



# Research & Development Highlights

92-205 Tedini-I Series

## Evaluation Protocol for Site Toxicity

### Introduction

There is an increased awareness about the environmental conditions found at active and former industrial land sites. This is due in part to the growing trend for urban residential areas to encroach on these industrial sites or former sites to be redeveloped for residential use. Consequently, there are potential health and safety concerns which may arise. In addition, federal and provincial governments are beginning require property owners clean up contaminated sites. While there are no current legislative requirements in Canada to complete Phase I environmental site investigations this type of investigation can be used to show due diligence on behalf of the property owner.

In the face of these concerns it is prudent and sensible to undertake an environmental site assessment before purchasing, redeveloping or remediating previously developed sites. At present there are no widely accepted professional standards or designations for individuals or companies providing environmental site assessment services either in Canada or the United States. This project was undertaken to develop a comprehensive and detailed Phase I environmental site investigation review. It does not include insurance or corporate compliance audits, which tend to examine management protocols and compliance with environmental regulations.

### Research Program

Comparative analysis was done on over 80 documents collected from various organizations across Canada that offer Phase I site assessment services. Four documents were selected for a final review and preparation of a model Phase I environmental site investigation procedure.

Analysis was based on each document's format, quantity of information collected and evaluated (both from the site in question and adjacent properties), and the quantity of sources used for cross reference purposes. Specifically the documents were ranked based on quality of 1) site history and records review, 2) site reconnaissance and interviews, and 3) report content.

### Findings

A comprehensive model Phase I environmental site investigation is described based on the three categories described above. These are presented in tabular form (see tables 1,2,3) and augmented in the summary section. A brief review of Phase II environmental site investigation procedure techniques is described as well as a decision making process for the implementation of this process. Due to the importance of the environmental consultant used for these investigations, an environmental consultant profile is given to help in the selection of a qualified consultant group.

### Implications for the Housing Industry

This report provides a good basis for considering a Phase I investigation. Specifically it aids in choosing an appropriate consultant, things to look for in a thorough Phase I investigation, as well as factors which influence the need for a Phase II investigation. A brief listing of industry associations involved in the review of professional standards development for companies providing Phase I assessment services is provided.

*Project Manager: Wayne Webster*  
*Research Report: Evaluation Protocol for Site Toxicity (1992)*  
*Research Consultant: Norecol Environmental Management Ltd.*

Table 1. Model Phase 1 Site Environmental Site Investigation.  
Site History Records Review

| Information source  | Type of Information   |
|---|---|
| <p>1. Maps and Photographs</p> <p>1.1 Geological Survey of Canada</p> <p>1.2 Provincial Ministry of Environment</p> <p>1.3 Fire Insurance Records</p> <p>1.4 Aerial Photographs</p>                 | <ul style="list-style-type: none"> <li>• soil maps<br/>regional geology</li> <li>• provincial soil maps</li> <li>• site plans showing UST locations</li> <li>• photographs dating back &gt;50 years</li> </ul>  |
| <p>2. Local Information Sources</p> <p>2.1 Libraries</p> <p>2.2 Archives</p>  | <ul style="list-style-type: none"> <li>• neighbours and long time residents</li> <li>• city directories</li> <li>• books, photographs, newspapers</li> </ul>  |
| <p>3. Company Records</p>   | <ul style="list-style-type: none"> <li>• site plans</li> <li>• building plans</li> <li>• permits</li> <li>• production and maintenance records</li> <li>• contingency plans</li> <li>• spill plans</li> </ul>   |
| <p>4. Regional and Municipal Records</p> <p>4.1 Regional District</p> <p>4.2 Municipality/Township</p> <p>4.3 Engineering Departments</p> <p>4.4 Health Departments</p> <p>4.5 Fire Departments</p> | <ul style="list-style-type: none"> <li>• air permits</li> <li>• sewer discharge permits</li> <li>• permits and licences department</li> <li>• landfill locations</li> <li>• subdivision/rezoning applications</li> <li>• building plans</li> <li>• surveys</li> <li>• public health records</li> <li>• landfill locations</li> <li>• inspections</li> <li>• violations</li> </ul> |
| <p>5. Title Search Companies</p>  | <ul style="list-style-type: none"> <li>• title transfer documents</li> </ul>  |
| <p>6. Federal and Provincial Records</p>  | <ul style="list-style-type: none"> <li>• federal and provincial ministries of Environment, branches dealing with waste management</li> <li>• lists of contaminated sites</li> <li>• permits issued</li> </ul>   |
| <p>7. Previous Geotechnical or Environmental Reports</p>  | <ul style="list-style-type: none"> <li>• engineering studios</li> <li>• geotechnical soil studies</li> <li>• environmental testing</li> </ul>   |

Table 2. Model Phase I Environmental Site Investigation.  
Site Reconnaissance and Interviews

|   |
|---|
| 1. Visual Inspection                    |
| 1.1 Topography                          |
| 1.2 Surface Water/Drainage              |
| 1.3 Fill/Debris                         |
| 1.4 Surface Staining/Soil Conditions    |
| 1.5 Vegetation                          |
| 1.6 USTs and Vent Pipes                 |
| 1.7 Storage Areas (solvents/chemicals)  |
| 1.8 Asbestos                            |
| 1.9 Transformers and Ballasts           |
| 1.10 Wells                              |
| 1.11 Utilities                          |
| 1.12 General Housekeeping               |
| 2. Personnel Interviews                 |
| 2.1 Waste Handling Methods              |
| 2.2 Underground and Above Ground Tanks  |
| 2.3 Asbestos/PCBs/Radon UFFI/Lead Paint |
| 2.4 Spills                              |
| 2.5 Monitor Wells on Property           |
| 3. Reconnaissance of Adjacent Sites     |
| 4. Photographic Documentation           |
| 5. Geologic and Hydrogeologic Setting   |
| 5.1 Water Supply                        |
| 5.2 Wells                               |

Table 3. Model Phase 1 Environmental Site Investigation.  
Report Content

|     |  |
|-----|--|
| 1.  | Executive Summary                                |
| 2.  | Purpose of Study                                 |
| 3.  | Scope of Work                                    |
| 4.  | Methodology                                      |
| 5.  | Site History and Records Review: Findings        |
| 6.  | Current Site Conditions and Interviews: Findings |
| 7.  | Conclusions and Recommendations                  |
| B.  | Standard Limitations                             |
| 9.  | References                                       |
| 10. | Figures and Tables                               |
| 11. | Appendices                                       |
|     | 11.1 Photographs                                 |
|     | 11.2 Copies of Previous Reports                  |
|     | 11.3 Regulatory Information                      |
|     | 11.4 Interview Records                           |

A full report on this research project is available from the Canadian Housing Information Centre at the address below.

*Housing Research at CMHC*

*Under Part IX of the National Housing Act, the Government of Canada provides funds to CMHC to conduct research into the social, economic and technical aspects of housing and related fields, and to undertake the publishing and distribution of the results of this research.*

*This factsheet is one of a series intended to inform you of the nature and scope of CMHC's technical research program.*

*The Research and Development Highlights factsheet is one of a wide variety of housing-related publications produced by CMHC.*

*For a complete list of Research and Development Highlights, or for more information on CMHC housing research and information, please contact:*

**The Canadian Housing Information Centre  
Canada Mortgage and Housing Corporation  
700 Montreal Road  
Ottawa, Ontario  
K1A 0P7**

**Telephone: (613) 748-2367  
FAX: (613) 748-2098**

*The information in this publication represents the latest knowledge available to CMHC at the time of publication, and has been reviewed by experts in the housing field. CMHC, however, assumes no liability for any damage, injury, expense, or loss that may result from use of this information.*