Regional Project Concept Template (Category A)

The information contained in this template should be uploaded to the PCMF IT platform by the Chair of the relevant regional cooperative agreement or the NLO of the Member State submitting the concept by **31 May 2014** at the latest. Based on this information the IAEA will assess whether this project concept is in line with the TC quality criteria and requirements. Concepts positively appraised will be further developed into full project documents during the design phase.

Region:	Latin America and the Caribbean		
Regional/Cooperative agreement (if applicable)	ARCAL	**Priority no. given by regional/cooperative agreement** (for concepts proposed under the auspices of regional cooperative agreements)	
Title	**STUDY OF POTENTIALLY TOXIC METAL POLLUTION OF ANTHROPOGENIC AND NATURAL ORIGIN AFFECTING URBAN SOILS AND AIR QUALITY**		
Field of activity	Environment: PER M-2 and M-4		
Regional project category[1]	☐ *Transnational* ***X*** *Regional standard setting* ☐ *Capacity building for developing countries* ☐ *Joint TC activities with a regional or international entity*		
Names and contact details of project counterparts and counterpart institutions (starting with the main counterpart)	Rita R. Plá Nuclear Chemistry Department - GAATEN rpla@cae.cnea.gov.ar Argentine National Atomic Energy Commission Av. del Libertador 8250 Buenos Aires 1429 Argentina Tel: +5411 4125 8572 Fax: +54 11 4125 8126		
Analysis of regional Gap/problems/needs	Soil pollution and air quality are subjects of worldwide growing concern. In Latin America and the Caribbean, urban population is increasing and life quality of urban populations as well as their sanitary status is linked to environmental quality. Anthropogenic activities together with natural phenomena produce pollutants affecting all biosphere compartments. Vehicles, refuse incineration, agriculture, combustion processes, mining, metallurgy and other industries, among other activities are responsible of increasing concentration of potentially toxic metals in soils and air. Some of these emissions may affect adjacent or even remote areas. Soils play an important role in environmental quality as they can act as emission sources (through erosion mechanisms) or as receptors of pollutants that could affect human health, for example due to atmospheric total deposition. As an example, chromium and lead, two elements for which polluted soils could be an important emission source can be cited. At parks or recreation areas exposed to significant amounts of pollution, soil erosion can have adverse sanitary effects, especially in children, due to their high absorption rate and developing nervous system. Biomonitoring as a method of study of air pollution means not only the best solution in terms of cost – benefit, but an air monitoring low cost system that enables simultaneous estimates of air quality in a large number of sites, being in many cases the only valid alternative. Air particulate matter could not only affect human health but also the quality of soil and water, as well as flora and fauna, diminishing the use of these resources by local populations. Examples of this situation are the high concentrations of copper, lead and zinc found in Antofagasta (Chile) particulate matter. Nuclear and related analytical techniques are highly suitable for the determination of potentially toxic chemical elements present in soil and airborne particulate matter. Soil contamination from anthropogenic activities may arise directly or come from total deposition		

[1] See the document entitled "Policy and Procedures for TC Regional Projects" at: http://pcmf.iaea.org/DesktopModules/PCMF/docs/2014_15_Docs/notes/Regional_TC_Project_Policy.pdf.

	phenomena, beginning with the contamination of the surface layer. The determination of contaminants in soil and air and their relationship to total deposition allow advancing in the application of nuclear techniques to evaluate the impact caused by these activities in urban areas.
Why should it be a regional project?	Pollution affecting environment is a growing worldwide concern. Latin America and the Caribbean are not free from problems related to pollution and deterioration of the quality of air, soil and water as well as their effect on human health and life quality. In urban environments, green areas are an important source of recreation for the population. Thus the importance of the elemental chemical characterization of surface soil and air quality, especially regarding the presence of toxic metals, as this knowledge will contribute to identify potential pollution problems and to assess their extension. This information together with other judgement criteria, will represent and important contribution for decision makers in environmental management of the study areas. As the problems are present in the whole region, it is necessary a regional approach to confront them. Moreover, it will enable the use of existing expertise and facilities. The project represents the possibility of establishing links between different groups applying nuclear analytical techniques to the characterization of soil and biomonitoring of air pollution as well as working on the harmonization of methodologies for the steps of the work. Although there have been no IAEA projects related to soil pollution, there are antecedents regarding biomonitoring of air pollution: CRP "Validation and application of plants as biomonitors of trace atmospheric pollution analyzed by nuclear and related techniques" (1998-2002); RLA/7/010 ARCAL LX "Application of Biomonitors through Nuclear and Related Techniques in Atmospheric Pollution Studies" (March 2002 – April 2005); PAR 2003 001 RQ "Air Quality in Asuncion controlled by biomonitors and Nuclear Analytical Techniques"; ARCAL RLA/2/013 "Correlation Studies between Atmospheric Deposition and Sanitary Problems in Latin America: Nuclear Analytical Techniques and the Biomonitoring of Atmospheric Pollution" (2008 – 2010).
Stakeholder analysis and partnerships	*End users:* *Environmental authorities* Information provided by this project together with other judgement criteria, will represent and important contribution for decision makers in environmental management of the study areas, to establish monitoring programs and control and remediation policies to improve the population life quality. *Beneficiaries* Direct beneficiaries of this Project are the inhabitants of the cities/regions/countries taking part in it. The project development will have an important social benefit, considering that the study will assess soil and air quality regarding toxic metals thus contributing to establishing monitoring programs and control and remediation policies to improve the population life quality. Considering that regarding the presence of elemental pollutants, soil and air quality has a direct impact on the citizens' quality of life, this project will benefit the whole population.
Overall objective (or developmental objective)	General Objective Contribute to the improvement of the population life quality, providing the authorities with information from studies on urban soil and air quality using nuclear and related analytical techniques, in Latin American and Caribbean cities.
Analysis of objectives	Specific objectives - A: Establish the baseline for potentially toxic metals and other

<table>
<tr><td></td><td>elements for the study areas
- B: Determine the concentration of potentially toxic metals and other elements in soil samples from urban environments in Latin America and the Caribbean, using nuclear and related analytical techniques and validated methods.
- C: Quantify heavy metals and other elements in air particulate by biomonitoring and/or total deposition techniques, at the study areas.
- Assess the distribution of elements of interest through maps and their correlation.
- D: Consolidate the analytical information through its organization in reports and/or databases.
- E: Assess the impact of the eventual pollution of anthropogenic or natural origin for the study areas.
- F: Transfer the produced information to the relevant authorities.

Please see tree in separate page.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Role of nuclear technology and the IAEA</td><td>Nuclear analytical techniques are especially apt for the elemental characterization of the matrices involved in this project. Due to their characteristics of accuracy and precision and the possibility of reaching very low detection limits using small samples they are the chosen techniques for this kind of analysis. Although these techniques and methodologies differ in accuracy, precision, detection limits and versatility, a joint approach of the our problem would allow to make the most of the analytical capacity of the region. Adding to this the possibility of exanching experiences concerning assessment and evaluation of analytical results, it would be possible to develop an efficient study of the urban soil pollution problem, common to all countries in the region.
Their advantages respect to non-nuclear analytical techniques have been mentioned in the PER 2007-2013 document. The region has
Nuclear and related analytical techniques are highly suitable for the determination of potentially toxic chemical elements present in soil and airborne particulate matter.

Indicate the nuclear technique that would be used and outline why it is suitable for addressing the problems/needs in question. Is this the only available technique? Does it have a comparative advantage over non-nuclear techniques?
The role of IAEA will be to contribute to strengthen the specific technical capacities for this problems in the region</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Project duration</td><td>2 years beginning in January 2016</td></tr>
<tr><td>Requirements for participation</td><td>Nuclear analytical techniques installed, human resources with experience in the application of the techniques to the matrices and elements to be determined.</td></tr>
<tr><td>Participating Member States</td><td>All ARCAL Members
Country: _____ Role:
□ Resource (providing expertise)
X Target (receiving expertise)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Funding and project budget</td><td>Provide an estimate of the total project costs and the funding expected from each stakeholder:
<table>
<tr><td colspan="2"></td><td>Euro</td><td>Comment</td></tr>
<tr><td colspan="2">Government cost-sharing</td><td></td><td>(to be sent to the IAEA)</td></tr>
<tr><td colspan="2">Counterpart institution(s)</td><td></td><td></td></tr>
<tr><td colspan="2">Other partners</td><td></td><td>Who?:</td></tr>
<tr><td>IAEA Technical Cooperation Fund (TCF):</td><td>Fellowships / Scientific visits / Training</td><td></td><td></td></tr>
</table></td></tr>
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		courses/ Workshops		
		Experts		
		Equipment		
		TOTAL	*400,000.-*	