

Hydrogeology 101 for the Petroleum Geologist

*J. Wills, President and Principal Hydrogeologist, Waterline Resources Inc., Calgary, Alberta
jwills@waterlineresources.com*

There has been two to three working generations of petroleum geologists since the WCSB was developed in the mid-1900s. During that time it was not uncommon for petroleum geologists to have limited career focus on water, other than to map and avoid it when targeting production intervals. Ironically, if they found water they had a dry hole and had failed. With the paradigm shift away from structural trap-based hydrocarbon targets, and towards regional hydrocarbon targets that require large volumes of water to develop (e.g., tight oil and gas developments, in-situ oil sands operations), it is crucial that the current and next generation of WCSB petroleum geologists increase their knowledge of hydrogeology, and water in general.

In the presentation, an overview of the following will be provided, with a specific focus on aspects applicable to petroleum geology:

- Hydrogeology 101 basics (hydraulic parameters, skin, flow rates, aquifer, aquitard, etc);
- Translating between reservoir engineering and hydrogeology terminology;
- Non-saline versus saline groundwater;
- Major non-saline and saline aquifers in the WCSB, and key regional assessments;
- Standard hydrogeological to assess well and aquifer long-term deliverability;
- Intensive water use energy sectors (existing and emerging markets);
- Water monitoring and management (is there is enough water to go around); and
- Key takeaways.