



EUROPEAN COMMISSION

**TWINNING LIGHT PROJECT**  
**EE06-IB-TWP-ESC-03**

**INCEPTION REPORT**

**Project Title:** Estimation of concentrations of radio-nuclides in Estonian ground waters and related health risks

**Partners:** CGIAM  
ARPA Lombardia  
ARPA Veneto  
ARPA Basilicata

**Date:** March 8 2009

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## SECTION 1: PROJECT DATA

<b>Project Title:</b>	Estimation of concentrations of radio-nuclides in Estonian ground waters and related health risks	
<b>Project No:</b>	EE06-IB-TWP-ESC-03	
<b>Financing Memorandum</b>	2006/18111.05.01	
<b>Project Approval date</b>	8.12.2008	
<b>Start date of activities</b>	20.01.2009	
<b>Project activities duration</b>	January 2009 to July 2009	
<b>Project Partners</b>	Local Partner: Estonia	MS Partner: Italy
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<b>Signatures:</b>	_____	_____
<b>Report n.</b>	1	
<b>Date of report:</b>	March 8 - 2009	
<b>Reporting period:</b>	January – March 2009	

## **SECTION 2: CONTENT**

### **2A – INTRODUCTION**

The overall objective of the project is the minimization of health risks caused by natural radionuclide in drinking waters in Estonia.

The Partnership Team is committed to provide targeted, up to date, and fully tailored technical support and training to its Twinning counterparts to fully implement requirements.

The project completion will lead to full implementation of the requirements under the following EU Directives:

- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration;
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy;
- Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption.

### **2B - BACKGROUND**

The amount of natural radionuclide contained in ground waters in Estonia is due to geological reasons.

“Requirements for the quality and control of drinking water and analysis methods” are defined by contents in the Decree of the Minister of Social Affairs No. 82 from 31.07.2001.

This was amended with the Decree of the Minister of Social Affairs No. 94 from 28.06.2002, which defined the parameter as an indicator. However, the exact extent of the problem is not clear.

Concentrations of such substances were analysed and reported occasionally by laboratories in Estonia and abroad, in the frames of different studies. Estonian Radiation Protection Centre is taking regular samples only from two survey points 2 times per year. Data from studies are available only as reports, compiled by OÜ Geoloogiakeskus (the Geological Survey of Estonia LLC) showing that the calculated total indicative doses of radio-nuclides in Cambrian-Vendian water bearing complex exceeded 2.7 times the indicator value of 0.1 mSv/year. Such water is consumed by 177 thousand people (14.7 % of the total population of Estonia). The data from other water bearing complexes is rather limited but able to suggest that annual

indicative doses from the water of Ordovician-Cambrian water bearing complexes might be even higher, as it is in contact with dictyonema shale.

Also in 1994-1998 with the purpose of finding the most appropriate methods for decreasing indicative dose levels in water, EC initiated project “TENAWA” (Treatment Techniques for Removing Natural Radionuclides from Drinking Water) including experts from Finland, Austria, Germany and Sweden.

Finally, radionuclide included in European Recommendation 2001/928/Euratom (radon-222 and its long lived daughters) have to be taken into account, as their presence in considerable amounts can't be excluded and their sanitary impact can be relevant.

## **2C – ACHIEVEMENT OF MANDATORY RESULTS**

The proposed deployment of the activities within the Twinning Project is divided into 3 technical Components:

1. Drinking water survey
2. Mitigation tests of radioactivity in the drinking water
3. Training and informing about the products of the project

Project activities, following the requirements of the Project fiche, are based on the previous knowledge of the Estonian waterworks.

At this purpose it has been necessary to establish contacts with Estonian experts of the participants institutions (sanitary, geological and Radiation Protection Centre representatives and waterworks administrators) to collect and discuss the information as well as to review existing data and resources.

The Twining project's experts Dr. Maurizio Forte and Dr. Rosella Rusconi from ARPA Lombardia, Dr. Flavio Trotti from ARPA Veneto, Dr. Riccardo Airoidi from CGIAM together with Dr. Leonardo Minervini from CGIAM during the first stage of the project implementation aimed at achieving a better understanding of the expectations and focus concerning the critical topics:

- Quality and congruency of analytical data: database of radiometric parameters was built by merging outputs of different laboratories.
- Representativity of analytical data: it was not straightforward whether analytical data draw a complete picture of radionuclide concentrations in Estonian aqueducts.

- Dose evaluation and risk assessment: it was necessary to plan a more realistic estimate of radiological risk to population based on existing data after their reorganization.
- Check effectiveness of existing water treatment plants: cost and benefit evaluation of possible upgrade of treatment plants were performed as well.
- Management of radioactive wastes produced by products of treatment plants.

In order to define all the stages of project implementation and in order to identify an effective strategy for the Twinning Project activities, a workshop has been organized; an integrated approach used in Italy with a summary of results has been presented by the Italian Short Term Experts (STEs) to the stakeholders and to the representatives from public sector and from the private companies operating in drinking and bathing sector, which will be involved over the development of the project.

Presentations were performed, both from Italian and Estonian side. The overall program is reported below:

#### Tallinn January 21st, 2009: Workshop Program

1. ARPA Lombardia: Institute general presentation. *Rosella Rusconi*
2. ARPA Veneto: Institute general presentation. *Flavio Trotti*
3. Milano aqueduct society: Institute general presentation. *Riccardo Airoidi*
4. Water radioactivity analysis: procedures and techniques. *Maurizio Forte*
5. Monitoring campaigns: the Italian experience. *Flavio Trotti*
6. Drinking water quality in Estonia. *Leena Albreht*
7. Monitoring of radionuclides in groundwater of Estonia. *Rein Perens, Lehte Savitskaja*
8. Environmental radioactivity studies at the Institute of Physics. *Madis Kiisk*
9. Water treatment in Tallinn. *Riho Sobi*
10. Water Treatment in Rakvere Vesi Ltd . *Aivar Lõhe*
11. Radioactivity removal from groundwater using adsorption and ion exchange. *Rein Munter, Pille Tõnisson, Johannes Sutt, Toivo Eensalu*

The Italian STE experts as well as the involved Estonian institutions (Health Protection Inspectorate, Geological Institute and Radioprotection Centre) have jointly developed the following subjects:

- 1) Concentrations of radionuclides in Estonian ground waters and related health risks are known and recorded;
- 2) The most appropriate method for removal of radionuclides from water found;
- 3) Guidelines concerning surveillance methods, analysis methods and threshold safety levels have been developed.

Finally, a meeting by the Ministry of Finance has been organized in order to set the schedule concerning the coming activities.

## 2D – ACTIVITIES IN THE REPORTING PERIOD

Over the reporting period the activities chiefly focused on Component 1

The products of Component 1 of the project are reports on:

- a) Analytical methods for radionuclides of interest
- b) Sampling plan (for critical areas)
- c) Evaluation of existing data and former survey results

In order to achieve the expected results additional information were requested by the Short Term Experts involved in the activities:

- 1) Translation of the Estonian report on monitoring of water resources (2005)
- 2) Complete database of radiometric analyses.
- 3) Inventory of aqueducts in the Cambrian-Vendian area (coast area), focusing on some selected aqueducts (Tallinn, Viimsi, Rakvere, Keila and Mahe) which will be fully described.

Moreover, also further detailed documents have been straight requested to involved institutions.

Furthermore also the Component 2 activities have been begun. A first analysis on methods identification for radionuclides removal from ground water has been accomplished.

<i>Component 1 - Drinking water survey</i> <i>Total expert days 12</i>	
<i>Names of MS experts:</i>	<i>Flavio Trotti</i>
<i>Duration of the activity:</i>	<i>From 20<sup>th</sup> to 22<sup>th</sup> of January 2009</i>
<i>Names of MS experts:</i>	<i>Riccardo Aioldi</i>
<i>Duration of the activity:</i>	<i>From 20<sup>th</sup> to 22<sup>th</sup> of January 2009</i>
<i>Names of MS experts:</i>	<i>Rossella Rusconi</i>
<i>Duration of the activity:</i>	<i>From 20<sup>th</sup> to 22<sup>th</sup> of January 2009</i>
<i>Names of MS experts:</i>	<i>Maurizio Forte</i>
<i>Duration of the activity:</i>	<i>From 20<sup>th</sup> to 22<sup>th</sup> of January 2009</i>
<i>Total number of mission days:</i>	<i>12</i>

***Component 2 - Mitigation tests of radioactivity in the drinking water***

***Total expert days 16***

***Names of MS experts: Leonardo Minervini***

***Duration of the activity: From 20th to 22th of January 2009***

***Total number of mission days: 3***

**2E – IMPLEMENTATION SCHEDULE**

TIME LINE							
N.	Actions	Months of the Year					
		Jan.	Feb.	Mar.	Apr.	May	Jun.
1	<b>Component 1: Drinking water survey</b>						
2	<b>COMPONENT 2: Mitigation tests of radioactivity in the drinking water</b>						
3	<b>Component 3: Training and informing about the products of the project</b>						

## 2F – ASSESSMENT

In terms of arrangements of the Project activities, the following aspects were covered:

- the state of the art of related (foregoing and on-going) Projects in the Health Protection Inspectorate
- the team composition
- general approach to be followed in all Project phases
- main processes and different components
- short and mid-term objectives

Besides, the key activities have been established and an accurate work-flow and methodology approach has been defined.

During all the phases of the Project implementation, as agreed with BC experts following the main projects requirements, a joined approach will be adopted:

- the activities will be chiefly carried out in Health Protection Inspectorate
- all the documents will be shared day by day;
- during the missions almost-daily check-point meetings will be held;
- during the drawing up of the reports the description of the most relevant processes for the *integrated system* is supposed to cover the specific defined integration requirements.

As far as organizational matters are concerned, to guarantee an efficient implementation of the Twinning project it has been designed a multi-level organisational structure:

- The first level is strategic and aims at coordinating the activities, monitoring the project's progress and its impact on the effectiveness of the Beneficiary/ies' activities.
- The second level is operational, overseeing all activities of the Twinning Project.

The organisation of the Short Term Expertise was customized for the purposes of the Twinning Project and according to the Project Activities. During the first part of the Project, satisfying agreements on cooperation between both BC and MS work-teams were reached. They mostly refer to a jointly elaborated work approach which would lead to the attainment of all the Twinning goals.

The Italian Project Leader as well as all the STEs involved in the Twinning Light Project were provided of an office space in the Health Protection Inspectorate with all the facilities to perform their activities.

ARPA VENETO, ARPA LOMBARDIA, ARPA BASILICATA and Centre of Integrated Geomorphology for the Mediterranean Area (CGIAM) are responsible for the technical and analytical side of the project and CGIAM is responsible for the administrative, logistical and financial management sides of it.

The Estonian Project Leaders provided a monitoring analysis of radioactivity and identified the laboratory with previous knowledge of the Estonian waterworks.

The Italian team has been able to ensure the achievement of all the Twinning Project objectives as well as the delivery of the technical reports and the Final Report, as set out in the contractual terms.

Further documents and/or info will be requested, if necessary, directly to involved intitutions.

Reports are supposed to be ready (or at least in an “advanced draft stage”) within the end of March.

### SECTION 3. EXPENDITURE

Within the reporting period 1 the Component1 have been performed, in total 15 working/days, as detailed in the 2D paragraph.

As for financial situation, the project analysis shows that funds used in this period are about **25,29 %** of the total budget.

During the reporting period 1 (one) Addendum and 1 (one) Side Letter have been proposed and approved.

The summary information is described below, for details see the Financial Report n. 1

<b>FINANCIAL REPORT</b>		<b>N. 1</b>			
<b>PERIOD COVERED:</b>		<b>January – March 2009</b>			
<b>PROJECT LEADER</b>		<b>MAURIZIO FORTE</b>			
<b>COVENANT NO.</b>		<b>EE06-IB-TWP-ESC-03</b>			
<b>Name of services / goods purchased or direct costs</b>	<b>Amount paid in EUR ( I Quarter)</b>	<b>Amount foreseen in original budget</b>	<b>Amount after Side Letter n. 1</b>	<b>BALANCE</b>	<b>Percentage</b>
<b>Project Co-ordination Costs</b>					
<b>Total Project Co-ordination/Management Costs</b>	-	<b>20.745,00</b>	<b>13.114,00</b>	<b>13.114,00</b>	<b>0,00 %</b>
<b>PROJECT ACTIVITIES</b>					
<b>Component 1 - Drinking water survey</b>					
<b>Total Component 1</b>	<b>14.935,97</b>	<b>14.634,00</b>	<b>14.272,00</b>	<b>-</b>	<b>104,65 %</b>
<b>Component 2 - Mitigation tests of radioactivity in the drinking water</b>					
<b>Total Component 2</b>	<b>3.679,80</b>	<b>17.508,00</b>	<b>20.658,00</b>	<b>3.903,40</b>	<b>17,81 %</b>
<b>Component 3 -Training and informing about the products of the project</b>					
<b>Total Component 3</b>	-	<b>15.815,00</b>	<b>20.658,00</b>	<b>20.658,00</b>	<b>0,00 %</b>
<b>ORGANIZATION OF MEETING/TRAINING/WORKSHOP</b>					
<b>Total organization of meeting/training/workshop</b>	-	<b>3.120,00</b>	<b>3.120,00</b>	<b>3.120,00</b>	<b>0,00 %</b>
<b>ACTUAL COST</b>	<b>18.615,77</b>	<b>71.822,00</b>	<b>71.822,00</b>	<b>53.206,23</b>	<b>25,92 %</b>
<b>of which from CONTINGENCIES (2,5%)</b>	<b>775,77</b>	<b>1.795,55</b>	<b>1.795,55</b>	<b>1.019,78</b>	<b>43,21 %</b>
<b>TOTAL BUDGET</b>	<b>18.615,77</b>	<b>73.617,55</b>	<b>73.617,55</b>	<b>55.001,78</b>	<b>25,29 %</b>

### 3A. FINANCIAL REPORT