JEP> Vol.2 No.1, March 2011

OPEN ACCESS

Natural Contaminants in Drinking Waters (Arsenic, Boron, Fluorine and Vanadium) in the Southern Pampean Plain, Argentina

PDF (Size:1237KB) PP. 97-108 DOI: 10.4236/jep.2011.21011

Author(s)

Martín E. Espósito, Juan D. Paoloni, Mario E. Sequeira, Nilda M. Amiotti, María del C. Blanco

ABSTRACT

This research aims at making a diagnosis of the presence of arsenic, boron, fluorine and vanadium in the waters from the basin of El Divisorio stream, tributary of Paso de las Piedras reservoir, in the southwest of Buenos Aires Province. This storage is used to provide water to the cities of Bahía Blanca and Punta Alta with a population of approximately 400,000 inhabitants. A selective and specific sampling of wells, perforations and superficial watercourses was made in 46 points, in an area of nearly 400 km2. Groundwaters had arsenic (max. 0.114 mg/l) exceeding the reference guideline in 97.3% of the samples, boron (max. 1.42 mg/l), vanadium (max. 0.8 mg/l) and fluorine (max. 6.6 mg/l), being respect- tively, 91.9%, 82.9%, and 67.6%. Regarding the superficial flow, while arsenic concentrations were higher than the limit in 100% of the cases (max. 0.072 mg/l), 88.9% corresponded to elevated boron (max. 1 mg/l) and vanadium (max. 0.23 mg/l) and only 22.2% to fluorine (max. 3.18 mg/l) ones. In all these cases, concentrations exceed the reference guideline values suggested by the World Health Organization, the Argentine Food Code and the Environmental Protec- tion Agency. The presence of these contaminants that finally could determine the quality of the water resource entering the reservoir is attributed to the natural characteristics of the environment since contributions by anthropic actions have not been detected in the area. The most critical sectors in the basin were identified in order to stress the possible negative influence of consuming these waters on the community's health, with the purpose of reporting the results to institutions, authorities and the population and applying them to preventive medicine.

KEYWORDS

Arsenic, Fluorine, Vanadium, Hydrochemistry, Risk

Cite this paper

M. Espósito, J. Paoloni, M. Sequeira, N. Amiotti and M. Blanco, "Natural Contaminants in Drinking Waters (Arsenic, Boron, Fluorine and Vanadium) in the Southern Pampean Plain, Argentina," *Journal of Environmental Protection*, Vol. 2 No. 1, 2011, pp. 97-108. doi: 10.4236/jep.2011.21011.

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