Environmental Health Impact of Legacy Uranium Mining in Portugal

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Abstract: Radioactive ores were extracted in Portugal for the production of radium and uranium from 1908 till 2001. During this period, sixty mines were operated mainly in the centre north region of the country, and extracted ores transported and processed in a few places in the region. With the drop of uranium prices in international markets occurred during the 90s, the uranium mining in Portugal ceased and the uranium mining company closed operations, such as in all western European countries. With the end of uranium mining industry in Portugal, concerns arose about the environmental impact of abandoned uranium mining and milling waste which triggered a global assessment of the environmental contamination and human health risk for populations living in the uranium region. The research carried out in 2003-2007 encompassed a range of selected mining and milling sites, such as Urgeiriça. The results allowed for endorsing environmental remediation actions namely to confine the more radioactive milling waste and to treat radioactive and acid mine drainage in order to abate environmental contamination and reduce the risk of human exposure to uranium waste radioactivity. Environmental remediation work and waste management measures implemented decreased the discharge of radioactive materials into the environment and reduced ambient radioactivity in several areas and thus the risk of radiological exposure to the population. Due to the long half-life of radionuclide's present in uranium mining and milling waste, these former uranium sites including the areas that were remediated, require stewardship and radiological surveillance for some time. The monitoring of radioactivity in the environment in these former uranium mining regions, in agreement with the EURATOM Treaty is carried out annually by the Nuclear and Technological Institute (ITN) and results delivered to the EU and to the public. Monitoring results show that the risk of radiation exposure of members of the public was abated and that actual radiation doses in most monitored sites are in line with the current and restrictive radiation dose limits. This is an important achievement and simultaneously, a remarkable journey. In the course of one century of worldwide uranium ore mining and milling industry, in Europe and Portugal we progressed from an environment

damaging extractive industry, to the discovery of the harmful effects of radioactive elements, to the set up of radiation protection regulations and, finally, to the control of uranium mining legacy and effective radiation protection of the public.

Short Curriculum Vitae: Biologist and Chemist, is Principal Investigator of the Nuclear and Technological Institute (ITN) / Instituto Superior Técnico - Universidade Técnica de Lisboa, Sacavém, Portugal. He is in charge of the environmental radioactivity monitoring programme in the regions of former uranium mining of Portugal, and has extensive work in the field of environmental radioactivity and radiation protection. He is a former staff member of the International Atomic Energy Agency and Head of the Marine Environmental Studies Laboratory of the IAEA/ UNEP/UNESCO in the Principality of Monaco. He is also an IAEA consultant for environmental radioactivity matters and monitoring programmes.