

Phase I environmental site assessment



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Update No. 1

Z768-01

April 2003

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The following revisions have been formally approved and are marked by the symbol delta (Δ) in the margin on the attached replacement pages:

Revised	Clauses 2.1, 7.1.4, 7.2.1.4, 7.2.3.2
New	None
Deleted	None

CSA Standard Z768-01 originally consisted of **22 pages** (vii preliminary and 22 text), each dated **November 2001**. It now consists of the following pages:

November 2001	iii–viii, 1, 2, 5–8, 11, 12, 17–22
April 2003	3, 4, 9, 10, and 13–16

- Update your copy by inserting these revised pages.
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1.3 Mandatory Language

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the standard. Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

2. Definitions and Reference Publications

2.1 Definitions

The following definitions apply in this Standard:

Adjoining properties — any properties that are contiguous or immediately adjacent to the property being assessed.

Assessor — a person or business entity that carries out a Phase I ESA according to the requirements of this Standard (see Clause 3.4).

Client — a person or business entity that commissions an assessor to perform a Phase I ESA.

Contamination — the presence of a substance of concern, or a condition, in concentrations above appropriate pre-established criteria in soil, sediment, surface water, groundwater, air, or structures.

Criteria — limits or levels for substances of concern that are established prior to commencing a Phase II ESA.

Environmental audit — a systematic process of objectively obtaining and evaluating evidence regarding a verifiable assertion about an environmental matter to ascertain the degree of correspondence between the assertion and established criteria, and then communicating the results to the client. A verifiable assertion is a declaration or statement about specific subject matter that is supported by documented data.

Note: *Environmental matters that might be the subject of an environmental audit include those aspects of an auditee's activities that may have an impact on the environment, such as the policies, procedures, and practices established by the auditee to safeguard the environment. The particular aspects addressed in a given environmental audit depend on the objectives and scope of the audit. In some cases, they may also relate to environmental aspects of training, health, safety, waste, hazardous materials transportation, emergency response measures, etc.*

Hazardous material — a material that may, upon exposure, constitute an identifiable risk to human health or the natural environment. Hazardous material criteria are established with regard to appropriate regulatory requirements.

Δ **Neighbouring property** — an adjoining property or any property that can reasonably be expected to have been a source of substances of concern on the site.

Phase I Environmental Site Assessment (ESA) — the systematic process, as prescribed by this Standard, by which an assessor seeks to determine whether a particular property is or may be subject to actual or potential contamination. A Phase I ESA does not involve the investigative procedures of sampling, analyzing, and measuring unless enhancements are agreed upon between the client and the assessor (see Clauses 6.2 and 6.3).

Note: The term “environmental audit” should not be used to describe a Phase I ESA. An environmental audit may include the review of a Phase I ESA. As well, a Phase I ESA may include a review of previously performed environmental audits.

Phase II Environmental Site Assessment (ESA) — the systematic, iterative process, as outlined in CSA Standard Z769, by which an assessor seeks to characterize and/or delineate the concentrations or quantities of substances of concern related to a site and compare those levels to established criteria.

Property — land and any improvements to land, consisting of any physical object attached to the land with some degree of permanence, including buildings and other fixtures. The terms “property” and “site” are used interchangeably in this Standard.

Site — a subset or combination of properties, as defined by the scope of work. The terms “site” and “property” are used interchangeably in this Standard.

Site owner/contact — the person designated by the client to have responsibility for the site and to act as a principal contact for the assessor.

User — a third-party person or business entity, other than the client, that uses and/or relies on the information obtained in a Phase I ESA.

Note: Users include purchasers, lenders, and regulatory agencies.

2.2 Reference Publications

This Standard refers to the following publications and where such reference is made it shall be to the edition listed below.

Note: Related reference publications are listed, for information purposes only, in Appendix D.

CSA Standard

Z769-00,
Phase II Environmental Site Assessment.

ASTM* Standard

E 1527-93,
Standard Practice for Environmental Site Assessments: Phase I, Environmental Site Assessment Process.

*American Society for Testing and Materials

3. Principles

3.1 General

3.1.1 General Features of Phase I ESAs

The following principles describe general features of Phase I ESAs. They include the

- use of competent, objective assessors;
- need to determine an appropriate level of assessment; and
- use of logical and systematic procedures during information gathering.

3.1.2 Use of Phase I Principles

The principles given in Clause 3.1.1 can be used to help resolve ambiguities that may arise when

- interpreting the terms of reference;
- performing the discretionary aspects of a Phase I ESA; and/or
- determining whether an adequate Phase I ESA has been conducted.

5.5 Authorization

Upon the assessor's request, the client shall provide any necessary authorization to obtain access to the property and to third-party information and documents.

6. General Practices

6.1 Components of a Phase I ESA

The four principal components of a Phase I ESA shall be as follows:

- (a) a records review;
- (b) a site visit;
- (c) interviews; and
- (d) an evaluation of information and reporting.

6.2 Enhancements to a Phase I ESA

Examples of enhancements to a Phase I ESA may include, but are not limited to,

- (a) more-detailed conclusions than those required in Clause 9.7;
- (b) risk evaluations;
- (c) steps that could be taken to confirm, refute, or delineate contamination; and
- (d) recommendations respecting site remedial measures.

6.3 Scope of Work

There shall be agreement between the client and the assessor on the scope of work before a Phase I ESA begins. The scope of work, as agreed upon by the client and assessor, shall be included in the Phase I ESA report and shall identify

- (a) the party for whom the Phase I ESA is being prepared;
- (b) the subject property;
- (c) the activities to be completed for the four components of the Phase I ESA, including a description of the optional records review items to be undertaken (see Clause 7.1.7); and
- (d) any enhancements to the requirements of this Standard.

The successful completion of the Phase I ESA shall be judged against conformance with the scope of work.

Note: *The contractual and legal obligations between the assessor and the client are beyond the scope of this Standard.*

6.4 Verification of Information

Where practical, the assessor should verify the accuracy of the information obtained in the Phase I ESA. When arriving at a conclusion, the assessor may rely on the information obtained if the assessor has personal knowledge that the information is correct or can be corroborated.

7. Conducting a Site Investigation

7.1 Records Review

7.1.1 Intent

The records review shall be designed to collect data on past activities on the site that could be interpreted as contributing to existing contamination. The records review should be the first activity in a Phase I ESA and, as a result, should provide the assessor with

- (a) an in-depth understanding of the site history;
- (b) knowledge of a range of possibilities with respect to contamination; and
- (c) documentable facts with respect to actual contamination.

7.1.2 Documentation of Sources

The Phase I ESA report shall document each source of information that was examined in the records review, even if a source revealed nil findings or no response was received. Documentation of sources shall be sufficient to enable reconstruction of the research either at a later date or by another party. For example, when obtaining regulatory information, the name of the regulatory body and individual providing the information should be noted.

7.1.3 Time Frame

Information should be reviewed back to the first property use that may have affected the site's environmental condition (eg, prior to development) or to the extent that historical information allows.

Δ 7.1.4 Search Distances

Since neighbouring properties may affect, or be affected by, the property being assessed, appropriate search distances shall be determined and documented in the scope of work (see Clause 6.3). The subject property shall require a records review consistent with the requirements of Clause 7.1.5. As a minimum, adjoining properties shall require a review of reasonably ascertainable records described in Clauses 7.1.6.1, 7.1.6.2, and 7.1.6.3, and publicly available records described in Clause 7.1.6.7.

The following factors shall be considered in determining search distances:

- (a) current and historical land use on the subject property and on neighbouring properties;
- (b) known or suspected contamination on the subject property and on neighbouring properties; and
- (c) where appropriate, proposed future use of the property, rezoning applications, or official plans for development.

7.1.5 Extent of Records Review

The assessor shall review the records that are described in Clause 7.1.6 and that are reasonably ascertainable. Specifically, reasonably ascertainable records are

- (a) provided by the client or publicly available;
- (b) obtainable within reasonable time and cost constraints; and
- (c) practically reviewable (ie, provided in a manner and form that yields information relevant to the property without the need for extraordinary analysis).

Records described in Clause 7.1.7 may be reviewed if deemed appropriate by the client and assessor.

7.1.6 Mandatory Records Review

7.1.6.1 Aerial Photographs

Aerial photographs may be used for evaluating historic land usage and showing general site usage, structures and improvements, tank farms, pits and sumps, poor drainage areas, access to the property, adjacent land use, and areas of disturbed soil.

Aerial photographs may be available from universities, public libraries, or companies that maintain collections of large-scale photogrammetric projects. Aerial photographs are routinely taken by federal, provincial, and territorial agencies.

7.1.6.2 Property-Use Records

Sources of property-use information may provide insight into the potential presence of contamination. Property-use information includes

- (a) insurance records (eg, fire insurance maps);
- (b) property-use directories (eg, industrial or city directories); and
- (c) contaminated site and property-use registries (eg, British Columbia Contaminated Site Registry), where available.

7.1.8 Helpful Information

Sources of information for the records review include, but are not limited to,

- (a) environmental audit reports;
- (b) public health notices regarding hazardous materials on the property or surrounding area;
- (c) well logs or water well databases;
- (d) inventories of waste disposal sites;
- (e) inventories of PCB waste storage sites;
- (f) inventories of coal gasification plants;
- (g) inventories of underground and above-ground storage tanks;
- (h) air, surface water, and groundwater quality data;
- (i) waste generator registries; and
- (j) prior environmental reports and studies (eg, Phase II ESAs, remediation reports).

7.2 Site Visit

7.2.1 General

7.2.1.1 Safety of the Assessor

The site visit shall be conducted with appropriate regard for the health and safety of the assessor.

7.2.1.2 Timing

The site visit should be conducted after completion of the records review. This enables the assessor to target specific areas of the property for investigation. For example, areas of disturbed soil revealed in an aerial photograph should be visually inspected for evidence of contamination.

7.2.1.3 Methodology

The assessor shall directly observe the subject property and shall record the method used to make the observations. It may be necessary to observe adjoining properties from the boundaries of the subject property or from publicly accessible areas.

Δ 7.2.1.4 Limitations

The assessor shall record general limitations, including those imposed by physical obstructions (eg, adjacent buildings, bodies of water, and paved areas) and limiting conditions (eg, snow or snow cover, denied access, inaccessible areas, and safety considerations).

7.2.1.5 Property Use

The assessor shall observe current uses or evidence of past uses of the property that involve, or have involved, such activities as use, treatment, storage, disposal, and generation of hazardous materials, landfilling, or the storage of waste water in impoundments. The assessor should also consider, to the extent possible, current or past uses of the adjoining and surrounding property.

7.2.1.6 Hazardous Materials

A list of hazardous materials, including wastes, shall be prepared that records relative quantities of materials, types of containers, and storage conditions.

7.2.1.7 Unidentified Substances

When unidentified substances are observed on the property, the approximate quantities involved, types of containers, and storage conditions shall be identified and described.

7.2.1.8 Storage Tanks

The approximate age, size, and, where possible, contents of each storage tank, as well as the location of abandoned or previously removed tanks, shall be identified. Above-ground and underground storage tanks, vent pipes, fill pipes, or access ways indicating underground storage tanks shall be identified and described.

7.2.1.9 Storage Containers

The presence, condition, and, where possible, contents of storage containers such as drums, totes, and/or pails shall be identified and described.

7.2.1.10 Odours

Strong, pungent, or noxious odours, and their possible sources, shall be identified and described.

7.2.1.11 Potable Water Supply

Sources of potable water for the property shall be identified and described.

7.2.1.12 Special Attention Items

The assessor shall identify the potential presence of substances including, but not limited to,

- (a) polychlorinated biphenyls (PCBs);
- (b) asbestos-containing materials (ACMs);
- (c) lead;
- (d) ozone-depleting materials; and
- (e) urea foam formaldehyde insulation (UFFI).

These substances and other conditions (eg, radon, mould, noise, electric and magnetic fields, and vibration) require special attention because of heightened public concern or specific environmental legislation.

7.2.2 Interior Observations

7.2.2.1 General

The interior of structures on the property shall be inspected for indications of contamination. Unless access is available, it is not necessary to look under floors, above ceilings, or behind walls. Within reason, all accessible rooms within the structures shall be inspected.

7.2.2.2 Heating and Cooling Systems

Heating and cooling systems shall be identified and described in terms of the energy (fuel source) and methods used to release and dispose of waste products (eg, combustion gases and ash).

7.2.2.3 Stains

Stains on floors, walls, or ceilings shall be identified and described. Where practical, the areal extent of the staining shall be identified and the likely spill source shall be described. The presence of cracks, proximity of floor drains and catch basins, or any other opportunities for contaminants to migrate away from a source shall be described.

7.2.2.4 Drains and Sumps

The assessor shall note the location and condition of floor drains and sumps that show any evidence of contamination.

7.2.2.5 Mechanical Equipment

The presence and, where possible, the current and past condition of hidden hydraulic lift equipment such as elevators or in-ground vehicle hoists shall be identified and described.

7.2.3 Exterior Observations

7.2.3.1 General

The exterior structures on the property shall be inspected for indications of contamination. This inspection shall include an examination of the exterior surfaces of structures (eg, the roof) and of the grounds.

Δ 7.2.3.2 Observation of Neighbouring Properties

The grounds of the neighbouring properties and associated structures shall be observed from the property and from publicly accessible vantage points.

7.2.3.3 Topographic, Geologic, and Hydrogeologic Conditions

The topographic conditions of the property and surrounding area shall be observed and noted. Where exposure of the subsurface exists (eg, trenches, pits, and ponds), the assessor shall observe and describe, in general terms, the geologic and hydrogeologic conditions.

7.2.3.4 General Description of Structures

The assessor shall observe and generally describe the structures or other improvements on the property. This includes describing the number of buildings as well as their estimated age, number of storeys, and location.

7.2.3.5 Wells

Abandoned and existing wells (eg, water, oil, gas, and disposal) shall be identified and described.

7.2.3.6 Sewage Disposal

The method of sewage disposal shall be identified and described. This includes indications of sewage systems, such as septic systems or cesspools, on the property.

7.2.3.7 Pits and Lagoons

Pits and lagoons on the property and on adjoining properties shall be identified and described, particularly if they have been used in connection with waste disposal or waste treatment.

7.2.3.8 Stained Materials

Stained materials (eg, soil and asphalt) shall be identified and described.

7.2.3.9 Stressed Vegetation

The locations and extent of stressed vegetation shall be identified and described.

7.2.3.10 Fill

Areas that appear to have been filled or graded by other than natural causes (or filled with material of unknown origin) shall be identified and described.

7.2.3.11 Waste Water

Waste water or other liquid discharge (see Clause 7.2.3.12 for storm water) shall be identified and described.

7.2.3.12 Watercourses, Ditches, or Standing Water

Surface water features (eg, ditches, streams, rivers, ponds, and lakes) on the property shall be identified and described. This should include storm water and runoff that may drain on or adjacent to the property.

7.2.3.13 Roads, Parking Facilities, and Rights of Way

Public thoroughfares crossing or bordering the property shall be identified. This includes any roads, streets, parking facilities, or rights of way.

7.3 Interviews

7.3.1 Purpose

The purpose of the interviews is to corroborate or augment the information gathered in the records review. The interview can also corroborate information from the site visit or provide information useful for planning the site visit.

7.3.2 Content

The questions to be asked in interviews pertain to current and past activities and events that may affect environmental conditions at the subject property. The questions should pertain to the applicable items detailed in Clauses 7.1 (records review) and 7.2 (site visit).

7.3.3 Methodology

Questions may be asked in person, by telephone, or in writing, at the discretion of the assessor. The assessor shall determine whether or not to ask questions before, during, or after the site visit.

7.3.4 Limitations

If the assessor asks questions of a person but does not receive answers or receives only partial answers, the interview may be deemed complete if

- (a) the questions have been asked (or an attempt has been made to ask the questions) in person or by telephone, and written records have been kept by the assessor of this process; or
- (b) the questions have been asked in writing, and no answer or incomplete answers have been obtained, and at least one reasonable follow-up (a telephone call or written request) was made asking for responses.

If the assessor was refused answers or did not receive complete answers to material questions, it shall be stated in the Phase I ESA report.

7.3.5 Interview Participants

7.3.5.1 Site Personnel

The assessor shall attempt to arrange a mutually convenient appointment for interviewing the site representative and a representative number of occupants of the property. Occupants may be interviewed in person or by telephone. Interviews should occur in connection with the site visit.

7.3.5.2 Third Parties

Where appropriate, and with consent from the client, the assessor may interview third parties such as neighbours of the property and former employees.

7.3.5.3 Government Officials

A reasonable attempt shall be made by the assessor to interview at least one staff member who is knowledgeable about the subject property and from at least one of the following types of government agencies (as applicable to the jurisdiction where the property is situated):

- (a) the local agency or regional office of the federal, provincial, territorial, or municipal agency having jurisdiction over environmental matters in the area in which the property is located;
- (b) the public health agency serving the area in which the property is located;
- (c) the fire department serving the property; or
- (d) engineering and works departments.

The assessor shall document the reasons for having chosen the subject agency.

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***Phase I Environmental
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Contents

Technical Committee on Environmental Auditing and Related Investigations vi

Preface viii

0. Introduction 1

0.1 Purpose 1

0.2 Uses of Phase I ESAs 1

0.2.1 General 1

0.2.2 Financial 1

0.2.3 Baseline Studies 1

0.2.4 Due Diligence 1

0.2.5 Site Remedial Measures or Redevelopment 1

0.2.6 Risk Assessment 2

0.2.7 Interpretation of Phase I ESAs 2

0.2.8 Reduction of Uncertainty 2

0.3 Interrelationship between Phase I and Phase II ESAs 2

1. Scope 2

1.1 Purpose 2

1.2 Limitations 2

1.3 Mandatory Language 3

2. Definitions and Reference Publications 3

2.1 Definitions 3

2.2 Reference Publications 4

3. Principles 4

3.1 General 4

3.1.1 General Features of Phase I ESAs 4

3.1.2 Use of Phase I Principles 4

3.2 Objectivity and Independence 5

3.3 Conflict of Interest 5

3.4 Competence of the Assessor 5

3.5 Due Care 5

3.6 Systematic Procedures 5

3.7 Levels of Assessment 5

3.8 Inherent Limitations 6

4. Roles and Responsibilities 6

4.1 Responsibilities of the Client 6

4.1.1 Designation of a Contact 6

4.1.2 Communication of Information to the Assessor 6

4.1.3 Access 6

4.1.4 Health and Safety Issues 7

4.2 Responsibilities of the Assessor 7

4.2.1 Procedures 7

4.2.2 Communication 7

4.2.3 Health and Safety Considerations 7

4.2.4	Liability Insurance	7
4.3	Responsibilities of Users	7
5.	Initiating a Phase I ESA	7
5.1	Establishing Needs and Objectives	7
5.1.1	Purpose and Use	7
5.1.2	Establishing Criteria	8
5.2	Defining the Scope of Work	8
5.3	Selecting and Contracting an Assessor	8
5.3.1	Selecting an Assessor	8
5.3.2	Contracting an Assessor	8
5.4	Access	8
5.5	Authorization	9
6.	General Practices	9
6.1	Components of a Phase I ESA	9
6.2	Enhancements to a Phase I ESA	9
6.3	Scope of Work	9
6.4	Verification of Information	9
7.	Conducting a Site Investigation	9
7.1	Records Review	9
7.1.1	Intent	9
7.1.2	Documentation of Sources	10
7.1.3	Time Frame	10
7.1.4	Search Distances	10
7.1.5	Extent of Records Review	10
7.1.6	Mandatory Records Review	10
7.1.7	Optional Records Review	12
7.1.8	Helpful Information	13
7.2	Site Visit	13
7.2.1	General	13
7.2.2	Interior Observations	14
7.2.3	Exterior Observations	15
7.3	Interviews	16
7.3.1	Purpose	16
7.3.2	Content	16
7.3.3	Methodology	16
7.3.4	Limitations	16
7.3.5	Interview Participants	16
7.3.6	Interviews Conducted for Prior Phase I ESAs	17
8.	Evaluation of Information	17
9.	Reporting of Information	17
9.1	General	17
9.2	Report Format	17
9.3	Deviations	17
9.4	Limitations	17
9.5	Assessor–Client Relationship	17
9.6	Findings	18
9.7	Conclusions	18
9.8	Names of Participants	18
9.9	Signatures and Qualifications	18

9.10 References and Supporting Documentation 18

Appendices

A — Phase I and II Environmental Site Assessments and Remedial Investigations 19

B — Remedial Investigation 20

C — Phase I ESA Report Format 21

D — Bibliography 22

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Preface

This is the second edition of CSA Standard Z768, *Phase I Environmental Site Assessment* (Phase I ESA). It supersedes the first edition published in 1994. This Standard has been developed to assist clients and assessors in planning, implementing, and interpreting the results of Phase I ESAs.

ASTM Standard E 1527 was an important source for this CSA Standard. As well, information and concepts from Technical Committee members, stakeholders, and other published sources have been incorporated in an attempt to account for the substantial regulatory differences between the US and Canada. It is worth noting that in the US, the ESA standard-setting process was intended to permit a user to satisfy one of the requirements to qualify for the “innocent landowner defense” against liability under the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*. In Canada, the development of guidelines and standards has been influenced by clients’ needs to make informed decisions concerning potentially contaminated sites.

This Standard was prepared by the Technical Committee on Environmental Auditing and Related Investigations under the jurisdiction of the Strategic Steering Committee on the Environment, and has been formally approved by the Technical Committee.

November 2001

Notes:

- (1) Use of the singular does not exclude the plural (and vice versa) when the sense allows.
- (2) Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.
- (3) This publication was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this publication.
- (4) CSA Standards are subject to periodic review, and suggestions for their improvement will be referred to the appropriate committee.
- (5) All enquiries regarding this Standard, including requests for interpretation, should be addressed to Canadian Standards Association, 178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3.
Requests for interpretation should
 - (a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
 - (b) provide an explanation of circumstances surrounding the actual field condition; and
 - (c) be phrased where possible to permit a specific “yes” or “no” answer.

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Z768-01

Phase I Environmental Site Assessment

0. Introduction

0.1 Purpose

This Standard establishes the principles and practices that are applicable to a Phase I Environmental Site Assessment (ESA). The purpose of a Phase I ESA is to identify actual and potential site contamination. Such identification involves the evaluation and reporting of existing information collected through records review, site visits, and interviews.

0.2 Uses of Phase I ESAs

0.2.1 General

Phase I ESAs may assist in reducing uncertainty about potential environmental liabilities and may be a basis for further investigation of the property. Phase I ESAs may be used to make informed decisions about property transactions, to identify certain baseline environmental conditions, to assist in meeting regulatory requirements, and as an initial step in site remediation.

0.2.2 Financial

Clients such as property owners, purchasers, lenders, and tenants may face the potential for liabilities (eg, additional costs) when dealing with the remediation or management of contaminated property. These liabilities may arise from actions such as government-initiated orders, loss of land resale value (due to contamination or perceived contamination), and litigation associated with contamination.

Phase I ESAs can be used to estimate the likelihood, types, and locations of contamination that may be present at properties. The information generated by Phase I ESAs can be used by property owners, purchasers, lenders, and lessees to make informed decisions about property management, facility operations, and investments.

0.2.3 Baseline Studies

A Phase I ESA may be used as a component of baseline environmental information about a site. When occupants or site uses change, a new Phase I ESA can be undertaken and compared with the baseline information to ascertain whether previous or current uses or activities may have had any environmental impact on the property (see also Clause 7.1.6.4).

0.2.4 Due Diligence

Many federal, provincial, and territorial environmental statutes provide for “strict liability” offences where the onus is on the responsible party to demonstrate that all reasonable care has been taken to prevent the commission of the offence (ie, due diligence defence). Phase I ESAs conducted in conformance with this Standard may be a contributing factor in establishing a due diligence defence.

0.2.5 Site Remedial Measures or Redevelopment

A Phase I ESA may provide a basis for evaluating the need for additional assessment or site remedial measures. Many of the tasks typically undertaken during Phase I ESAs are some of the initial steps of decommissioning or redeveloping a property.