

EARTH TIDE AND BAROMETRIC EFFECTS ON MONITORING WELLS AND RECORDED PRESSURES

By:

Leo L. Van Sambeek
RESPEC
Rapid City, South Dakota, USA

Elmar L. Goldsmith
Canatech Management Services Inc.
Chilliwack, British Columbia, Canada

ABSTRACT

The measured water levels (pressures) in monitoring wells contain earth-tide- and barometric-induced pressure increments. The induced pressure increments make the pressure records noisy and the induced pressure increments can exceed the magnitude of meaningful pressure changes. Three methods are described for removing the earth tide and barometric effects from measured pressures: a spreadsheet approach, a wavelet decomposition approach, and a regression deconvolution approach. Examples are also given for how the earth-tide- and barometric-induced effects can be used to estimate or infer geohydrological properties and aquifer characteristics.

Keywords: Earth tides, barometric pressure, monitoring wells, aquifer characteristics, geohydrological properties, Saskatchewan potash