

by our intervention. The Northern Muya tunnel is a uniquely complex geotechnical system. Here we encounter a multitude of tectonic faults, rocks of different strength, an abundance of thermal and pressure waters, and a high degree of seismicity. This is, perhaps, the world's most complex tunnel project. The work on the tunnel has caused a number of serious environmental changes with an ecological effect. The natural regime of subterranean and surface springs has been disrupted. The upland moors have disappeared. The Japanese stone pine and growths of rhododendron that once covered the slopes have dried up. The brooks have disappeared. The run-off of polluted waters from the tunnel has contaminated the water in the Muyakan R., which over the past years has resulted in a significant decrease of the white-fish population (lenok, grayling). Because the slopes were cut down somewhat, the intensity of landslides increased. There are also the standard problems of clearing away, burying and utilizing household waste, as well as smoke pollution of the atmosphere. How are these problems being solved? It would be unfair to ignore the extensive measures being taken by the environmental institutes of the Siberian Department of the USSR Academy of Sciences in the zone affected by BAM in accordance with the "Siberia" program, or the substantial expenditure and efforts of "Bamtonnelstroi" in purifying the waters of the Northern Muya tunnel, undertaken in accordance with the recommendations of the Environmental Protection Laboratory of our Institute. However, none of the problems, including water purification, have been adequately resolved, despite the millions of roubles spent on this.

Q: Had any scientifically proven principles of environmental exploitation under permafrost conditions been developed before construction work got underway?