

Use of a Cloud-Based Geodatabase to Cost-Effectively Assess the Risk Posed by Aging Infrastructure

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Summary

The management of subsurface and surface issues related to aging oil & gas infrastructure-related represents a complex undertaking that benefits from a multi-disciplinary approach. In the case Surface Casing Vent Flow (SCVF) and Gas Migration (GM), such issues may be the first sign of wellbore integrity problems that may have the potential to cause adverse impact. Understanding risk related to SCVF/GM requires some understanding of the source (wellbore environment), exposure pathways (wellbore, aquifers, surface water features) and receptors (aquifers, water wells, aquatics, and terrestrial features). A leaky well casing with no nearby environmental receptor poses considerably less risk, and would be mitigated differently, than would a similar leaky well located near a receptor. One of the most challenging aspects is with the assessment of the subsurface pathway/receptor environment where a detailed understanding of hydrogeology is essential. Such challenges can be overcome via a cloud-based GIS geodatabase that combines water/geology/environmental data with energy well data for use in screening risks/hazard relating to known well/areas of SCVF/GM. The approach utilizes existing data to assist in prioritizing mitigation of leaky wellbores in a cost-effective manner. The screening tools can be applied to a single well bore or on an entire asset.

The presentation will provide an overview of water/hydrogeologic fundamentals and will also demonstrate the use of the geodatabase that allows for the rapid filtering/assessing/screening of risk related to a SCVF/GM event, in the context of the local risk-related parameter data. Use of the geodatabase for other aging infrastructure risk components will also be discussed. The presentation content is applicable to a wide audience, including company directors, senior financial and technical managers, project-based geoscience and engineering staff, and operations staff including risk-based decision makers and environmental specialists.

Mr. Jamie Wills is president and co-founder of Waterline, an Alberta and BC-based hydrogeology and environmental consulting firm. His almost 30 years of experience have focused on the energy sector in western Canada. Jamie has a graduate degree in hydrogeology from the University of Waterloo, and he is a past-President of the Canadian Chapter of the International Association of Hydrogeologists. He is the chair of the Hydrogeology Division of the CSPG, and has presented and chaired at numerous conferences over the last two decades