Design of a Monitoring Network for Detecting Underground Contamination

— A Study for the Coleville Site (Phase II)

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1. INTRODUCTION

Due to the leakage of an underground storage tank, the Coleville Compressor Station is contaminated by Extracted Hydrocarbons, BTEX, Glycol, PAHs and Metals. Investigation of the site contamination situation is important for further in-depth studies.

From September to November 2000, Jacques Whitford environment Limited has undertaken a preliminary investigation on Coleville site (Phase-I moitoring program) (JWEL, 2001). However, more information is required for site conditions and plume distributions of contaminants before implementing further simulation modeling, risk assessment, and decision analysis.

To obtain further information effectively, a sound design for the on-site monitoring network is needed. This network will help to provide useful information of site stratigraphy, soil physics and chemistry, geological and hydrological conditions, site contamination situations, etc.

As a comparison, an improper design will not only lead to unnecessary waste of monitoring costs, but also, more importantly, mislead the subsequent simulation modeling, risk assessment, and site remediation decisions.

Therefore, the objective of this study is to design a sampling network for the Coleville site, based on:

(a) methodologies of sampling for underground contamination;
(b) careful research of the site conditions;
(c) consideration of data required for the simulation of contaminant transport.

A three dimensional sampling scheme will be proposed for obtaining details of the on-site soil properties and contamination situations, which will then be used for further simulation modeling, risk assessment, and site remediaiton studies.