
DEGRADATION OF THE ENVIRONMENT ON THE NIS-NAFTAGAS PROMET LOCATIONS DUE TO THE BOMBARDMENT

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The man-caused degradation of the spheres surrounding the Earth is an everyday phenomenon. Today, modern man, equipped with all kinds of knowledge, wise and creative, is facing the most difficult challenge in the course of his evolution: how to overcome the crisis of mankind caused by multiple, severe pollution of the global environment resulting from the continuous growth of the number of industrial facilities, steam power plants, nuclear power plants and their waste materials, how to overcome the forthcoming crisis of depletion of unrenovable energy resources, how to stop the disintegration of recently still stable systems, necessary for the existence of man (anthropogenic climate changes, air and water pollution, destruction of the ozone layer, erosion, etc.), how to prevent population explosion, hunger and poverty, and finally how to improve severely disturbed ethical relations. The effects of environmental degradation may result either from natural catastrophes, or from failures and mistakes in production processes and technological solutions, the latter being entirely due to the human factor. Industrial accidents are usually happening within certain production units, thus being limited to smaller areas. It happens very rarely that a human activity may endanger the whole territory of a country. It, however, happened during the bombardment of the territory of FRY.

During the bombardment of the Central Storage of Novi Sad and the Central Storage of Sombor in April-May 1999, tons of oil products (fuels and lubricants) were spilt, released into the atmosphere, water and ground, or burnt, which produced a large scale impact on the environment. Clouds of black smoke were spreading over the cities (Novi Sad and Sombor), carrying large amounts of sulphur dioxide, nitrogen oxide, polycyclic aromatic hydrocarbon (PAH), lead, aerosoles with chemical compounds from paints, furniture, textiles, plastics, synthetic and other insulation materials, of which asbestos is known to be a carcinogenic material. All the above mentioned chemicals belong to the group of permanent pollutants, globally dangerous for atmosphere and other media.

The quantities of harmful and hazardous materials that were released within one or a few days, must not be released within several years, or even decades, in any of industrially developed countries. It will be hard to determine which of the effects are worse: the ones resulting from the direct spilling of oil products from storage tanks, or the ones resulting from the burning up of big quantities of oil products of organic origin, whose products of the burning endangered flora and fauna in the area to which they were brought by precipitations. At that time, the quantity of precipitations was ten times larger than the

average quantity in the past several years, which caused the large quantity of the products of burning, after spreading through the air, to fall onto the ground.

Spilling of oil products into the Danube is not only a local problem. Oil products of certain density $0.70 - 0.95 \text{ g/cm}^3$ at 15° C , as a hydrophobic liquid, produce a thin film on the water surface, which gradually transforms into emulsion "oil product – water" and prevents the air exchange between water and air, causing the death of the living organisms beneath the surface. The increase of water acidity happens due to the increase of CO_2 concentration. It is regarded that water is unusable in case of 1 litre of oil mixing with one million litres of water.

The impact of a pollutant from the atmosphere on the flora can be either direct or indirect. Direct impact is manifested in the penetration of a pollutant from an organ up to the cells and its chemical reactions with certain components. Major direct pollutants are compounds of sulphur, fluor, ethylene, ozone, oxide, carbon, chlorine and hydrocarbon. Indirect impact is caused by the particles of smoke, dust and led – insoluble solid particles which, settled on the surface of plants, disturb normal penetration of the sunlight, moisture and gases, which are necessary for the process of photosynthesis.

Air and water pollution can be more easily detected compared to ground pollution, which can remain unnoticed for a long period of time. The contact of a pollutant with ground is not so obvious as it is with air and water. Ground is opaque and it has certain buffer characteristics, which makes it possible for harmful materials to remain undetected for a long time. The only suitable and applicable treatment is the replacement of the degraded ground and its further treating in the designed deposits.

The Central Storage of Novi Sad – Within the period between 7th April and 24th May 1999, the facilities were bombed for six times. Effects of the bombardment actions were both direct and indirect damages to the storage tanks area, storage facilities, infrastructure and other facilities, buildings and stored goods.

Destroyed goods	burnt	spilt into ground
1. FUELS	396 158 kg	44 018 kg
1.1. MB-86	76 553 kg	8 506 kg
1.2. Heating oil	77 774 kg	8 642 kg
1.3. Fuel oil	241 831 kg	26 870 kg
2. LUBRICANTS	235 897 kg	26 211 kg
2.1. Motor oil	134 259 kg	14 918 kg
2.2. Industry oil	21 446 kg	2 383 kg
2.3. Greases	25 964 kg	2 885 kg
2.4. Other lubricants	54 228 kg	6 025 kg

It is estimated that during the bombardment of the storage tank area with accompanying installations, about 90% was burnt and 10% spilt. Out of destroyed firefighting vehicles and mobile and immobile firefighting equipment, about 1 425 kg of firefighting powder was spilt. The replaced ground polluted with spilt oil products and firefighting chemicals on the surface of $1\,805 \text{ m}^2 \times 0,2 \text{ m} = 361 \text{ m}^3$.

The Central Storage of Sombor - Within the period between 10th May and 22 May 1999, the facilities were bombed for five times. Effects of the bombardment actions were both direct and indirect damages to the storage tank area, storage facilities, infrastructure and other facilities, buildings and stored goods.

Destroyed goods	burnt	spilt into the ground
3. FUELS	1 175 070 kg	130 563 kg
3.1. MB-86	490 362 kg	54 485 kg
3.2. MB-95	300 772 kg	33 419 kg
3.3. D-2	356 820 kg	39 647 kg
3.4. Heating oil	27 116 kg	3 012 kg
4. LUBRICANTS	4 649 kg	516 kg
4.1. Motor oil	751 kg	83 kg
4.2. Industry oil	2 158 kg	240 kg
4.3. Greases	522 kg	58 kg
4.4. Other lubricants	1 218 kg	135 kg

It is estimated that during the bombardment of the storage tank area with accompanying installations, about 90% was burnt and 10% spilt. Out of destroyed firefighting vehicles and mobile and immobile firefighting equipment, about 450 kg of firefighting powder was spilt. The replaced ground polluted with spilt oil products and firefighting chemicals on the surface of $2\,750\text{ m}^2 \times 0,2\text{ m} = 550\text{ m}^3$.