EGU21-3414
https://doi.org/10.5194/egusphere-egu21-3414
EGU General Assembly 2021

Groundwater flow in Naturally Occurring Asbestos (NOA) rich settings: new findings on the relation among concentration, types and mobility of mineral fibres, and geological characteristics of aquifer formations.

Chiara Avataneo[1], Elena Belluso[1,2,3], Silvana Capella[1,2], Manuela Lasagna[1], and Domenico Antonio De Luca[1]

[1]Dept. of Earth Sciences, University of Torino, Italy
[2]Interdepartmental Centre for Studies on Asbestos and other Toxic Particulates "Giovanni Scansetti", University of Torino, Italy
[3]CNR-IGG, National Researches Council - Geosciences and Georesources Institute, Torino, Italy

Weathering and erosion of asbestos-bearing rocks, such as meta-ophiolites (e.g. serpentinite rocks and metabasites), is the principal natural cause of asbestos water dispersion in Naturally Occurring Asbestos (NOA) rich settings. Water pollution by asbestos may occur as a consequence of superficial and groundwater flow through natural rock formations with NOA, depending on several characteristics of either the rocks (e.g. mineralogical composition, fracture grade) and hence the water (e.g. pH, speed).

Given the importance of groundwater resources for both drinking water and agricultural and industrial activities, groundwater asbestos pollution represents an environmental problem and could even constitute a risk for human health. In fact, waterborne asbestos can come into contact with human beings as airborne fibres after water vaporization, or by ingestion, especially if they are present in drinking water. While a lot is known about diseases caused by airborne asbestos respiration, not enough has been yet understood about potential noxiousness of its ingestion. For this reason, the necessity to set a Maximum Contaminant Level (MCL) for asbestos in potentially usable water is still debated.

As the North-Western and Central Alps are rich in NOA and also in naturally occurring asbestiform minerals non-asbestos classified, it's essential to understand if, how and which type of mineral fibres can eventually be released into water and to correlate them to the geolithological and hydrogeological characteristics of the area.

The results of a surface water and groundwater sampling and analysis campaign, settled in the North-Western Alps, will be presented. The main aim is to investigate the principal aspects related to asbestos and asbestiform fibres presence in water, in particular their natural occurrence in groundwater, linked to hydrological and geolithological characteristics of the reservoir. Furthermore, laboratory test to study the flow of polluted water through a packed column will be

designed and observations on the methodology to evaluate waterborne mineral fibres behaviour into porous media will be presented.

These data are fundamental to monitor asbestos (and asbestiform) fibres transportation due to water flowing into NOA and to better understand the relationship among geology, hydrogeology and mineral fibres presence in water.