

NSW mining and extractives industry

What is ionising radiation?

Ionising radiation is the transfer of energy through space or material (human body tissue) in the form of electromagnetic waves or subatomic particles which is capable of causing ionisation in matter, i.e. is capable of changing neutral atoms into charged atoms, called ions, by removing, or sometimes adding, electrons.

Why is it a health hazard?

Ionising radiation can damage human cells. Safe Work Australia guidance describes the health effects as outlined below.

“Most organs and tissues of the body are unaffected by the loss of even substantial numbers of cells, but if the number lost is large enough, there will be observable harm reflecting a loss of tissue function. The probability of causing such harm will be zero at small doses but, above some level of dose (the threshold), it will increase steeply to unity (100 per cent). Above the threshold, the severity of

What are the exposure monitoring requirements for the health hazard?

In mining and mineral processing operations, workers may be exposed to naturally occurring sources of radiation in the work environment, including radiation from mined (uranium) or processed materials.

A person conducting a business or undertaking (PCBU) must ensure that work-related exposures to ionising radiation does not exceed the recommended dose limit of 20 mSv per year, averaged over a period of five consecutive calendar years.¹ There are also annual dose limits for the lens of the eye, skin and hands and feet.

Personal exposure monitoring is carried out using devices that detect and measure the concentration of radiation.

Exposure monitoring of radiation should be undertaken by a competent and specifically trained individual in radiation.

Further information is available from Australian Radiation Protection and Nuclear Safety Agency

What are the health monitoring requirements for the health hazard?

Levels of radiation need to be monitored to ensure they remain below a recommended standard. The methods used to measure the amount of radioactive material in the body depend on the nature of the exposure.

Biological methods include samples collected from individuals including; urine, body fluid, blood, hair clippings etc. Routine health monitoring programs may be established if individuals are exposed to significant quantities.

¹ Reference: Recommendations for limiting exposure to ionising radiation (1995) and national standard for limiting occupational exposure to ionising radiation (1995) and national standard for limiting occupational exposure to ionising radiation (republished 2002); Radiation Protection Series No. 1; ARPANSA.

Ionising radiation

January 2018

What is ionising radiation?

Why is it a health hazard?

What are the exposure monitoring requirements for the health hazard?

What are the health monitoring requirements for the health hazard?

the harm will also increase with the dose.”

Low doses of radiation over a long period can cause long term health effects. Cells may become cancerous or DNA may become affected causing mutations.

www.arpansa.gov.au and Safe Work Australia and W.A. Dept Mines, Industry Regulation and Safety

www.dmp.wa.gov.au/Safety/How-is-radiation-safety-9686.aspx

For more information on biological monitoring for ionising radiation contact should be made with an occupational physician.

