

Excessive arsenic and boron concentrations determined in natural waters within the Department of Tacna in southern Peru are associated with active Andean volcanism, being further exacerbated by the ongoing mining activity in the area. Both arsenic and boron concentrations at five investigated sites significantly exceed the maximum permissible limits determined by the World Health Organisation and the Peruvian legislation for drinking water, thus affecting the health and wellbeing of the local population. Due to the remoteness of the area of interest, which lacks infrastructure, skilled human resources as well as capital, Photon Water Technology s.r.o. has come up with a solution based on the use of small water treatment plants operating on the principle of reverse osmosis in combination with a commercial remediation product Katalox Light<sup>®</sup>. This product enables the formation of alkaline conditions needed for proper complexation of boron into  $B(OH)_4^-(aq)$ , which is better remediated by the proposed technology. Reverse osmosis can remediate arsenic, although the efficiency of As removal depends on the chemical composition of natural waters at the investigated sites. Laboratory experiments have been focused to prove the viability of Katalox Light<sup>®</sup> for enhancing the rate of boron removal within the designed two-step remediation process. The usage of Katalox Light<sup>®</sup> led to the boron removal of 89%, albeit at pH 11, which is deemed unsuitable for drinking water purposes. Using a smaller column of Katalox Light<sup>®</sup> (containing an identical material, although with a filling volume of 5 litres instead of 31 litres column used prior to the testing in late November 2019) has not yielded satisfactory results as the highest boron removal was determined at 50% with a considerable slump in the efficiency of boron removal with a marginal decrease in pH only. The utilisation of Katalox Light<sup>®</sup> in combination with reverse osmosis shows promises in terms of boron remediation, though multiple issues concerning the compliance of this remediation technology with the WHO guidelines as well as the Peruvian legislation for drinking water must be addressed by further detailed studies.

**Keywords:** contamination geology, arsenic, boron, drinking water, Peru