Specialists of the Institute of Oil and Gas Geology and Geophysics. A.A. Trofimuk SB RAS, Institute of Mining. N.A. Chinakala SB RAS and LLC NIC Bamtonnel studied an abandoned tunnel in the Kemerovo region to develop a methodology for ensuring the safety of underground structures. For underground objects, the method of multi -channel analysis of surface seismic waves (Masw) was first used.

As the scientific information portal “Scientific Russia” notes, when exploring the security of existing underground objects, it is important to take into account the petrophysical and geophysical data, which subsequently become the basis in the design of tunnels, but they may not be enough to identify dangerous areas.

One of the problems for experts is the exact determination of the distance from the location of the tunneling complex to the zones dangerous for passing, as well as the diagnosis of the state of the tunnel and the mountain massif. To solve such problems, the researchers used the method of multi -channel analysis of surface seismic waves (Masw), which was not previously used for underground objects.

Studies were conducted in an abandoned tunnel in the area of Artyst – Tomosinskaya. Seismic exploration from the western portal showed poor casing contact with the mountain massif, which can be associated with cracks and voids that cause seeping of water.

Project participants noted the successful use of ground methods in underground conditions to search for problematic zones. “The results obtained showed that the equipment, as well as the observation and processing methods used in ground engineering seismic seismic exploration, are successfully applicable underground,” the study participants noted.