

## ***Who are we?***

### ***The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)***

***ARPANSA is a Federal Government agency responsible for protecting the health and safety of people, and protecting the environment, from the harmful effects of radiation (ionizing and non-ionizing).***

*Specifically, ARPANSA is responsible for:*

- *promoting uniformity of radiation protection and nuclear safety policy and practices across jurisdictions of the Commonwealth, the States and the Territories;*
- *providing advice to Government and the community on radiation protection and nuclear safety;*
- *undertaking research and providing services in relation to radiation protection, nuclear safety and medical exposures to radiation; and*
- *regulating all Commonwealth entities (including Departments, Agencies and Bodies Corporate) involved in radiation or nuclear activities.*

*The baseline environmental radiation study uses the expertise and resources within ARPANSA*

- *ARPANSA maintains two offices, with the Scientific Branches in Melbourne, and the Corporate and Regulatory Branches in Sydney.*
- *The Health Physics Section and the Environmental Radioactivity Section are part of the Environmental and Radiation Health Branch, based in Melbourne*

## ***What are we measuring?***

The Environmental and Radiation Health Branch within ARPANSA has an on-going interest in assessing radiation exposure in the environment and in the workplace. The Branch maintains radiation measurement systems for the determination of radioactivity in soil, water, air, food and other materials, as well as within the body. The present measurement programme is part of a larger scale study of the variability of the natural radiation background across Australia and the determination of baseline background levels at selected locations, including the suburbs around Lucas Heights, in the immediate area around the ports that host visits by nuclear powered warships and in regions with high levels of natural radiation. ARPANSA field teams are involved in two types of measurements for this survey. (Background radiation is discussed in the information sheet entitled *What's Background Radiation?*)

### ***Mapping of Background Gamma-ray Radiation***

The Health Physics Section from ARPANSA will use a vehicle mounted gamma-ray spectroscopy system to measure the natural radiation in the suburbs within a 5 km radius of Lucas Heights. The measurement system can identify and quantify levels of naturally occurring and artificial gamma-ray emitting radioactivity within a 100 metre radius of the vehicle. The data will be analysed to produce maps showing the variation of background radiation dose rate and the concentration of selected naturally occurring radionuclides (such as uranium, thorium and potassium). (The radiation mapping system is discussed in the information sheet *What's on the roof of the car*).

## Collection of Environmental Samples

Radioactivity present in the environment, natural or artificial, can lead to exposure to numbers of the public through a number of different pathways. The main pathways for exposure are illustrated in diagram below. The purpose of the current field work is to develop methods and protocols for a long-term study of radioactivity levels in the environment around the ANSTO site. The long-term aim is to develop the capability for the detection of any potential environmental contamination resulting from the operations at Lucas Heights. The sampling program will be carried out by members of the Environmental Radioactivity Section of ARPANSA. (The activities of the Section are discussed in the information sheet *Environmental Radioactivity Section* )

The first stage is to accurately establish the average natural background and the variations in that background for the area around Lucas Heights. This requires the measurement of samples of soil, surface water, ground water, vegetation and airborne dust, at representative sampling sites in the suburbs around Lucas Heights. Much of the work done at ARPANSA involves studies of materials containing elevated levels of radioactivity, whereas this study will involve measuring lower levels of radioactivity. Therefore, this first field trip will be an orientation exercise to allow staff to become familiar with the area, to identify possible measurement sites for detailed follow-up study, and to test measurement equipment and procedures.

## Human Radiation Exposure Pathways

(Adapted From IAEA Safety Series 109, 1994)

