



Two Case Studies – Exploring Lessons Learned from Both Traditional and Innovative Permeable Reactive Barrier Design and Installation Approaches

Permeable reactive barriers (PRBs) have been employed as a remediation technology since the 1990s, yet their application and design strategies have evolved considerably over time. This presentation will provide practical insights into how consultants and contractors determine when a PRB is the appropriate solution for petroleum hydrocarbon (PHC) contamination and how to maximize its effectiveness under real-world conditions.

Through two (2) case studies, we will explore lessons learned from both traditional and innovative PRB design and installation approaches. Key discussion points include:

Site characterization and design challenges: Addressing data gaps, understanding complex subsurface conditions, and applying the Membrane Interface Hydraulic Profiling Tool (MiHPT) to refine design assumptions.

Design considerations: Evaluating preliminary options such as trench versus injected PRBs, selecting appropriate reactive media, and integrating bench-scale testing to validate design concepts before field deployment.

Field implementation and performance monitoring: Strategies for successful full-scale installation, anticipating construction challenges, and establishing effective performance monitoring to ensure long-term remedial goals are met.

Collaborative problem-solving: How consultants and contractors work together to proactively identify potential issues, implement field modifications without compromising objectives, and align project solutions with client priorities and business drivers.

Beyond the case studies, the presentation will review the lessons from multiple PRB projects throughout Ontario, highlighting recurring challenges and unique site-specific considerations. Attendees will gain practical insights into overcoming technical, logistical, and operational hurdles, enhancing PRB performance, and fostering effective collaboration across project teams.

By combining technical rigor with field-tested strategies, this presentation will equip remediation professionals with actionable guidance to improve PRB planning, design, and execution in diverse environmental conditions.

Trevor Janzen Terrapex

Trevor serves as the Manager of Client Development for Terrapex for all service lines and offices in Ontario to provide direction and strategic leadership to Key Client Account Leaders and Service Line Managers in the development and implementation of client engagement and relationship development strategies to increase revenue for the company. Trevor is a Senior Project Manager, Senior Technical Advisor, and Key Client Account Manager with 28 years of experience in environmental site assessment, remediation and risk management, vapour intrusion and excess soil management in the environmental consulting industry at hundreds of sites in Canada. He is a licensed professional geoscientist (limited), a chartered chemist, and QPESA with the MECP for filing Records of Site Conditions (RSCs) under O. Reg 153/04 and O. Reg 406/19.

Trevor has provided strategic and practical technical advice to clients involved in the acquisition, divestiture, or development of real estate and brownfield sites and designs and implements practical, cost-effective remediation and risk-based strategies (often involving a combination of remedial technologies) to meet client objectives and file RSCs when required. Remedial and risk man-

agement strategies that have been designed and implemented (often in combination) include: excavation, risk assessment and risk management (including soil vapour, sub-slab soil vapour and indoor air monitoring programs in support of due diligence and O. Reg 153 risk assessments), sub-slab depressurization (SSD), bioremediation, in-situ chemical oxidation and reduction, surfactant flushing, permeable reactive barrier (PRB), soil vapour extraction (SVE), multi-phase vacuum extraction (MPVE), and pump and treat.

Trevor has served as the National Portfolio and Program Director and single-point-of-contact for several large national developer and real estate clients, Canada's largest independent suppliers and marketers of fuel and petroleum products, and large multi-property portfolios in Ontario and throughout Canada. Trevor also has experience leading national strategic planning and vision setting; providing operational and strategic leadership; leading and shaping business strategy to deliver innovative value-add solutions; business development; employee performance; technical training; and building and leading multidisciplinary teams.