

Damage caused by a Water well in the Historical Center of Petrópolis, State of Rio de Janeiro, south-eastern Brazil.

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A news item published in the *Jornal do Brasil* on May 10, 1998 about the “*incredible vila which sinks at Petrópolis; ground subsides and residences over 100 years old are in danger of collapse*”, caught the attention of the authorities and professional classes alike to come to the help of the outraged community.

Geologists and engineers offered their services immediately to identify the cause of the damage and solve the problem. A survey was made of the cracks in walls of houses. Geophysical surveys and geotechnical drilling were carried out in addition to the installation of water-level recorders to determine the position and form of the cone of depression around a single water well, suspected to be the cause of the problem.

This well, one of many in the area, had been drilled on a stream flat consisting of silty-clay alluvium, originally rich by watersprings of the Imperial Family Fazenda. It is 100 m deep (32 m soil and 68 m rock), and the some 50 m away from the *vila*.

Investigations showed that well usage over two months extracting water from the soil, resulted a lowering of the water table by some 6 m with consequent differential subsidence and property damage. After the well had had been sealed by the authorities, the static level returned to 2.20 m from the surface after one month of observations. The water table continues to be monitored by the local community. To preserve the National Heritage several geotechnical and environmental norms were recommended.