NPL
National Physical Laboratory

NPL Environmental Radioactivity Proficiency Test Exercise 2007

Arvic Harms, Chris Gilligan and Simon Jerome

LSUF 28 November 2006

NPL Environmental Radioactivity PTE 2007

- 13th exercise in a series of environmental radioactivity proficiency test exercises (started in 1989)

- 7 aqueous sample types:
  - -alpha, beta and gamma emitters at two concentration levels
  - -potentially volatile beta emitters at one concentration level

- 1 solid sample type (activated concrete)

NPL

Sample type A

Alpha High (AH): 20 g sample in HDPE bottle, nuclides 1-20 Bq/g

Alpha Low (AL): 500 g sample in HDPE bottle, nuclides 1-20 Bq/kg

^{226}Ra, ^{237}Np, ^{238}U, ^{238}Pu, ^{239}Pu, ^{241}Am and ^{244}Cm

NPL

Sample type B

Beta High (BH): 100 g sample in HDPE bottle, nuclides 1-20 Bq/g

Beta Low (BL): 500 g sample in HDPE bottle, nuclides 1-20 Bq/kg

^{3}H, ^{55}Fe, ^{63}Ni, ^{89}Sr, ^{90}Sr and ^{99}Tc

NPL

Sample type G

Gamma High (GH): 100 g sample in HDPE bottle, nuclides 1-20 Bq/g

Gamma Low (GL): 500 g sample in HDPE bottle, nuclides 1-20 Bq/kg

Mixture of a minimum of eight gamma-emitting radionuclides from the following candidate list:

^{7}Be, ^{22}Na, ^{40}K, ^{46}Sc, ^{51}Cr, ^{54}Mn, ^{59}Fe ^{56}Co, ^{57}Co, ^{58}Co, ^{60}Co, ^{65}Zn, ^{85}Sr, ^{88}Y, ^{91}Y, ^{95}Zr, ^{95}Nb, ^{103}Ru, ^{106}Ru, ^{109}Cd, ^{110m}Ag, ^{111}Ag, ^{113}Sn, ^{123m}Te, ^{124}Sb, ^{125}Sb, ^{125}I, ^{134}Cs, ^{137}Cs, ^{133}Ba, ^{140}Ba, ^{139}Ce, ^{141}Ce, ^{144}Ce, ^{147}Nd, ^{152}Eu, ^{154}Eu, ^{155}Eu, ^{153}Gd, ^{160}Tb, ^{166m}Ho, ^{170}Tm, ^{192}Ir, ^{203}Hg and ^{207}Bi

NPL

Sample type B2 and SC

Beta 2 (B2): 500 g sample in HDPE bottle, nuclides 100-500 Bq/kg

^{3}H (Aqueous and OBT)**, ^{14}C** (carbonate)**, ^{129}I** and **^{36}Cl**

Solid Concrete (C):

Crushed concrete sample (50 g) containing a variety of radionuclides (~ 1 Bq/g total, excluding ^{3}H) including:

^{3}H, ^{14}C, ^{41}Ca, ^{55}Fe, ^{60}Co, ^{63}Ni, ^{133}Ba, ^{152}Eu and ^{154}Eu

NPL

Time table

Provisional time table

- Date of sample despatch: March 2007
- Deadline for return of results: 16 June 2007
- Date of meeting: September 2007
- Date of publication of the report: 30 September 2007

Please contact Arvic Harms (arvic.harms@npl.co.uk or radioactivity@npl.co.uk) for more information

NPL