

# International Conference on the Management of Naturally Occurring Radioactive Materials (NORM) in Industry

VIRTUAL EVENT

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## Adapted method of radiological risk assessment in gold extraction mining in Burkina Faso.

### Abstract

The purpose of this work is to protect people and the environment against harmful effect of naturally occurring radioactive materials in in gold mining. It therefore aims to inform the promoters and workers of the mining sector about the effective doses to which they could be exposed per year in performing their duties in their workplace at gold mining. This research is focused on an adapted method of effective dose assessment from NRPB (National Radiological Protection Board) approach. For the process, exposures pathways were used in accordance with the most critical cases. These pathways are external exposure to gamma rays and internal exposure by inhalation. The method of calculation was based on the results of activity concentrations obtained through using of gamma spectrometry analyses detector GeHP. The results of the adapted method applied on the samples data have indicated overall low annual effective doses. The dose rate ranges was from 2.45 to 23.3  $\mu\text{Sv}$  / year for gold mines samples. These values are significantly lower than the exposure values limit 1 mSv / year established by the Canadian guideline of NORM management for casual workers. In addition to this, the nuclide identified from analyses showed the presence of U-235 and certain daughters in the gold mining. The information indicate presence of internal exposure hazards by inhalation as long as its a chronic exposure. Despite the low levels of annual effective doses in the gold mining, it is therefore necessary for mining to develop and maintain good practices applied for health and environment protection in sites; in particular by using personal protection equipments, in accordance with precautionary principle as commanded in sustainable development projects. In addition, the country is encouraged to develop a guide, even regulation for the NORMs to frame the NORMs

Key words: Effective doses; Inhalation exposure; External exposure

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