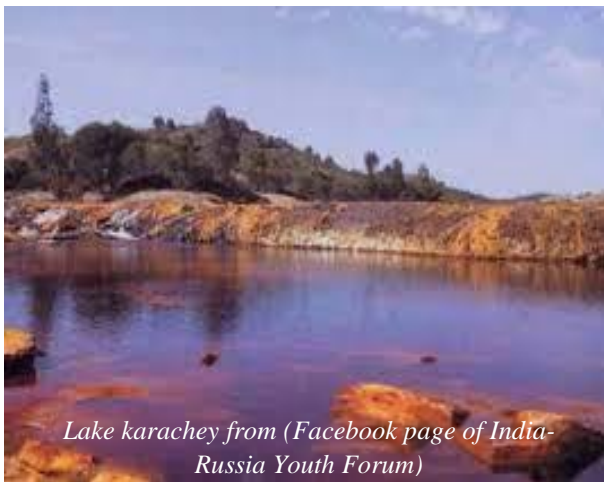


# Lake Karachey: A Dark History of ‘Black Water’

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Lake karachey from (Facebook page of India-Russia Youth Forum)

Lake Karachey (Karachey: “black water” or “black creek” in many North-western Turkic languages including Tatar); also known as Karachai or Karachaj was a small lake located in the southern Ural Mountains, near the city of Ozersk in present Central Russia. It spreads across an area of 15ha and is situated at a height of 251m above the sea level. This lake has been termed “the most polluted (open-air) place on Earth, from radiological point of view” (according to a report by Worldwatch Institute on nuclear waste based in Washington D.C.). Another report (by National Resource Defense Council-NRDC) states that in 1990, the radiation level, surrounding the region, where the radioactive effluents were dumped) was *600 roentgens/hr (approximately 6 Sv/hr)* which was sufficient to kill a person within less than one hour. But to know the reason as to why a beautiful lake turned this lethal, we must have a look at the backstory.....

It all started with the establishment of “MAYAK PRODUCTIONS ASSOCIATION”, in between 1946-1948, by NKVD chief Lavrenti Beria. The setting up of the plant was a part of the secret mission with an aim to produce plutonium for the ‘Soviet Atomic Bomb Project’. Being a secret mission of national importance and global impact, things were pretty hushed up and matters like proper disposal of waste material and worker’s health were hardly paid any attention.

The cooling water used in the reactors was extracted from Lake Kyzyltash, the largest natural lake there. This



lake was directly contaminated by the careless use of ‘open-cycle cooling systems. Although Lake Karachey was even closer, it was smaller in size to provide cooling water but a convenient dumping ground for the large quantities of high-level radioactive waste which was of extremely high temperature and unfit for storing in the underground vats of

the facility. Almost 500 million Ci of  $\beta$ -radioactive nuclides were dumped in the lake.

The primary plan was to store radioactive waste materials which could be later returned to Mayak facility's underground storage vats. With passing time this idea proved impossible as the radioactive levels increased and became lethal. But this process continued for a long time until on 29<sup>th</sup> September, 1957 a tank storing thousands of tons of nuclear waste exploded due to a defective cooling system which was left unrepaired.

This came to be known as the Kyshtym Disaster in history and had almost four times impact than the Chernobyl Disaster. The explosion had an energy of almost 75 tons of TNT (310 gigajoules) and released around 740-800 PBq (20 MCi)<sup>3</sup> of radioactivity, causing widespread contamination by radioactive masses over an area of 52000 sq.km.

Around 1960 the lake began to dry out. In 1968, a draught resulted in spread of 185 PBq of radioactive dust from the dried area of the lake, exposing half a million people to harmful radiations.

The filling of the lake started in



between 1978 and 1986, when it was packed with 10,000 hollow concrete bricks. Since then, the conservation of the affected regions was taken up by a 'federal target program', "Nuclear and Radiation Safety in 2005 and for the period up to 2015". The remaining parts of the lake were packed in November of 2015. By December of 2016 the final layer of rock and soil was laid, making the condition better than before.

But even after everything, the lake continues to contaminate underground water due to seeping of toxic materials from the lake to other underground water resources. Even today lake contains about 120 million Ci. It remains as a vivid example of how human interests continue to exploit the nature, its resources and adversely affect the human species.