

Valuation of Contaminated Property

111.1501 Introduction

The valuation of contaminated real estate is a challenging assignment. Fortunately, over the last few years there have been many advances that facilitate a reliable analysis. Determining the effect that contamination has on the marketability and value of real property did not become a major issue in the United States until the enactment of the Comprehensive Environmental Response, Compensation, and Liability Act in 1980. The imposition of CERCLA's joint and several liability program prompted new concerns for owners of contaminated property, primarily because of the financial costs associated with cleaning up contamination and related health risk concerns. Owners are strictly liable for cleanup under the statute¹ and similar state statutes, and therefore are responsible for paying cleanup costs.

When CERCLA was first enacted, some reactions in the real estate and lender markets bordered hysteria. While still a significant and complex issue, generally environmental science has improved significantly, with both better assessment and evolved remediation measures. Government agencies also have instituted more sensible oversights and valuation methodologies have become far more refined.²

Furthermore, contamination must be considered in context of the overall purchasing decision criteria, coupled with the realities of industrialized society. While nobody goes out of their way to live or work on or near a contaminated site, the larger question is whether or not the contamination issue has a material impact in the market, when considered along with the host of other relevant real estate issues. Such issues could include location, square footage, amenities, access, the availability of other properties, and so forth. Some contaminants, such as asbestos, lead, arsenic, and mold, are naturally occurring materials. Exhaust and factory emissions emit some level of pollution and any discharge into a sewer line could impact water supplies. In an industrial society, some "background" levels of hazardous materials contaminate virtually all properties. Contamination does not automatically translate into a diminution in

value. Indeed, a "property is considered innocent until it is proven guilty, by market data."³

111.1502 Damage Economics

Real estate damage economics has made considerable strides over the last several years. Today, the Appraisal Institute, based in Chicago, has various courses, numerous articles, and books published on the topic. The scope of a real estate damage assignment typically includes (1) determining the "unimpaired" property value, assuming that the detrimental condition does not exist, if necessary, utilizing the traditional appraisal approaches; (2) demonstrating proficiency in the accepted real estate damage economic methodologies; (3) reviewing the specific environmental factors; (4) identifying the appropriate valuation methodology and collecting and analyzing environmental market data; and (5) concluding what the impact is, if any, on the "unimpaired" condition of the subject property resulting from the detrimental condition.

(a) Unimpaired Valuation

A diminution in value study often is expressed as a percentage of the baseline or unimpaired value. Accordingly, the first step often involves determining the value of the subject property, utilizing the traditional approaches to value, under the hypothetical assumption that the detrimental condition does not exist. If the market data shows that there is no diminution in value, this step may not be necessary. Generally, the unimpaired valuation is based upon the "market value" of the subject property, assuming that it is unimpaired.

"Market value" is defined as:

[T]he most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

¹ 42 USC 9607.

² Richard A. Neustein and Randall Bell, "Diminishing Diminution - A Trend in Environmental Stigma," *Environmental Claims Journal* (Vol. 11, No. 1/Autumn 1998): 47-59.

³ Orell Anderson, MAI, "Environmental Contamination: An Analysis in the Context of the Detrimental Conditions Matrix," *The Appraisal Journal* (July 2001): 323

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- both parties are well informed and/or well advised, and acting in what they consider their own best interests;
- a reasonable time is allowed for exposure in the open market;
- payment is made in terms of cash in United States dollars or in terms of financing arrangements comparable thereto; and
- the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.”⁴

Determining the unimpaired market value ultimately is the result of applying the traditional approaches to value, specifically, the cost approach, the income approach, and the sales comparison approach. In all three approaches, sales or rental comparables can be derived from the market, adjusted for differences between them and the attributes of the subject property, and utilized in the valuation process. In some cases, such as where the property was purchased without knowledge of any detrimental condition, the purchase price inherently may reflect the unimpaired value.

(1) *The Cost Approach*

The cost approach to valuation combines the value of the land (based on comparisons with similar properties) and then factors in the costs of replacing or reproducing property improvements with deductions for property obsolescence and depreciation. Property appraisers use this approach primarily to assess unique types of properties such as libraries, schools, churches and hospitals, new or proposed projects.

For example:

Land Value (60,000 SqFt @ \$10/SqFt)	\$ 600,000
Improvement Cost New (10,000 SqFt @ \$55/SqFt)	550,000
Less Depreciation (5 Year Age/50 Year Life=10%) ⁵	(55,000)
Depreciated Value of Improvements	495,000
Land and Depreciated Improvements	\$1,095,000

(2) *The Income Approach*

The income approach to valuation focuses on a property's ability to generate revenue and income. The income approach is applicable to income producing properties, such as office buildings, retail centers,

and industrial properties. The potential gross income first is computed by analyzing lease and rental comparable data, subtracting vacancy and expenses, and capitalizing the net income. This is done by dividing the net operating income by the capitalization rate. The capitalization rate generally is derived from dividing the net income by the price of sales comparables. A discounted cash flow analysis also may be performed.

For example, if the subject property generates \$100,000 in net operating income, and comparable capitalization rates are 10 percent, then the indicated value of the subject property is \$100,000 divided by 10 percent, or \$1 million.

Potential Gross Income	\$ 175,000
Less Vacancy & Collections	<u>10,000</u>
Effective Gross Income	165,000
Less Expenses:	
Taxes	10,000
Insurance	5,000
Management	15,000
Maintenance	10,000
Utilities	20,000
Reserves	<u>5,000</u>
Net Operating Income	100,000
Capitalization Rate	10%
Indicated Value	\$1,000,000

(3) *The Sales Comparison Approach*

The sales comparison approach, also known as the market data approach, compares data from recent sales of similar properties to determine the property's market value. Essentially the sales comparison approach compares the price per square foot, or some other unit of comparison, of sales comparable market data, to the subject property.

For example, if the sales comparables have sold for an adjusted price of \$95 per square foot, then multiplying the square footage by this figure derives the value of the subject property.

$$10,000 \text{ SqFt @ } \$95/\text{SqFt} = \$950,000$$

Once the three approaches to value are utilized, they are reconciled into a final estimate of value. In these examples, the cost approach indicated a value of \$1,095,000, the income approach indicates a value of \$1,000,000 and the Sales Comparison indicates a value of \$950,000. The final estimate of the baseline value would fall within this range.

(b) *General Detrimental Conditions*

Having addressed the fundamental elements of appraisal, but prior to focusing upon environmental conditions, it should be recognized that contamina-

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⁴ Appraisal Institute, Dictionary of Real Estate Appraisal, Fourth Edition (Chicago: Appraisal Institute, 2002), 177-178.

⁵ Depreciation tables can also be used in these calculations.

tion is a subset of hundreds of detrimental conditions that may impact real estate values. Of the hundreds

of conditions, all can be categorized into one of ten categories.

THE BELL CHART																						
Ten Categories of Research & Damage Economics																						
ID Class	Research	Damage Valuation	Damage Economics																			
I	General Condition	<p>There are numerous issues that may be researched by real estate professionals. Many issues have no impact on value, but if a question of value arises, a Detrimental Condition (DC) analysis is required. The starting point for such an analysis is the DC Matrix, which illustrates the array of potentially relevant issues. All nine elements of the DC Matrix should be considered. This can yield a</p> <table border="1"> <tr> <th colspan="3">Detrimental Condition Matrix</th> </tr> <tr> <th></th> <th>Assessment</th> <th>Repair</th> <th>Ongoing</th> </tr> <tr> <th>Cost</th> <td>Assessment Costs & Responsibility</td> <td>Repair Costs & Responsibility</td> <td>Ongoing Costs & Responsibility</td> </tr> <tr> <th>Use</th> <td>Use Impacts While Assessed</td> <td>Use Impacts While Repaired</td> <td>Impact on Highest & Best Use</td> </tr> <tr> <th>Risk</th> <td>Uncertainty Factor</td> <td>Project Incentive</td> <td>Market Resistance</td> </tr> </table>	Detrimental Condition Matrix				Assessment	Repair	Ongoing	Cost	Assessment Costs & Responsibility	Repair Costs & Responsibility	Ongoing Costs & Responsibility	Use	Use Impacts While Assessed	Use Impacts While Repaired	Impact on Highest & Best Use	Risk	Uncertainty Factor	Project Incentive	Market Resistance	<p>DCs may have a variety of impacts which, upon analysis, vary on a case-by-case basis.</p>
Detrimental Condition Matrix																						
	Assessment	Repair	Ongoing																			
Cost	Assessment Costs & Responsibility	Repair Costs & Responsibility	Ongoing Costs & Responsibility																			
Use	Use Impacts While Assessed	Use Impacts While Repaired	Impact on Highest & Best Use																			
Risk	Uncertainty Factor	Project Incentive	Market Resistance																			
II	Transactional Condition	<p>variety of valuation patterns based upon the inclusion, exclusion and timing of each element, as reflected in the DC Model. Damages benchmarked against the <i>Baseline Value</i>. In determining the impact on value, it is critical that a distinction be made between the DC and unrelated issues. For example, market conditions may be responsible for a change in value that is unrelated to the condition being studied.</p> <p>The impact of DCs on property values is ultimately an empirical question that requires the application of one or more of the three traditional approaches to value:</p> <ol style="list-style-type: none"> The Sales Comparison Approach utilizing market data with and without the DC. The Income Capitalization Approach utilizing income and risk factors with and without the DC. The Cost Approach utilizing data with and without the costs and losses associated with a DC. <p>The DC Matrix, coupled with the three approaches to value, provides the fundamental framework for the analysis of DCs. (From the book, <i>Real Estate Damages</i>)</p>	<p>DC Model</p> <p>Value vs Time</p> <p>Key to Graphs</p> <ul style="list-style-type: none"> --- Unimpaired Value - - - Value With DC A: Unimpaired Value B: DC Occurs-Discovered C: Assessment Stage D: Repair Stage E: On-Going Stage F: Market Resistance 																			
III	Market Condition																					
IV	Distress Condition																					
V	External Condition																					
VI	Building Condition																					
VII	Site Condition																					
VIII	Environmental Condition																					
IX	Conservation Condition																					
X	Natural Condition																					

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Detrimental Conditions Matrix			
	Assessment	Repair	Ongoing
Cost	Cost to Assess Damage	Cost to Repair or Remediate	Ongoing Costs i.e., monitoring
Use	Impact on Use While Assessed	Impact on Use While Repaired or Remediated	Ongoing Impact on Use or Impact on Highest & Best Use
Risk	Uncertainty Factor	Project Incentive	Market Resistance

As the Bell Chart illustrates, environmental contamination is a Class VIII Detrimental Condition (DC). Like any category of DC, it has unique issues that must be considered.

The basic framework for valuing any real estate damage allegation begins with the Detrimental Conditions Matrix (see chart, top of this page).⁶ While the nine quadrants within the matrix may not all be applicable, they all should be considered in the context of every valuation assignment:

Assessment Stage. This stage typically applies to the period where engineers or other consultants assess the extent of physical damage.

Repair Stage. This stage includes the time period when any property conditions are corrected, repaired, or remediated. This includes any costs associated with repairing the damages, any disruptions to use during any necessary remediation, and any project incentive to entice a buyer to purchase a property that is damaged but not yet repaired.

Ongoing Stage. This stage computes any ongoing costs such as environmental, geotechnical, or noise monitoring, etc.; any ongoing alterations to the use or highest and best use of the subject property; and any ongoing risk, termed “market resistance” (sometimes called “stigma”), which could exist as a result of the construction issues.

111.1503 Environmental Issues

With the general frameworks for valuation and detrimental conditions established, the next step is to investigate the specific environmental issues. In 2003, the Uniform Standards of Professional Appraisal

⁶ Randall Bell, *Real Estate Damages: An Analysis of Detrimental Conditions* (Chicago: Appraisal Institute, 1999), 8-15. Also see Randall Bell, “The Impact of Detrimental Conditions on Property Value,” *The Appraisal Journal* (October 1998): 380-391.

Practice (USPAP) adopted the cost, use, and risk issues set forth within the DC Matrix, specifically when dealing with environmental issues.⁷ Considered within the “assessment,” “remediation,” and “ongoing” stages, the nine quadrants should be researched carefully in the context of environmental issues.

Appraisers must look to the marketplace for answers and analyze what the marketplace itself is actually saying. Scientific conclusions about persistence of contaminants do not necessarily correlate with the marketplace’s conclusion about the duration of economic impact on real estate.⁸ Accordingly, one must ask, “Can the ultimate reliability of the valuer’s results be demonstrated and supported by credible market evidence?”⁹

(a) Assessment Costs

Prior to any valuation, a qualified engineer must characterize the extent of any contamination. The types of contaminants, along with the level of contamination, should be known. Most, if not all, properties have trace or detectable levels of background contamination. This is virtually irrelevant. The relevant question is whether or not the level of contamination meets an “actionable level” of the U.S. Environmental Protection Agency (EPA) or other governmental agency. The reasonable costs for performing an assessment to determine the level of contamination, called a Phase II assessment, would be considered within this quadrant of the DC Matrix.

⁷ 2003 Uniform Standards of Professional Appraisal Practice, Advisory Opinion 9.

⁸ Richard J. Roddewig, “Temporary Stigma: Lessons from the Exxon Valdez Litigation,” *The Appraisal Journal* (January 1997): 100.

⁹ John D. Dorchester, Jr., “The Federal Rules of Evidence and *Daubert*: Evaluating Real Property Valuation Witnesses,” *The Appraisal Journal* (July 2000): 306.

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(b) Assessment Use

Some types of contaminants can cause a disruption to property use and others do not. For example, if chlorinated solvents are found in the soils of an industrial park, and drinking water aquifers are not impacted, then the typical use of the property may continue undisrupted. On the other hand, if the assessment process disrupts the use of the property, or if engineers or health officials believe that there may be an exposure risk until the site is characterized, there may be a disruption of use. For owner-occupied properties, such losses often are computed as the cost of leasing substitute facilities while the assessment is conducted. For investment properties, the loss of income often is the best way to measure the impact on use.

One of the basic facts relating to contamination and liability under the law is whether a property is a source of a release that poses a risk, merely a non-source or adjacent property onto which the contamination has migrated, or merely proximate to the contamination.¹⁰ As such, a critical factor within this quadrant of the DC Matrix is called “SNAP.”

Specifically, SNAP means determining if the property is a “source property” (the property from which the contamination was emitted), “non-source” (a property that was contaminated by the adjoining property owner), “adjacent” (a property that is not contaminated, but that shares a property boundary with one that is), or “proximal” (a property that is not contaminated, is not adjacent to one that is, but is located in the same general area as a contaminated property). This distinction is essential, as there are varying costs, liabilities, and risks depending on the category into which the subject property falls. Generally, a source property has more potential for risk than an adjacent property.

Stigma claims can arise when a property is located near contaminated property and has suffered an alleged diminution in value because of its proximity to the contamination. Generally, when a plaintiff brings a marketplace stigma claim, there is no direct physical impact on the plaintiff’s property (adjacent or proximal) and no substantial interference with the plaintiff’s use of the property. Therefore, in seeking to recover damages, the plaintiff’s intention is to be compensated economically for the diminution in property value and not for any physical harm or invasion onto the land.¹¹

¹⁰ Bell, 128-129.

¹¹ See generally Anthony Vale and Joanna Cline, *Stigma and Property Contamination—Damnum Absque Injuria*, 33 Tort & Ins. L. J. (Spring 1998) and E. Jean Johnson, *Environmental*

(c) Assessment Risk

Stigma, which is better termed risk, reflects any discounts by the marketplace as a result of the detrimental condition. Diminution in value tends to be greatest immediately after the loss or damage is identified, before the nature and extent of the difficulty is fully known.¹²

There are different types of risk depending on the stage within the overall lifecycle of the detrimental condition. The risk before remediation can be significantly different from the risk during remediation and any risk remaining after remediation, and current valuation methodologies take this into account.

Prior to the characterization of a site, there can be tremendous uncertainty regarding type or levels of contamination. Often, uncharacterized properties do not sell until a Phase II site assessment has been completed. It is conceivable that a property can sell in a contaminated but uncharacterized condition, and any discount to the property would be termed an uncertainty factor. However, once characterized, this type of risk becomes moot.

(d) Remediation Costs

Of all the quadrants of the DC Matrix, remediation costs often are the most obvious. Environmental engineers generally provide these costs, often in the form of a competitive bid. Like any situation involving contractors, there can be a variance in cleanup costs between different firms, and some proposals may be more competitive or comprehensive than others.

Defining the responsibility for cleanup costs also is considered in this category. For example, if a military base emits a large hydrocarbon plume that spreads throughout the neighborhood and underneath a residential neighborhood, one would not deduct the cleanup costs from the value of the house, because the responsibility for the cleanup belongs to the military base, and not to the homeowner.

(e) Remediation Use

There is a wide array of remediation measures. Some methods are nonintrusive and others require vacating and partial site excavation. Accordingly, if a service station has a nonintrusive vapor extraction unit installed that allows the business to continue uninterrupted, there may be no deductions for loss of use. On the other hand, if the business is shut down

Stigma Damages: Speculative Damages in Environmental Tort Cases, 15 UCLA J. Envtl L. & Pol’y 185 (1996-1997).

¹² Michael V. Sanders, “Post-Repair Diminution in Value from Geotechnical Problems,” *The Appraisal Journal* (January 1996): 63.

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or moved, and the site is excavated, there may be substantial impact associated with the loss of use. This often is computed by measuring the lost income, or if moving is a possibility, determining the costs of leasing alternative facilities until the remediation is completed.

(f) Remediation Risks

If a contaminated property sells in a characterized, but unremediated condition, then the market may require a discount for the nuisance of managing the clean up. This type of "risk" is called "project incentive." Nonetheless, this is far from being an "automatic" deduction, and there are numerous instances where no such discount is applicable in the sale of contaminated property.

There can be a concern, or risk, that the remediation costs may escalate beyond those that were originally estimated. In these situations, insurance controls, called "cost cap" insurance, may be purchased that insure against this concern. Furthermore, indemnification from a responsible party can reduce or eliminate this type of risk.

(g) Ongoing Costs

With environmental properties, there can be ongoing costs and expenses, even after the remediation is completed. Typically, these would include ongoing monitoring programs. This cost is computed by projecting forward these costs with inflation, and then discounting the expense flow to a lump sum figure.

(h) Ongoing Use Impacts

After remediation, there can be ongoing impacts to the use of the property. These could include ongoing monitoring or institutional controls, such as deed restrictions, that restrict the future uses of the property.

If the property is restricted from a use that would not have been contemplated anyway, such as a child-care facility in an industrial area, such restrictions may have little or no detrimental impact. However, if the restriction has a material impact on the use or redevelopment uses of the property, this could cause a diminution in value.

(i) Ongoing Risk

When the term "stigma" is utilized, it is most often in the context of an ongoing risk. Although the term "stigma" still is used, there has been a trend in the real estate community to refer to this risk factor as "market resistance." *Webster's New World Dictionary* (3rd ed. 1988) defines stigma as "something that detracts from the character or reputation of a group, person, etc.; mark of disgrace or reproach . . . a mark,

sign, etc. indicating that something is not considered normal or standard."

Calculating property damages traditionally depends on whether the injury is permanent or temporary and curable. When injury to the property is permanent the appropriate measure is the diminution in property value, which is determined by the difference in the fair market value of the premises before and after the injury.¹³ If the injury is temporary and "reasonably curable by repairs," the measure of recovery may be any depreciated rental or use value or repair costs if they are less than the diminished market value.¹⁴

Awarding marketplace or proximity stigma damages is not well-settled law. Federal and state courts are split on the issue.¹⁵ Generally, courts are less likely to allow claims for marketplace stigma than for stigma claims based on damages to property that is or was actually contaminated.

*Bixby Ranch v. Spectrol Electronics Corp.*¹⁶ was the first case to award permanent post-cleanup stigma damages. In *Bixby*, the claim for stigma damages was based on the theory that even though the defendant agreed to clean up the property to current government standards, it was possible that remediation standards would change in the future, which could require additional remediation. Using the sales comparison approach, comparing the site with pristine sites, the experts stated even after the cleanup, the property would be devalued. The jury agreed, and awarded \$826,500 in permanent post-cleanup stigma damages. Since the *Bixby* case, many other courts have ruled on post-cleanup stigma damages.¹⁷

¹³ Keeton at § 89, 637-640.

¹⁴ *Id.*

¹⁵ See *Desario v. Industrial Excess Landfill Inc.*, 68 Ohio App. 3d 117, 587 N.E.2d 454 (Ohio Ct. App. 1991) (physical intrusion is not needed for a proximity stigma damage claim); See also *Allen v. Uni-First Corp.*, 151 Vt. 229, 558 A.2d 961 (1988) (claims for property devaluation, lacking evidence of actual physical harm to a particular property, can be supported by showing contamination's widespread impact on the neighborhood); *Adkins v. Thomas Solvent Co.*, 440 Mich. 293, 487 N.W.2d 715 (Mich. 1992) (See discussion *infra.*) But see *Berry v. Armstrong Rubber Co.*, 989 F.2d 822 (5th Cir. 1993), *cert. denied*, 510 U.S. 117, 114 S.Ct. 1067 (1994) (market value loss due to stigma is not actionable absent actual or threatened physical property damage); *Adams v. Star Enterprise*, 51 F.3d 417 (4th Cir. 1995) (recovery not allowed for property diminution resulting from negative public perception); *Wilson v. Amoco Corp.*, 33 F. Supp. 2d 969, 980 (D. Wyo. 1998) (plaintiff may not recover damages based solely on stigma absent proof of some physical injury or harm to the specific plaintiff's property, plaintiff must establish a nuisance, trespass, or negligence claim independently), and 33 F. Supp. 2d 981, 986 (D. Wyo. 1998) (related case).

¹⁶ No. BCO2556 slip op. (Cal. Super. Ct. 1993).

¹⁷ See *In re Paoli Railroad Yard PCB Litigation*, 35 F.3d 717

Ultimately, when stigma or risk is evaluated, any mitigation strategies should be considered, including insurance policies or indemnifications that may offset or eliminate any such risks altogether.

111.1504 Environmental Valuation Methodologies

The DC Matrix outlines the issues that must be considered with every assignment involving contamination or other real estate damage issue. The valuation methodologies applied must address these issues.

A market does exist for purchasing damaged real estate. Properties with minor damage or where the damage has been repaired may sell for full value or there may be a diminution in value, depending upon the market data. The Uniform Standards of Professional Appraisal Practice specifically mandates that any deduction from the unimpaired value for environmental issues must be supported by market data. In other words, an appraiser or economist may not just state a figure that is based solely upon their experience. In the context of the environmental issues that must be addressed within the DC Matrix, there is a clear contrast between a standard appraisal, which hypothetically dismisses any environmental issues, and an environmental valuation, which does address the realities of the environmental conditions of the property (see Environmental Economics exhibit at EDDG 111:1510).

(a) DC Cost Approach

With contaminated properties, this approach can be utilized by deducting the “costs” that are related to the contamination issues from the unimpaired value.¹⁸

(3d Cir. 1994) (plaintiff can recover damages for diminution of property value caused by market stigma from fear of physical danger, without any actual harm, under a permanent nuisance theory if the plaintiff can show that the property cannot be restored to its original market value). *See also Scribner v. Summers*, 138 F.3d 471 (2nd Cir. 1998) (owners of contaminated land may be entitled to stigma damages for injury to their land remaining even after remediation efforts are complete); *Bradley v. Armstrong Rubber Co.*, 130 F.3d 168 (5th Cir. 1997) (Mississippi would permit recovery of stigma damages in a toxic contamination case if the property cannot be restored to its pre-contamination condition); *Nashua v. Norton*, 1997 WL 204904 (W.D.N.Y. 1997) (Damages for a public nuisance action are not limited to response costs, but also may include stigma damages if the plaintiff's property cannot be restored to its pre-contamination value); *Santa Fe Partnership v. ARCO Products Co.*, 46 Cal. App. 4th 967, 54 Cal. Rptr. 2d 214 (1996) (Post-remediation stigma damages for chemical pollution are unavailable under continuing nuisance or trespass theories, but can be recovered where the nuisance is permanent or unabatable).

Unimpaired Value	\$1,000,000
Less:	
Assessment: Costs, Use, and Risks	30,000
Repair: Costs, Use and Risks	50,000
Ongoing: Costs, Use, and Risks	<u>20,000</u>
Value, As Is	\$ 900,000

(b) DC Income Approach

Essentially, with income-producing contaminated properties, the objective is to examine the income and expenses to determine if the situation has any impact on the income, expenses, or the capitalization rate. When the approach is applicable, there are various factors that should be considered, including lost rents; increased vacancy; projected costs and time of the cleanup; any indemnity, mortgage and equity yield rates; and financing costs.

When utilizing this approach, there are two key questions that should be asked. First, has the net operating income been impacted by the contamination, i.e., lower rents, higher vacancy, one time expenses, higher ongoing expenses, and so forth? Second, has the capitalization rate been impacted as a result of the contamination? Because the capitalization rate is actually a weighted blend of both lenders' and investors' interests, this issue can be addressed by interviewing both lenders and investors to determine how each have reacted in situations involving loans or purchases of similarly contaminated properties.

For example, if the income remains the same, but the capitalization rate has been affected by the contamination, then the value would be impacted, as demonstrated below:

The capitalization rate, which in this example is 9 percent, is actually a weighted blend of the equity rate (the return required by investors) and the mortgage constant (the rate required by a lender). The proportion is a relationship of equity and debt.

Equity: 25%	X .12 (Equity Rate)	=	.0300
Debt: 75%	X .08 (Mortgage Constant)	=	.0600
Indicated Capitalization Rate		=	.0900
		=	9.0%

¹⁸ It should be noted that the Cost Approach for contaminated property, like conventional appraisals, has a more limited role in actual valuation assignments. Furthermore, elements of the Sales Comparison Approach or the Income Approach are utilized in some of the calculations of the Cost Approach.

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Accordingly, if the property has \$180,000 of net operating income, the indicated value as if unimpaired would be as follows:

Net Operating Income: $\$180,000/9\% = \$2,000,000$

If the market does not alter any component of the capitalization rate, such as the equity rate or the loan constant or the loan-to-ratio value, then there would be no diminution in value.

However, if lenders now require a 50 percent down payment, for example, rather than the conventional 25 percent, the capitalization rate would be impacted, and accordingly, so would the value.

Equity: 50%	X .12 (Equity Rate)	=	.0600
Debt: 50%	X .08 (Mortgage Constant)	=	.0400
Indicated Capitalization rate		=	.1000
		=	10%

Accordingly, if the property has \$180,000 of net operating income, the indicated value, as if impacted by the environmental issues, would be as follows:

Net Operating Income: $\$180,000/.10\% = \$1,800,000$

In this example there would be a \$200,000 diminution in value (\$2 million less \$1.8 million) from the risks associated with the environmental contamination.

(c) DC Sales Comparison Approach

When applicable, this approach often is employed by cross-referencing contaminated properties, obtained from governmental agency databases, with public records that indicate whether or not the property has sold. If so, then additional information can be gathered, such as the types and levels of contaminants, if it sold cleaned or dirty, if there were any discounts to the sales price as a result of the contamination, and so forth.

Unimpaired Value			
(From Comparable Sales of Uncontaminated Property)			\$1,000,000
Less:			
Remediation Costs (Verified with Party to Sale)			200,000
Sale Price, Contaminated (Actual Sales Price)			<u>700,000</u>
Project Incentive (To Be Solved)		\$	100,000
Project Incentive ¹⁹ (\$100,000/\$1,000,000)			10%

On the other hand, the market data could reflect that there is no risk or project incentive:

¹⁹ This risk could also include "market resistance," depending on the stage in which the property sold.

Unimpaired Value

(From Comparable Sales of Uncontaminated Property) \$1,000,000

Less:

Remediation Costs (Verified with Party to Sale)	200,000
Sale Price, Contaminated (Actual Sales Price)	<u>800,000</u>
Project Incentive (To Be Solved)	\$ 0
Project Incentive ²⁰	None

Like a conventional sales comparison approach, adjustments can be made for differences between the contaminated property's characteristics and those of the subject property.²¹ If, for example, several similarly contaminated properties were found that sold in a post-remediated condition for full value, then that market data would indicate that there would be no ongoing risk, or market resistance, in the case involving the subject property.

With any situation involving the diminution of value of real estate, there must be a methodology to measure any impacts when no case studies or market transaction data are available. One such accepted methodology is the "Survey Approach" whereby real estate professionals or others are formally surveyed in an effort to determine the most likely response from the marketplace. This approach has been published in the *Appraisal Journal* and the *Real Estate Damages* textbook.

Any survey should be in a written format and designed to outline the key facts in a fair and impartial way, and address the cost, use, and risk elements of the Detrimental Conditions matrix. There are various types of surveys, and for a statistical survey the "Law of Large Numbers" rule essentially states that if a homogeneous population of 30 or more is surveyed, then the survey is considered statistically valid from a population standpoint. On the other hand, an opinion survey of lenders or market participants may have less than this, and while not being a statistical survey, still may be valid.

111.1505 Conclusion

The diminution of property value caused by environmental contamination goes far beyond the conventional appraisal process. Ultimately, the value of contaminated properties is an empirical question that requires the application of one or more of the three traditional approaches to value that have been re-

²⁰ Ibid.

²¹ Thomas Jackson and Randall Bell, "The Analysis of Environmental Case Studies," *Appraisal Journal* (January 2001): 87

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fined to address the unique aspects of damaged properties. Market data is required in supporting any diminution in value conclusion. These methodologies, coupled with more sensible government agency regu-

lations, improved assessment and remediation engineering, insurance products, and other industry improvements, can result in a sensible and reliable estimate of value.

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ENVIRONMENTAL ECONOMICS

Appraisals vs. Environmental Valuation

	APPRAISAL	ENVIRONMENTAL VALUATION
Conforms to the Uniform Standards of Professional Appraisal Practice (USPAP)	Yes	Yes A standard appraisal is a "starting point" for an environmental valuation
Environmental Condition Considered	No Generally all environmental issues are "assumed away"	Yes The actual condition of the property is analyzed
Comparable Market Data Required	Yes Typically obtainable from commercial data sources, such as COMPS.com, LoopNet, CoStar, MLS, etc.	Yes All opinions must be based upon case studies. Typically commercial data sources not available. Requires cross-reference of agency databases with public records, plus verification with key market participants. Dozens of "leads" may yield only one valid case study
Environmental Agency Research Required	No	Yes Extensive environmental agency research. For each comparable, a file (typically from 1 to 12 boxes) is reviewed. Often also involves a EDR or FirstSearch report.
Remediation Costs Analyzed	No	Yes Engineers are consulted in determining the most cost-effective remediation strategies
Impact on Use Analyzed	No	Yes All impacts on use are considered, including loss of use during assessment or remediation, and on-going impacts, such as deed restrictions
Environmental Risks Analyzed	No	Yes All environmental risks are studied, such as project incentive (entrepreneurial profit) or market resistance (stigma) and must be supported by actual market case studies or data
Mitigation or "Offsets" Considered	No	Yes Offsets, responsible parties and credit worthiness, and insurance or legal claims can be analyzed to derive a "net" impact on the property's value
"As Is" Valuation Conclusion	No Hypothetical (pretend) value that may or may not reconcile with the actual value	Yes The valuation is inclusive of the actual environmental conditions

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