

AN INTERACTIVE MAP OF NATURAL URANIUM CONTENT IN TAP WATER IN DWELLINGS SURROUNDING THE JOINT RESEARCH CENTRE OF ISPRA

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The largest part of JRC-ISPRA nuclear activities, today, belongs to **decommissioning** and **waste management** works: nuclear research activities are still performed in the field of **radioisotopes production**, **nanoparticles activation**, **nuclear safety and security**, etc.
Around **400 exposed workers** operate in the Ispra Site.

JRC-ISPRA applies on its Site the Italian Law, which specifies, among others, some requirements for Individual Monitoring of workers:

- Worker's radiological **classification**, according to risks' assessment in their specific workplace
- Routine worker's **individual monitoring** scheme, with specified frequencies
- Individual **external** dosimetric assessment for cat. A workers
- Proper radiotoxicological **internal** dosimetric assessment for cat. A
- Possibility to employ **ambient** dose assessments for Cat. B workers
- Need for **Radon** dosimetric assessments in underground workplaces



Radiotoxicology analyses (among other occupational health tasks) are performed by the **Medical Service**, belonging to DG HR/C5.

Available RTX techniques currently include determination of: Alpha emitters (Am + Pu), ^{238}U e $^{235}\text{U}/^{238}\text{U}$ analysis using ICP-MS, Beta emitters (liquid scintillation), Gamma emitters (gamma spectrometry).

The RTX Laboratory annually participates in the international network of radiotoxicological laboratories **Intercomparison of Radiotoxicological Exercises (PROCORAD)**

Uranium analyses via ICP-MS are ISO 17025 accredited (UKAS Testing 2417) since 2002 (urine) and 2001 (water), and permit the determination of uranium isotopes in both biological samples and potable water with a **limit of quantification of 5 ng/l**.

The **Radiation Protection Sector** and the **Medical Service** started, in 2009, a joint initiative aimed at mapping natural uranium concentrations in tap water publicly available in dwellings around the Joint Research Centre Site: it was well known, since many years, that some **public tap waters in the surroundings** show significant levels of natural uranium (**up to 11.000 ngUnat/l**).

While the committed dose due to the ordinary daily consumption of tap waters showing unusually high levels of natural uranium content is not significant from a radiological point of view, this circumstance may significantly impact the interpretation and the evaluation of RTX analyses on urine samples of exposed workers, whose levels of uranium content would not be linked to work activities. Even if the majority of JRC-ISPRA radiological facilities in which uranium was present made use of **depleted** or **enriched** uranium (*a priori* easing the Qualified Expert's task to highlight and separate possible work contamination cases from natural uranium ingestion due to water consumption) internal contamination due to work activities in nuclear facilities (inside or outside the JRC-ISPRA) cannot *a priori* be excluded.

This measurement campaign, which will come to its end in 2013, is aimed at assessing natural uranium content in tap water using ICP-MS methodology, and making results available via a GOOGLE MAPS interface. In its first phase, the campaign is made possible with the spontaneous help of some JRC-ISPRA workers, either exposed to radiation risks or not, who already submitted more than 1000 water samples to the analyses.

