

[Form 2 (to be reported to Committee on Countermeasures for Contaminated Water Treatment
and to be disclosed to public)]

Technology Information	
Area	6 (Select the number from "Areas of Technologies Requested")
Title	Understanding the groundwater flow Solutions and methods for quick and reliable determination of strontium and tritium in water
Submitted by	Eichrom Laboratories
<p>1. Overview of Technologies (features, specification, functions, owners, etc.)</p> <p>Private and independent organization, Eichrom Laboratories is one of the few European laboratories possessing a large number of authorizations from various Ministries and a range of approved parameters accredited ISO17025 by COFRAC (French equivalent of Japan Accreditation Board). These official recognitions allow Eichrom to use its expertise and know-how in numerous domains. In the past 10 years, Eichrom Laboratories became one of the European private leaders in radioactivity commercial testing.</p> <p>As part of its radionuclides protocols/methods, Eichrom laboratories are using Eichrom resins products which have been internationally successful and have become the standard technology in the field of radiochemistry. These products, patented for most of them, have been developed in 1991 in USA. Almost all accredited laboratories and regulatory agencies in the world are using Eichrom resins (JCAC in Japan, IRSN and EDF in France, AIEA in Austria, EPA & DOE in the USA, NPL in the United Kingdom...).</p> <p>Not only for its expertise in the radioactive analytical field, customers choose Eichrom Laboratories because of their excellence in operations, allowing customers to receive reliable results in a short lead time, even for big batches of samples. Eichrom is showing great skills in routine analysis.</p> <p>These assets explain why all type of customers are trusting and working with Eichrom such as nuclear industry (EDF, AREVA, IRSN...), authorities (French Nuclear Authority...), non-governmental agencies (Greenpeace, ACRO,...) cities (Paris area, Lisbon in Portugal...).</p> <p>In the coming 12 months, Eichrom Laboratories is planning to set up a facility in Japan in order to offer same type and quality of services than in Europe.</p> <p>Because of the emergency of the situation regarding Fukushima, we are willing to first install a mobile laboratory in order to perform as quickly as possible the first tritium and strontium analyses. This Eichrom mobile laboratory, made within a shelter, has been developed in collaboration with a European Nuclear Institute and could be quickly sent to Japan in order to start tritium and strontium analysis as soon as possible.</p> <p>In 2012, amongst the 8,000 samples we received in our laboratory, we performed for about 30,000 different radionuclides determination, including about 5,000 tritium and 400 strontium analyses in water. Most of these analyses have been performed under ISO17025 certification.</p>	

For these customers' requests, we applied the following summarized methods which offer reliable and quick results:

- **Tritium:** we initially perform a distillation of the water in order to isolate tritium from the potential other multi beta emitters. Tritium pure fraction is then measured by Liquid scintillation Technique. Sample size = 20 mL, Duration time 4.5 hours, Limit of Detection of 15 Bq/L.
 - Our solution represents a gain if time of a **factor 6 and factor 5** for LoD compare to your described methods in IRID document, which says respectively 27 hours and 80 Bq/L.If needed, for complex water sample with high salt content, we can also use a preliminary step using Eichrom Tritium resins.

- **Strontium:** we initially prepare a pre concentration step followed by the use of Eichrom Strontium Resin. Once the strontium is eluted, we then measure it using LSC. Duration time 12 hours, Limit of Detection of 0.05 Bq/L.
 - Our solution represents a gain if time of a **factor 8 and factor 10** for LoD compare to your described "c" method in IRID document, which says respectively 4 days and 0.8 Bq/L.

We are offering a one stop shopping solution by bringing our technical expertise, our mobile laboratory and our very good reputation. Lot of customers rely on us and trust us because of our efficiency to deal with large amount of samples in a short lead time.

2. Notes (Please provide following information if possible.)

- Technology readiness level (including cases of application, not limited to nuclear industry, time line for application)
- Challenges
- Others (referential information on patent if any)

【Areas of Technologies Requested】

- (1) Accumulation of contaminated water (Storage Tanks, etc.)
- (2) Treatment of contaminated water (Tritium, etc.)
- (3) Removal of radioactive materials from the seawater in the harbor
- (4) Management of contaminated water inside the buildings
- (5) Management measures to block groundwater from flowing into the site
- (6) Understanding the groundwater flow