**Radioactive Pollution**

# Radioactive pollution occurs when ‘Radioactive’ metals releasing dangerous beta rays which can cause cancer and other mutative diseases. These types of pollution can occur by either the dumping of radioactive waste from nuclear power plants into water bodies, damage of nuclear reactors leading to radioactive contamination that would last for many years and many more. In the Second World War, when the U.S.A attacked Hiroshima and Nagasaki of Japan,1945' the atomic bomb left a radioactive footprint leading to highly mutative diseases. So, most of the people who survived the atomic bombing died eventually from cancers and mutations.

The ability of certain materials to emit the proton, gamma rays and electrons by their nuclei is known as the radioactivity. The protons are known as the alpha particle and the electrons are also known as the beta particle. Those materials are known as the radioactive elements. The environmental radiations can be from different sources and can be natural or manmade.

**Sources of Environmental Radiation:**

**(i) Natural (Background) Radiation:**

This includes cosmic rays that reach the surface of the earth from space and terrestrial radiations from radioactive elements present in the earth’s crust.

Many radioactive elements such as radium 224, uranium 235, uranium 238, thorium 232, radon 222, potassium 40 and carbon 14 occur in rocks, soil and water.

**(ii) Man-made Radiation:**

1- Mining and refining of plutonium and thorium

2-Production of nuclear weapons involves the tests of nuclear arms. These tests produce large amount of radioactive elements into the environment and make other materials also radioactive. They include strontium 90, cesium 137, iodine 131 and some others.

The radioactive materials are transformed into gases and fine particles which are carried to distant places by wind. When rain drops, the radioactive particles fall on the ground, it is called nuclear fallout. From the soil radioactive substances are taken by plants, thence they reach humans and animals through food chains. Iodine 131 damages white blood corpuscles, bone marrow, spleen, lymph nodes, skin cancer, sterility and defective eye sight and may cause lung tumours. Strontium 90 accumulates in the bones and may cause bone cancer and tissue degeneration in most animals and man.

**3- Atomic Reactors and Nuclear Fuels:**

The operation of a nuclear power plant releases large amounts of energy. This energy is used in large turbines, which produce electricity. Both the fuel elements and coolants contribute to radiation pollution. Wastes from atomic reactors also contain radioactive materials. The biggest problem is the disposal of these radioactive wastes. If these wastes are not properly disposed off, can harm the living organisms wherever they may be dumped. Inert gases and halogens escape as vapours and cause pollution as they settle on land or reach surface waters with rain.

**4- Radio Isotopes:**

Many radioactive isotopes such as 14C. 125I, 32P and their compounds are used in scientific research. Waste waters containing these radioactive materials reach water sources like rivers through the sewers. From water they enter human body through food chains.

**5- X-rays and Radiation Therapy:**

Human beings also voluntarily receive radiation from diagnostic X-rays and radiation therapy for cancer.

6- People working in power plants, nuclear reactors, fuel processors or living nearby are vulnerable to radiation exposure.

**Effects of Radioactive Pollution:**

**Harmful Effects:**

The effects of radiation were first noted in 1909 when it was found that uranium miners suffer from skin burn and cancer due to radiations from the radio-active mineral. Different organisms show different sensitivity to ionising radiations. For example, tests have shown that pine trees are killed by radiations in which oak trees continue to thrive comfortably.

The cells which actively grow and divide are quickly damaged. This category includes the cells of skin, intestinal lining, bone marrow, gonads and embryo. Radiations have both immediate or short-range and delayed or long-ranged effects.

**(i) Short Range (Immediate) Effects:**

They appear within days or a few weeks after exposure. The effects included loss of hair, nails, subcutaneous bleeding, change in number and proportion of blood cells, changed metabolism, and proportion of blood cells, etc.

**(ii) Long Range (Delayed) Effects:**

They appear several months or even years after the exposure. The effects are caused by development of genetic changes, mutations, shortening of life span, formation of tumour, cancers, etc. The effect of mutations can persist in the human race.

All organisms are affected by radiation pollution. Some organisms preferentially accumulate specific radioactive materials. For example, oysters accumulate 65Zn, fish accumulate 55Fe, marine animals accumulate 90Sr.

NOISE POLLUTION

**Noise pollution** or **noise disturbance** is the excessive [noise](http://en.wikipedia.org/wiki/Noise) that may harm the activity or balance of human or animal life. The source of most outdoor noise worldwide is mainly caused by [machines](http://en.wikipedia.org/wiki/Machines) and [transportation systems](http://en.wikipedia.org/wiki/Transport), [motor vehicles](http://en.wikipedia.org/wiki/Motor_vehicle), [aircraft](http://en.wikipedia.org/wiki/Aircraft), and [trains](http://en.wikipedia.org/wiki/Trains). Poor [urban planning](http://en.wikipedia.org/wiki/Urban_planning) may give rise to noise pollution, since side-by-side industrial and residential buildings can result in noise pollution in the residential areas.

Indoor noise can be caused by machines, building activities, and music performances, especially in some workplaces. [Noise-induced hearing loss](http://en.wikipedia.org/wiki/Noise-induced_hearing_loss) can be caused by outside (e.g. trains) or inside (e.g. music) noise.

Different types of noise pollutants may include sounds generated by aircraft, trains, boats, automobile traffic, construction, industrial manufacturing, vehicle alarms or even loud music.

EFFECTS:

High noise levels can contribute to cardiovascular effects in humans, a rise in blood pressure, and an increase in stress and vasoconstriction, and an increased incidence of coronary artery disease. It can also cause damage to the ear drum which can cause deafness.

In animals, noise can increase the risk of death by altering predator or prey detection and avoidance, interfere with reproduction and navigation, and contribute to permanent hearing loss.