - Titr	351.3	101.03	25.76	Multi	MCAW	5	25 %	2 mg/L	49.0	153.0	52.0	44.0	158.0	44.0	158.0	52.0		50 ug/L	Range
	TKN - Nessler	351.3	101.03	25.76	Multi	MCAW	5	25 %	2 mg/L	49.0	153.0	52.0	44.0	158.0	44.0	158.0	52.0		50 ug/L	Range

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR Recovery			OPR Recovery			MS/MSD Recovery			
No.	Analyte	Reference Method	Recovery	Precision	Labs	Source	CAL points	CAL lin	Spike conc	Low	High	Precision	Low	High	Low	High	RPD	MDL	ML Value	ML Calc
	TKN - Electrode	351.3	101.03	25.76	Multi	MCAW	5	25 %	2 mg/L	49.0	153.0	52.0	44.0	158.0	44.0	158.0	52.0		50 ug/L	Range
	TKN - Phenate	351.1	71.70	27.98	Multi	MCAW	5	25 %	2 mg/L	15.0	128.0	56.0	10.0	134.0	10.0	134.0	56.0		50 ug/L	Range
	TKN - Block/color	351.2	99.00	8.82	Single	MCAW	3	10 %	2 mg/L	52.0	146.0	26.5	46.0	152.0	46.0	152.0	32.0		100 ug/L	Range
	TKN - Potentio	351.4	100.00	10.00	No data	Default	3	10 %	200 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		30 ug/L	Range
32.	Lead - Flame	239.1	109.90	36.70	Multi	Apx D	5	25 %	100 ug/L	36.0	184.0	74.0	29.0	191.0	29.0	191.0	74.0		40 ug/L	Data
	Lead - Furnace	239.2	93.80	22.75	Multi	Apx D	5	25 %	100 ug/L	48.0	140.0	46.0	43.0	144.0	43.0	144.0	46.0		5 ug/L	Range
	Lead - ICP	200.7	94.79	12.58	Multi	Apx C	3	10 %	100 ug/L	69.0	120.0	26.0	67.0	123.0	67.0	123.0	26.0	10 ug/L	20 ug/L	3.18 x MDL
	Lead - DCP	---																		
	Lead - Volt	---																		
	Lead - Color	---																		
33.	Magnesium - Flame	242.1	97.90	29.81	Multi	MCAW	5	25 %	100 ug/L	38.0	158.0	60.0	32.0	164.0	32.0	164.0	60.0		20 ug/L	Range
	Magnesium - ICP	200.7	97.71	17.67	Multi	Apx C	3	10 %	100 ug/L	62.0	134.0	36.0	58.0	137.0	58.0	137.0	36.0	20 ug/L	50 ug/L	3.18 x MDL
	Magnesium - DCP	---																		
	Magnesium - Grav	---																		
34.	Manganese - Flame	243.1	95.43	13.15	Multi	Apx D	3	25 %	100 ug/L	69.0	122.0	27.0	66.0	125.0	66.0	125.0	27.0		100 ug/L	Range
	Manganese - Furnace	243.2	106.20	21.05	Multi	Apx D	5	25 %	100 ug/L	64.0	149.0	43.0	59.0	153.0	59.0	153.0	43.0		1 ug/L	Range
	Manganese - ICP	200.7	94.30	4.12	Multi	Apx C	3	10 %	100 ug/L	86.0	103.0	8.3	85.0	104.0	85.0	104.0	8.3	1 ug/L	2 ug/L	3.18 x MDL
	Manganese - DCP	---																		

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
		Reference		Prec-					Spike	Recovery		Prec-	Recovery		Recovery			ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	CAL points	CAL lin	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
	Manganese - Persulf	---																		
	Manganese - Perioda	---																		
35.	Mercury - CV/Man	245.1	92.90	29.40	Multi	MCAW	5	25 %	4 ug/L	34.0	152.0	59.0	28.0	158.0	28.0	158.0	59.0		0.2 ug/L	DL
	Mercury - CV/Auto	245.2	102.00	2.00	Single	MCAW	3	10 %	10 ug/L	91.4	112.6	6.0	90	114	90	114	7.2		0.2 ug/L	DL
36.	Molybdenum - Flame	246.1	97.00	2.33	Single	MCAW	3	10 %	300 ug/L	84.0	110.0	7.0	83.0	111.0	83.0	111.0	8.4		300 ug/L	Data
	Molybdenum - Furnace	246.2	100.00	10.00	No data	Default	3	10 %	10 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		3 ug/L	Range
	Molybdenum - ICP	200.7	96.92	7.78	Multi	Apx C	3	10 %	100 ug/L	81.0	113.0	16.0	79.0	115.0	79.0	115.0	16.0	4 ug/L	10 ug/L	3.18 x MDL
	Molybdenum - DCP	---																		
37.	Nickel - Flame	249.1	96.67	2.00	Single	MCAW	3	10 %	1 ug/L	86.0	108.0	6.0	84.0	109.0	84.0	109.0	7.2		0.2 ug/L	Data
	Nickel - Furnace	249.2	90.37	26.65	Multi	Apx D	5	25 %	100 ug/L	37.0	144.0	54.0	31.0	149.0	31.0	149.0	54.0		5 ug/L	Range
	Nickel - ICP	200.7	95.48	10.44	Multi	Apx C	3	10 %	100 ug/L	74.0	117.0	21.0	72.0	119.0	72.0	119.0	21.0	5 ug/L	20 ug/L	3.18 x MDL
	Nickel - DCP	---																		
	Nickel - Color	---																		
38.	Nitrate	352.1	104.12	22.69	Multi	MCAW	5	25 %	1 mg/L	58.0	150.0	46.0	54.0	155.0	54.0	155.0	46.0		0.1 mg/L	Range

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
No.	Analyte	Reference Method	Recovery	Precision	Labs	Source	CAL points	CAL lin	Spike conc	Recovery Low	Recovery High	Precision	Recovery Low	Recovery High	Recovery Low	Recovery High	RPD	MDL	ML Value	ML Calc
39.	NO2-NO3 - Cd/Man	353.3	100.00	12.50	Single	MCAW	3	10 %	40 ug/L	33.0	167.0	37.5	25.0	175.0	25.0	175.0	45.0		10 ug/L	Range
	NO2-NO3 - Cd/Auto	353.2	105.75	4.14	Single	MCAW	3	10 %	290 ug/L	83.0	128.0	12.4	80.0	131.0	81.0	131.0	15.0		50 ug/L	Range
	NO2-NO3 - Cd/Hydra	353.1	99.00	5.13	Single	MCAW	3	10 %	400 ug/L	71.0	127.0	15.4	68.0	130.0	68.0	130.0	19.0		10 ug/L	Range
40.	Nitrite - Spec/Man	354.1	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		10 ug/L	Range
	Nitrite - Spec/Auto	---																		
41.	Oil & Grease	413.1	93.00	6.43	Single	MCAW	1	10 %	15 mg/L	58.0	128.0	19.3	54.0	132.0	54.0	132.0	24.0		5 mg/L	Range
42.	TOC	415.1	101.01	7.78	Multi	MCAW	3	10 %	100 mg/L	85.0	117.0	16.0	83.0	119.0	83.0	119.0	16.0		1 mg/L	Method
43.	Organic nitrogen	---																		
44.	O-phosphate - Auto	365.1	87.20	22.00	Multi	MCAW	5	25 %	300 ug/L	43.0	132.0	45.0	38.0	136.0	38.0	136.0	45.0		10 ug/L	Range
	O-phosphate - Man 1	365.2	97.25	5.37	Multi	MCAW	3	10 %	300 ug/L	86.0	108.0	11.0	85.0	110.0	85.0	110.0	11.0		10 ug/L	Range
	O-phosphate - Man 2	365.3	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		10 ug/L	Range
45.	Osmium - Flame	252.1	100.00	10.00	No data	Default	3	10 %	5 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		1 mg/L	Method

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
No.	Analyte	Reference Method	Recovery	Precision	Labs	Source	CAL points	CAL lin	Spike conc	Recovery Low	Recovery High	Precision	Recovery Low	Recovery High	Recovery Low	Recovery High	RPD	MDL	ML Value	ML Calc
	Osmium - Furnace	252.2	100.00	10.00	No data	Default	3	10 %	250 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		50 ug/L	Range
46.	DO - Winkler	360.2	100.00	1.00	Single	MCAW	3	10 %	1 mg/L	94.7	105.3	3.0	94	106	94	106	3.6		50 ug/L	Range
	DO - Electrode	360.1	100.00	1.00	Single	MCAW	3	10 %	1 mg/L	94.7	105.3	3.0	94	106	94	106	3.6		50 ug/L	Range
47.	Palladium - Flame	253.1	100.00	10.00	No data	Default	3	10 %	1 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		500 ug/L	Range
	Palladium - Furnace	253.2	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		20 ug/L	Range
	Palladium - DCP	---																		
48.	Phenol - Color/Man	420.1	100.00	10.31	Multi	MCAW	3	10 %	300 ug/L	79.0	121.0	21.0	77.0	123.0	77.0	123.0	21.0		5 ug/L	Method
	Phenol - Color/Auto	420.2	98.00	1.12	Single	MCAW	3	10 %	1 mg/L	92.0	104.0	3.4	92.0	105.0	92.0	105.0	4.1		2 ug/L	Range
49.	Phosphorus - GC	---																		
50.	Phosphorus - Asc/Man	365.2	103.09	30.00	Multi	MCAW	5	25 %	300 ug/L	43.0	164.0	60.0	37.0	170.0	37.0	170.0	60.0		10 ug/L	Range
	Phosphorus - Asc/Man	365.3	99.00	22.00	Multi	MCAW	5	25 %	300 ug/L	55.0	143.0	44.0	50.0	148.0	50.0	148.0	44.0		10 ug/L	Range
	Phosphorus - Asc/Auto	365.1	87.20	22.00	Multi	MCAW	5	25 %	300 ug/L	43.0	132.0	45.0	38.0	136.0	38.0	136.0	45.0		10 ug/L	Range

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
No.	Analyte	Reference Method	Recovery	Precision	Labs	Source	CAL points	CAL lin	Spike conc	Recovery Low	Recovery High	Precision	Recovery Low	Recovery High	Recovery Low	Recovery High	RPD	MDL	ML Value	ML Calc
	Phosphorus - Block	365.4	98.00	3.00	Single	MCAW	3	10 %	2 mg/L	82.0	114.0	9.0	80.0	116.0	80.0	116.0	11.0		10 ug/L	Range
						W														
51.	Platinum - Flame	255.1	100.00	10.00	No	Default	3	10 %	10 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		5 mg/L	Range
					data															
	Platinum - Furnace	255.2	100.00	10.00	No	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		100 ug/L	Range
					data															
	Platinum - DCP	---																		
52.	Potassium - Flame	258.1	103.00	12.50	Single	MCAW	3	10 %	2 mg/L	36.0	170.0	37.5	28.0	178.0	28.0	178.0	45.0		100 ug/L	Range
						W														
	Potassium - ICP	200.7	83.05	17.12	Multi	Apx C	3	10 %	1 mg/L	48.0	118.0	35.0	45.0	121.0	45.0	121.0	35.0	300 ug/L	1 mg/L	3.18 x MDL
	Potassium - FPD	---																		
	Potassium - Color	---																		
53.	Total Solids	160.3	100.00	10.00	No	Default	1	---	100 mg/L	47.0	153.0	30.0	6040	146.0	40.0	160.0	36.0		10 mg/L	Range
					data															
54.	TDS	160.1	100.00	10.00	No	Default	1	---	100 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		10 mg/L	Range
					data															
55.	TSS	160.2	100.00	10.00	No	Default	1	---	100 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		4 mg/L	Range
					data															
56.	Settleable Solids	160.5	100.00	10.00	No	Default	1	---	5 mL/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		0.2 mL/L	Method
					data															
57.	Volatile Residue	160.4	100.00	6.47	Multi	MCAW	3	10 %	50 mg/L	87.0	113.0	13.0	85.0	115.0	85.0	115.0	13.0		10 mg/L	Range
						W														

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
		Reference		Prec-					Spike	Recovery		Prec-	Recovery		Recovery				ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	CAL points	CAL lin	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
58.	Rhodium - Flame	265.1	100.00	10.00	No data	Default	3	10 %	1 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		1 mg/L	Range
	Rhodium - Furnace	265.2	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		20 ug/L	Range
59.	Ruthenium - Flame	267.1	100.00	10.00	No data	Default	3	10 %	1 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		1 mg/L	Range
	Ruthenium - Furnace	267.2	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		100 ug/L	Range
60.	Selenium - Furnace	270.2	96.12	16.72	Multi	Apx D	3	10 %	100 ug/L	62.0	130.0	34.0	59.0	133.0	59.0	133.0	34.0		5 ug/L	Range
	Selenium - ICP	200.7	91.13	26.35	Multi	Apx C	5	25 %	1 mg/L	38.0	144.0	53.0	33.0	150.0	33.0	150.0	53.0	20 ug/L	50 ug/L	3.18 x MDL
	Selenium - Hydride	---																		
61.	Silica - Color/Man	370.1	85.70	7.80	Multi	MCAW	3	10 %	5 mg/L	70.0	102.0	16.0	68.0	103.0	68.0	103.0	16.0		2 mg/L	Range
	Silica - Color/Auto	---				W														
	Silica - ICP	200.7	53.86	45.38	Multi	Apx C	5	25 %	1 mg/L	d	145.0	91.0	d	154.0	d	154.0	91.0	20 ug/L	50 ug/L	3.18 x MDL
62.	Silver - Flame	272.1	89.40	17.60	Multi	MCAW	3	10 %	500 ug/L	54.0	125.0	36.0	50.0	129.0	50.0	129.0	36.0		100 ug/L	Range
	Silver - Furnace	272.2	94.88	18.20	Multi	W Apx D	3	10 %	100 ug/L	58.0	132.0	37.0	54.0	135.0	54.0	135.0	37.0		1 ug/L	Range
	Silver - ICP	200.7	49.73	47.50	Multi	Apx C	5	25 %	100 ug/L	d	145.0	95.0	d	155.0	d	155.0	95.0	2 ug/L	5 ug/L	3.18 x MDL
	Silver - DCP	---																		
63.	Sodium - Flame	273.1	100.00	1.54	Multi	MCAW	3	10 %	5 mg/L	96.0	104.0	3.1	96.0	104.0	96.0	104.0	3.1		30 ug/L	Range
	Sodium - ICP	200.7	99.77	24.27	Multi	W Apx C	5	25 %	1 mg/L	51.0	[1]	9.0	46.0	154.0	46.0	154.0	49.0	30 ug/L	100 ug/L	3.18 x MDL
	Sodium - DCP	---																		

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
		Reference		Prec-					Spike	Recovery		Prec-	Recovery		Recovery				ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	CAL points	CAL lin	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
	Sodium - FPD	---																		
64.	Specific conductance	120.1	97.98	7.55	Multi	MCAW	3	10 %	5 mg/L	82.0	114.0	16.0	81.0	115.0	81.0	115.0	16.0		No data	
65.	Sulfate - Color/Auto	375.1	99.00	1.80	Single	MCAW	3	10 %	100 mg/L	89.0	109.0	5.4	88.0	110.0	88.0	110.0	6.5		10 mg/L	Range
	Sulfate - Grav	375.3	102.00	1.45	Single	MCAW	3	10 %	100 mg/L	94.0	110.0	4.4	93.0	111.0	93.0	111.0	5.3		10 ug/L	Range
	Sulfate - Turbid	375.4	96.99	7.15	Multi	MCAW	3	10 %	100 mg/L	82.0	112.0	15.0	81.0	113.0	81.0	113.0	15.0		1 mg/L	DL
66.	Sulfide - Turbid	376.1	100.00	10.00	No data	Default	3	10 %	10 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		1 mg/L	DL
	Sulfide - Color	376.2	100.00	10.00	No data	MCAW	3	10 %	10 mg/L	64.0	136.0	36.0	60.0	140.0	60.0	140.0	36.0		No data	
67.	Sulfite - Turbid	377.1	100.00	10.00	No data	Default	3	10 %	10 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		3 mg/L	DL
68.	Surfactants	425.1	101.36	9.13	Multi	MCAW	3	10 %	3 mg/L	83.0	120.0	19.0	81.0	122.0	81.0	122.0	19.0		25 ug/L	Range
69.	Temperature	170.1	---	---															N/A	
70.	Thallium - Flame	279.1	100.00	3.00	Single	MCAW	3	10 %	600 ug/L	84.1	115.9	9.0	82	118	82	118	11.0		600 ug/L	Data
	Thallium - Furnace	279.2	87.10	11.79	Multi	Apx D	5	25 %	100 ug/L	63.0	111.0	24.0	61.0	114.0	61.0	114.0	24.0		5 ug/L	Range
	Thallium - ICP	200.7	82.90	28.34	Multi	Apx C	5	25 %	1 mg/L	26.0	140.0	57.0	20.0	146.0	20.0	146.0	57.0	20 ug/L	50 ug/L	3.18 x MDL

Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
No.	Analyte	Reference Method	Recovery	Precision	Labs	Source	CAL points	CAL lin	Spike conc	Recovery Low	Recovery High	Precision	Recovery Low	Recovery High	Recovery Low	Recovery High	RPD	MDL	ML Value	ML Calc
71.	Tin - Flame	282.1	96.00	6.25	Single	MCAW	3	10 %	4 mg/L	62.0	130.0	18.8	58.0	134.0	58.0	134.0	23.0		10 mg/L	Range
	Tin - Furnace	282.2	100.00	10.00	No data	W Default	3	10 %	10 mg/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		20 ug/L	Range
	Tin - ICP	200.7	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0	7 ug/L	20 ug/L	3.18 x MDL
72.	Titanium - Flame	283.1	97.00	3.50	Single	MCAW	3	10 %	2 mg/L	78.0	116.0	10.5	76.0	118.0	76.0	118.0	13.0		2 mg/L	Data
	Titanium - Furnace	283.2	100.00	10.00	No data	W Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		50 ug/L	Range
	Titanium - ICP	200.7	100.00	10.00	No data	Default	3	10 %	100 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		1 ug/L	Range
73.	Turbidity	180.1	100.00	2.31	Single	MCAW	3	10 %	25 NTU	87.0	113.0	6.9	86.0	114.0	86.0	114.0	8.4		0.05 NTU	Est
74.	Vanadium - Flame	286.1	100.00	5.00	Single	W MCAW	3	10 %	2 mg/L	73.5	126.5	15.0	70	130	70	130	18.0		2 mg/L	Range
	Vanadium - Furnace	286.2	85.11	32.80	Multi	W Apx D	5	25 %	100 ug/L	19.0	151.0	66.0	12.0	158.0	12.0	158.0	66.0		10 ug/L	Range
	Vanadium - ICP	200.7	94.15	7.88	Multi	Apx C	3	10 %	100 ug/L	78.0	110.0	16.0	76.0	112.0	76.0	112.0	16.0	3 ug/L	10 ug/L	3.18 x MDL
	Vanadium - DCP	---																		
	Vanadium - Color	---																		
75.	Zinc - Flame	289.1	99.93	18.60	Multi	Apx D	3	10 %	100 mg/L	62.0	138.0	38.0	59.0	141.0	59.0	141.0	38.0		50 ug/L	Range
	Zinc - Furnace	289.2	168.59	67.06	Multi	Apx D	7	25 %	100 ug/L	34.0	303.0	135.0	21.0	317.0	21.0	317.0	140.0		0.2 ug/L	Range

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Table IF- Standardized QC and QC Acceptance Criteria for Methods in 40 CFR Part 136, Table IB

		Data					Specifications												
										IPR			OPR		MS/MSD				
		Reference		Prec-					Spike	Recovery		Prec-	Recovery		Recovery				ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	CAL points	CAL lin	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
	Zinc - ICP	200.7	93.26	12.89	Multi	Apx C	5	25 %	100 ug/L	67.0	120.0	26.0	64.0	122.0	64.0	122.0	26.0	2 ug/L	5 ug/L	3.18 x MDL
	Zinc - DCP	---																		
	Zinc - Color/Dithiz	---																		
	Zinc - Color/Zincon	---																		

Table 1F Note:

The QC acceptance criteria given in Table 1F were developed from data published in the following sources. For Method 200.7, promulgated at 40 CFR Part 136, Appendix C, QC acceptance criteria were developed using the regression equations at the end of the method. The concentration given in the Spike Conc column is the concentration at which the QC acceptance criteria were calculated. For calculating the precision criterion, the overall standard deviation (S) was used (not the single-analyst standard deviation (SR)). For the remaining 200-series metals methods, QC acceptance criteria were developed from the regression equations in 40 CFR Part 136, Appendix D, where available; otherwise, from performance data published at the end of each method in Methods for Chemical Analysis of Water and Wastes (MCAWW; EPA 600/4–79–020; NTIS PB–123677). For methods other than Method 200.7 and the 200-series metals methods, data published at the end of each method in MCAWW were used, if available; otherwise default QC acceptance criteria, as described below, were used.

The databases used to develop regression equations for Method 200.7 and the 200-series metals methods were not readily available. Therefore, QC acceptance criteria were calculated using the procedures given in the Streamlining Guide. Where interlaboratory data were available, these data were used and the QC limits were calculated as follows:

IPR lower recovery limit = average − 2 × interlab sd
IPR upper recovery limit = average + 2 × interlab sd
IPR precision limit = 2 × sd
OPR and MS/MSD lower limit = average recovery − 2.2 × interlab sd
OPR and MS/MSD upper limit = average recovery + 2.2 × interlab sd

Where interlaboratory data were not available but single-laboratory data were available, the single-laboratory data were used and the QC limits were calculated as follows:

IPR lower recovery limit = average − 5.3 × interlab sd
IPR upper recovery limit = average + 5.3 × interlab sd
IPR precision limit = 3.0 × sd
OPR/MS/MSD lower recovery limit = average − 6.0 × interlab sd
OPR/MS/MSD upper recovery limit = average + 6.0 × interlab sd

The multipliers include interlaboratory/single laboratory allowances and are explained in the Streamlining Guide.

Where neither interlaboratory nor single-laboratory data were available, default values of 100 percent recovery and 10 percent RSD were used and the QC limits were calculated assuming single laboratory data. This resulted in the following default values:

IPR lower recovery limit: 47%
IPR upper recovery limit: 153%
IPR precision limit: 30% RSD
OPR/MS/MSD lower recovery limit: 40%
OPR/MS/MSD upper recovery limit: 160%

Minimum levels were set to the level listed in the method (ML, low end of the range, sensitivity, or other level, as noted) or, if an MDL was available, were calculated by multiplying the MDL by 3.18 and rounding to the number nearest to 1, 2, or 5 × 10n, where n is an integer.

2. On page 15046, the table titled, ''Standardized QC and QC Acceptance Criteria for Methods in 40 CFR 141.23(k)(1)'' is corrected to read as follows:

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Standardized QC and QC Acceptance Criteria for Methods in 40 CFR 141.23(k)(1)

		Data					Specifications												
		Reference		Prec-			CAL		MCL	Spike	IPR Recovery		Prec-	OPR Recovery		MS/MSD Recovery			ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	Points	Lin	(ug/L)	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
1.	Alkalinity - Titr/Man	---																			
	Alkalinity - Titr/Auto	---																			
2.	Antimony - Furnace	---							6.0												
	Antimony - Hydride	---							6.0												
	Antimony - ICP/MS	200.8	98.8	8.067	Multi	Tbl 12	3	10 %	6.0	6 ug/L	82.0	115.0	17.0	81 0	117.0	81.0	117.0	17.0	0.4 ug/L	1 ug/L	3.18 x MDL
	Antimony - STGFAA	200.9	95.4	2.8	Single	Tbl IE	3	10 %	6.0	20 ug/L	80.56	110.2	8.4	78.6	112.2	78.6	112.2	11.0	0.8 ug/L	2 ug/L	3.18 x MDL
3.	Arsenic - Furnace	---							50												
	Arsenic - Hydride	---							50												
	Arsenic - ICP	200.7	98.27	13.59	Multi	Apx C	3	10 %	50	200 ug/L	71.0	126.0	28.0	68.0	129.0	68.0	129.0	28.0	53 ug/L	200 ug/L	3.18 x MDL
	Arsenic - ICP/MS	200.8	100.44	6.9	Multi	Tbl 12	3	10 %	50	50 ug/L	86.0	115.0	14.0	85.0	116.0	85.0	116.0	14.0	1.4 ug/L	5 ug/L	3.18 x MDL
	Arsenic - STGFAA	200.9	88.4	10	Single	Tbl IE	3	10 %	50	10 ug/L	35.0	142.0	30.0	28.0	149.0	28.0	149.0	36.0	0.5 ug/L	2 ug/L	3.18 x MDL
4.	Asbestos - TEM	100.1							7 MFL												
	Asbestos - TEM	100.2							7 MFL												
5.	Barium - Flame	---							2000												
	Barium - Furnace	---							2000												
	Barium - ICP	200.7	76.88	18.47	Multi	Apx C	3	10 %	2000	1 mg/L	39.0	114.0	37.0	36.0	118.0	36.0	118.0	37.0	2 ug/L	5 ug/L	3.18 x MDL
	Barium - ICP/MS	200.8	96.31	4.55	Multi	Tbl 12	3	10 %	2000	1 mg/L	87.0	106.0	9.1	86.0	107.0	86.0	107.0	9.1	0.8 ug/L	2.0 ug/L	3.18 x MDL
6.	Beryllium - Flame	---							4.0												
	Beryllium - ICP	200.7	97.54	25.11	Multi	Apx C	3	10 %	4.0	4 ug/L	47.0	148.0	51.0	42.0	153.0	42.0	153.0	51.0	0.3 ug/L	1 ug/L	3.18 x MDL
	Beryllium - ICP/MS	200.8	110.50	12.70	Multi	Tbl 12	3	10 %	4.0	4 ug/L	85.0	136.0	26.0	82.0	139.0	82.0	139.0	26.0	0.3 ug/L	1 ug/L	3.18 x MDL
	Beryllium - STGFAA	200.9	106	9.4	Single	Tbl IE	3	10 %	4.0	2.5 ug/L	56.0	156.0	28.2	49.0	163.0	49.0	163.0	34.0	0.02 ug/L	0.05 ug/L	3.18 x MDL

Standardized QC and QC Acceptance Criteria for Methods in 40 CFR 141.23(k)(1)

		Data					Specifications												
		Reference		Prec-			CAL		MCL	Spike	IPR Recovery		Prec-	OPR Recovery		MS/MSD Recovery			ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	Points	Lin	(ug/L)	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
7.	Cadmium - Furnace	---							5.0												
	Cadmium - ICP	200.7	100.07	8.15	Multi	Apx C	3	10 %	5.0	50 ug/L	83.0	117.0	17.0	82.0	118.0	82.0	118.0	17.0	4 ug/L	10 ug/L	3.18 x MDL
	Cadmium - ICP/MS	200.8	100.5	16.1	Multi	Tbl 12	3	10 %	5.0	5 ug/L	68.0	133.0	33.0	65.0	136.0	65.0	136.0	33.0	0.5 ug/L	2 ug/L	3.18 x MDL
	Cadmium - STGFAA	200.9	105.2	6.3	Single	Tbl IE	3	10 %	5.0	0.5 ug/L	71.0	139.0	18.9	67.0	143.0	67.0	143.0	23.0	0.05 ug/L	0.2 ug/L	3.18 x MDL
8.	Calcium - Flame	---							---												
	Calcium - ICP	200.7	89.22	22.38	Multi	Apx C	3	10 %	---	100 ug/L	44.0	134.0	45.0	39.0	139.0	39.0	139.0	45.0	10 ug/L	20 ug/L	3.18 x MDL
	Calcium - Titr	---							---												
9.	Chromium - Furnace	---							100												
	Chromium - ICP	200.7	98.54	9.39	Multi	Apx C	3	10 %	100	100 ug/L	79.0	118.0	19.0	77.0	120.0	77.0	120.0	19.0	7 ug/L	20 ug/L	3.18 x MDL
	Chromium - ICP/MS	200.8	100.45	3.69	Multi	Tbl 12	3	10 %	100	100 ug/L	93.0	108.0	7.4	92.0	109.0	92.0	109.0	7.4	0.9 ug/L	2 ug/L	3.18 x MDL
	Chromium - STGFAA	200.9	105.7	3.1	Single	Tbl IE	3	10 %	100	2.5 ug/L	89.0	123.0	9.3	87.0	125.0	87.0	125.0	12.0	0.1 ug/L	0.2 ug/L	3.18 x MDL
10.	Conductivity	---																			
11.	Copper - Flame	---							1000												
	Copper - Furnace	---							1000												
	Copper - ICP	200.7	92.94	4.71	Multi	Apx C	3	10 %	1000	1 mg/L	83.0	103.0	9.5	82.0	104.0	82.0	104.0	9.5	6 ug/L	20 ug/L	3.18 x MDL
	Copper - ICP/MS	200.8	97.56	6.39	Multi	Tbl 12	3	10 %	1000	1 mg/L	84.0	111.0	13.0	83.0	112.0	83.0	112.0	13.0	0.09 ug/L	0.2 ug/L	3.18 x MDL
	Copper - STGFAA	200.9	111.5	10	Single	Tbl IE	3	10 %	1000	10 ug/L	58.0	165.0	30.0	51.0	172.0	51.0	172.0	36.0	0.7 ug/L	2 ug/L	3.18 x MDL
12.	Cyanide - CATC	---							200												
	Cyanide - Spectro/Man	---							200												
	Cyanide - Spectro/Auto	335.4	100	10	No data	Default	3	10 %	200	200 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0		5 ug/L	Range

Standardized QC and QC Acceptance Criteria for Methods in 40 CFR 141.23(k)(1)

		Data					Specifications													
		Reference		Prec-			CAL		MCL	Spike	IPR Recovery		Prec-	OPR Recovery		MS/MSD Recovery			ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	Points	Lin	(ug/L)	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
	Cyanide - ISE	---							200												
13.	Fluoride - Elec/man	---							2000												
	Fluoride - Elec/auto	---							2000												
	Fluoride - SPADNS	---							2000												
	Fluoride - Auto/Aliz	---							2000												
	Fluoride - IC	300.0	87.7	5	Single	MCAWW	3	10 %	2000	2 mg/L	61.0	115.0	15.0	57.0	118.0	57.0	118.0	18.0	5 ug/L	20 ug/L	3.18 x MDL
14.	pH - Electrode	150.1	---	---					6.5-8.5												
	pH - Auto	150.2	---	---					6.5-8.5												
15.	Lead - Furnace	---							---												
	Lead - ICP/MS	200.8	100.20	12.10	Multi	Tbl 12	3	10 %	---	10 ug/L	76.0	125.0	25.0	73.0	127.0	73.0	127.0	25.0	0.6 ug/L	2 ug/L	3.18 x MDL
	Lead - STGFAA	200.9	101.80	4.00	Single	Tbl IE	3	10 %	---	10 ug/L	80.0	123.0	12.0	77.0	126.0	77.0	126.0	15.0	0.7 ug/L	2 ug/L	3.18 x MDL
16.	Mercury - CV/Man	245.1	100.34	43.82	Multi	MCAWW	3	10 %	2.0	2 ug/L	12.0	188.0	88.0	3.0	197.0	3.0	197.0	88.0		0.2 ug/L	Range
	Mercury - CV/Auto	245.2	102	4.5	Single	MCAWW	3	10 %	2.0	2 ug/L	78.0	126.0	13.5	75.0	129.0	75.0	129.0	17.0		0.2 ug/L	Range
	Mercury - ICP/MS	200.8	100	10	No data	Default	3	10 %	2.0	2 ug/L	47.0	153.0	30.0	40.0	160.0	40.0	160.0	36.0	No data		
17.	Nickel - Flame	---							100												
	Nickel - Furnace	---							100												
	Nickel - ICP	200.7	95.48	10.44	Multi	Apx C	3	10 %	100	100 ug/L	74.0	117.0	21.0	72.0	119.0	72.0	119.0	21.0	15 ug/L	50 ug/L	3.18 x MDL
	Nickel - ICP/MS	200.8	95.11	5.16	Multi	Tbl 12	3	10 %	100	100 ug/L	84.0	106.0	11.0	83.0	107.0	83.0	107.0	11.0	0.5 ug/L	2 ug/L	3.18 x MDL
	Nickel - STGFAA	200.9	103.8	4.3	Single	Tbl IE	3	10 %	100	20 ug/L	81.0	127.0	12.9	78.0	130.0	78.0	130.0	16.0	0.6 ug/L	2 ug/L	3.18 x MDL
18.	Nitrate - IC	300.0	100.7	5	Single	MCAWW	3	10 %	10000	10 mg/L	74.0	128.0	15.0	70.0	131.0	70.0	131.0	18.0	13 ug/L	50 ug/L	3.18 x MDL

Standardized QC and QC Acceptance Criteria for Methods in 40 CFR 141.23(k)(1)

		Data					Specifications													
		Reference		Prec-			CAL		MCL	Spike	IPR Recovery		Prec-	OPR Recovery		MS/MSD Recovery			ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	Points	Lin	(ug/L)	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
	Nitrate - Cd/Auto	353.2	97.31	7.10	Multi	MCAWW	3	10 %	10000	2.5 mg/L	83.0	112.0	15.0	81.0	113.0	81.0	113.0	15.0		50 ug/L	Range
	Nitrate - ISE	---							10000												
19.	Nitrite - IC	300.0	97.7	5	Single	MCAWW	3	10 %	1000	100 ug/L	71.0	125.0	15.0	67.0	128.0	67.0	128.0	18.0	4 ug/L	10 ug/L	3.18 x MDL
	Nitrite - Cd/Auto	353.2	97.31	7.10	Multi	MCAWW	3	10 %	1000	2.5 mg/L	83.0	112.0	15.0	81.0	113.0	81.0	113.0	15.0		50 ug/L	Range
	Nitrite - Spec/Auto	---							1000												
	Nitrite - Spec/Auto	---							1000												
20.	O-phosphate - IC	300.0	100.4	3.8	Single	MCAWW	3	10 %	---	500 ug/L	80.0	121.0	11.4	77.0	124.0	77.0	124.0	14.0	61 ug/L	200 ug/L	3.18 x MDL
	O-phosphate - Asc/Auto	365.1	87.2	22	Multi	MCAWW	3	10 %	---	300 ug/L	43.0	132.0	45.0	38.0	136.0	38.0	136.0	44.0		10 ug/L	Range
	O-phosphate - Asc/Sing	---							---												
	O-phosphate - Phos/Mo	---							---												
	O-phosphate - Auto/seg	---							---												
	O-phosphate - Auto/Dis	---							---												
21.	Selenium - Furnace	---							50												
	Selenium - Hydride	---							50												
	Selenium - ICP/MS	200.8	102.48	9.8	Multi	Tbl 12	3	10 %	50	50 ug/L	82.0	123.0	20.0	80.0	125.0	80.0	125.0	20.0	7.9 ug/L	20 ug/L	3.18 x MDL
	Selenium - STGFAA	200.9	88.9	10	Single	Tbl IE	3	10 %	50	25 ug/L	35.0	142.0	30.0	28.0	149.0	28.0	149.0	36.0	0.6 ug/L	2 ug/L	3.18 x MDL

Standardized QC and QC Acceptance Criteria for Methods in 40 CFR 141.23(k)(1)

		Data					Specifications													
		Reference		Prec-			CAL		MCL	Spike	IPR Recovery		Prec-	OPR Recovery		MS/MSD Recovery			ML	ML
No.	Analyte	Method	Recovery	ision	Labs	Source	Points	Lin	(ug/L)	conc	Low	High	ision	Low	High	Low	High	RPD	MDL	Value	Calc
22.	Silica - ICP	200.7	53.86	45.38	Multi	Apx C	5	25 %	---	1 mg/L	d	145.0	91.0	d	154.0	d	154.0	91.0	58 ug/L	200 ug/L	3.18 x MDL
	Silica - Color	---							---												
	Silica - Color/Mo Blue	---							---												
	Silica - Molybdosil	---							---												
	Silica - Heteropoly	---							---												
	Silica - Auto/Mo react	---							---												
23.	Sodium - Flame	---							---												
	Sodium - ICP	200.7	99.77	24.27	Multi	Apx C	5	25 %	---	1 mg/L	51.0	149.0	49.0	46.0	154.0	46.0	154.0	49.0	29 ug/L	100 ug/L	3.18 x MDL
24.	Temperature	---																			
25.	Thallium - ICP/MS	200.8	101.5	14.5	Multi	Tbl 12	3	10 %	2.0	2 ug/L	72.0	131.0	29.0	69.0	134.0	69.0	134.0	29.0	0.3 ug/L	1 ug/L	3.18 x MDL
	Thallium - STGFAA	200.9	95.4	2.8	Single	Tbl IE	3	10 %	2.0	20 ug/L	80.0	111.0	8.4	78.0	113.0	78.0	113.0	11.0	0.7 ug/L	2 ug/L	3.18 x MDL

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Note to Table "Standardized QC and QC Acceptance Criteria for Methods in 40 CFR 141.23(k)(1)"

The QC acceptance criteria given in this table were developed from data published in the following sources. For Method 200.7, incorporated by reference into 40 CFR 141.23(k)(1), QC acceptance criteria were developed using the regression equations in Table 9 at the end of the method and published in Table 4 of Method 200.7 at 40 CFR 136, Appendix C. The concentration given in the Spike Conc column is the concentration at which the QC acceptance criteria were calculated. For calculating the precision criterion, the overall standard deviation (S) was used (not the single-analyst standard deviation (SR)). For the remaining 200-series metals methods, QC acceptance criteria were developed from data in a table either at the end of the method, as referenced in the table, or from performance data published at the end of each method in Methods for Chemical Analysis of Water and Wastes (MCAWW; EPA 600/4–79–020; NTIS PB–123677). For methods other than Method 200.7 and the 200-series metals methods, data published at the end of each method were used, if available; otherwise default QC acceptance criteria, as described below, were used.

The databases used to develop regression equations for Method 200.7 and the 200-series metals methods were not readily available. Therefore, QC acceptance criteria were calculated using the procedures given in the Streamlining Guide. Where interlaboratory data were available, these data were used and the QC limits were calculated as follows:

IPR lower recovery limit = average $-2 \times$ interlab sd
IPR upper recovery limit = average $+ 2 \times$ interlab sd
IPR precision limit = $2 \times$ sd
OPR and MS/MSD lower limit = average recovery $-2.2 \times$ interlab sd
OPR and MS/MSD upper limit = average recovery $+ 2.2 \times$ interlab sd

Where interlaboratory data were not available but single-laboratory data were available, the single-laboratory data were used and the QC limits were calculated as follows:

IPR lower recovery limit = average $-6.0 \times$ interlab sd
IPR upper recovery limit = average $+ 6.0 \times$ interlab sd
IPR precision limit = $3.0 \times$ sd
OPR/MS/MSD lower recovery limit = average $-6.0 \times$ interlab sd
OPR/MS/MSD upper recovery limit = average $+ 6.0 \times$ interlab sd

The multipliers include interlaboratory/single-laboratory allowances and are explained in the Streamlining Guide.

Where neither interlaboratory nor single-laboratory data were available, default values of 100 percent recovery and either 5 or 10 percent RSD were used and the QC limits were calculated assuming single laboratory data. This resulted in the following default values:

IPR lower recovery limit: 47%
IPR upper recovery limit: 153%
IPR precision limit: 30% RSD
OPR/MS/MSD lower recovery limit: 40%
OPR/MS/MSD upper recovery limit: 160%

Minimum levels were set by setting the ML to the low end of the range listed in the method or, if an MDL was available, by multiplying the MDL by 3.18 and rounding to the number nearest to 1, 2, or 5×10^n, where n is an integer.

3. On page 15049, Table 141.40(n)(11) is corrected to read as follows:

TABLE 141.40(N)(11)

Parameter/ Methodology	Reference method	Other approved methods		
		EPA	Standard methods 18th ed.[1]	Other
1. aldicarb				
HPLC/Fl	531.1		6610	.....
2. aldicarb sulfone				
HPLC/Fl	531.1		6610	.....
3. aldicarb sulfoxide				
HPLC/Fl	531.1		6610	.....
4. aldrin				
GC/ECD	508.1	505, 508	.....	.....
GC/MS	525.2		.....	.....
5. butachlor				
GC/MS	525.2		.....	.....
GC/NPD	507		.....	.....
6. carbaryl				
HPLC/Fl	531.1		6610	.....
7. dicamba				
GC/ECD	515.2	515.1	.....	.....
HPLC	555		.....	.....
8. dieldrin				
GC/ECD	508.1	505, 508	.....	.....
HPLC	525.2		.....	.....
9. 3-hydroxycarbofuran				
HPLC/Fl	531.1		6610	.....
10. methomyl				
HPLC/Fl	531.1		6610	.....
11. metolachlor				
GC/ECD	508.1		.....	.....
GC/MS	525.2		.....	.....
GC/NPD	507		.....	.....
12. metribuzin				
GC/ECD	508.1		.....	.....
GC/MS	525.2		.....	.....
GC/NPD	507		.....	.....
13. propachlor				
GC/ECD	508.1	508	.....	.....
GC/MS	525.2		.....	.....

Note: The following acronyms are used in this table:
ECD Electron Capture Detector
Fl Fluorescence

GC Gas Chromatography
GC/MS Gas Chromatography/Mass Spectrometry
HPLC High Performance Liquid Chromatography
NPD Nitrogen Phosphorous Detector
UV Ultraviolet Detector

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