

**Technical Memorandum**

**Date:** April 19, 2011

**To:** Peter Quackenbush, MDEQ

**cc:** Michelle Mullin, USEPA  
Jason Smith, Tecumseh Products Company  
Tina Beresford, Tecumseh Products Company (TPC Files)  
Douglas McClure, Conlin, McKenney and Philbrick, PC

**From:** Graham Crockford and Stacy Metz

**Project No.:** 02751.16

**Subject:** **Groundwater Discharge Permit Requirement for Proposed Permeable Reactive Barrier at the Former Tecumseh Products Company Site in Tecumseh, Michigan**

A Workplan to Install a Permeable Reactive Barrier (PRB) Downgradient of the Southern Source Area (Workplan) at the former Tecumseh Products Company (TPC) site located at 100 East Patterson Street, Tecumseh, Michigan was submitted to USEPA for review on March 30, 2011. The Workplan describes the proposed PRB design, installation, and associated performance monitoring. At present, shallow groundwater affected by chlorinated volatile organic compounds (CVOCs) is migrating off-site at concentrations above residential and non-residential groundwater screening levels for vapor intrusion (GWSLs). The purpose of the proposed PRB is to address the potential vapor intrusion pathway downgradient of the southern source area by treating shallow CVOC-affected groundwater along the eastern (downgradient) property line before it migrates off site.

The proposed PRB is designed to treat the CVOC-affected groundwater at the downgradient property line via enhanced reductive dechlorination (ERD). The proposed PRB includes both a **trenched** portion and an **injected** portion. It is RMT's understanding that a permit is not needed to install the trenched portion of the barrier. RMT contacted Jim Janiczek, DEQ chief of groundwater permits, regarding groundwater discharge permit requirements and reviewed MDEQ Part 22 Groundwater Quality Rules to determine if a Groundwater Discharge Permit Exemption for *In Situ* Remediation would be required for the injected portion of the barrier. Jim Janiczek, explained that no permit is required if the injected material is below residential Part 201 criteria. If the injected material has concentrations above residential Part 201 criteria, a permit exemption, i.e. an approval letter from the department division with compliance oversight is required. Jim Janiczek referred RMT to the Part 22 Rules to determine if department approval is required.

Per Rule 2210(u)(ii), no discharge permit is required if the remedial action discharge is at or below residential Part 201 criteria. The proposed injected portion of the barrier will be composed of ABC+<sup>®</sup>, a product produced by Redox Tech which typically contains a slurry of zero valent iron and an organic substrate, i.e. lactates, and fatty acids. RMT has communicated with Redox Tech concerning the formulation of ABC+<sup>®</sup>. Without modification, the ABC+<sup>®</sup> slurry contains dipotassium phosphate which acts as a micronutrient. This dipotassium phosphate would result in a total phosphorus concentration in

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the slurry above residential Part 201 groundwater criteria. No other components of the slurry contain constituents above residential Part 201 groundwater criteria. Redox Tech has agreed to substitute the dipotassium phosphate with a similarly effective food grade yeast extract and a carbonate buffer. With this revised formulation, it is RMT's understanding that pursuant to Rule 2210(u)(ii) neither a groundwater discharge permit, nor an approval letter from the department division with compliance oversight is required for the proposed PRB installation.

A copy of the Workplan is attached for your reference. The PRB installation is scheduled to begin May 16, 2011. If you have any questions or need further information, please contact Graham Crockford at RMT by email at [graham.crockford@rmtinc.com](mailto:graham.crockford@rmtinc.com) or by phone at (734) 971-7080.

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# Workplan