

# CARACTERIZACIÓN HIDROQUÍMICA Y EVALUACIÓN DE LOS IMPACTOS DE LAS ACTIVIDADES AGRÍCOLAS EN LA CALIDAD DEL AGUA DE UN ACUÍFERO FISURADO DEL BASAMENTO PRECÁMBRICO URUGUAYO

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## ABSTRACT

Punta Espinillo area is located in the Northwest of Montevideo district/Uruguay, beside the right margin of Santa Lucia river, in the mouth of this one, into the *de la Plata* river. The territory structure is built in small plots from 3 to 5 hectares. This zone is characterised by an intense agronomic activity, which produces the mayor amount of the vegetables consumed in Montevideo City. It has a high demand of water for irrigation systems, which one has not been rational planed. Nowadays, in every plot there is a well, which determines a mean density of wells, near to 4 every 400 m<sup>2</sup>. The water is extracted from a fractured aquifer system that has exceptional characteristics because of its water amount, but the great exploitation generates high drawdowns in wells, even coming to the extreme of their complete depletion. In connection with this, there is an increase of ions concentrations of sodium, chlorates, sulphates and nitrates very above of the national and international sanitary standard, also associated with non appropriate agronomic practices and the possibility of marine waters intrusion. These hypotheses were tested with the study of chemical analyses represented by geochemical contour maps and some geochemical indexes. On one hand, the sodium and chlorates geochemical contour maps shows that there is an increase in the concentration in wells who are located so far away from the Rio de la Plata river to has a connection with it. On the other hand, the potenciomtric contour maps shows that the water flow directions are from north to south, to the Rio de la Plata. In addition, the geochemical indexes calculated were  $Mg^{++}/Ca^{++}$ ,  $K^{+}/Na^{+}$  and  $Cl^{-}/HC03^{-}$ . These relations shows that all the waters has a continental origin in opposite to the marine water intrusion suspected. On the other hand, in relation to nitrates, all the wells has very high concentrations, some of them above 300 mg/L. the mayor amounts are associated with plots who generally use natural animal fertilisers. Theses concentrations of sodium, chlorates and nitrates qualify theses waters as non potable, for the international standards, and non acceptable for the national standards. In relation with irrigation, they has severe restrictions because of the risk of alcalinization and salinization of the soils.