

## SCHEDULE 4

### Sampling and analysis

#### PART 3

##### Monitoring for indicative dose and analytical performance characteristics

**6.** A local authority may use reliable screening strategies to indicate the presence of radioactivity in water intended for human consumption.

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**Commencement Information**

**I1** Sch. 4 para. 6 in force at 20.11.2017, see [reg. 1](#)

- 7.** The strategies referred to in paragraph 6 may include screening for—
- (a) certain radionuclides or individual radionuclide; or
  - (b) gross alpha activity or gross beta activity (where appropriate gross beta activity may be replaced by residual beta activity after subtraction of the K-40 activity concentration).

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**Commencement Information**

**I2** Sch. 4 para. 7 in force at 20.11.2017, see [reg. 1](#)

##### Screening for certain radionuclides, or screening for an individual radionuclide

**8.** If one of the activity concentrations exceeds 20% of the corresponding derived value or the tritium concentration exceeds its parametric value listed in Part 3 of Schedule 1 an analysis of additional radionuclides is required.

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**Commencement Information**

**I3** Sch. 4 para. 8 in force at 20.11.2017, see [reg. 1](#)

**9.** A local authority must, in deciding which radionuclides require to be measured for each supply, take into account all relevant information about likely sources of radioactivity.

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**Commencement Information**

**I4** Sch. 4 para. 9 in force at 20.11.2017, see [reg. 1](#)

##### Screening strategies for gross alpha activity and gross beta activity

- 10.** Subject to paragraph 11 the recommended screening levels are—
- (a) 0,1Bq/l for gross alpha activity; and
  - (b) 1,0Bq/l for gross beta activity.

**Changes to legislation:** There are currently no known outstanding effects for the The Private Water Supplies (Wales) Regulations 2017, PART 3. (See end of Document for details)

**Commencement Information**

**I5** Sch. 4 para. 10 in force at 20.11.2017, see [reg. 1](#)

**11.** If the gross alpha activity exceeds 0,1Bq/l or the gross beta activity exceeds 1,0Bq/l, analysis for specific radionuclides is required.

**Commencement Information**

**I6** Sch. 4 para. 11 in force at 20.11.2017, see [reg. 1](#)

**12.** The Welsh Ministers may set alternative screening levels for gross alpha activity and gross beta activity where it can be demonstrated by the local authority that the alternative levels are in compliance with an indicative dose of 0,1 mSv.

**Commencement Information**

**I7** Sch. 4 para. 12 in force at 20.11.2017, see [reg. 1](#)

**Calculation of the indicative dose**

**13.** The indicative dose must be calculated from—

- [<sup>F1</sup>(a) the measured radionuclide concentrations and the dose coefficients referred to as “standard values and relationships” in Article 13, and recommended for the estimation of doses from internal exposure in the definition of “standard values and relationships” in Article 4(96), of Council Directive 2013/59/Euratom laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation; or]
- (b) more recent information recognised by the Welsh Ministers, on the basis of the annual intake of water (730 l for adults).

**Textual Amendments**

**F1** Sch. 4 para. 13(a) substituted (28.3.2019) by [The Rural Affairs, Environment, Fisheries and Food \(Miscellaneous Amendments and Revocations\) \(Wales\) Regulations 2019 \(S.I. 2019/463\)](#), regs. 1(3), 29(3)

**Commencement Information**

**I8** Sch. 4 para. 13 in force at 20.11.2017, see [reg. 1](#)

**14.** Where the following formula is satisfied, it can be assumed that the indicative dose is less than the parametric value of 0,1 mSv and no further investigation is required—

**Derived concentrations for radioactivity in water intended for human consumption (l)**

Origin	Nuclide	Derived concentration
Natural	U-238 <sup>3</sup>	3,0 Bq/l

(1) This table allows only for the radiological properties of uranium, not for its chemical toxicity.

Origin	Nuclide	Derived concentration
Artificial	U-234 <sup>3</sup>	2,8 Bq/l
	Ra-226	0,5 Bq/l
	Ra-228	0,2 Bq/l
	Pb-210	0,2 Bq/l
	Po-210	0,1 Bq/l
	C-14	240 Bq/l
	Sr-90	4,9 Bq/l
	Pu-239/Pu-240	0,6 Bq/l
	Am-241	0,7 Bq/l
	Co-60	40 Bq/l
	Cs-134	7,2 Bq/l
	Cs-137	11 Bq/l
I-131	6,2 Bq/l	

(1) This table allows only for the radiological properties of uranium, not for its chemical toxicity.

#### Commencement Information

**I9** Sch. 4 para. 14 in force at 20.11.2017, see [reg. 1](#)

#### Performance characteristics and methods of analysis

**15.** For the following parameters and radionuclides, the method of analysis used must, as a minimum, be capable of measuring activity concentrations with a limit of detection specified below:

Parameters and radionuclides	Limit of detection (Notes 1,2)	Notes
Tritium	10 Bq/l	Note 3
Radon	10 Bq/l	Note 3
gross alpha	0,04 Bq/l	Note 4
gross beta	0,4 Bq/l	Note 4
U-238	0,02 Bq/l	
U-234	0,02 Bq/l	
Ra-226	0,04 Bq/l	
Ra-228	0,02 Bq/l	Note 5
Pb-210	0,02 Bq/l	
Po-210	0,01 Bq/l	
C-14	20 Bq/l	
Sr-90	0,4 Bq/l	

**Changes to legislation:** There are currently no known outstanding effects for the The Private Water Supplies (Wales) Regulations 2017, PART 3. (See end of Document for details)

<b>Parameters and radionuclides</b>	<b>Limit of detection (Notes 1,2)</b>	<b>Notes</b>
Pu-239/Pu-240	0,04 Bq/l	
Am-241	0,06 Bq/l	
Co-60	0,5 Bq/l	
Cs-134	0,5 Bq/l	
C2-137	0,5 Bq/l	
1-131	0,5 Bq/l	

Note 1: The limit of detection must be calculated according to the ISO standard 11929: Determination of the characteristic limits (decision threshold, detection limit, and limits of confidence interval) for measurements of ionising radiation — Fundamentals and application, with probabilities of errors of 1st and 2nd kind of 0,05 each.

Note 2: Measurement uncertainties must be calculated and reported as complete standard uncertainties, or as expanded uncertainties with an expansion factor of 1,96 according the ISO Guide for the Expression of Uncertainty in Measurement.

Note 3: The limit of detection for tritium and for radon is 10% of its parametric value of 100 Bq/l.

Note 4: The limit of detection for gross alpha activity and gross beta activities are 40% of the screening values of 0,1 and 1,0 Bq/l respectively.

Note 5: This limit of detection applies only to initial screening for indicative dose for a new water source; if initial checking indicates that it is not plausible that Ra-228 exceeds 20% of the derived concentration, the limit of detection may be increased to 0,08 Bq/l for routine Ra-228 nuclide specific measurements, until a subsequent re-check is required.

#### **Commencement Information**

**I10** Sch. 4 para. 15 in force at 20.11.2017, see [reg. 1](#)

**Changes to legislation:**

There are currently no known outstanding effects for the The Private Water Supplies (Wales) Regulations 2017, PART 3.