

Land Value After Remediation



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Real Estate as Primary Factor

Physical:	
Housing and shelter	Houses, apartment buildings, condo's
Work environment	roads, sidewalks, utility poles, distribution lines, water/sewer services, well/septic, landfill sites
Retail - goods & services	roads, sidewalks, utility poles, distribution lines, water/sewer services, well/septic, landfill sites
Recreation	roads, sidewalks, utility poles, distribution lines, water/sewer services, well/septic, landfill sites
Storage of materials	roads, sidewalks, utility poles, distribution lines, water/sewer services, well/septic, landfill sites
Infrastructure	roads, sidewalks, utility poles, distribution lines, water/sewer services, well/septic, landfill sites

Real Estate as Primary Factor

Economic	
Capital markets	personal investment (residence & other), corporate investment
Goods & services	management, sales/brokerage, mortgages, professional services, supplies
Basis for taxation	municipal property/business tax, capital gains tax, GST/HST, deed registration fees, development permits
Government fund transfer	provincial transfer to municipalities, Federal transfer payments

Real Estate and Typical Contaminants

Physical:		Typical contaminant:
Housing and shelter	Houses, apartment buildings, condo's	Oil tank leaks, UFFI, noise, light, mold
Work environment	Offices, factories, hotels, warehouses, hospitals, universities, port facilities, airports, mining operations, utility generation	Oil/gas tank leaks, asbestos, noise, PCB's, hazardous chemicals, nuclear radiation, mold, bacteria
Retail - goods & services	shops, shopping centres, garden centres, car lots, gas stations, restaurants	Oil/gas tank leaks,
Recreation	cinemas, golf courses, parks & wilderness areas, beaches, water courses for boating & fishing	Pesticides, oil spills
Storage of materials	tank farms, car scrap yards, tire disposal, lumber yards, chemical storage, munitions & explosives	Oil/gas tank leaks, dangerous chemicals, fire/explosion hazard
Infrastructure	roads, sidewalks, utility poles, distribution lines, water/sewer services, well/septic, landfill sites	Ground water pollution (chemical, faecal choliform & naturally occurring pollutants), electrical current, odors

Real Estate and Typical Contaminants

Economic:		Effects:
Capital markets	personal investment (residence & other), corporate investment	Reduces asset value
Goods & services	management, sales/brokerage, mortgages, professional services, supplies	Increases need for professional services, supplies
Basis for taxation	municipal property/business tax, capital gains tax, GST/HST, deed registration fees, development permits	Reduces taxable income to government
Government fund transfer	provincial transfer to municipalities, Federal transfer payments	Reduces transfer amounts

Process of Remediation

Process	Description
Repair	Repair of factors that suppress environmental damage
Removal & disposal	Elimination of the hazard through removal and disposal
Operations + maintenance programmes	Properly maintains hazardous substance at or below acceptable levels
Isolation	Separates and isolates the hazardous substance for storage on-site
Encapsulation	Uses impermeable membrane to 'encapsulate' the hazardous material
Uses a structural membrane to 'enclose' the hazardous substance	Uses a structural membrane to 'enclose' the hazardous substance

Issues Affecting Value

Important Remediation Issues Affecting Value	
Cost of clean-up	Professional assessments Hard cost of clean-up Associated soft costs (legal, financing, supervisory) Ongoing monitoring
Effectiveness of Clean-up	Degree of remediation
Time needed to complete the process	Affects value throughout clean-up Can lead to short term stigma Can lead to long term or permanent stigma
Future Use Restrictions	Can lead to long term or permanent stigma

Definitions Relating to Valuation of Contaminated Real Estate

Term	Definition
Diminution in Value	The difference between the unimpaired and impaired values of the property being appraised. The difference can be due to the increased risk and/or costs attributable to the property's environmental condition
Environmental Contamination	Adverse environmental conditions resulting from the release of hazardous substances into the air, surface water, groundwater or soil. Generally, the concentrations of these substances would exceed regulatory limits established by appropriate federal, state (provincial) and/or local agencies
Environmental Risk	<p>The additional or incremental risk of investing in, financing, buying and/or owning property attributable to its environmental condition. This risk is derived from perceived uncertainties concerning:</p> <ol style="list-style-type: none"> 1. the nature and extent of contamination 2. estimates of future remediation costs and their timing 3. potential for changes in regulatory requirements 4. liabilities for clean-up (buyer, seller, third party) 5. potential for off-site impacts 6. other environmental risk factors, as may be relevant

Definitions Relating to Valuation of Contaminated Real Estate

Term	Definition
Environmental Stigma	An adverse effect on property value produced by the market's perception of increased environmental risk due to contamination
Remediation Cost	The cost to clean-up (or remediate) a contaminated property to the appropriate regulatory standards. These costs can be for the clean-up of on-site contamination as well as mitigation of off-site impacts due to migrating contamination
Remediation Lifecycle	A cycle consisting of three stages of clean-up of a contaminated site: before remediation or clean-up; during remediation; and after remediation. A contaminated property's remediation lifecycle stage is an important determinant of the risk associated with environmental contamination. Environmental risk can be expected to vary with the remediation lifecycle stage of the property

Source:

Appraisal Foundation USPAP (2004), Advisory Opinion 9



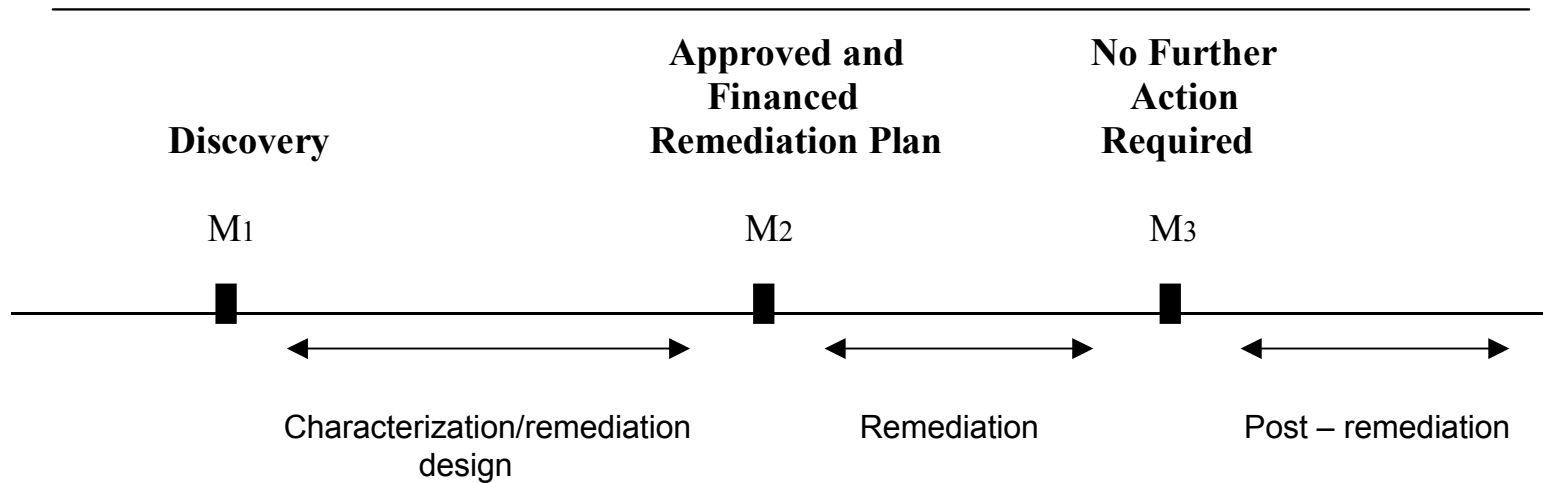
Contaminated Property The Value Lifecycle

The three stages in the lifecycle of a contaminated property are:

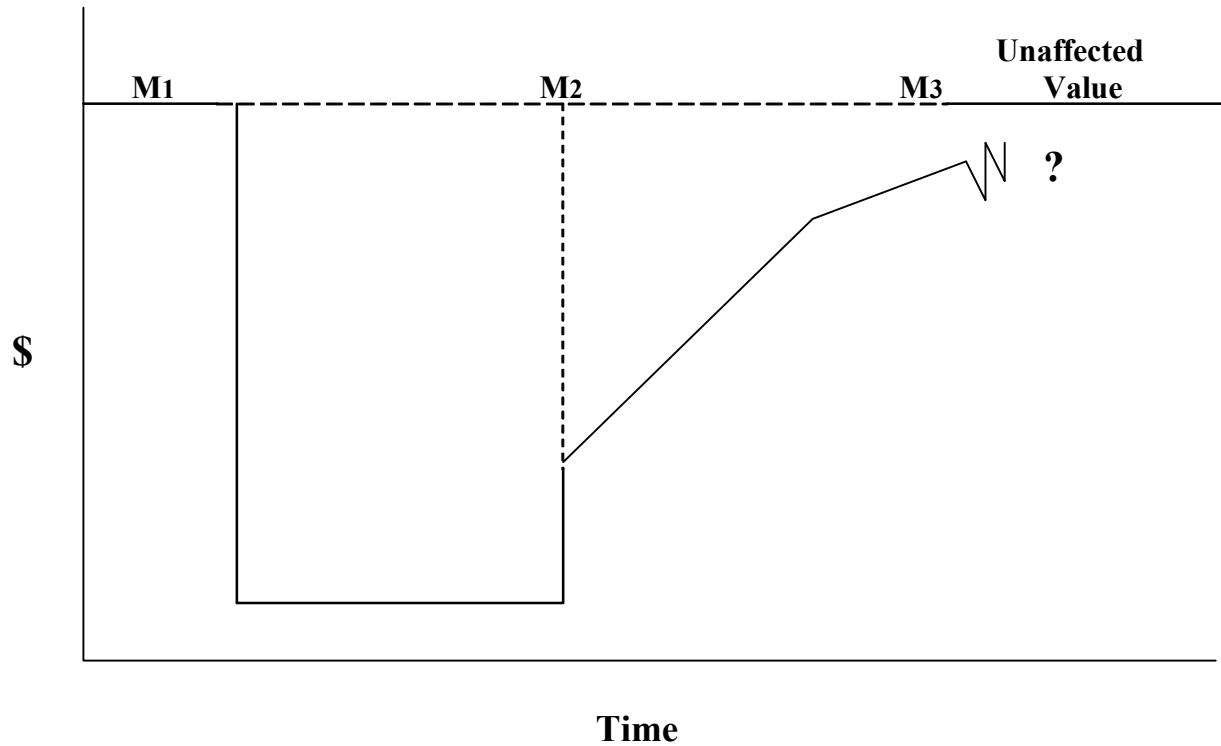
Term	Name	Description
M1	Discovery	Time between discovery of the environmental hazard and knowing the extent of contamination and remediation cost
M2	Approved and Financed Remediation Plan	The time of obtaining a remediation action plan based on professional assessment of the extent of contamination, where remediation costs have been established
M3	No further action required	The point after remediation has been completed

Remediation Lifecycle Timeline

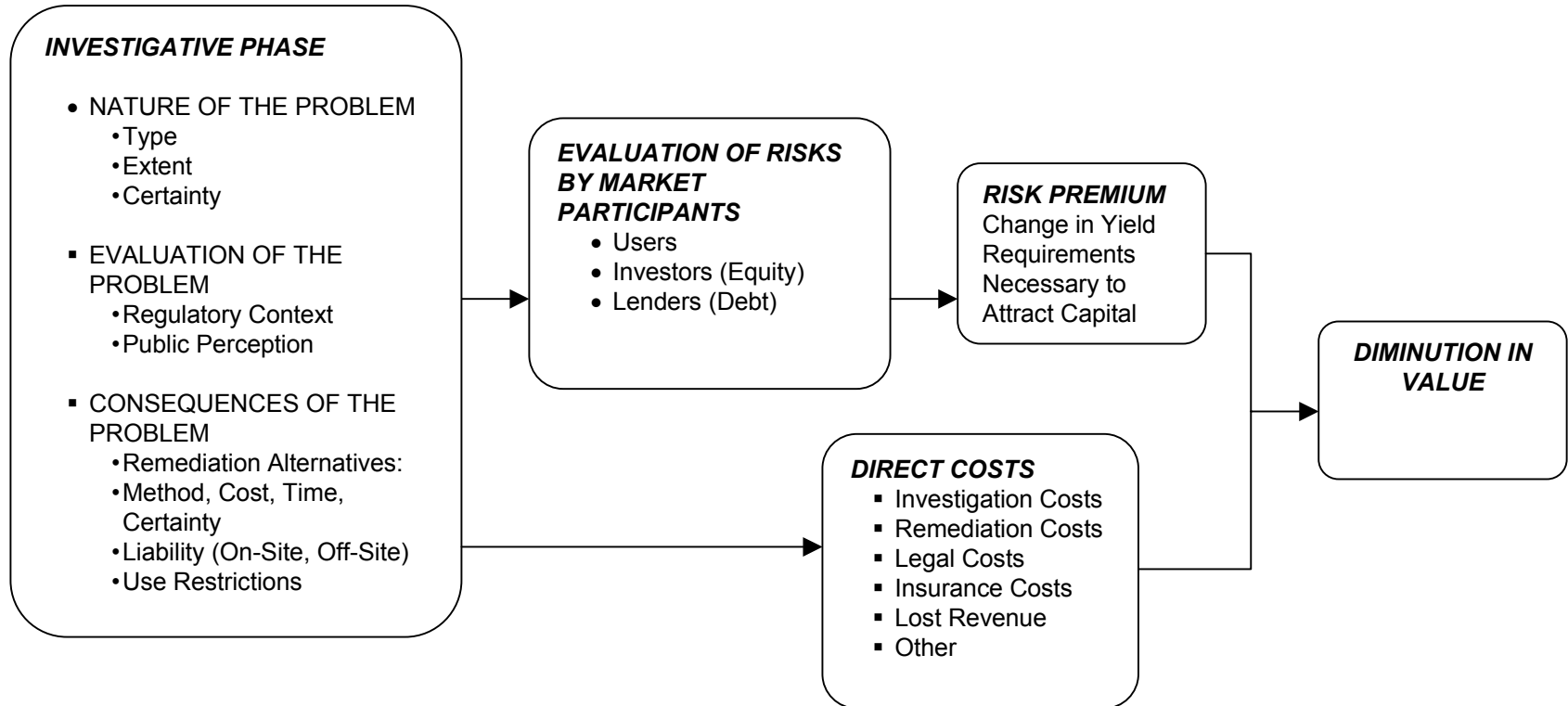
Diagrammatic representation of the M1, M2 and M3 timeline.



Value Changes Throughout Remediation Lifecycle



Factors Purchasers Consider in Valuation



Based on James A. Charmers, PhD and Thomas O. Jackson, MAI
Appraisal Journal, January 1996

Direct Costs of Remediation

The following is a list of the main direct costs that can usually be determined with some accuracy

- 1 Investigation costs
- 2 Remediation costs - short and long term
- 3 Legal costs
- 4 Insurance costs / revenue
- 5 Lost business revenue + holding costs (disruption)
- 6 Management cost (actual + opportunity cost)
- 7 Operating cost increase
- 8 Financing cost increases
- 9 Liability - adjacent properties

The Risk Factor

Risks are determined by market factors:

- 1 Purchasers who determine risks
 - a. from knowledge base (scientific evidence / professional report)
 - b. from perception
 - 'fear factor' (what might happen)
 - 'phobia' (not under any circumstance)
 - 'lack of knowledge' (media 'scaremongering')

- 2 Lenders who determine risks
 - a. from knowledge base (direct experience / research / scientific evidence)
 - b. from policy (averse to risk)

Risk as Determined by a Purchaser

- 1 **No risk**
Complete clean-up
no element of 'stigma'

- 2 **Stigma**
Results from 'uncertainty'
 - a. Uncertainty about potential remaining health risks after clean-up
 - b. Uncertainty regarding the need to do additional remediation work in the future
 - c. Uncertainty over how others may perceive the property

(Quote: US EPA - Property values, stigma, & superfund)

Itemized Typical Risk Factors

Typical risk factors considered by purchasers include:

- a. Possible errors in the risk assessment process (hidden costs)
- b. Possible future increased liability due to changes in regulation / legislation
- c. Ignorance - lack of knowledge
- d. Change in science - may determine greater future health risk
- e. Risk associated with projected clean-up cost (contingency risk)
- f. Perceived risk (sensational news media reporting)
- g. Pure phobia (general aversion)
- h. Trouble factor (want return for risk)
- i. Problems in achieving normal levels of financing (ratio and rate)

Effects of Stigma on Value

- Effects:***
- 1 Reduces demand**
 - 2 Reduces future value expectations**
 - 3 Increases yields necessary to attract investors**
 - 4 Increases equity requirement**

Typical Commercial Valuation Scenario

	<i>Pre- Contamination</i>	<i>Post- Contamination</i>
Gross income	\$250,000	\$225,000
Vacancy/debt allowance	5%	7.50%
Effective income	\$237,500	\$208,125
Less:		
Operating costs	\$45,000	\$50,000
Net operating income	\$192,500	\$158,125
Capitalisation rate	11.50%	12%
Overall value	\$1,673,913	\$1,317,708
Rounded	\$1,670,000	\$1,320,000

Typical Residential Valuation Scenario

Adjustment Items	SUBJECT (had oil spill)	Comparable A (similar oil spill)	Comparable B (no oil spill)
Sale Price		\$175,000	\$185,000
Date of sale (time)		\$0	\$0
Lot size		\$0	\$0
Location		\$0	\$0
Floor area		\$0	\$0
# rooms		\$0	\$0
Effect of Stigma		\$0	-\$10,000
Adjusted Value indicator		\$175,000	\$175,000

Ways to Avert / Reduce Stigma

Industry players can avert or reduce stigma:

- 1 Increase scientific knowledge base and ways of measuring contamination
- 2 Continue to monitor successes in contamination clean-up
- 3 Build on experience in site management practises
- 4 Have a good level of community involvement - share knowledge, avert fear factor
- 5 Manage potential adverse media publicity through education - proactive, not reactive
- 6 Share knowledge, experience and goals within the industry
- 7 Promote good governance of legislated and industry policies

Bibliography

1. Liquidity Loss and Delayed Transactions with Leaking Underground Storage Tanks, by Robert A. Simons, Ph.D. and Arthur Sementelli – The Appraisal Journal, July, 1997.
2. Risk Factors in the Appraisal of Contaminated Property, by James A. Chalmers, Ph.D., and Thomas O. Jackson, MAI, The Appraisal Journal, January 1996.
3. The Environmental Opinion, Basis for an Impaired Value Opinion, by Albert R. Wilson, The Appraisal Journal, July, 1994.
4. How North American Appraisers Value Contaminated Property and Associated Stigma, by William N. Kinnard, Jr., MAI, SRA, Ph.D., and Elaine M Worzala, Ph.D – The Appraisal Journal, July, 1999.
5. Environment and the Appraiser, by Richard J. Roddewig, MAI – The Appraisal Journal, January, 1999
6. Mortgage Equity Analysis in Contaminated Property Valuation, by Thomas O. Jackson, MAI – The Appraisal Journal, January, 1998.
7. Issues in the Valuation of Contaminated Property, by James A. Chalmers, Ph.D., and Scott A. Roehr - The Appraisal Journal, January, 1993.
8. Groundwater Contamination and Residential Property Values, by Mark Dotzour, Ph.D. – The Appraisal Journal, January, 1997
9. Environmental Damage Valuation & Cost Benefit News, by Damage Evaluation Associates, Kenneth Acks, 1996.
10. Appraisal Foundation (US), 2004 USPAP, Advisory Opinion 9
11. Coming Clean for Economic Development: A resource book on environmental cleanup and economic development opportunities, by Charles Bartsch, Elizabeth Collaton, and Edith Pepper – Framework of Environmental and Economic Development Concerns, Northeast Midwest Institute, Washington, D.C., 1996.
12. Stigma Damage: Recent Trends Affecting the Value of Contaminated Properties, by Robert J. Strachota (reported in Shenhon Company, Business and Real Estate Valuations) May 6&7, 1998
13. The Effects of Environmental Hazards and Regulations on Urban Development, (Urban Institute/Northeast Midwest Institute/University of Louisville/University of Northern Kentucky) – Posted to US Environmental Protection Agency, August, 1997.

14. Mitigating Factors in Appraisal and Valuation of Contaminated Real Property, by Allan E. Gluck, MAI, Donald C. Nanney Esq., and Wayne C. Lusvardi – Real Estate Issues, Vol. 25, No. 2, Summer 2000
15. Contaminated Real Estate: Implications for real estate appraisers, by Larry O. Dybvig, AACI – The Research and Development Fund, Appraisal Institute of Canada, December, 1992

Bibliography

1. Liquidity Loss and Delayed Transactions with Leaking Underground Storage Tanks, by Robert A. Simons, Ph.D. and Arthur Sementelli – The Appraisal Journal, July, 1997.
2. Risk Factors in the Appraisal of Contaminated Property, by James A. Chalmers, Ph.D., and Thomas O. Jackson, MAI, The Appraisal Journal, January 1996.
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4. How North American Appraisers Value Contaminated Property and Associated Stigma, by William N. Kinnard, Jr., MAI, SRA, Ph.D., and Elaine M Worzala, Ph.D – The Appraisal Journal, July, 1999.
5. Environment and the Appraiser, by Richard J. Roddewig, MAI – The Appraisal Journal, January, 1999
6. Mortgage Equity Analysis in Contaminated Property Valuation, by Thomas O. Jackson, MAI – The Appraisal Journal, January, 1998.
7. Issues in the Valuation of Contaminated Property, by James A. Chalmers, Ph.D., and Scott A. Roehr - The Appraisal Journal, January, 1993.
8. Groundwater Contamination and Residential Property Values, by Mark Dotzour, Ph.D. – The Appraisal Journal, January, 1997
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10. Appraisal Foundation (US), 2004 USPAP, Advisory Opinion 9
11. Coming Clean for Economic Development: A resource book on environmental cleanup and economic development opportunities, by Charles Bartsch, Elizabeth Collaton, and Edith Pepper – Framework of Environmental and Economic Development Concerns, Northeast Midwest Institute, Washington, D.C., 1996.
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