

Environmental Protection Agency
§ 141.25

Contaminant	Detection limit (mg/l)
Hexachlorobenzene .....	.0001
Hexachlorocyclopentadiene .....	.0001
Lindane .....	.00002
Methoxychlor .....	.0001
Oxamyl .....	.002
Picloram .....	.0001
Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl) .....	.0001
Pentachlorophenol .....	.00004
Simazine .....	.00007
Toxaphene .....	.001
2,3,7,8-TCDD (Dioxin) .....	.000000005
2,4,5-TP (Silvex) .....	.0002

(19) Analysis under this section shall only be conducted by laboratories that have received certification by EPA or the State and have met the following conditions:

(i) To receive certification to conduct analyses for the contaminants in § 141.61(c) the laboratory must:

(A) Analyze Performance Evaluation (PE) samples provided by EPA, the State, or by a third party (with the approval of the State or EPA) at least once a year by each method for which the laboratory desires certification.

(B) For each contaminant that has been included in the PE sample achieve quantitative results on the analyses that are within the following acceptance limits:

Contaminant	Acceptance limits (percent)
DBCP	±40
EDB	±40.
Aalachlor	±45.
Atrazine	±45.
Benz[a]pyrene	2 standard deviations.
Carbofuran	±45.
Chlordane	±45.
Dalapon	2 standard deviations.
Di(2-ethylhexyl)adipate	2 standard deviations.
Di(2-ethylhexyl)phthalate	2 standard deviations.
Dinoseb	2 standard deviations.
Diquat	2 standard deviations.

Contaminant	Acceptance limits (percent)
Endothall	2 standard deviations.
Endrin	±30.
Glyphosate	2 standard deviations.
Heptachlor	±45.
Heptachlor epoxide	±45.
Hexachlorobenzene	2 standard deviations.
Hexachloro- cyclopentadiene	2 standard deviations.
Lindane	±45.
Methoxychlor	±45.
Oxamyl	2 standard deviations.
PCBs (as Decachlorobiphenyl)	0–200.
Picloram	2 standard deviations.
Simazine	2 standard deviations.
Toxaphene	±45.
Aldicarb	2 standard deviations.
Aldicarb sulfoxide	2 standard deviations.
Aldicarb sulfone	2 standard deviations.
Pentachlorophenol	±50.
2,3,7,8-TCDD (Dioxin)	2 standard deviations.
2,4-D	±50.
2,4,5-TP (Silvex)	±50.

(ii) [Reserved]

(Approved by the Office of Management and Budget under control number 2040-0090)

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§ 141.25 Analytical methods for radioactivity.

(a) Analysis for the following contaminants shall be conducted to determine compliance with §§ 141.15 and 141.16 (radioactivity) in accordance with the methods in the following table, or their equivalent determined by EPA in accordance with § 141.27.

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Contaminant	Methodology	Reference (method or page number)								
		EPA ¹	EPA ²	EPA ³	EPA ⁴	SM ⁵	ASTM ⁶	USGS ⁷	DOE ⁸	Other
Naturally occurring:										
Gross alpha ⁿ and beta.	Evaporation	900.0	p 1	00-01	p 1	302, 710 B		R-1120-76		
Gross alpha ¹¹	Co-precipitation	903.1	p 16	00-02	p 19	710 C	D 3454-91	R-1141-76		
Radium 226	Radon emanation	903.0	p 13	Ra-03		304, 305,	D 2460-90	R-1140-76	Ra-05	N.Y. ⁹
	Radio chemical	904.0	p 24	Ra-05	p 19	7500 Ra B		R-1142-76		
Radium 228	Radio chemical	904.0				304, 7500-Ra D				
	Fluorometric	908.0				7500 U B	D 2907-91	R-1180-76		
Uranium ¹²	Alpha spectrometry	908.1				7500 U C (17th Ed.)		R-1181-76		
	Alpha spectrometry					7500 U C (18th or 19th Ed.)	D 3972-90	R-1182-76		
	Laser Phospho rometry						D 5174-91			
Man-made:	Radio chemical	901.0	p 4			7500-Cs B	D 2459-72	R-1111-76		
Radioactive cesium.	Gamma ray spectrometry.	901.1				7120 (19th Ed.)	D 3649-91	R-1110-76		
	Gamma ray spectrometry.	902.0	p 6			7500-I B	D 3649-91	R-1111-76		
	Radio chemical	902.0	p 9			7500-I C				
	Gamma ray spectrometry.	901.1				7500-I D	D 4785-88			
	Radio chemical	905.0	p 29			7120 (19th Ed.)				
Radioactive iodine	Gamma ray spectrometry.	905.0				303, 7500-Sr B				
	Radio chemical	906.0	p 34	Sr-04	p 65	306, 7500-3H B	R-1160-76			
	Liquid scintillation	901.1	H-02		p 87	7120 (19th Ed.)	D 4079-91	R-1171-76		
Radioactive Strontium 89, 90.	Gamma ray	902.0	p 92		p 92	7500-Cs B	D 3649-91			
Tritium	Gamma emitters	901.0				7500-I B	D 4785-88			

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of documents 1 through 10 was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW., Washington, DC 20460 (Telephone: 202-260-3027); or at the Office of Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC. 1."Described Procedures for Measurement of Radioactivity in Drinking Water", EPA 600/4-80-032, August 1980. Available at U.S. Department of Commerce, National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161 (Telephone 800-553-8847), PB 80-22-744.

2."Interim Radiochemical Methodology for Drinking Water", EPA 600/4-75-008(revised), March 1976. Available at NTIS, ibid. PB 255255.

3."Radiochemistry Procedures for Analysis of Environmental Samples", March 1979. Available at NTIS, ibid. EMISL LV 053917.

4."Radiochemical Analytical Procedures for Analysis of Environmental Samples", March 1979. Available at American Public Health Association, 1015 Fifteenth Street N.W., Washington, D.C. 20005. All methods for the Examination of Water and Wastewater", 13th, 17th, 18th, 19th Editions. 1971, 1989, 1992, 1995. Available at American Public Health Association, 1015 Fifteenth Street N.W., Washington, D.C. 20005. All methods for the Examination of Water and Wastewater", 13th, 17th and 19th editions except 7500-U C Fluorometric Uranium was discontinued after the 17th Edition, 7/20 Gamma Emitters is only in the 13th Edition, and 302, 303, 304, 305 and 306 are only in the 13th Edition.

5."Standard Methods for the Examination of Water and Wastewater", 13th, 17th, 18th and 19th editions, except 7500-U C Fluorometric Uranium was discontinued after the 17th Edition, 7/20 Gamma Emitters is only in the 13th Edition, and 302, 303, 304, 305 and 306 are only in the 13th Edition.

6."Annual Book of ASTM Standards", Vol. 1, 102, 1994. Available at American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

7."Methods for Determination of Radionuclides in Water and Fluvial Sediments", Chapter A-6 in Book 5 of "Techniques of Water-Resources Investigations of the United States Geological Survey, 1977. Available at U.S. Geological Survey (USGS) Information Services, Box 25286, Federal Center, Denver, CO 80225-0425.

8."EMIL Procedures Manual", 27th Edition, Volume 1, 1990. Available at the Environmental Measurements Laboratory, U.S. Department of Energy (DOE), 376 Hudson Street, New York, NY 10014-3621.

⁹ "Determination of Ra-226 and Ra-228 (Ra-02)" January 1980, Revised June 1982. Available at Radiological Sciences Institute Center for Laboratories and Research, New York State Department of Health, Empire State Plaza, Albany, NY 12201

¹⁰ "Determination of Radon 228 in Drinking Water", August 1980. Available at State of New Jersey, Department of Environmental Protection, Division of Environmental Quality, Bureau of Radiation and Inorganic Analytical Services, 9 Ewing Street, Trenton, NJ 08625.

¹¹ Natural uranium and thorium-230 are approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods; americium-241 is approved with co-precipitation methods.

¹² Uranium (U) is determined by mass, a 0.67 pCi/ μ g of uranium conversion factor must be used. This conservative factor is based on the 1:1 activity ratio of U-234 to U-238 that is characteristic of naturally occurring uranium.

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(b) When the identification and measurement of radionuclides other than those listed in paragraph (a) of this section is required, the following references are to be used, except in cases where alternative methods have been approved in accordance with § 141.27.

(1) *Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions*, H. L. Krieger and S. Gold, EPA-R4-73-014. USEPA, Cincinnati, Ohio, May 1973.

(2) *HASL Procedure Manual*, Edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, NY., 1973.

(c) For the purpose of monitoring radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus 100 percent at the 95 percent confidence level (1.96σ where σ is the standard deviation of the net counting rate of the sample).

(1) To determine compliance with § 141.15(a) the detection limit shall not exceed 1 pCi/l. To determine compliance with § 141.15(b) the detection limit shall not exceed 3 pCi/l.

(2) To determine compliance with § 141.16 the detection limits shall not exceed the concentrations listed in Table B.

TABLE B—DETECTION LIMITS FOR MAN-MADE BETA PARTICLE AND PHOTON EMITTERS

Radionuclide	Detection limit
Tritium	1,000 pCi/l.
Strontrium-89	10 pCi/l.
Strontrium-90	2 pCi/l.
Iodine-131	1 pCi/l.
Cesium-134	10 pCi/l.
Gross beta	4 pCi/l.
Other radionuclides	1/10 of the applicable limit.

(d) To judge compliance with the maximum contaminant levels listed in §§ 141.15 and 141.16, averages of data shall be used and shall be rounded to the same number of significant figures as the maximum contaminant level for the substance in question.

(e) The State has the authority to determine compliance or initiate enforcement action based upon analytical results or other information compiled by

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their sanctioned representatives and agencies.

[41 FR 28404, July 9, 1976, as amended at 45 FR 57345, Aug. 27, 1980; 62 FR 10173, Mar. 5, 1997]

§ 141.26 Monitoring frequency for radioactivity in community water systems.

(a) Monitoring requirements for gross alpha particle activity, radium-226 and radium-228.

(1) Initial sampling to determine compliance with § 141.15 shall begin within two years of the effective date of these regulations and the analysis shall be completed within three years of the effective date of these regulations. Compliance shall be based on the analysis of an annual composite of four consecutive quarterly samples or the average of the analyses of four samples obtained at quarterly intervals.

(i) A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis *Provided*, That the measured gross alpha particle activity does not exceed 5 pCi/l at a confidence level of 95 percent (1.65σ where σ is the standard deviation of the net counting rate of the sample). In localities where radium-228 may be present in drinking water, it is recommended that the State require radium-226 and/or radium-228 analyses when the gross alpha particle activity exceeds 2 pCi/l.

(ii) When the gross alpha particle activity exceeds 5 pCi/l, the same or an equivalent sample shall be analyzed for radium-226. If the concentration of radium-226 exceeds 3 pCi/l the same or an equivalent sample shall be analyzed for radium-228.

(2) For the initial analysis required by paragraph (a)(1) of this section, data acquired within one year prior to the effective date of this part may be substituted at the discretion of the State.

(3) Suppliers of water shall monitor at least once every four years following the procedure required by paragraph (a)(1) of this section. At the discretion of the State, when an annual record taken in conformance with paragraph (a)(1) of this section has established that the average annual concentration is less than half the maximum contaminant levels established by § 141.15,