



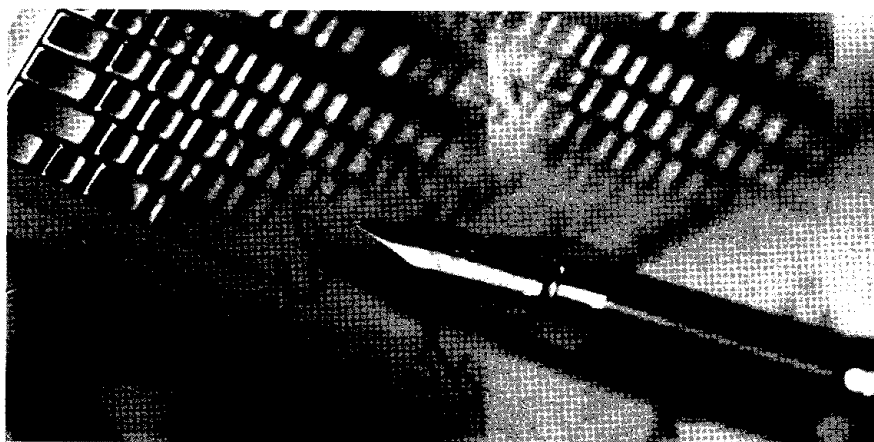
RESEARCH REPORT

PHASE 1

ENVIRONMENTAL SITE

ASSESSMENT INTERPRETATION

GUIDELINES



HOME TO CANADIANS
Canada

CMHC—HOME TO CANADIANS

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PHASE 1
ENVIRONMENTAL SITE ASSESSMENT
INTERPRETATION GUIDELINES

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DISCLAIMER

This study was conducted for Canada Mortgage and Housing Corporation under Part IX of the National Housing Act. The analysis, interpretations and recommendations are those of the consultant and do not necessarily reflect the views of Canada Mortgage and Housing Corporation or those divisions of the Corporation that assisted in the study and its publication.

PHASE 1 ENVIRONMENTAL SITE ASSESSMENT INTERPRETATION GUIDELINES

The following document has been prepared by Jacques Whitford Environment Limited (JWEL) for property owners, lenders, mortgage insurers, environmental consultants and others associated with the real estate industry to assist in the evaluation of Phase 1 Environmental Site Assessment (ESA) reports.

The Interpretation Guidelines were developed as part of a national research project which included three tasks as follows:

- Task 1: The evaluation of 80 representative Phase 1, 2 and 3 ESA reports received from environmental consultants across Canada (JWEL Report dated March 18, 1994).
- Task 2: Regional meetings with mortgage insurers across Canada to present the findings of the ESA evaluations and to identify training requirements.
- Task 3: Development of the Phase 1 ESA Interpretation Guidelines presented herein.

The objective of the Phase 1 Environmental Site Assessment Interpretation Guidelines is to provide a simplified and consistent means for identifying whether or not the Phase 1 Environmental Site Assessment report contains all of the required components by current standards and if the conclusions presented are logically founded.

The Guidelines incorporate the general requirements of both the CMHC Policy for Managing Environmental Risks, June, 1993 and the Canadian Standards Association (CSA) Phase 1 Environmental Site Assessment Information Product No. Z768-94, April, 1994. It is recommended that both of these reference documents be consulted in conjunction with these Guidelines.

The attached Phase 1 Environmental Site Assessment Evaluation Form can be used as a checklist for the author of the report or as a tool to assist in report review. The form is divided into nine report components which are further broken down into key points within each component. An "X" is marked in the box adjacent to the key point, indicating whether or not that point is addressed in the report. Following the key points, there is a question regarding the adequacy of each component of the report. For full acceptance of the report, a response of "Yes", to each of the nine questions, Q1 to Q9, is required on the form. Should an answer require comments, a space has been provided in the right hand column to indicate a comment number. The corresponding comments are to be provided on a separate sheet listed by comment number.

It should be noted that in certain cases a report component may be acceptable when some of the key points are incomplete. Some judgement is required in the review of the reports. To assist in applying this judgement, a discussion has been provided for each of the nine report components following the evaluation form. The discussion provides descriptions of the key points, examples and some guidance on the minimum requirements for acceptance of the report component.

PHASE 1 ENVIRONMENTAL SITE ASSESSMENT EVALUATION FORM

Site Location: _____

Type of Property: _____ Report Date: _____

	Complete	Not Complete	Comment No.
1.0 Purpose			
1.1 Statement of Purpose	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Q1. Do you understand the reason for conducting the ESA? Does the reason suit the required purpose of the report?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
2.0 Scope of Work			
2.1 Historical Review	<input type="checkbox"/>	<input type="checkbox"/>	
2.2 Site Inspection	<input type="checkbox"/>	<input type="checkbox"/>	
2.3 Interviews	<input type="checkbox"/>	<input type="checkbox"/>	
2.4 Report	<input type="checkbox"/>	<input type="checkbox"/>	
2.5 Limitations	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Q2. Were all of the above activities carried out?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
3.0 Historical Review			
3.1 Interviews	<input type="checkbox"/>	<input type="checkbox"/>	
3.2 Aerial Photographs	<input type="checkbox"/>	<input type="checkbox"/>	
3.3 Fire Insurance Records	<input type="checkbox"/>	<input type="checkbox"/>	
3.4 City Directories	<input type="checkbox"/>	<input type="checkbox"/>	
3.5 Land Registry	<input type="checkbox"/>	<input type="checkbox"/>	
3.6 Company Records	<input type="checkbox"/>	<input type="checkbox"/>	
3.7 Government Records	<input type="checkbox"/>	<input type="checkbox"/>	
3.8 Previous ESA Reports	<input type="checkbox"/>	<input type="checkbox"/>	
3.9 Date of First Development	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Q3. Can you identify from the historical description whether there are potential site liabilities?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
4.0 Property			
4.1 Location	<input type="checkbox"/>	<input type="checkbox"/>	
4.2 Legal Description and Zoning	<input type="checkbox"/>	<input type="checkbox"/>	
4.3 Site Plan	<input type="checkbox"/>	<input type="checkbox"/>	
4.4 Topography	<input type="checkbox"/>	<input type="checkbox"/>	
4.5 Geology	<input type="checkbox"/>	<input type="checkbox"/>	
4.6 Surface Water	<input type="checkbox"/>	<input type="checkbox"/>	
4.7 Ground Cover	<input type="checkbox"/>	<input type="checkbox"/>	
4.8 Fill	<input type="checkbox"/>	<input type="checkbox"/>	
4.9 Current Site Use	<input type="checkbox"/>	<input type="checkbox"/>	
<i>Q4. Are the physical characteristics of the property well described?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____

	Complete	Not Complete	Comments
5.0 Adjacent Properties			
5.1 North	<input type="checkbox"/>	<input type="checkbox"/>	
5.2 South	<input type="checkbox"/>	<input type="checkbox"/>	
5.3 East	<input type="checkbox"/>	<input type="checkbox"/>	
5.4 West	<input type="checkbox"/>	<input type="checkbox"/>	
5.5 Nearby Concerns	<input type="checkbox"/>	<input type="checkbox"/>	
5.6 Commercial/Industrial Activities	<input type="checkbox"/>	<input type="checkbox"/>	
Q5. Is the surrounding area well described?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
6.0 Building			
6.1 Date of Construction	<input type="checkbox"/>	<input type="checkbox"/>	
6.2 Construction Materials	<input type="checkbox"/>	<input type="checkbox"/>	
6.3 Heating/Cooling System	<input type="checkbox"/>	<input type="checkbox"/>	
6.4 Electrical Distribution	<input type="checkbox"/>	<input type="checkbox"/>	
6.5 Water and Sewer Connections	<input type="checkbox"/>	<input type="checkbox"/>	
6.6 Drains/Sumps	<input type="checkbox"/>	<input type="checkbox"/>	
6.7 Designated Substances	<input type="checkbox"/>	<input type="checkbox"/>	
Q6. Is the building construction described? Can you tell if potential hazards exist?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
7.0 Storage Tanks			
7.1 Location	<input type="checkbox"/>	<input type="checkbox"/>	
7.2 Size	<input type="checkbox"/>	<input type="checkbox"/>	
7.3 Contents	<input type="checkbox"/>	<input type="checkbox"/>	
7.4 Type	<input type="checkbox"/>	<input type="checkbox"/>	
7.5 Protection	<input type="checkbox"/>	<input type="checkbox"/>	
7.6 Date of Installation	<input type="checkbox"/>	<input type="checkbox"/>	
7.7 Previous Tests	<input type="checkbox"/>	<input type="checkbox"/>	
7.8 Reported Leaks	<input type="checkbox"/>	<input type="checkbox"/>	
Q7. Can you tell if storage tanks are present on site? If so, has possible leakage been addressed?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
8.0 Report Supplements			
8.1 Site Photographs	<input type="checkbox"/>	<input type="checkbox"/>	
8.2 Consultant Qualifications	<input type="checkbox"/>	<input type="checkbox"/>	
8.3 Interview Records	<input type="checkbox"/>	<input type="checkbox"/>	
8.4 Supporting Technical Documents	<input type="checkbox"/>	<input type="checkbox"/>	
Q8. Are all critical report supplements included? If so, do they support report conclusions?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
9.0 Conclusions and Recommendations			
Q9. Is the report logically sound? Do you agree with the conclusions and recommendations provided?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
Is the answer to all questions Q1 to Q9 yes?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
If yes, then Report Acceptable <input type="checkbox"/>		If No, then Report Not Acceptable <input type="checkbox"/>	
Signature of Reviewer _____ Date:_____			

1.0 PURPOSE

A clear understanding of the purpose of the specific Phase 1 ESA report under review is required to identify that it is being conducted for the required reason. Phase 1 ESAs can be carried out for numerous purposes such as:

- Identification of any potential areas of environmental liability associated with a site prior to completion of a real estate transaction.
- Development of a Phase 2 work plan as part of a larger environmental baseline study where contamination is suspected.
- Investigation of potential liabilities specifically associated with a tenant's operations on a site.
- Identification of designated substances prior to demolition of a building.
- Investigation of a specific incident on a site.

Generally, the first statement of purpose provided above is suitable for the parties involved with a real estate transaction.

If a clear statement of purpose, such as the one above is not provided, the reviewer must satisfy himself/herself through other information provided in the report that this was in fact the purpose in order to answer "Yes" to question Q1.

2.0 SCOPE OF WORK

The Scope of Work must include a historical review, a site inspection and interviews with people associated with the site as well as regulatory bodies, presented in a comprehensive report. Any limitations to the above scope should be identified and the reason for the limitation should be provided. Common significant limitations which would result in a response of "No" to Q2 would include: not investigating the interior of a building during the site visit, relying on only one source of historical information or providing a checklist report in absence of a comprehensive documented report.

3.0 HISTORICAL REVIEW

The historical review component of the Phase 1 ESA is of major importance. The report should provide a chronological summary of activities carried out in the area and on site, from the date of first development up until present.

Sufficient details of any commercial or industrial activity in the area should be provided to fully assess potential environmental concerns. The number of sources of historical information, and the availability of these sources varies in different regions in Canada.

The information sources described below are available to the majority of Canadian consultants.

3.1 Interviews

Interviews are carried out to obtain information on the environmental characteristics of the site. Two categories of interviews should be carried out as follows:

1. Interviews with federal, provincial and municipal regulatory officials, aimed at identifying any existing or past environmental orders, permits, complaints, violations, records of spills, storage tanks, etc. on site. The regulatory body of jurisdiction for each environmental issue may vary from region to region within Canada.
2. Site history interviews carried out to gain an understanding of past and present site activities with regard to potential areas of environmental liability. The following site history interviews may be carried out, as required, to gain an understanding of all activities which may result in environmental impacts:
 - . Past and present site representatives (i.e. Facility Manager);
 - . Site occupants;
 - . Neighbours; and
 - . Previous owners.

3.2 Aerial Photographs

Aerial photographs provide a visual historical progression of a site and surroundings. Photographs dating back to the 1920s and updated regularly up to present are easily accessible at select universities and libraries as well as federal, provincial and territorial agencies in most regions. Aerial photographs typically show physical structures such as buildings, aboveground storage tanks, fuel pumps, quarries, landfills, excavations, bodies of water, etc.

3.3 Fire Insurance Records

Fire insurance reports provide details on past site characteristics such as bodies of water, buildings, site use, storage tanks, etc. The site plans included in the reports are particularly useful.

Fire insurance reports dating back to the late 1800s were prepared for insurance companies for underwriting purposes. The reports are available primarily for urban areas and can be found at municipal and national archives and through private enterprise.

3.4 City Directories

City directories are municipal telephone books arranged by address and are often available at municipal archives. The researcher should obtain a list of past occupants to whom a telephone was registered given the address of the property. A review of this list will identify any past occupants of concern.

3.5 Land Registry

Provincial land registries provide a record of past owners of a property and indicate any restrictions on the land such as rights of way. This information does not necessarily indicate that the owner actually occupied the site, however, it can be incorporated into the overall site history to gain a better understanding of past site activities. For example, if land registry information indicates that a property has been listed to private names since Crown ownership, this may reinforce a conclusion that the site has been used for residential purposes.

3.6 Company Records

Valuable information can be obtained from records available on site. This can include:

- . Past and present site plans;
- . Permits;
- . Maintenance records;
- . Asbestos/PCB/etc. surveys;
- . Utility drawings;
- . Spill records;
- . Chemical material safety data sheets;
- . Waste management records;
- . Environmental monitoring data;
- . Inventory of storage tanks; and
- . Environmental compliance reports.

3.7 Government Records

Other government records are often available through municipal offices. The type of information kept in municipal archives and engineering departments can include drawings, city planning documents, public work projects, heritage property information and general municipal historical documents.

3.8 Previous ESA Reports

To avoid duplication, information obtained from other environmental site assessments can be included in the report provided that the information was originally obtained in a manner which was consistent with this guide and no changes which would affect the conclusions have occurred. Previous ESAs are used to supplement the report under review and not replace it. The time period between previous reports and the report under review will dictate the reliability of the previous reports. Changes to site conditions, surrounding site use, and environmental legislation may make conclusions from past reports irrelevant.

3.9 Date of First Development

The historical review should date back to the first development of the property. If this information is not available, the report should clearly identify what attempts were made to gain the information and the historical review should date back to as early as possible. Historical information from before 1900 can be difficult to obtain and confirm.

The historical review may not require all of the above sources of historical information. In order to answer "Yes" to question Q3 on the Phase 1 ESA Evaluation Form, the reviewer must be satisfied that the degree of effort put into the historical review is sufficient for the complexity of the past site use. In addition, each past site activity or incident of environmental concern should have a corresponding conclusion that states why this concern does not require further study, or alternatively, a recommendation for a Phase 2 Environmental Site Assessment should be included. The following is an example of an acceptable historical research:

The historical research of past land use included the following:

- *A review of aerial photographs dated 1926, 1947, 1959, 1963, 1964, 1965, 1967, 1976 and 1987 (aerial photographs included in Appendix 1).*
- *A review of previous land owners dating back to 1911 at the Land Registry Office (copies of titles included in Appendix 2).*

- *A review of the Fire Insurance Plans dated 1929 and 1959.*
- *Interviews with Joe Fibber, Municipal Engineering Department (January 24, 1994) and Dr. William Dumper, Property Occupant (January 24, 1994) (copies of interview records included in Appendix 3).*

Telephone directories by address are not kept for the Town of ABC.

Table 1 summarizes our historical review of the property:

TABLE 1			
<i>Time Period</i>	<i>Property Owner</i>	<i>Land Use</i>	<i>Sources of Information</i>
<i>Prior to 1926</i>	<i>Various Individuals</i>	<i>Undeveloped, vacant land</i>	<i>Air photographs, Joe Fibber, Land Registry</i>
<i>1926 to 1977</i>	<i>Sally Spillar</i>	<i>Garage with fuel pumps and automobile dealership.</i>	<i>Aerial photographs, Land Registry, Fire Insurance Plans</i>
<i>1979 to 1980</i>	<i>Dr. William Dumper</i>	<i>Medical Centre, non-operational garage</i>	<i>Aerial photographs, Land Registry, Dr. William Dumper</i>
<i>1980 to 1994</i>	<i>B.O.D. Ltd.</i>	<i>Medical Centre, Garage demolished in 1985 and addition built</i>	<i>Aerial photographs, Land Registry, Dr. William Dumper</i>

The major environmental concerns associated with the past site use are the occupation by an automobile garage with gasoline pumps and an automobile dealership. Figure 1 in Appendix 4 identifies the approximate location of these past site occupants.

Based on the 1929 and 1959 Fire Insurance Plans and discussions with Joe Fibber of the Municipal Engineering Department, two gasoline pumps were located at the north end of the property near the property boundary. Mr. Fibber indicated that the pumps were still on the site in 1979. It is estimated that the automobile garage was in operation on the north side of the site for approximately 53 years between 1926 and 1979. The estimated underground storage tank locations are shown on Figure 1.

The 1929 Fire Insurance Plan identifies the tanks as having a capacity of 500 gallons each and containing leaded gasoline. None of the sources contacted could confirm that the tanks were removed from the ground.

No past environmental concerns were identified with neighbouring site use.

It is recommended that a Phase 2 intrusive investigation be carried out to verify that all tanks were removed from the ground and no residual environmental impacts have resulted from the tanks on site.

The above example provides sufficient detail to gain an understanding of the potential environmental liabilities associated with the site since its development, provides a preliminary assessment of the areas of concern and provides recommendations to fully assess these concerns. The response to question Q3 for the above example would be "Yes".

If, for example, the site had been original, wooded land up until 1990 at which time the first and present residential development was constructed, a historical review which included only review of air photos, municipal records and interviews may suffice to fully describe and assess potential environmental liabilities associated with past site use.

4.0 PROPERTY

The Property component of a Phase 1 ESA describes the current physical characteristics of the site. Specific environmental issues such as surface staining, fill and waste materials are based on property observations. The physical characteristics of the site are required along with the discussion of specific environmental issues so that the reader will gain an understanding of the potential impacts to the property resulting from these issues. The following points are included under the property component of the report:

4.1 Location

A full civic address should be provided in the report. This information should be supplemented with a site location plan (or key plan). The benefit of the site location plan is that it provides a view of the site in relation to its surroundings.

4.2 Legal Description and Zoning

The legal description confirms that the site location is as stated in the civic address and defines the sites boundaries. The legal description is required in addition to the civic address to ensure that the entire property was investigated under the scope of work. In addition, the legal description is required to obtain historical information from the Provincial Land Registry. The municipal zoning of the property, which should correspond to the site use should also be provided.

4.3 Site Plan

A site plan allows the reader to visualize the site, the neighbouring properties and the location of potential environmental liabilities (i.e. storage tanks). The plan should include the entire subject property, significant details of the adjoining properties on all sides and a north arrow. The areal extent of the site should be identified in the report.

4.4 Topography

The topography or surface features, slopes and elevations of the site should be described. Topographic maps of regions are available, however, this information should be obtained directly from observations of the site and the surrounding area. Significant topographic features, such as slopes, swales, hills and gullies should be noted and shown on the site plan.

4.5 Geology

A description of the soils and rocks and their structure underlying the site should be provided. Geological maps are available through the Geological Survey of Canada which provide the types of soils, the depth to bedrock and the type of bedrock. This information is useful in determining if any potential spills would have migrated off of or onto the property. For example, contaminants are more likely to migrate through sand than clay. There are also some specific concerns related to different types of geological units. Naturally occurring substances such as Radon, metals, asbestos, etc. can be found in higher concentrations in specific geological units.

4.6 Surface Water

Surface water, including lakes, rivers, ponds, creeks, etc., can be a receptor or a transporter of contaminants. The Phase I ESA should identify any bodies of water on the investigated site and the location of the nearest body of water in relation to the site. Consideration should be given to other activities which are connected to the investigated site through a common body of water. For example, a creek which receives effluent from an upstream industry may warrant chemical testing.

4.7 Ground Cover

A description of the type of ground cover (asphalt, grass, flower beds, etc.) should be included for the entire property. Details should be provided on such observations as stressed vegetation, surface staining or unidentified protrusions from the ground which could indicate environmental concerns. These conditions may warrant further investigation. If no indication of these, or other potential impacts to the property were observed, this also should be stated.

4.8 Fill

Fill is material which has been placed on a property or relocated on that property such that it is no longer in its natural state. Fill can be used to fill in an excavation, for drainage associated with a structure or parking lot or to alter the topography. Fill is common on developed properties. Significant quantities of fill of unknown origin on a property could result in an environmental liability should it contain contaminants. The Phase 1 ESA report should identify whether or not fill is suspected based on the topography and historical research and should provide an assessment whether or not the presence of fill would warrant a Phase 2, intrusive ESA. Conditions which may indicate a Phase 2 ESA is required may include:

- . large quantities of fill on site;
- . signs of debris in the fill;
- . historical information that indicates that waste was placed in the fill; and
- . detectable odours.

4.9 Current Site Use

Environmental liabilities may also be present as a result of current site use. The report should identify the primary site use (i.e. apartment building, condominium, nursing home, home for the aged, vacant land etc.) and the relevant activities carried out on that site. For example, a nursing home may produce biomedical waste. Details on the type of waste, monthly quantity of waste, location of waste disposal, etc. should be provided in the report. If there are any commercial, industrial or unusual activities carried out on the site, they should be described.

In addition, for each item of environmental concern identified there should be either a conclusion stating why this concern does not require further study or a recommendation for a Phase 2 ESA.

The following example illustrates an acceptable property component of a Phase 1 ESA report:

The property is legally described as Lots 1 to 3, Plan 61, and Lots 39 to 40, Plan 35403 in the City of ABC.

A key plan and a site plan (Figures. 1 and 2, respectively) of the property are provided in Appendix 1. The property has an areal extent of approximately 2,370 m². According to the City of ABC Planning and Development Department, the property and surroundings are zoned as C1, a general commercial zone under city By-law Z-2K.

The closest body of water is the leachate river located approximately 700 m south of the site.

All of the surface of the investigated property, outside of the building footprint, is paved and used for parking. The property and the general area is relatively flat, except for the area south of DEF Avenue which slopes downwards towards DEF Avenue at a grade of 3 to 5%. Surface water from the property drains into the Municipal storm sewers.

Based on geological maps, obtained from the Geological Survey of Canada the site is located in an area of Champlain Sea Sediment, which is described as "clay and silt underlying erosional terraces; upper part of marine deposits removed to variable depths by fluvial erosion so in places the clay is uniform blue-grey; unit includes lenses, bars and channel fills of sand and pockets of nonmarine silt that were formed during terrace (or channel) cutting". The average depth to bedrock is approximately 30 m.

A layer of fill approximately 0.6 m in thickness is present beneath the pavement structure. According to GHI Construction (responsible for the parking lot construction in 1992) this was clean select subgrade material transported from JKL Quarry.

No surface soil staining, protrusions from the ground of unknown origin or other potential environmental concerns were identified on the property during a site visit carried out on May 2, 1994.

In order to answer "Yes" to question Q4 on the Phase 1 ESA Evaluation Form, the reader should be able to visualize the site based on the information provided and should be convinced that the consultant physically inspected the site. Conclusions and/or recommendations must accompany all identified environmental concerns.

5.0 ADJACENT PROPERTIES

Environmental liabilities can exist as a result of contaminants migrating from nearby properties to the subject property. A description of site use should be provided for adjoining properties on all sides of the investigated site. Special attention should be given to commercial or industrial activities. Sufficient detail on the type of commercial or industrial activity should be provided to assess potential sources of contamination. Less detail is required for adjoining residential use. In addition, nearby hazardous activities on properties that do not neighbour directly on the subject site, such as landfills, or heavy industrial parks should be discussed in the report. These nearby hazardous activities can be obtained from aerial photographs, zoning maps and interviews and do not require a detailed investigation under this Phase of the assessment. Distances from potential sources of contamination to the investigated property line should be provided. Alternatively, these can be shown on the site plan.

The potential for transport of contaminants onto the site should be assessed in the Phase 1 ESA report and appropriate recommendations to verify impacts to the property should be furnished. The following is an example of an adequate Adjacent Properties section of the report:

The adjoining properties are identified on Figure No. 2. The investigated site is bounded to the north by Regional Road No. 1 (former Highway No. 10), on the other side of which is located a single storey structure occupied by Quickie Limited, a courier service; and to the west by 2nd Road, opposite which is undeveloped business park land. On the west side of 2nd Road, approximately 150 m to the southwest of the property, is located the municipal landfill. The landfill has been used from 1980 until present for disposal of domestic waste received from residents within the town limits. According to Mr. Dumpit, landfill operator since 1980, no commercial or industrial waste has been received in the landfill since commencement of operation. Recommendations to further assess potential impacts to the investigated site, resulting from migration of contaminants from the landfill are provided in Section 6.0 of this report. No evidence of storage tanks was identified on neighbouring properties and with the exception of the landfill, no environmental concerns were identified with adjacent land use.

Assume that one of the adjoining properties in the above example was a gasoline station. In this case, details on the types of fuels; location, size, age and spill protection on storage tanks; and history of spills would be required and one would anticipate appropriate recommendations for a Phase 2 investigation based on the above.

In order to answer "Yes" to question Q5 on the Phase 1 ESA Evaluation Form, the reviewer should have a clear understanding of:

- . Site activities on all adjoining sites;
- . Major environmental concerns in the general area;
- . The potential for site impacts resulting from adjacent property use; and
- . What is required to fully assess potential site impacts.

6.0 BUILDING

Environmental liabilities can arise from the types of materials used in building construction and from the methods of construction. The Phase 1 ESA report should provide general background information on all buildings and structures on site and should assess specific potential environmental liabilities associated with the buildings and structures.

General background information on the buildings should include:

- . Date of construction;
- . Construction materials;
- . Mechanical (heating/cooling) systems;
- . Electrical Distribution;
- . Water/sewer connections (municipal or private); and
- . Drains and sump pits.

The likelihood of any designated or hazardous materials on site which pose environmental or health and safety risks should be identified based on visual inspection and available records. The quantification of such materials may only be possible through Phase 2 testing. These materials include, but are not limited to, the following:

- . Asbestos containing materials (ACMs);
- . Polychlorinated biphenyls (PCBs);
- . Lead;
- . Ozone depleting substances (CFCs, halon etc.);
- . Urea foam formaldehyde insulation (UFFI); and
- . Chemical storage.

The above materials should be addressed in the report due to heightened public concern and/or the existence of regulations or guidelines respecting these substances. The methodology used to investigate the above materials should be specified. The list of substances requiring special attention may vary over time resulting from research in the field of hazardous materials.

In addition to the above, there are a number of physical conditions of potential concern such as electromagnetic radiation (EMR), noise, vibration, air quality, and radon or other soil gases. These conditions can result from either man made processes or natural environmental conditions and may affect the intended property use, resulting in an environmental liability. It is not practical to test for each one of these conditions in each case and the information that can be obtained without testing is limited. Recommendations for Phase 2 testing should be provided for the above conditions where visual observations

and interviews with site personnel have indicated that there is reason for concern. For example, if it is reported that people who work in the building suffer from headaches and nausea on a regular basis, recommendations for a Phase 2 investigation to determine the cause should be provided.

An example of an acceptable building component of a report is provided below:

The building has an areal extent of approximately 9,050 m². The investigated building was constructed around 1966. The upper-most two floors were added to the original building between 1967 and 1970. The building has 9 storeys of apartments for a total of 56 units and a mechanical penthouse. There is also a two storey section of the building at the north side of the site which is used for administration and social events. An attached two level parking structure, including one level underground, was observed as shown on Figure 2 in Appendix 1.

The exterior walls are constructed of masonry brick veneer, cast-in-place concrete and interior plaster finishes. The upper two floors were similarly constructed, utilizing drywall in place of plaster. The interior walls are concrete with plaster finishes. The floors are structural concrete slabs. The type of wall insulation could not be confirmed without carrying out an intrusive inspection of the walls. Photographs of the investigated site are provided in Appendix 3.

Mr. Lea Kay of Covertight Roofing Ltd. (responsible for installing the roofs) was contacted on April 11, 1994, regarding the composition of the roof systems at the investigated site. The building roof consists of a structural concrete slab with conventional built up roof systems. The lower, two storey roof level was recently replaced in 1993 and makes use of woodfibre board roof insulation. The upper roof level utilizes a phenolic board insulation.

The building is heated by means of gas fired boilers, gas fired forced air units and individual electric combination heaters/air conditioners for each apartment. The pool is heated by gas fired water heaters. The gas fired boilers are located in the basement in a room adjacent to the garage and on the fourth floor mechanical room. The common areas of the building are cooled by air conditioners located on the roof top, in the mechanical penthouse and in the basement. Electricity is supplied by ABC Hydro.

Asbestos

The common use of friable (breakable by hand) asbestos containing materials in construction stopped in the mid 1970's. A limited visual inspection of the building interior identified potential asbestos containing materials.

Based on visual inspection, potential asbestos containing materials were identified on the pipe insulation elbows, joints and straight sections, and boiler insulation. It should be noted that destructive investigations into the interior of walls and the roof were not carried out and therefore the investigation does not consist of a complete asbestos survey. It is also possible that asbestos could be present in floor and ceiling tiles, wallplaster, wall joint compound and in mechanical units.

If asbestos is to remain in the building, a detailed asbestos survey is recommended and an asbestos management program is required under Provincial Regulation 123. Under this regulation, asbestos need not be removed from a building unless it is damaged beyond repair or is likely to be disturbed as for example during major renovations or demolition. If removal is required, the specifics of the removal operations must follow the procedures identified in Provincial Regulation 123.

Polychlorinated Biphenyls (PCBs)

The use of PCBs in electrical equipment such as transformers, fluorescent lamps ballasts and capacitors was common up to 1980.

The Federal Chlorobiphenyls Regulation, SOR/91-152, prohibits the use of PCBs in the above electrical equipment installed after July 1, 1980. As the construction of the building pre-dates this period, PCBs in electrical equipment was investigated.

The electrical supply for the building was traced from the outside of the property limits throughout the building. An electrical vault operated by ABC Hydro was located in the basement near the boiler room. ABC Hydro was contacted for information regarding the transformers inside the vault on April 11, 1994. Mr. Marty Ohm provided information that the vault contains six transformers and the contents of each had been tested previously. The test results, included in Appendix 4, indicate that no PCBs were detected in any of the six transformers.

A random inspection of eight fluorescent lamp ballasts was carried out. One of the inspected fluorescent lamp ballasts was identified as possibly containing PCBs as per the Ministry of Environment publication "Identification of Lamp Ballasts Containing PCBs", 1991. Based on the age of the building, the presence of PCB containing lamp ballasts is anticipated. As the lamp ballasts are decommissioned, the serial number and date of manufacture should be checked to determine if the ballasts are PCB contaminated. It is not a requirement to remove operating PCB containing equipment, however, should the equipment be put out of operation, they should be handled and stored according to the Federal Storage of PCB Material Regulations; SOR 92-507.

Ozone Depleting Substances

CFC R-22 is present in the building's common area cooling system, located on the lower roof level, in the mechanical penthouse and in the basement boiler room. CFC R-12 is likely present in the window mounted air conditioners for individual apartments. A late model air conditioning unit was observed on the lower roof level. A CFC recovery unit which is used by the air conditioning service contractor was observed on site at the time of inspection. Maintenance practices on all CFC equipment should be conducted as per the Federal Code of Practice for the Reduction of CFC Emissions from Refrigeration and Air Conditioning Systems, 1989.

Radon

Radon gas is a product of the decay series that begins with Uranium. Radon is produced directly from radium which can be commonly found in geological units which contain black shale and granite. Radon gas can migrate through the ground and enter buildings through porous concrete or fractures. Radon tends to accumulate in poorly ventilated basements.

Neither black shale nor granite was identified on the geological maps for the area. Furthermore, the basement area is well ventilated and is not permanently occupied. Radon gas does not appear to be an issue for this site.

Lead Paint

In Canada, the past use of lead in both interior and exterior paint was extensive. Canadian regulations in 1976 limited the amount of lead in interior paint to 0.5% by weight. There are currently no regulations in place governing the removal of lead paint where the Occupational Health and Safety exposure limits are not exceeded. In the absence of a detailed paint testing program it is assumed that some paint in the building does contain lead. The paint was found to be in good condition. There are no anticipated environmental concerns regarding lead paint at this time.

UREA Formaldehyde Foam Insulation (UFFI)

The majority of UFFI was installed in new and existing construction in Canada between 1975 and 1978 as part of the Canadian Home Insulation Program. As the building on site was constructed prior to this time period, the presence of UFFI was investigated. The limited visual inspection of the building did not identify the presence of UFFI in the areas inspected.

Chemical Storage

Chemicals identified in use at the investigated site include general purpose cleansers and swimming pool chemicals. No potential environmental liabilities associated with chemical use were identified for this site.

No other substances or environmental conditions were observed which would affect the intended use of the property.

In order to answer "Yes" to question Q6 on the Phase 1 ESA Evaluation Form, the reviewer should be satisfied that:

- . General background information on the building or structure is provided in the report.
- . The building inspection has included the designated or hazardous (special attention) materials listed above and comments on the potential presence of these materials has been provided along with appropriate recommendations for verification.
- . Any other physical concerns noted in the report have been addressed with recommendations provided to fully assess these concerns.

7.0 STORAGE TANKS

Storage tanks are the most common cause of subsurface impacts to soil and groundwater resulting in environmental liability. Prior to providing recommendations for an intrusive, Phase 2 ESA, the Phase 1 ESA should furnish a minimum amount of information in order to assess whether or not further investigation is required and if so, to determine the most efficient method for conducting the Phase 2 ESA.

When storage tanks are present, the information listed below should be provided in the Phase 1 report. Should some of this information not be available, this should be stated with reasons provided.

- . Location;
- . Size;
- . Contents;
- . Type (aboveground/underground, steel, fibreglass, etc.);
- . Protection (corrosion protection, double lined, leak detectors, etc.);
- . Date of installation;
- . Previous tests (pressure tests, dip tests, etc.); and
- . Reported leaks.

An example of an acceptable Storage Tanks component of a report is provided below:

The storage and handling of petroleum products, including gasoline, diesel and oil, is regulated under the Provincial Petroleum Products Regulation. Table 1 summarizes all storage tanks identified during our site reconnaissance. No surficial staining was observed around any of the tank installations.

Table 1. Storage Tanks									
Tank No.	Location	Type of Tank	Contents	Size of Tank (litres)	Date of Installation	Previous Tests	Type of Tank Protection	Leaks Reported	Source of Information
1	In tunnel sprinkler room	Above ground, steel	Diesel generator fuel	1,200	1982	none	Concrete block dyke	No	Site Superintendent, Visual
2	In tunnel sprinkler room	Above ground, steel	Diesel generator fuel	1,200	1982	none	Concrete block dyke	No	Site Superintendent, Visual
3	In maintenance garage	Above ground, steel	Gasoline	1,200	1982	none	Concrete block dyke	No	Site Superintendent, Visual
4	Outside SE of building	Underground, steel	Waste oil	2,400	1982	none	none	No	Site Superintendent
5	Outside NW of building	Underground, steel	Diesel generator fuel	2,400	1989	none	none	No	Site Superintendent

The Provincial Petroleum Products Regulation stipulates that petroleum product suppliers must obtain a tank registration number prior to filling any above ground or underground tank containing more than 250 litres. The Provincial Ministry of Energy and Resources has adopted an internal policy that there will be a grace period up until July 11, 1994 before applying this section of the regulation. Therefore, all of the above mentioned tanks (none of which are presently registered with the Ministry of Energy and Resources) should be registered prior to July 11, 1994.

Section 1 of the regulation requires that steel underground tanks be protected by either installing galvanized corrosion protection system (Standard CAN4-S603.1-M85) or by electrochemical corrosion control (Standard CSA C22.3 No. 4-1974). According to Section 2 of the regulation, unprotected steel underground tanks must be removed in accordance with the following schedule:

- 1. Before January 1, 1993, for tanks 25 years old or older as of August 20, 1991.*
- 2. Before January 1, 1995, for tanks 20 - 24 years old as of August 20, 1991.*
- 3. Before January 1, 1996, for tanks 17-19 years old as of August 20, 1991.*
- 4. Before January 1, 1997, for tanks 15 or 16 years old as of August 20, 1991.*
- 5. Before January 1, 1998, for a tank that is less than 15 years old as of August 20, 1991 unless protection, as identified above, is added to the tank.*

Item 5 applies to both of the steel underground storage tanks located outside the building. The installation of the above ground storage tanks identified on site complies with the requirements of the Provincial Petroleum Products Regulation.

As the integrity of the existing underground storage tanks could not be verified, a Phase 2, subsurface investigation is recommended in the proximity of each underground storage tank.

In order to answer "Yes" to question Q7 on the Phase 1 ESA Evaluation Form, sufficient information should be identified in the report to support conclusions that a Phase 2 ESA either is, or is not, warranted. Appropriate recommendations should be provided.

8.0 REPORT SUPPLEMENTS

Other components of the Phase 1 ESA report to those discussed above are required to support the conclusions and recommendations.

The following supplements should be enclosed within the report:

- . Site photographs ;
- . Consultant qualifications;
- . Interview records; and
- . Supporting technical documents.

In order to answer "Yes" to question Q8 on the Phase 1 ESA Evaluation Form, all of the above report supplements should be provided, or this information should be included in the body of the report.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The objective of conducting an Environmental Site Assessment is to provide conclusions on the potential for environmental liability associated with the site. The conclusions should be founded by the information provided in the report. If insufficient information was obtained to conclude that liabilities do not exist on site, recommendations for additional, Phase 2 investigations should be provided.

In order to answer "Yes" to question Q9 on the Phase 1 ESA Evaluation Form, all conclusions should be supported by the content in the report and appropriate recommendations should be provided. The report reviewer should be in agreement with the conclusions and recommendations provided.

SECTION 1

SECTION 2

SECTION 3

SECTION 4

SECTION 5

SECTION 6

SECTION 7

SECTION 8

SECTION 9