

Groundwater Licencing – Challenges in an Evolving Water Shortage

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From 1920 to mid-2015, the population of Alberta has increased from 0.5 to 4.2 million or approximately eight-fold. Most of the population growth has been in Southern Alberta. Population growth has been accompanied by commercial and industrial activities growth. This combination has created an unprecedented demand on our surface and groundwater resources. Calgary was once known as “a small city on a big river”, but today Calgary is a “big city on a small river”. Historically, industries in Southern Alberta had access to readily available surface water licences; consequently, our rivers and streams have become critically stressed. As a result, Alberta Environment and Parks were compelled to place a moratorium on new surface water licences from the South Saskatchewan River Basin (SSRB). This has placed an incredible demand on our groundwater resources, as any distance from a river or tributary is the preferred source for domestic use water wells. Country residential development and industry are now relying, more than ever, on groundwater resources in Southern Alberta.

Alberta Environment and Parks has developed a Guide to Groundwater Authorization, which carefully describes procedures for evaluating aquifer yield and other information required prior to issuing an authorization to divert groundwater. As a result of the moratorium on surface water licencing in Southern Alberta, groundwater that is directly connected to a source of surface water is not permitted to be licenced either. For example, groundwater which is excluded from licencing would include the gravel alluvium directly adjacent to the Bow or the Highwood Rivers.

A case study demonstrating investigative techniques used to assess ‘contentious’ surface to groundwater connections is presented. The case study involves pumping test drawdown / recovery plots, geological cross sections, hydrochemistry, and groundwater piezometry to evaluate aquifer characteristics of a site for licencing. It determined that local groundwater was not directly connected to or under the direct influence of a nearby river. The investigative techniques also demonstrate how we can provide assurances that our surface water resources are not inadvertently affected.

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Steve Mailath is a Principal Hydrogeologist at Trace Associates Inc., with over 30 years of experience in the environmental consulting and oil and gas industries. His specialties are the assessment of soil and groundwater contamination, migration processes, contaminant fate, groundwater remediation and management, groundwater resource evaluation, management and licencing, analytic and numeric groundwater modelling, remediation technology development, regulatory liaison, surface and groundwater interaction, and expert testimony. His expertise includes municipal and industrial waste contaminant fate, impact evaluation, and risk assessment. He has prepared industry guidelines and has been an instructor at workshops regarding contaminant assessment, remediation, and environmental impact assessment.