- during the extraction of mineral raw materials: dust emissions from mining and primary processing of the rock mass; specific gaseous emissions from blasting, dust emissions from the waste dumps;
- during the transport of raw materials and finished products: emissions of pollutants from the operation of vehicles.

2. Rejection and violation of land:

- during construction and operation of a plant for the extraction of minerals: mining allotment, land transport and communication infrastructure, the formation of heaps;
- when placing the cement production facilities and creation of sanitary protection zone.

3. Pollution of the hydrosphere:

- during construction and operation of a plant for the extraction of mineral raw materials: the formation of depression cones due to water pumping (the area of craters can be up to 200-300 km^2);
- breaching of the hydrogeological regime, pollution of groundwater and surface water with complete degradation of rivers due to siltation and erosion of coasts, excess levels of water contamination;
- during the production of cement - water use and wastewater discharge.

4. Violation of subsoil during construction and operation of a plant for the extraction of mineral raw materials, characterized by violation of the integrity of the rock mass, withdrawal and loss of adequate resources.

Considering negative impact which is made by the cement industry on the environment, can be the main directions of greening: reduction of volumes of emissions by catching and utilization of dust, use of thermal energy of flue gases, alternative materials and fuel and others.

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ASSESSMENT OF ABSORBED DOSE FROM IONISING RADIATION USING ELECTRON PARAMAGNETIC RESONANCE

Electron paramagnetic resonance (EPR) dosimetry is a physical method for the assessment of absorbed dose from ionising radiation. It is based on the measurement of stable radiation induced radicals in human calcified tissues (primarily in tooth enamel). EPR dosimetry with teeth is now firmly established in retrospective dosimetry. It is a powerful method for providing information on exposure to ionising radiation many years after the event, since the 'signal' is 'stored' in the tooth or the bone. This technique is of particular relevance to relatively low dose exposures

or when the results of conventional dosimetry are not available (e.g. in accidental circumstances). The use of EPR dosimetry, as an essential tool for retrospective assessment of radiation exposure is an important part of radioepidemiological studies and also provides data to select appropriate countermeasures based on retrospective evaluation of individual doses. Despite well established regulations and protocols for maintaining radiation protection dose limits, the assurance that these limits will not be exceeded cannot be guaranteed, thus providing new challenges for development of accurate methods of individual dose assessment.

EPR consists of the resonant absorption of electromagnetic energy at electron-spin transitions. A static magnetic field should be applied to resolve different electron-spin levels. Unpaired electrons of free radicals have spin equal to ½. In a magnetic field there are two magnetic levels, +½ and –½ with different energies. The transition between two these levels is possible under following resonance condition:

$$h\nu = g\mu_B B$$

where ν is resonance frequency, h is Plank's constant, g is the g-factor, μB is the Bohr magneton, and, B is the magnetic field induction.

The device for EPR registration is called an EPR spectrometer. Today, EPR dosimetry is a leading method for retrospective dosimetry of individual radiation exposures. The EPR method have its own advantages and disadvantages.

The pluses are:

- measuring of the volume of samples;
- dose reconstruction in distinctive tissues;
- dose reconstruction after long periods of exposure;
- dose reconstruction for many years after the exposure.
- And the minuses are:
- the difficulty in collecting material for analysis;
- reconstruction of the individual dose is complicated and labour-consuming.

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PROTON AND ELECTRON ACCELERATORS IN THE TREATMENT OF ONCOLOGICAL DISEASES

At present electron and proton accelerators are widely used in the diagnostics and treatment of cancer. There exist electron and proton therapy. The former is applied in the treatment of superficial or subcutaneous diseases (skin cancer, clay pipe cancellation, intraoral cancer, cervical carcinoma, breast cancer), while the latter is more universal since it allows to work at any body depth (eye melanoma, brain tumor, cancer of the head and neck, spinal cord tumor, lung carcinoma, a tumor in the skull base, prostate cancer, pituitary cancer, liver cancer). The basic advantage of