Istituto Superiore per la Protezione e la Ricerca Ambientale
Servizio di Metrologia Ambientale

Workshop on Reference Materials, Harmonization of Methods and Laboratory Accreditation

Rome, 25 June 2009

Cooperation between the IAEA and ISPRA

A. Fajgelj, P. Martin, U. Sansone, and G. Voigt

Department of Nuclear Sciences and Applications
Agency's Laboratories Seibersdorf

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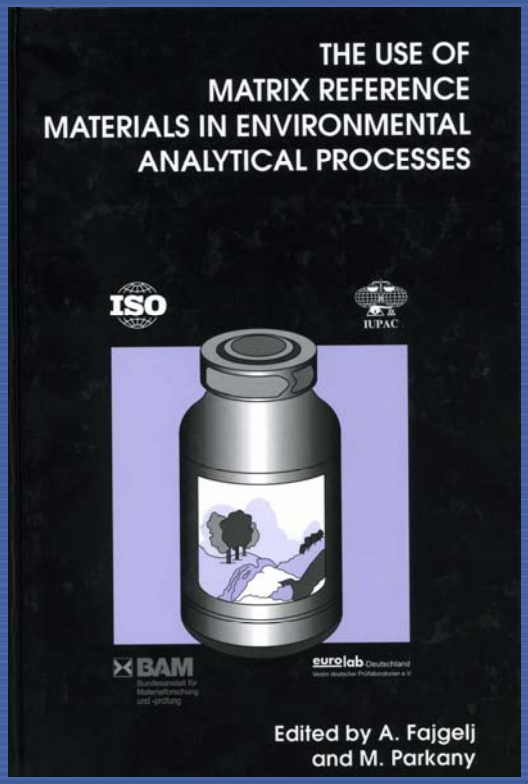
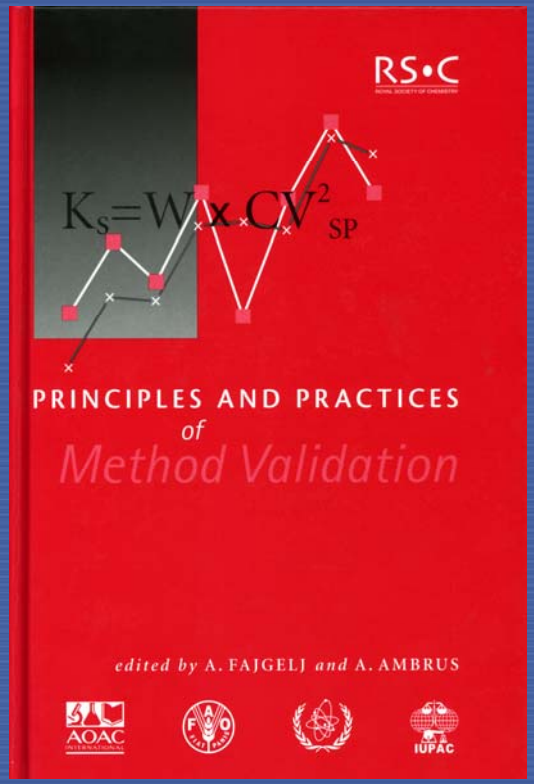
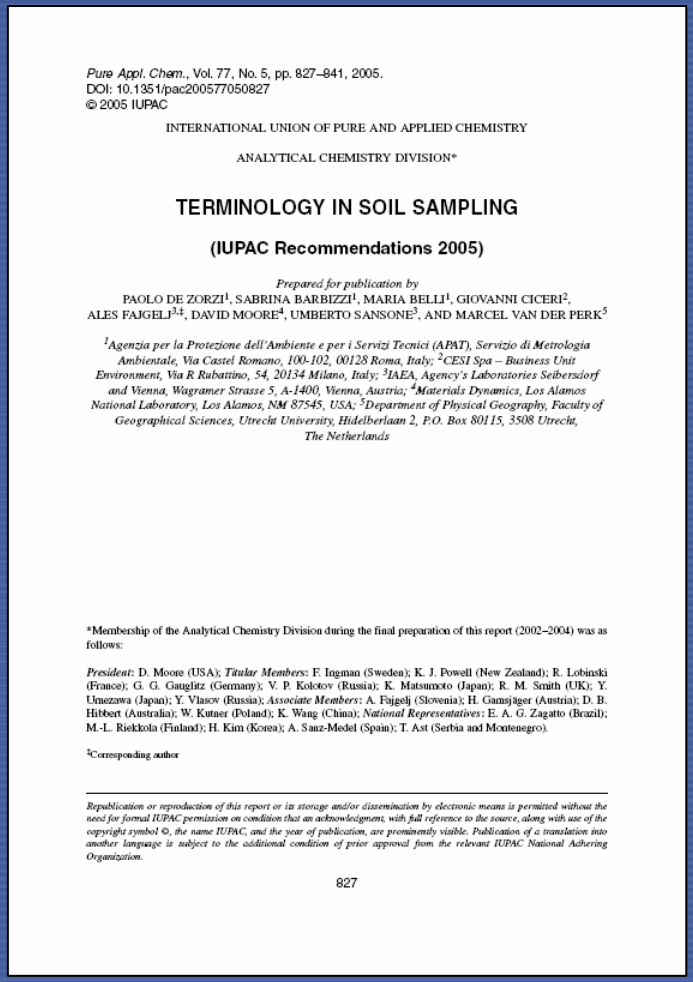
IAEA
International Atomic Energy Agency

Start of close cooperation

In April and November 1999 the IUPAC Interdivisional Working Party on Harmonization of Quality Assurance organized two workshops:







Pure Appl. Chem., Vol. 77, No. 5, pp. 827–841, 2005.
DOI: 10.1351/pac200577050827

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

ANALYTICAL CHEMISTRY DIVISION*

TERMINOLOGY IN SOIL SAMPLING

(IUPAC Recommendations 2005)

Prepared for publication by
PAOLO DE ZORZI[1], SABRINA BARBIZZI[1], MARIA BELLI[1], GIOVANNI CICERI[2], ALES FAJGELJ[3,‡], DAVID MOORE[4], UMBERTO SANSONE[3], AND MARCEL VAN DER PERK[5]

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*Membership of the Analytical Chemistry Division during the final preparation of this report (2002–2004) was as follows:

President: D. Moore (USA); *Titular Members*: F. Ingman (Sweden); K. J. Powell (New Zealand); R. Lobinski (France); G. G. Gauglitz (Germany); V. P. Kolotov (Russia); K. Matsumoto (Japan); R. M. Smith (UK); Y. Umezawa (Japan); Y. Vlasov (Russia); *Associate Members*: A. Fajgelj (Slovenia); H. Gamsjäger (Austria); D. B. Hibbert (Australia); W. Kutner (Poland); K. Wang (China); *National Representatives*: E. A. G. Zagatto (Brazil); M.-L. Riekkola (Finland); H. Kim (Korea); A. Sanz-Medel (Spain); T. Ast (Serbia and Montenegro).

‡Corresponding author

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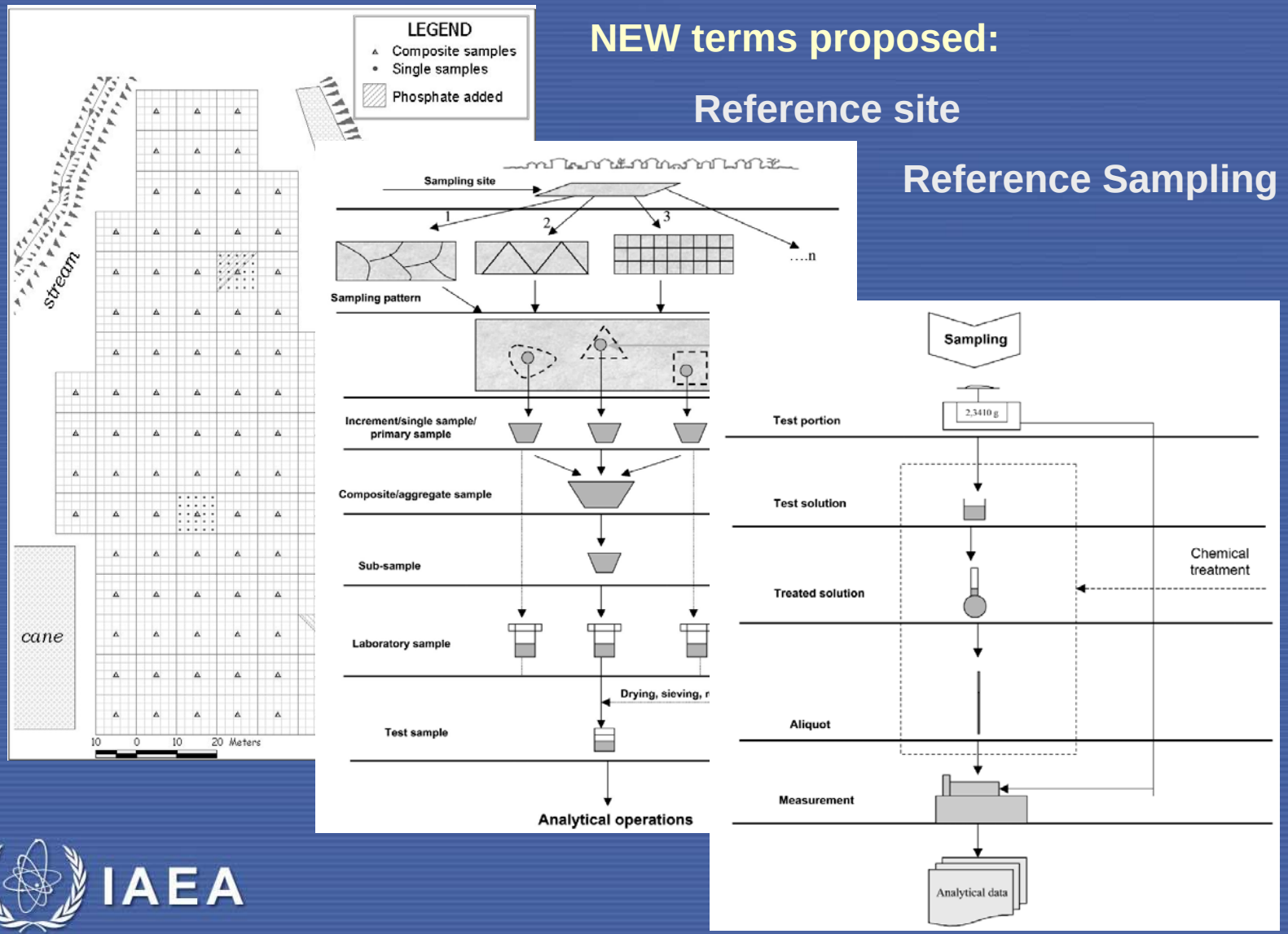
SOILSAMP project



NEW terms proposed:

Reference site

Reference Sampling

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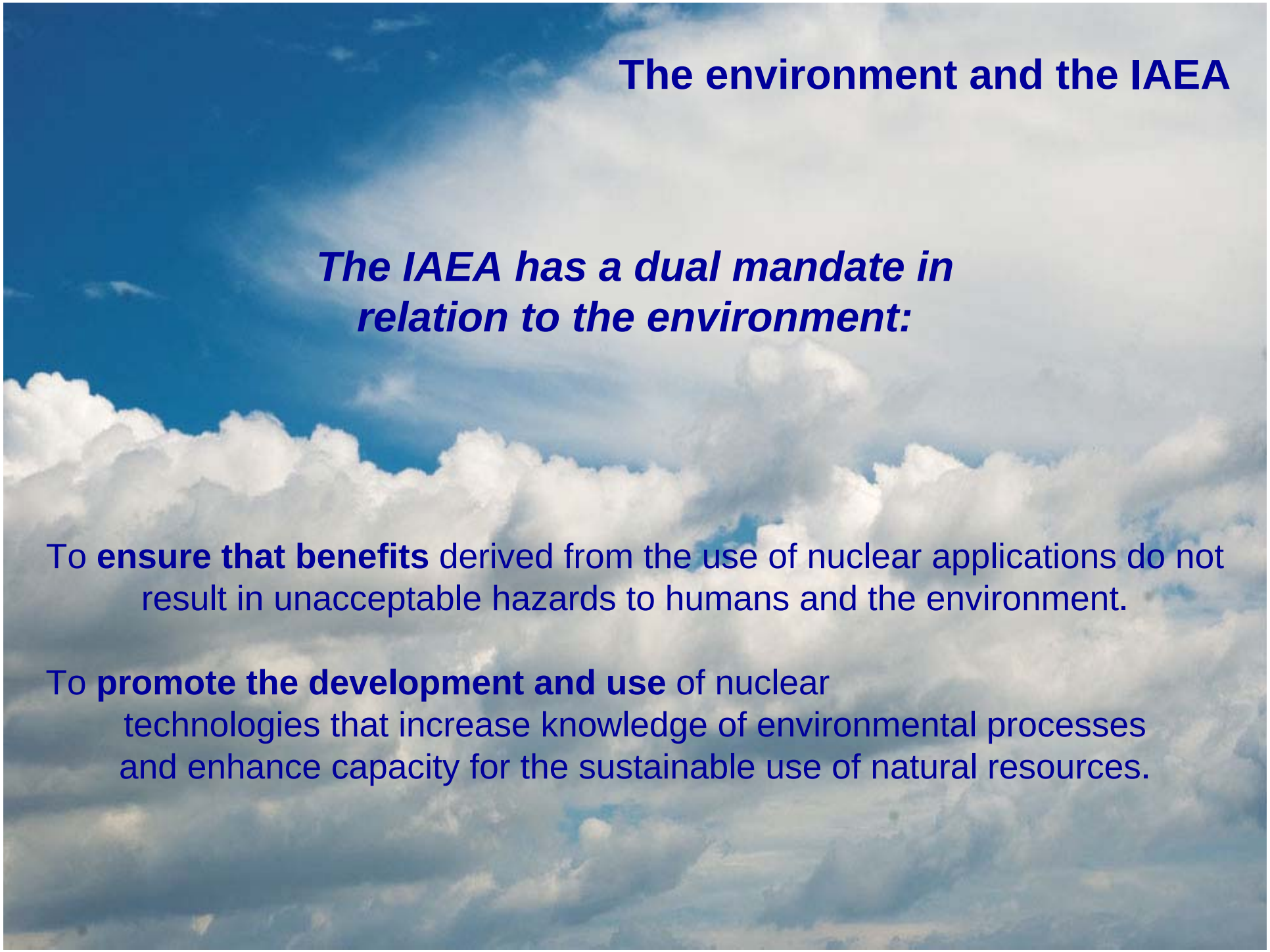


The environment and the IAEA

The IAEA has a dual mandate in relation to the environment:

To **ensure that benefits** derived from the use of nuclear applications do not result in unacceptable hazards to humans and the environment.

To **promote the development and use** of nuclear technologies that increase knowledge of environmental processes and enhance capacity for the sustainable use of natural resources.

The IAEA Laboratories

- Together with NAML (Monaco Laboratories) the only laboratory facility within the UN system with R&D activities

IAEA

IAEA ALMERA Network

Since 2005 ISPRA is a member of the IAEA ALMERA network.

ALMERA is world-wide group of laboratories capable of providing reliable and timely analysis of environmental samples in the event of an accidental or intentional release of radioactivity in the environment

IAEA

ALMERA Sampling Intercomparison

In the frame of the ALMERA network ISPRA organized a soil Sampling Intercomparison Exercise in the agricultural reference site of Udine, Italy

(14-18 November 2005)

IAEA

International Standardisation

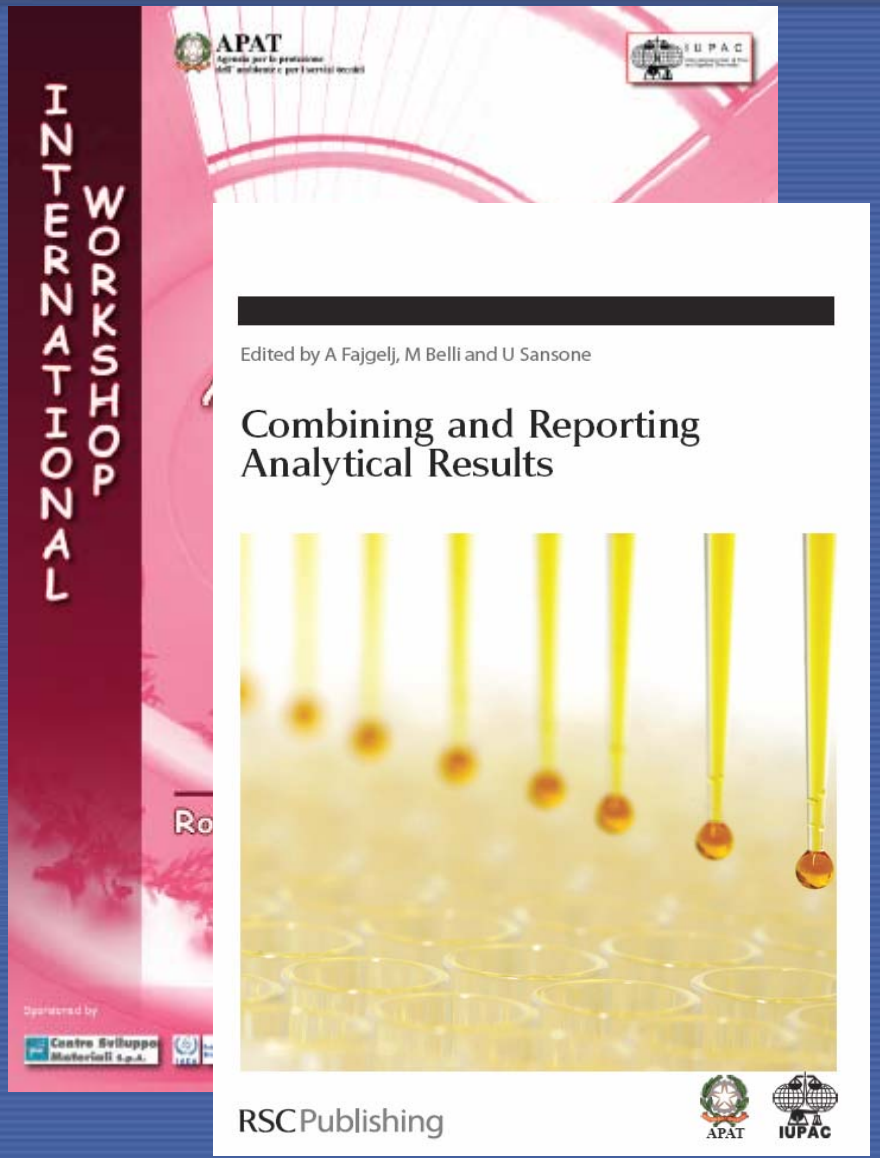
In 2006 the IAEA sponsored the ISPRA-IUPAC workshop on "Combining and reporting analytical results.

ISO Guide 34:2009

5.12 Metrological traceability

1.12.5 To ensure the metrological traceability of the assigned values, the reference material producer shall provide documentary evidence that all measurement results used for value assignment are traceable to the same reference as the assigned value.

NOTE A combination of results obtained by different methods and/or laboratories – all being traceable to the same reference – is also traceable tot this reference.



IAEA

IAEA Reference Materials

Department of Nuclear Sciences & Application

Seibersdorf & Headquarter Laboratories

Physics, Chemistry & Instrumentation

- **Chemistry Unit** → **RMs of terrestrial origin**
- **Isotope Hydrology Unit** → **RMs in the field of isotope hydrology**

FAO-IAEA Agriculture & Biotechnology

- **Soil Science Unit** → **N-15 & C-13 labelled plant RMs**

Marine Laboratory Monaco → **RMs of marine origin**

IAEA

PCI - Chemistry Unit
Programmatic framework (2008-2009)

Subprogramme 2.4.4: SUPPORTING ANALYTICAL LABORATORY PERFORMANCE

Project 2.4.4.1	Laboratory Quality Management Activities & Metrology
Project 2.4.4.2	Reference materials for terrestrial environments
Project 2.4.4.3	ALMERA Network
Project 2.4.4.4	IAEA reference materials for environment and trade

Co-ordinate laboratories for RMs production & proficiency test organization

IAEA

IAEA RM Advisory Group

ISPRA is a member of the IAEA Advisory Group for the production and characterization of reference materials of terrestrial origin

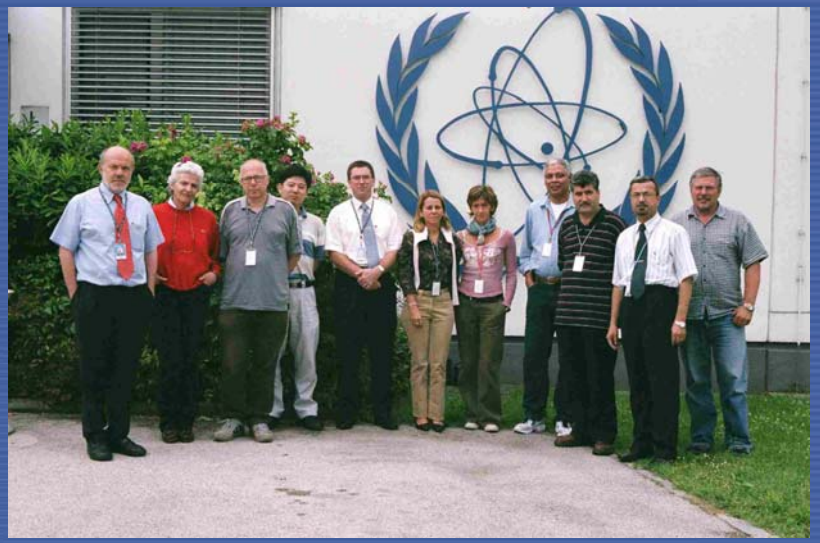
Objectives

- Quality policy and quality requirements for the IAEA reference materials
- Harmonization of production and certification approaches and documentation of the procedures
- Collaboration in production and certification of Reference Materials and in Interlaboratory Comparison Exercises

IAEA

IAEA Advisory Group for Reference Materials of Terrestrial Origin

- *Rafaat Al Merey*
  AECS - Atomic Energy Commission of Syria
- *Maria Belli*
  ISPRA – Italian Environmental Protection Agency
- *Maura Julia Bragança*
  IRD-CNEN - Brazil
- *Almir Faria Clain*
  IRD-CNEN - Brazil
- *Yongjae Kim*
  KINS - Korea Institute of Nuclear Safety
- *Matjaz Korun*
  IJS – Institute Jožef, Slovenia
- *Rosella Rusconi & Maurizio Forte*
  ARPA Lombardia, Italy
- *Sándor Tarjan*
  Hungarian Agricultural Authority



IAEA

New Reference Materials

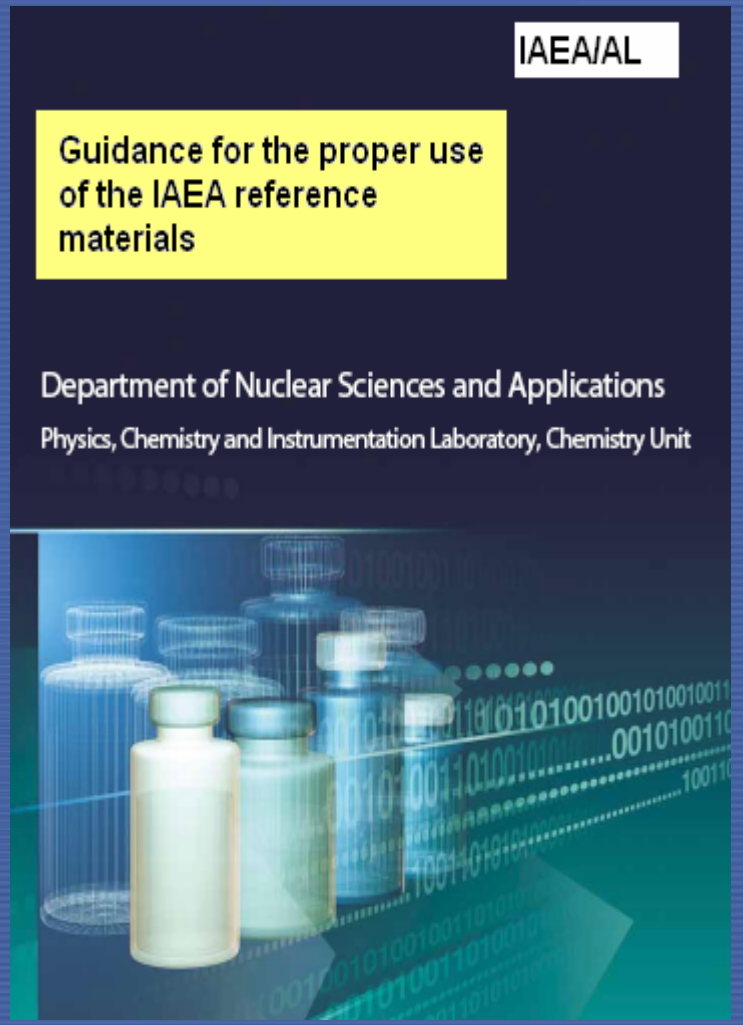
The IAEA-450 reference material (Platinum and Trace Elements in Algae) was prepared and characterized in cooperation with ISPRA

IAEA-450 will used in the CCQM Key Comparison K-75 and Pilot Study P-118 “Toxic Metals in Algae”

IAEA

Guidance documents

ISPRA is contributing in the preparation of the IAEA publication “Guidance for the proper use of the IAEA Reference Materials”



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Common Publications

Pure Appl. Chem., Vol. 77, No. 5, pp. 827–841, 2005.
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Applied Radiation and Isotopes 66 (2008) 1588–1591
Contents lists available at ScienceDirect
Applied Radiation and Isotopes
journal homepage: www.elsevier.com/locate/apradiso

A soil sampling reference site: The challenge in defining reference material for sampling

Paolo de Zorzi[a,*], Sabrina Barbizzi[a], Maria Belli[a], Ales Fajgelj[b], Radojko Jacimovic[c], Zvonka Jeran[c], Umberto Sansone[c], Marcel van der Perk[d]
[a] Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici (APAT), Servizio Metrologia Ambientale, Via di Castel Romano, Rome 100-00128, Italy
[b] International Atomic Energy Agency (IAEA), Agency's Laboratories Seibersdorf, Vienna A-1400, Austria
[c] Jožef Stefan Institute, Jamova 39, Ljubljana 1000, Slovenia
[d] Department of Physical Geography, Utrecht University, P.O. Box 80115, TC Utrecht 3508, The Netherlands

Applied Radiation and Isotopes 66 (2008) 1582–1587
Contents lists available at ScienceDirect
Applied Radiation and Isotopes
journal homepage: www.elsevier.com/locate/apradiso

The effect of short-range spatial variability on soil sampling uncertainty

Marcel Van der Perk[a,*], Paolo de Zorzi[b], Sabrina Barbizzi[b], Maria Belli[b], Ales Fajgelj[c], Umberto Sansone[c], Zvonka Jeran[d], Radojko Jaćimović[d]
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[d] Jožef Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia

Accred Qual Assur (2007) 12:563–567
DOI 10.1007/s00769-007-0309-y

GENERAL PAPER

Comparability and compatibility of proficiency testing results in schemes with a limited number of participants

Ilya Kuselman · Maria Belli ·
Stephen L. R. Ellison · Ales Fajgelj ·
Umberto Sansone · Wolfhard Wegscheider

Available online at www.sciencedirect.com
ScienceDirect
CHEMOSPHERE
Chemosphere 70 (2008) 745–752
www.elsevier.com/locate/chemosphere

Estimation of uncertainty arising from different soil sampling devices: The use of variogram parameters

Paolo de Zorzi[a,*], Sabrina Barbizzi[a], Maria Barbina[b], Ales Fajgelj[c], Radojko Jacimovic[d], Zvonka Jeran[d], Sandro Menegon[b], Alessandra Pati[a], Giannantonio Petruzzelli[e], Umberto Sansone[c], Marcel Van der Perk[f]

Journal of Radioanalytical and Nuclear Chemistry, Vol. 267, No.3 (2006) 623–629

Freshwater suspended particles: An intercomparison of long-term integrating sampling systems used for environmental radioactivity monitoring

C. Galas,[1] U. Sansone,[2*] M. Belli,[1] S. Barbizzi,[1] G. P. Fanzutti,[3] V. Kanivets,[4] A. Pati,[1] R. Piani,[3] M. Repetti,[5] C. Terzoni,[5] O. V. Voitsekhovitch[4]
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DOI 10.1007/s00769-006-0238-1

GENERAL PAPER

The role of different soil sample digestion methods on trace elements analysis: a comparison of ICP-MS and INAA measurement results

Stefania Gaudino · Chiara Galas · Maria Belli ·
Sabrina Barbizzi · Paolo de Zorzi · Radojko Jaćimović ·
Zvonka Jeran · Alessandra Pati · Umberto Sansone

Some limitations in using ^{222}Rn to assess river–groundwater interactions: the case of Castel di Sangro alluvial plain (central Italy)

Luisa Stellato · Emma Petrella · Filippo Terrasi ·
Paolo Belloni · Maria Belli · Umberto Sansone ·
Fulvio Celico

Accred Qual Assur (2007) 12:391–398
DOI 10.1007/s00769-006-0247-0

GENERAL PAPER

Implementation of proficiency testing schemes for a limited number of participants

Maria Belli · Stephen L. R. Ellison ·
Ales Fajgelj · Ilya Kuselman · Umberto Sansone ·
Wolfhard Wegscheider

Available online at www.sciencedirect.com
SCIENCE DIRECT
ANALYTICA CHIMICA ACTA
Analytica Chimica Acta 562 (2006) 51–58
www.elsevier.com/locate/aca

The fractionation and determination procedures for the speciation of ^{210}Pb and ^{210}Po in soil samples

Guogang Jia[a,*], Maria Belli[b], Senlin Liu[a], Umberto Sansone[b], Changheng Xu[a], Silvia Rosamilia[b], Xuefu Xiao[a], Stefania Gaudino[b], Ling Chen[a], Hetao Yang[a]
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Temporal reduction of the external gamma dose rate due to ^{137}Cs mobility in sandy beaches

M. Rizzotto,[1*] J. Toso,[1] H. Velasco,[1] M. Belli,[2] U. Sansone[3*]
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SCIENCE DIRECT
JOURNAL OF ENVIRONMENTAL RADIOACTIVITY
Journal of Environmental Radioactivity 89 (2006) 172–187
www.elsevier.com/locate/jenvrad

Concentration and characteristics of depleted uranium in biological and water samples collected in Bosnia and Herzegovina

Guogang Jia*, Maria Belli, Umberto Sansone, Silvia Rosamilia, Stefania Gaudino
Agency for Environmental Protection and for Technical Services, Via V. Brancati 48, 00144 Roma, Italy

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Available online 27 June 2006

IAEA

Instead of conclusion

We are looking forward for continuing successful cooperation...

IAEA