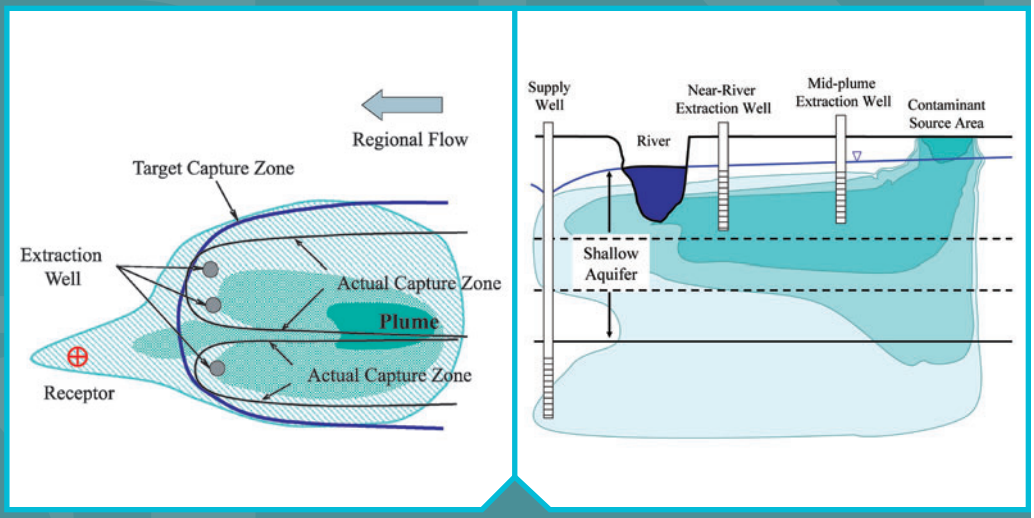
EPA 600/R-08/003 | January 2008 | www.epa.gov/ord

United States
Environmental Protection
Agency

A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems

FINAL PROJECT REPORT



Office of Research and Development
National Risk Management Research Laboratory | Ground Water and Ecosystems Restoration Division

EPA/600/R-08/003
January 2008

A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems

Project Officer
David S. Burden
Ground Water and Ecosystems Restoration Division
U.S. EPA, National Risk Management Research Laboratory
Ada, OK 74820

National Risk Management Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, OH 45268

To download this and other EPA/ORD/NRMRL/GWERD publications visit http://www.epa.gov/ada/

Office of Research and Development
National Risk Management Research Laboratory | Ground Water and Ecosystems Restoration Division

NOTICE

The U.S. Environmental Protection Agency through its Office of Research and Development and the Office of Superfund Remediation and Technology Innovation funded and managed the research described herein. This document was prepared by GeoTrans, Inc. for the U.S. Environmental Protection Agency (U.S. EPA) under Tetra Tech Contract No. 68-W-02-034, Subcontract No. G9015.0.037.03.01, and under Dynamac Contract No. 68-C-02-092, Subcontract No. 092580. It has been subjected to the Agency`s review and has been approved for publication as an EPA document. No official endorsement should be inferred. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

FOREWORD

The U.S. Environmental Protection Agency is charged by Congress with protecting the Nation's land, air, and water resources. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. To meet this mandate, EPA's research program is providing data and technical support for solving environmental problems today and building a science knowledge base necessary to manage our ecological resources wisely, understand how pollutants affect our health, and prevent or reduce environmental risks in the future.

The National Risk Management Research Laboratory (NRMRL) is the Agency's center for investigation of technological and management approaches for preventing and reducing risks from pollution that threatens human health and the environment. The focus of the Laboratory's research program is on methods and their cost-effectiveness for prevention and control of pollution to air, land, water, and subsurface resources; protection of water quality in public water systems; remediation of contaminated sites, sediments and ground water; prevention and control of indoor air pollution; and restoration of ecosystems. NRMRL collaborates with both public and private sector partners to foster technologies that reduce the cost of compliance and to anticipate emerging problems. NRMRL's research provides solutions to environmental problems by: developing and promoting technologies that protect and improve the environment; advancing scientific and engineering information to support regulatory and policy decisions; and providing the technical support and information transfer to ensure implementation of environmental regulations and strategies at the national, state, and community levels.

This document describes a systematic approach for performing capture zone analysis associated with ground-water pump and treat (P&T) systems. The intended audience is technical professionals that actually perform capture zone analyses (i.e., hydrogeologists, engineers) as well as project managers who review those analyses and/or make decisions based on those analyses.

Stephen G. Schmelling, Director
Ground Water and Ecosystems Restoration Division
National Risk Management Research Laboratory

This page left intentionally blank.

CONTENTS

EXHIBITS

TABLE

FIGURES

ACKNOWLEDGEMENTS

The U.S. EPA Office of Research and Development (ORD) wishes to express their appreciation to the U.S. EPA Ground Water Forum for their initial conception of the idea for this document and their helpful comments received during the writing. The Ground Water Forum was instrumental in the development and review of this document along with ORD scientists Mr. Steve Acree, Dr. David Burden, Dr. David Jewett, and Dr. Randall Ross.