Aquifer sampling using ball check-valves system: what about sample representativeness?
Frédéric Gal, Laurent André, Emmanuelle Petelet Giraud, Arnaud Wuilleumier

To cite this version:
Frédéric Gal, Laurent André, Emmanuelle Petelet Giraud, Arnaud Wuilleumier. Aquifer sampling using ball check-valves system: what about sample representativeness?. 43rd IAH CONGRESS, Sep 2016, Montpellier, France. hal-01325596

HAL Id: hal-01325596
https://hal-brgm.archives-ouvertes.fr/hal-01325596
Submitted on 2 Jun 2016

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers. L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
Aquifer sampling using ball check-valves system: what about sample representativeness?

ABSTRACT n° 1426

Authors:

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gal Frederick</td>
<td><a href="mailto:f.gal@brgm.fr">f.gal@brgm.fr</a></td>
<td>France</td>
</tr>
<tr>
<td>André Laurent</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>Petelet-Giraud Emmanuelle</td>
<td></td>
<td>France</td>
</tr>
<tr>
<td>Wuilleumier Arnaud</td>
<td></td>
<td>France</td>
</tr>
</tbody>
</table>

Topic : Topic 8 - progress in conceptual models, tools and methods
Sub Topic :
Keywords : deep sampling, representativeness, water chemistry
Comments : to be preferentially proposed in Session 8.06 - Verification of conceptual patterns and expected natural effects of regional groundwater flow by interpretation of relevant field observations
Conflict of Interest : 0

Date of submission : 2016-02-19

ABSTRACT [ 271 Words ]

Deep aquifer monitoring is a challenge in terms of representativeness of the sample. Such monitoring is often done when pumping is not adequate due to: 1) too deep water table level, 2) no willing to add disturbance to the aquifer (low recharge rate) or 3) too difficult management at surface of discharge waters. Deep sampling may rely on the use of sampling bottles but these have a fixed volume and need to lower and to remove the bottle each time a sample is needed.

Ball check-valves and pressure gas drive samplers have been developed to overcome this bias such as the US U-tube system. Here we present investigations with a system developed by the BRGM (GazOGaz, patent FR1259214), relying on similar functioning but having more flexibility in the use. Such a system allows the collection of a virtually unlimited volume of water at any depth in the water column.

Nevertheless, there is a frequent question about the use that may be done of waters collected using deep sampling. Site managers or public authorities wonder about the comparisons that can be made with samples obtained using classical pumping methodology. The present survey has been designed in that objective. By carefully describing physico-chemical parameters along the water column and by performing both in-situ deep sampling and pumping at fixed depth, characteristics of waters existing in 2 boreholes located near Castres (Tarn, France) are investigated in details with specific focus on the dissolved elements. Conclusions on how deep sampling may be used and useful for aquifer characterization are presented together with the limits of applicability of such a sampling procedure.