

Test Methods and Minimum Levels

Test methods found in 40 CFR §136 are required for all analyses of parameters under this general permit unless other test methods are explicitly required or allowed in this general permit.¹ All analyses of parameters under this general permit must comply with the *National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting* rule.² Only sufficiently sensitive test methods may be used for analyses of parameters under this general permit. A test method is sufficiently sensitive where:³

1. The method minimum level (ML) is at or below the level of the applicable water quality criterion or permit limitation for the measured pollutant or pollutant parameter;
2. In the case of NOIs, the ML is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a site's discharge is high enough that the method detects and quantifies the level of the pollutant or parameter in the discharge; or
3. The method has the lowest ML of the EPA-approved analytical methods.

For the purposes of the RGP, the ML is the lowest level at which the laboratory analytical testing method provides a detectable concentration of the target analyte in a sample.⁴ The ML represents the lowest concentration at which the concentration of a parameter can be measured with a known level of confidence. The MLs specified in this appendix may be:

1. Published in a method;
2. Concentrations equivalent to the lowest acceptable calibration point used by a laboratory;
3. Calculated by multiplying the method detection limit (MDL) in a method, the MDL determined by a lab,⁵ or an interim ML (IML) by a multiplying factor; or
4. An IML, based on the actual performance for a test method at EPA's New England Regional Laboratory.

The detection limit (DL) for all parameters in this general permit must be equal to or less than the ML required for that parameter. When a sample is analyzed for a parameter, but the parameter is not detected ("non-detect"), operators must report the non-detect using the data qualifier signifying less than the DL achieved for that parameter (e.g., <2 µg/L, if the DL reported for the parameter is 2 µg/L). For the purposes of the RGP, the DL is the lowest concentration that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method during routine laboratory operating conditions (i.e., the level above which a value is reported for an analyte, and the level below which an analyte is reported as non-detect).

For parameters included in the RGP that are limited below the MLs specified, an operator will be in compliance with the test method and ML requirements for a parameter if the sample result is below the compliance level specified in Part 2.1.1 of the RGP for that parameter.

¹ Test methods approved under CWA §304(h), including approved alternative test procedures and allowable method modifications. See 40 CFR Part 136.5 and 136.6.

² Federal Register, Vol. 79, No. 160, Tuesday, August 19, 2014; FR Doc. 2014-19557.

³ 40 CFR §122.21(e)(3), 40 CFR §122.44(i)(1)(iv) and 40 CFR §136.1.

⁴ EPA is considering related terms to be synonymous, which include, but are not limited to: "quantitation limit," "reporting limit," and "level of quantitation".

⁵ The MDL is determined using the procedure at 40 CFR Part 136, appendix B, defined as the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

Parameter	Chemical Abstracts Service (CAS) Number(s)	Inorganic Test Methods				
		ICP/AES ¹ 200.7	ICP/MS ² 200.8	GFAA ³ 200.9	Other	Notes
						Digestion
a. Inorganics						
Ammonia					SM ⁴ 4500 B and D (0.1 mg/L) 350.1 (0.01 mg/L)	
Chloride	16887006				300.0, SM ⁴ 4110 B (0.1 mg/L)	
Total Residual Chlorine	7782-50-5				SM ⁴ 4500-Cl D (200 µg/L) SM ⁴ 4500-Cl G (50 µg/L) SM ⁴ 4500-Cl E	
Total Suspended Solids					160.2 SM ⁴ 2540D (5 mg/L)	
Antimony	7440360	20 µg/L	0.5 µg/L	3 µg/L		200
Arsenic	7440382	20 µg/L	1 µg/L	3 µg/L		206.5
Cadmium	7440439	10 µg/L	0.2 µg/L	0.5 µg/L		200
Chromium III	7440473	20 µg/L	1 µg/L	1 µg/L		200
Chromium VI	18540299				7196 A (10 µg/L) 218.6, 1636 (1 µg/L)	
Copper	7440508	20 µg/L	0.2 µg/L	3 µg/L		200
Iron	7439896	40 µg/L	55 µg/L			200
Lead	7439921	20 µg/L	0.2 µg/L	3 µg/L		200
Mercury	7439976				245.1, 7470 A (0.2 µg/L) 245.7, 1631 (0.001 µg/L)	3112 B
Nickel	7440020	20 µg/L	0.2 µg/L	5 µg/L		200
Selenium	7782492	40 µg/L	1 µg/L	5 µg/L		200
Silver	7440224	10 µg/L	0.2 µg/L	5 µg/L		200
Zinc	7440666	15 µg/L	2 µg/L			200
Cyanide	57125				335.4 (5 µg/L)	4500-CN OIA-1677 (5 µg/L)

Parameter	CAS Number(s)	Organic Test Methods				
		GC ⁵	GC/MS ⁶	HPLC ⁷	State Methods ⁸	Other ⁹
b. Non-Halogenated Volatile Organic Compounds						
Total BTEX	71-43-2 + 108-88-3 + 100-41-4 + 106-42-3 + 95-47-6 + 1330-20-7	602 (0.5 µg/L)	624 (1-2 µg/L) 1624 (2-4 µg/L)		MA VPH (5 µg/L)	8260 (2 µg/L) 524.2 (0.5 µg/L)
Benzene	71-43-2	602 (0.5 µg/L)	624, 1624 (2 µg/L)		MA VPH (5 µg/L)	8260 (2 µg/L) 524.2 (0.5 µg/L)
1,4 Dioxane	123-91-1		1624 (50 µg/L)			8260 (5 µg/L) 522 (0.1 µg/L)
Acetone	67-64-1		1624 (50 µg/L)			8260 (50 µg/L) 524.2 (10 µg/L)
Phenol	108-95-2		625 (2.5 µg/L)			8270 (5 µg/L) 420.1, 420.2 (2 µg/L) 420.4 (50 µg/L)
c. Halogenated Volatile Organic Compounds						
Carbon Tetrachloride	56-23-5	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
1,2 Dichlorobenzene	95-50-1	601, 602 (0.5 µg/L)	624 (2.5 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
1,3 Dichlorobenzene	541-73-1	601, 602 (0.5 µg/L)	624 (2.5 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
1,4 Dichlorobenzene	106-46-7	601, 602 (0.5 µg/L)	624 (2.5 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
Total dichlorobenzene	95-50-1 + 541-73-1 + 106-46-7	601, 602 (0.5 µg/L)	624 (2.5 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
1,1 Dichloroethane	75-34-3	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)

Parameter	CAS Number(s)	Organic Test Methods				
		GC ⁵	GC/MS ⁶	HPLC ⁷	State Methods ⁸	Other ⁹
1,2 Dichloroethane	107-06-2	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
1,1 Dichloroethylene	75-35-4	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
Ethylene Dibromide ¹⁷	106-93-4	8011, 504.1 (0.01 µg/L) 618 (1 µg/L)	SIM ¹⁰ (0.1 µg/L)			524.2 (1 µg/L) 8260 (10 µg/L)
Methylene Chloride	75-09-2	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
1,1,1 Trichloroethane	71-55-6	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
1,1,2 Trichloroethane	79-00-5	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
Trichloroethylene	79-01-6	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
Tetrachloroethylene	127-18-4	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
cis-1,2 Dichloroethylene	156-59-2	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
Vinyl Chloride	75-01-4	601 (0.5 µg/L)	624 (1 µg/L)			8260 (5 µg/L) 524.2 (0.5 µg/L)
d. Non-Halogenated Semi-Volatile Organic Compounds						
Total Phthalates	85-68-7 + 84-742 + 117-84-0 + 84-66-2 + 131-11-3 + 117-81-7	606 (10 µg/L)	625 (2.5 µg/L) 1625 (5 µg/L)			8270 (5 µg/L) 525.2 (0.5 µg/L)
Diethylhexyl phthalate	117-81-7	606 (10 µg/L)	625 (2.5 µg/L) 1625 (5 µg/L)			8270 (5 µg/L) 525.2 (0.5 µg/L)

Parameter	CAS Number(s)	Organic Test Methods				
		GC ⁵	GC/MS ⁶	HPLC ⁷	State Methods ⁸	Other ⁹
Total Group I Polycyclic Aromatic Hydrocarbons	56-55-3 + 50-32-8 + 205-99-2 + 207-08-9 + 218-01-9 + 53-70-3 + 193-39-5	610 (5 µg/L)	625 (0.5 µg/L) 1625 (10-20 µg/L)	610 (0.5-2 µg/L)	MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 525.2 (0.5 µg/L)
Benzo(a)anthracene	56-55-3	610 (5 µg/L)	625 (0.5 µg/L)	610 (2 µg/L)	MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 525.2 (0.5 µg/L)
Benzo(a)pyrene	50-32-8	610 (5 µg/L)	625 (0.5 µg/L)	610 (2 µg/L)	MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 525.2 (0.5 µg/L)
Benzo(b)fluoranthene	205-99-2	610 (5 µg/L)	625 (0.5 µg/L)	610 (2 µg/L)	MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 525.2 (0.5 µg/L)
Benzo(k)fluoranthene	207-08-9	610 (5 µg/L)	625 (0.5 µg/L)	610 (2 µg/L)	MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 525.2 (0.5 µg/L)
Chrysene	218-01-9	610 (5 µg/L)	625 (0.5 µg/L)	610 (2 µg/L)	MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 525.2 (0.5 µg/L)
Dibenzo(a,h)anthracene	53-70-3	610 (5 µg/L)	625 (0.5 µg/L)	610 (2 µg/L)	MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 525.2 (0.5 µg/L)
Indeno(1,2,3-cd)pyrene	193-39-5	610 (5 µg/L)	625 (0.5 µg/L)	610 (0.5 µg/L)	MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 525.2 (0.5 µg/L)

Parameter	CAS Number(s)	Organic Test Methods				
		GC ⁵	GC/MS ⁶	HPLC ⁷	State Methods ⁸	Other ⁹
Total Group II Polycyclic Aromatic Hydrocarbons	83-32-9 + 208-96-8 + 120-12-7 + 191-24-2 + 206-44-0 + 86-73-7 + 91-20-3 + 85-01-8 + 129-00-0	610 (5 µg/L)	625 (0.5-2.5 µg/L)	610 (0.5-2 µg/L)	MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 525.2 (0.5 µg/L)
Naphthalene	91-20-3	610 (5 µg/L)	625 (0.5 µg/L)	610 (2 µg/L)	MA VPH (5 µg/L) MA EPH (5 µg/L)	8270 (5 µg/L) SIM ¹⁰ (0.1 µg/L) 524.2 (0.5 µg/L) 8260 (2 µg/L)
e. Halogenated Semi-Volatile Organic Compounds						
Total Polychlorinated Biphenyls	1336-36-3A	608 (0.5 µg/L)				8082 (0.5 µg/L) 1668B (0.00005 µg/L)
Pentachlorophenol	87-86-5	604 (10 µg/L)	625 (5 µg/L)			8270 525 (5 µg/L)
f. Fuels Parameters						
Total Petroleum Hydrocarbons					1664A (5 mg/L)	
Ethanol	64-17-5					1666/1671/D3695
Methyl-tert-Butyl Ether	1634-04-4		524.2 (10 µg/L)		MA VPH (5 µg/L)	8260 (10 µg/L)
tert-Butyl Alcohol	75-65-0		524.2 (10 µg/L)			624, 8260 (10 µg/L)
tert-Amyl Methyl Ether	994-05-08		524.2 (10 µg/L)			624, 8260 (10 µg/L)

Footnotes:

- ¹ Inductively Coupled Plasmas/Atomic (optical) Emissions Spectrometry
- ² Inductively Coupled Plasmas/Mass Spectrometry
- ³ Graphite Furnace Atomic Absorption
- ⁴ Standard Method
- ⁵ Gas Chromatography
- ⁶ Gas Chromatography/Mass Spectrometry
- ⁷ Liquid Chromatography
- ⁸ The Massachusetts test methods for Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH) cannot be used for the purposes of analysis under this general permit.
- ⁹ Test methods 8260 and 8270 cannot be used for the purposes of analysis under this general permit unless approved for use in accordance with 40 CFR Part 136.5. Specific preparation methods may be required.
- ¹⁰ Selected Ion Monitoring is a test method modification allowed in 40 CFR Part 136.6.

Additional Notes:

- ¹ Method revision numbers are generally not shown. Generally, the most recent method revision should be used for analyses.
- ² The ML for SM⁵ 4500-CI D, the amperometric direct method, 200 µg/L, is the level above which this method is recommended for use, as noted in the method; the ML for SM⁵ 4500-CI G, the DPD spectrophotometric method (DPD colorimetric method), 50 µg/L, is the lowest acceptable calibration point, as noted in the method, and is the compliance level for TRC in this general permit. SM 4500-CI E, the low-level amperometric direct method (low-level amperometric titration method) should be used when the TRC effluent limitation is < 50 µg/L. A ML is not noted in the method for SM 4500-CI E, but a detection limit of 10 µg/L is noted. See Standard Methods for the Examination of Water and Wastewater for the full text of these methods.
- ³ Method OIA-1677 does not measure iron cyanide complexes.
- ⁴ Methods 522, 504.1, 524, and 525.2 are drinking water methods that can be used in special situations.
- ⁵ Methods 3520 (continuous extraction), 3535 (solid phase extraction), and 3510 (separatory funnel extraction) are comparable organic preparation methods.