# Arsenic contamination of tunnel seapge water along the Median Tectonic line, Japan

**Abstract n° 1404**

Ii Hiroyuki, Wkayama, Japan

hiro@center.wakayama-u.ac.jp

Ishinabe Kazuhumi, Kinki Regional Berau, Ministry of Land, Infrastructure, Transport and Tourism, Nara, Japan

Yamashita Yuji, Takenakadoboku, Gose, Japan

Uno Jyunji, Tekken Coprporation, Wkayama, Japan

Nishimura Toshiki, Undergraduate Wakayama University, Wkayama, Japan

KEYWORDS: arsenic, tunnel seepage, tectonic line

Along the north of Median tectonic line, there were some metal mines with As minerals in Japan. Before the several tunnel constructions for the Keinawa high way road, arsenic contamination rocks composed of granite was found from borehole investigation at the north of the Median tectonic line in the Kii Peninsula. There were two types of arsenic contamination rocks. One was sheared black colored granite with minute As minerals. Another was hydrothermal quartz veins with chalcopyrite CuFeS2, molybdenite MoS2 and arsenopyrite FeAsS. As concentration in rivers around the tunnel before tunnel construction were under 0.01mg l, the Japanese Environmental Standard. No concern for As water contamination was carried before tunnel construction. Then, As concentration of tunnel spoil was measured by dissolution test and high As rocks were carried to the waste disposal site. However, As concentration of tunnel seepage water was over 0.1mg L, the Japanese Effluent Standard. After in detail investigation for river water, As concentration for some rivers close to the tunnel were found to be over 0.01 mg L. The relation between geology and As concentration of tunnel seepage was clarified. Along the valley close to the tunnels parallel to the Median tectonic line, high As seepage water was found in the sheared granite with chlorite and small amount of minutes arsenopyrite. Rarely quartz vein with small amount of chalcopyrite, molybdenite and arsenopyrite was found. Stable isotopic ratios of hydrogen for tunnel seepage water were always 4 to 5 per mil lower than those in the river waters around the tunnel. Tunnel was constructed at the small isolated plateau and maximum distance from the tunnel to surface is 150 m. Then, the big hydrogen isotope difference between tunnel seepage and river waters were thought not to depend on altitude effect but evaporation of river water.