



French Non Governmental Organization for Radioactivity Control

Independent laboratory of radioactivity analysis

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Analysis Report

RAP110617-OCJ(01)-v1

SAMPLE IDENTIFICATION


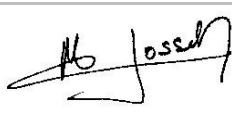
Sample's nature : Urines

Reference date : May, 20th 2011

Unit : Bq/l

RESULTS (Bq/l)

ACRO's identification	Sample No.	Sex / Age	Cesium-134	Cesium-137
100603-GPJ-01	U-1	Male / 9	1.04 ± 0.26	1.22 ± 0.28
100603-GPJ-02	U-2	Male / 16	0.76 ± 0.21	0.78 ± 0.22
100603-GPJ-03	U-3	Male / 6	0.76 ± 0.27	0.62 ± 0.23
100603-GPJ-04	U-4	Female / 8	0.41 ± 0.20	0.43 ± 0.19
100603-GPJ-05	U-5	Female / 9	0.91 ± 0.23	0.93 ± 0.23
100603-GPJ-06	U-6	Male / 6	0.80 ± 0.27	0.88 ± 0.27
100603-GPJ-07	U-7	Male / 7	1.00 ± 0.27	1.30 ± 0.30
100603-GPJ-08	U-8	Female / 8	1.13 ± 0.34	1.19 ± 0.35
100603-GPJ-09	U-9	Female / 8	0.70 ± 0.20	0.90 ± 0.22
100603-GPJ-10	U-10	Male / 13	1.06 ± 0.29	1.22 ± 0.30

VISA	
EDITOR	APPROVAL
	
Name	Name
Antoine BERNOLLIN	Mylène JOSSET

APPENDIX 1

ANALYSIS		GAMMA	
TITLE	Measurement of gamma emitters nuclides by gamma spectrometry		
TREATMENT	The raw sample is homogenised. A representative part is taken to be conditioned in a geometry adapted to the gamma measurement.		
MATERIAL	High-Purity Germanium (HPGe), type N coaxial , 32% efficiency, mounted in a vertical cryostat. The samples are placed in a 10-cm thick lead shielding. Data are readout by a digital acquisition system (DSPEC-ORTECH). The energy range is taken as 27-2000 keV. The containers are plastic round boxes with a fiducial volume of 61ml (ref. 7215) and standard geometries of 500ml.		
UNITS	The measured quantity is the activity in becquerel (Bq) per liter (L)		

RESULTS

IN GENERAL	<p>Measurements are performed with identical geometries as those of the standard (calibrated) sources. They concern gamma-emitters radionuclides displaying one or several emission peaks within the reference energy range. Among all the radionuclides detected in the samples, only the most abundant are displayed in the tables, without any specific demand from the client. In all cases, the tables display at least all detected artificial radionuclides.</p> <p>Only elements with activity larger than the decision threshold are given. On the contrary, for the specified radionuclides, the value of decision threshold is indicated, with the inferior "<" sign. When it is not possible to deduce a satisfying detection limit LD, the data are replaced by the sign "-". When an element has been detected but cannot be quantified properly, the mention "Identified but Not Quantified" (INQ) is reported. The measured activity of each radioelement is given with its absolute uncertainty calculated within a 95% interval of confidence (2 times the standard deviation). Each expressed activity, including the detection limit, is calculated at the reference date indicated in the table (collection date and time).</p>
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APPENDIX 2

INFORMATION ABOUT THE LABORATORY ACRO	
Measurements capacities	The ACRO laboratory can measure radon concentration in the air, tritium (HTO) in liquids and gamma radionuclides in all kind of matrices. Other measurements are under development. The measurement protocols are in accordance to the actual French and International standards (ISO/CEI 17025).
QUALIFICATION	
The laboratory is qualified for radioactivity measurements in the environment by the French nuclear safety authority (ASN)	
Décision n°DEP-DEU-0704-2009 du 8/12/09 De l'Autorité de Sûreté Nucléaire	<ul style="list-style-type: none"> - Measurement of gamma-emitters radionuclides in biological matrices - Tritium measurement in waters
Décision n°DEP-DIS-346-2008 de l'Autorité de Sûreté Nucléaire	<ul style="list-style-type: none"> - Radon concentration (volume activity) in public places
Décision n°CODEP-DEU-2010-031543 du 15/06/10 de l'Autorité de Sûreté Nucléaire	<ul style="list-style-type: none"> - Measurement of gamma-emitters radionuclides in waters - Uranium isotopes in soils - Thorium isotopes in soils - Radium-226/228 and decaying partners in soils.