

ENVIRONMENTALLY IMPAIRED VALUATION: A TEAM APPROACH TO A BALANCE SHEET PRESENTATION

By Albert R. Wilson

The development of a value opinion for a property with environmental problems is a highly complex process. The legal issues and the complexity of the technological tasks that must be addressed are formidable and, currently, poorly defined. In an effort to cut through the complications and provide a clear outline of how an environmentally impaired value may be arrived at, this paper considers a different point of view. Specifically, a balance sheet—essentially equivalent to a traditional financial balance sheet—will be developed by a coordinated team of experts in order to provide a more familiar and straightforward presentation of the process and issues involved.

Over the past decade, the valuation and evaluation of property, real or personal, have become more and more involved with environmental issues. Increasingly the appraiser is asked to render value opinions involving technical areas that are often beyond the scope of the appraiser's expertise or experience and within time frames that are unrealistic given the actual situation. Authorities such as Peter Patchin, MAI, Maxwell Ramsland, MAI, Robert Foreman, MAI, Dr. William Kinnard, Jr., MAI, SRA, and others have often noted these problems and the highly specialized nature of the skills and information required to provide an "environmentally encumbered" or "environmentally impaired" value opinion. The Appraisal Institute has taken note of this situation in Guide Note 8 to its Standards of Professional Appraisal Practice and advised caution and the use of expert opinions in appraisals that may or do involve environmental hazards. All of these admonitions are worthwhile and interesting, but the real question is: Given an environmental impairment, how may the value opinion be developed?

Based on the collective experience of a large and highly diverse group of specialists in the field, Environmental Analysis & Valuation (EAV) has developed a specific and highly structured approach. The key points of the approach are the subject of this paper. This approach is generic as to the type of property; that is, it is applicable to the valuation of any real property or business enterprise. However, a number of background issues and language matters must be discussed first, along with several major theoretical issues that will eventually require answers.

BACKGROUND

First, under the federal Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also called Superfund) and state Superfund laws, the financial impact of environmental impairments is directly assigned to the "owner, operator, or transporter" of the substances involved and, further, any such liabilities are "strict, joint, and several."

Second, each environmental problem is as unique as a fingerprint. Based on our collective experience, the use of comparables in the analysis of a specific situation is highly limited; each situation must be examined on its own terms. The sales comparison approach is useful in establishing the unimpaired value provided that certain cautions are observed, but it has very limited applicability in establishing adjustments to arrive at an environmentally impaired value, as will be shown. Particularly, the appraiser must avoid the use of percentage adjustment factors in establishing the impaired value because such factors cannot generally account for a number of specific circumstances and therefore can result in highly misleading value indications. This fact introduces the need for a multidisciplinary valuation team to determine the impaired value.

Third, the appraiser should be specifically aware that "comparables" may no longer be "comparable" for environmental reasons. For example, in the Denver area properties in the immediate vicinity of the Rocky Mountain Arsenal are being purchased at above-market prices with part of the incremental price being paid to settle legal issues between the purchaser and the seller. In other toxic waste sites in Denver, properties are transferring at what appear to be below-market prices, even though nearly identical environmental problems exist.

This problem of comparable values that are *not* comparable is often difficult to identify. Among the difficulties is the fact that the real reasons for discounting or increasing a property's value are not necessarily recorded and may possibly be the subject of specific nondisclosure agreements between the parties. The efforts of competing forces may result in a hidden discount and an offsetting hidden inflator, giving a surface appearance of unaffected market value.

Fourth, impaired value opinions often must consider additional issues such as the problem of "negative leverage." Negative leverage is a phrase coined to clearly distinguish the nontraditional relationship between the value of an asset and the magnitude of an environmental liability that may be associated with it. Specifically, there is no relationship. An asset valued at \$10,000 may have an environmental liability associated with it from the owner's point of view in excess of several millions of dollars.

Frankly, there is not yet a consensus on how to account for environmental liabilities as they pertain to property value. One of the open questions in this area is: May real property have a negative value? Traditional appraisal theory would argue that the lowest real property value attainable is zero; but if a liability is attached to the property in excess of its unimpaired value, how is the balance accounted for? With respect to the Superfund laws, it is clear that environmental liability is a condition of ownership, and the owner's balance sheet would have to reflect the liability. But is this a part of the "bundle of rights" associated with the real property or something else?

The Superfund Amendments and Reauthorization Act of 1986 (SARA) clearly states that a purchaser of a property may be held to be an innocent purchaser and not liable for Superfund costs provided that after the exercise of "all appropriate inquiry" the purchaser would have had no reason to know of, nor any connection with, the deposition of the hazardous materials. The corollary to this statement is that if the purchaser had knowledge of the condition, the purchaser cannot be "innocent" and will therefore acquire not only ownership interest in the property but "strict, joint, and several" interest in the liability.

In the "innocent landowner" concept is a subtle trap. Specifically, suppose that the purchaser was truly "innocent," what is the property's value? If the magnitude of the liability exceeds the unimpaired value of the property, the answer may be zero because the property cannot be marketed. No succeeding owner is likely to be willing to acquire the property because the succeeding owner would not be "innocent," since disclosure on sale requirements would have provided the succeeding owner with knowledge. However, if the environmental problem threatens neighboring property, human health, or the environment, the current owner may have to remediate the problem to prevent increasing liability even though the owner is "innocent." In consequence, the property may have a negative value from the point of view of the owner without Superfund liability.

A fifth issue is how a property may develop environmental liability. Three major conditions exist in this process:

- 1) *Acquisition of liability through self-contamination.* A property may be contaminated through some process specific to the property such as the dumping of wastes produced by the property owner or the construction of a building with asbestos-containing materials (ACMs).

- 2) *Acquisition of liability through contamination of others.* A property may contaminate not only itself but its neighbors, and the owner of the originating property thereby becomes liable for the damages done to others. This is a major source of "negative leverage."
- 3) *Acquisition of liability through contamination by others.* A property may not have been contaminated through any action of its owners or tenants but is contaminated by an unrelated third party. This is the major idea behind the "innocent landowner" concept.

Sixth is the question of what constitutes an environmental liability. Thus far I have implied that hazardous substances are the environmental risks of concern, but the Superfund laws do not stop there. CERCLA and SARA define environmental liabilities in terms of both human and sensitive environment targets. Sensitive environment targets include such things as endangered flora and fauna, historically or culturally important sites, and wetlands.

Seventh, environmental risk offsets are universal and essentially unending. The Occupational Safety and Health Act Hazard Communications Rule requires that virtually every commercial or industrial property must have at least a formal written and active environmental risk management program, and the cost of this program will affect operating costs. The deposition of a hazardous waste 150 years ago may obligate the current owner under Superfund, hence the argument that liabilities are perpetual and unending.

AN IMPORTANT ISSUE OF LANGUAGE

We are beginning to experience language problems in the environmental valuation field. In particular, several words and phrases have been troubling:

- 1) Encumbered/unencumbered versus impaired/unimpaired
- 2) Cost to cure versus cost to control
- 3) Stigma, or negative intangible impact

Encumbered/Unencumbered versus Impaired/Unimpaired

The use of the word "encumbered" to imply that a piece of property has some sort of offset to value as a result of environmental problems is easily confused with other encumbrances having a more traditional valuation meaning, such as easement or right-of-way encumbrances. To improve clarity in the reporting of environmental impacts on value, I am going to use the terms "impaired" and "unimpaired" subject to the following definitions and with the following usage.

Unimpaired value—The unimpaired value of the subject property will be the value as if there were no environmental offsets associated with the subject as established by the three classic approaches to value (cost, sales comparison or market value, and income approaches). Great care must be taken in establishing the unimpaired value opinion when using the sales comparison or income approaches due to hidden environmental impairment offsets in the data.

Impaired value—The impaired value of the subject property is established through the following formula:

$$\text{Impaired Value} = \text{Unimpaired Value} - \text{Stigma Offset} - \text{Cost to Control}$$

The implication of this formula is that the impaired value opinion cannot be established through use of the sales comparison approach, and this is in fact what we are beginning to realize through increased research in the area. Only in certain exceptional situations—primarily those involving area evaluations—can the sales comparison approach yield the data necessary to evaluate the impact of environmental impairments and then only those of an area-wide nature, not property-specific impairments.

Peter J. Patchin, MAI, has pointed out that the reason for this is that property-specific impairments are as unique as fingerprints and the comparison of contaminated property sales is essentially comparing apples and oranges. Not only do the differences between the specific engineering and health risk assessment facts of the environmental situation result in significant comparison problems, but differences in stigma reactions between the marketplaces of the comparables may further complicate the issue.

Cost to Cure versus Cost to Control

There have been many cases where the phrase "cost to cure" has been used when discussing environmental impairments. The problem is uncertainty. In only very rare circumstances can a final cure be developed for environmental problems. One of the few instances of a cure being possible is ACMs in a building, although even then a complete cure may not always be possible. Usually, and this is one of the major bases for the stigma effect, a complete cure is simply not technologically, legally, or financially possible (or, for that matter, necessarily desirable), particularly in cases of soil and groundwater contamination. The point is, cost to cure is often misleading because no cure has been effected. The terms "remediation" and "remediate" refer generally to the control *or* cure of an environmental problem.

Stigma, or Negative Intangible Impact

Stigma may be viewed as the marketplace's reaction to the perception of a problem that will impact value. There should be no attempt to assume that stigma will be rational or irrational, and such a distinction would not be appropriate because value is not dependent on whether the marketplace is rational or irrational. For the purposes of this paper, stigma may be defined as being composed of objective and subjective uncertainty.

Objective Uncertainty. Although it may seem a contradiction in terms, a part of the stigma impact is a result of an objective and realistic reaction to uncertainty. To this point experience indicates that the primary basis for this component of stigma relates to uncertainty in the estimates of the total cost to deal with an environmental impairment. To some extent the impact of this component can be measured through a sensitivity analysis of the estimates to changes in the various underlying assumptions, such as the estimated amount of materials involved, the estimated cost of disposal or of control-system operating costs, the estimated health risk impact, the possibility of changes in the regulatory standards governing the control of the risk, and the like.

Subjective Uncertainty. This component can only be estimated by individuals experienced in the marketplace and deals directly with the nature of the marketplace's reaction to the presence of an environmental risk. To some extent, statistical analysis of prior sales of impaired property may be a guide to the range of the subjective uncertainty component, but at best such statistics will be only a very general guide and the judgment of the experienced appraiser will be the primary method of evaluation. The appraiser must keep in mind that the rationality, or lack thereof, of the marketplace with respect to the problem is not important; only the sum total likely impact is of concern. Experience indicates that the following factors should be considered here.

- 1) The strength of the market for the subject property will affect the subjective uncertainty component. Generally the stronger the market, the weaker the impact.
- 2) The degree to which the market is familiar with the risk. The greater the degree of familiarity, generally the less the subjective uncertainty impact.
- 3) The availability, cost, and terms of debt and equity financing given the presence of a risk. (See Unimpaired Financing Analysis below for further discussion.) This factor is partially subjective and partially objective in nature.

Unimpaired Financing Analysis

Similar to the unimpaired value opinion, an unimpaired financing analysis will examine the costs and terms of debt and equity financing for the subject property as if no environmental impairment existed. The basis for this examination, which is normally a discrete but less formal part of an appraisal opinion, should be an objective set of credit risk analysis standards and industry ratios applicable to the subject property. The results of this analysis should be the debt/equity ratios, debt and equity financing terms and conditions, and the rates for debt and equity financing in the current local marketplace for the subject property.

An analysis of the differences between the unimpaired financing analysis data and applicable and relevant impaired financing analysis data for the property as affected by contamination will provide significant information for the analysis of part of the impact of stigma on value. This analysis will tend to quantify at least one major component that may influence the uncertainty associated with stigma. The development of the unimpaired financing analysis will be especially important in the assignment of damages, providing an objective assessment of what the cost of financing for the subject property should have been if there were no environmental problems, and against which actual financing proposals can then be compared to determine differences that may be attributable to the impairment.

A VALUATION DISCUSSION PROBLEM

Here is a problem that deserves discussion, but for which I can offer no resolution. Which should occur first, a deduction from the unimpaired value opinion for an easement restriction followed by deductions for environmental impairments, or the deduction of the environmental impairments followed by the deduction for the easement restriction? To see the importance of the question, consider the following information.

An easement exists that restricts part of the subject property to use only as green space or parking lots. The appraiser believes that this easement reduces the value of the property by 60%. Which of the following two methods of calculating the value is most supportable?

Method 1

Unimpaired, Unencumbered Value Opinion	\$12.00
Easement Restriction (60%)	7.20
Unimpaired, Encumbered Value Opinion	\$4.80
Environmental Impairment (Stigma Only)	1.20
Impaired, Encumbered Value Opinion	\$3.60

Method 2

Unimpaired, Unencumbered Value Opinion	\$12.00
Environmental Impairment (Stigma Only)	1.20
Impaired, Unencumbered Value Opinion	\$9.80
Easement Restriction (60%)	5.88
Impaired, Encumbered Value Opinion	\$3.92

In this case the difference in the final value is only 9%, but if the environmental impairment deduction is greater, the difference becomes greater.

THE ENVIRONMENTAL BALANCE SHEET

Assume that a property—whether real or personal—has only environmentally related impairments. An outline balance sheet would then have the following major sections.

- 1) The asset entry will be the value of the property as if it had no impairments. This shall be termed the "unimpaired value opinion" of the asset.
- 2) The liability entry will be the environmental offsets to value. In general, these are divided as follows:
 - a) The cost to determine if a problem is likely to be present. This is the cost for conducting a Phase I Environmental Risk Assessment.
 - b) The cost to quantify the magnitude of the problem from an engineering viewpoint and to develop a set of alternative courses of action from which the owner will choose a remediation strategy. These are generally the costs of Phase II and III Environmental Risk Assessments, which can run into the hundreds of thousands of dollars and take many months to complete.
 - c) Once a management plan of action—a remediation strategy—has been selected, the estimated costs for at least four major incremental budgets and the present value of these budgets. These items are, to one extent or another, always going to be present with respect to virtually any property. The four budgets are: operations and maintenance; training and notification; planned response actions; and emergency response actions (in lieu of insurance coverage, which is generally unavailable).
 - d) An estimate of the liability imposed on the owner as a result of prior actions, such as Superfund liabilities.
 - e) An estimate of the offset to value resulting from stigma offsets, which are very hard to quantify in many cases. However, various techniques for developing estimates are available and are reasonably reliable.

The total of all of these items will be referred to as the "total environmental liabilities." Note again that there is absolutely no reason to expect that the total environmental liabilities will have any direct relationship to the value of the asset. The total may range from a minor fraction of the asset value to many multiples of the asset value.

- 3) The net worth is represented by the owner's impaired position. Because of the generally accepted idea that real property in particular cannot have a value of less than zero, this entry must be constructed with some care in order to have the balance sheet balance. In particular, the entry must be divided into two components: a component applicable to the real property that cannot be less than zero and a residual component applicable to the owner that cannot be greater than zero and that accounts for any diminution in excess of the unimpaired value for real property resulting from the total environmental liabilities.
- 4) The final major entry is simply the balancing line that checks to determine that the sum of the total environmental liabilities plus the owner's impaired position is equal to the unimpaired value.

THE DEVELOPMENT OF THE ENVIRONMENTAL BALANCE SHEET

In general, no one professional discipline will cover all of the topics required in the development of the valuation opinion involving environmental risks. Integral to value opinion development will

EXHIBIT 1

IMPAIRED VALUE OPINION BALANCE SHEET			
UNIMPAIRED VALUE OPINION			\$
ENVIRONMENTAL LIABILITIES:			
Cost to Determine Suspect Impairments		\$	
Cost to Identify Magnitude of Impairments and Course of Action		\$	
Present Value of Action Plan Components:			
Operations and Maintenance Programs	\$		
Planned Response Actions	\$		
Notification, Training, and Recordkeeping	\$		
Emergency Response Actions	\$		
SUBTOTAL—Present Value of Action Plan		\$	
Estimated Additional CERCLA/SARA Liabilities		\$	
Estimated Negative Intangible (Stigma) Impact		\$	
TOTAL ENVIRONMENTAL LIABILITIES			\$
OWNER'S IMPAIRED POSITION:			
Impaired Property Value Opinion*		\$	
Owner's Equity**		\$	
TOTAL OWNER'S IMPAIRED POSITION			\$
TOTAL OWNER'S IMPAIRED POSITION AND ENVIRONMENTAL LIABILITIES			\$

* The *GREATER* of: zero or unimpaired value *less* environmental liabilities.

** The *LESSER* of: zero or unimpaired value *less* environmental liabilities.

be a valuation team including experts in disciplines such as appraisal, finance, accounting, engineering, hydrogeology, industrial hygiene, and the like. Each member of the team will make important and necessary contributions.

The detailed development of the Environmental Balance Sheet, outlined in the figure on the next page, involves a series of specific tasks.

Task 1

The development of the unimpaired value opinion. This task has become considerably more difficult given the presence or possible presence of environmental issues. Although the classic three approaches to value opinion development—cost, income, and sales comparison—are still valid and applicable, extra caution must be observed in practice. The objective is to determine the value of the property as if there were no environmentally related offsets. The product of this task would be a standard appraisal opinion of the unimpaired value of the subject real property or business enterprise.

Task 2

This task must take place simultaneously with Task 1 and constitutes a comprehensive Phase I Environmental Risk Assessment. The purpose is to determine if there is any reasonable basis to suspect the presence of environmental risks associated with the property and if such suspicion exists to document it. The reason for simultaneity is simply that environmental offsets to value, especially in comparables, may be hidden and only revealed through the research inherent in this task. This task involves the development of a carefully documented subject and surrounding property history to identify suspected environmental impairments. For the purposes of this and subsequent analysis steps, the surrounding property must be carefully defined to include all of the area that may be within reasonable reach of environmental transport mechanisms. The legally identified transport mechanisms are: 1) air (e.g., regional air quality control districts); 2) surface water; 3) groundwater; 4) fire or explosion; and 5) direct contact.¹ This task and all subsequent work is conducted under the "negative default" concept fundamental to environmental liability identification and analysis.² The products of this task are:

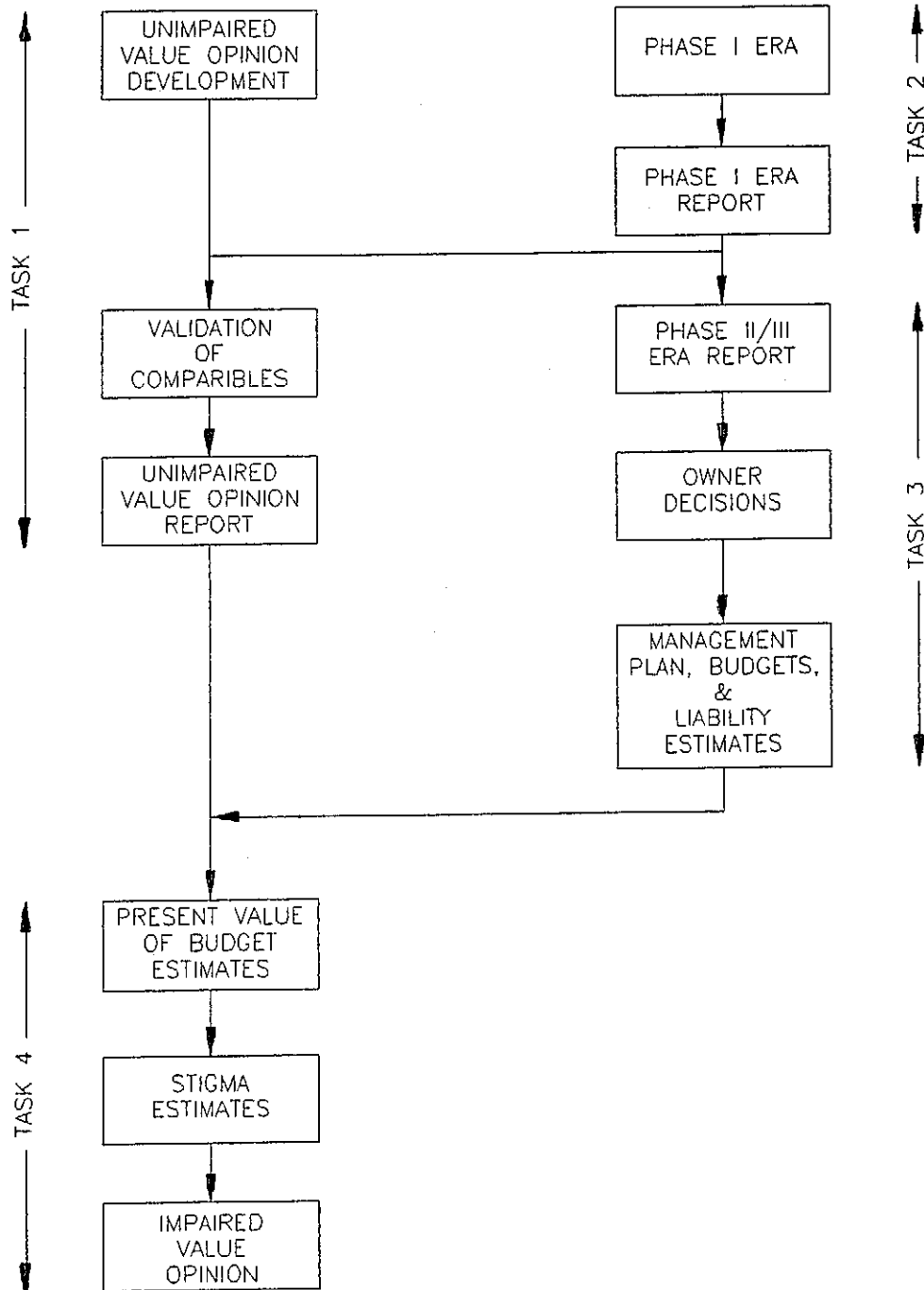
- a) The identification of transport mechanisms and conditions that determine the current and future distribution pattern of environmental risks to, from, or on the subject property.
- b) The identification of the types, quantities, and possible locations of suspect environmental risks that may have been deposited on the subject property from surrounding properties.
- c) The identification of the types, quantities, and possible locations of suspect environmental risks that may have been deposited on surrounding properties from the subject property.
- d) The identification of suspect environmental risks on the subject property itself.
- e) Preliminary analysis of the restrictions on the highest and best use of the subject property deriving from environmental risks.

Task 2 Costs: Minimum of \$4,000 to \$5,000, and ranging upward to \$50,000. The cost of a Phase I Assessment has almost no relationship to the value of the subject property. It is primarily dependent on the local land use history. Factors such as the time span of development history, the types of development (industrial, residential, agricultural), and the intensity of development are

1. 40 CFR 300 Appendix A.

2. "Negative default" is the underlying concept of all federal laws, rules, and regulations concerning the environment. In general, it may be thought of as a "guilty until proven innocent" approach.

EXHIBIT 2
TASK AND OPINION DEVELOPMENT RELATIONSHIPS



the primary determinants in the cost of Phase I. This cost appears on the balance sheet as the Cost to Determine Suspect Impairments.

(Note: The American Society for Testing and Materials (ASTM) is currently working on a set of Phase I Audit protocols, which it hopes to publish by Spring 1993. These protocols are a step in the right direction, forming a nationally recognized set of criteria for the performance of a Phase I Audit, but unfortunately the ASTM Phase I is not sufficient for valuation purposes. The ASTM Phase I specifically addresses the single issue of defining "due diligence" under Superfund for purposes of determining "innocent landowner" status. As was pointed out earlier in this paper, "innocent landowner" status may still result in a real property value of less than zero from the point of view of the owner. The ASTM Phase I protocol is not sufficiently comprehensive to deal with this issue and explicitly states that it will not deal with it.)

Task 3

If Task 2 reveals a reasonable basis to suspect the presence of an environmental risk, Task 3 must be conducted to determine the magnitude of the risk and the alternative response actions available to the owner. Note that contrary to the folklore of environmental risks, it is rare that either the laws or prudent environmental risk management will dictate the removal of the source of an environmental risk. Such a course of action is generally the greatest risk and greatest cost alternative and will not eliminate the need for environmental risk management programs and their costs. Without the information developed in Task 3, it is impossible to accurately assign value offsets.

As part of this task, the owner will have to make substantive decisions concerning which of the alternatives will be applied and formulate the budgets necessary to fund the alternatives chosen. Until these budgets have been formulated and their present value impact developed, offsets to value cannot be stated. This task is vital to a complete analysis of both the objective impacts, such as increased operating costs, and stigma impacts.

The first step of Task 3 requires the analytical confirmation of the presence or absence of the suspect environmental risks. Task 2 developed the data on suspected risks and their likely locations and provided significant details concerning the possible existence of such risks enabling the design of a highly efficient physical investigation program. The first step of Task 3 will be to execute the physical sampling and analysis program to develop the necessary engineering data required by the situation.

The second step of Task 3 uses engineering and hazard risk assessment data and a knowledge of the owner's intentions to quantitatively evaluate the impact of those intentions on the risks. Although the term "engineering" has been used, it should not be misconstrued. In this context, engineering includes all facets of environmental risk assessment as well as the more traditional uses of the term.

For example, a major financial impact may result from the presence of an endangered species or other form of "sensitive environment" factor in relation to the owner's intentions. Major projects have been delayed or stopped because of the presence of one of these factors. This will be an issue of considerable importance whenever the requirements of the National Environmental Policy Act or similar constraints are involved.

The risk assessment component of the engineering analysis will usually provide a specific set of constraints on the highest and best use of the property and may provide significant constraints on any intended construction in the form of health and safety or additional engineering design considerations.

The third step of Task 3 involves the development of an environmental risk control/remediation program for the subject property that will meet the dual objectives of minimizing risk to human health and the environment and minimizing the present value of total implementation and risk costs. The costs associated with the implementation of this program provide the basis for the objective value impacts resulting from the presence of the risks and form the basis for an analysis of the stigma impacts on property marketability and mortgagability. This is the key to formal analysis of the impairment's impact on the unimpaired value.

The products of this task are:

- a) A formal environmental engineering report on the subject property.
- b) A formal engineering analysis and a set of alternative remediation actions for the control of the risks on the subject property given the owner's intentions.
- c) A formal management plan outline for implementation of the risk control/remediation program and the implementation and operating cost estimates for the program alternatives.
- d) A formal analysis of the likely sources of subjective impact on value resulting from the presence of controlled and remediated environmental risks and mitigation programs.
- e) An analysis of the likely value impacts resulting from the presence of the controlled/remediated environmental risks on the highest and best use, marketability, and mortgagability of the subject property.

This task constitutes a comprehensive Phase II/III Environmental Risk Assessment and often a formal Remedial Investigation/Feasibility Study (RI/FS) under the National Contingency Plan.

Task 3 Costs: Generally in the neighborhood of \$1 to \$3 per square foot of vacant land. No reasonable estimates are available for the evaluation of ongoing business enterprises or developed properties. These expenses appear on the balance sheet as "Cost to Identify Magnitude of Impairment and Course of Action."

In effect, Tasks 1 through 3 will have developed a set of documents equivalent to financial planning statements, in particular an inventory of environmental risks and a management plan of action for dealing with those risks. It is becoming a more frequent condition of financing that such an inventory and management action plan be developed and implemented, often with auditing requirements as a further condition of financing. Such a program must meet three major sets of constraints: 1) the requirements of the existing or reasonably anticipated laws, rules, and regulations for the protection of human health and the environment; 2) the financial constraints imposed by the owner's reasonable allocation of resources and available technology; and 3) the need to assure the potentially affected public (e.g., unions, employees, tenants, media, etc.) that the risks are, and may be reasonably expected to remain, under positive control.

To develop such a program will require significant levels of interaction among the valuation team, client management, client legal counsel, and possibly other interested groups, but until such a program is finally approved and appropriate budgets for implementation and operation are developed, the objective cost impacts on value cannot be properly analyzed. In addition, significant subjective cost impacts can often be mitigated by the existence of well-defined risk management plans that will tend to reassure the various public groups of the owner's intentions and methods.

Task 4

Task 4 is the process of actually applying the liabilities developed in Task 3 to the unimpaired value to arrive at the owner's impaired position (the impaired value opinion). Provided that the preceding tasks have been accomplished correctly, this task is more in the nature of accounting and summation as opposed to technically detailed or complex work.

The engineering effects of implementing and operating the risk mitigation programs, the costs for controlling or remediating existing risks both initially and in the long term, and the likely

impact of controlled risks on the marketplace for the property and financing will all strongly influence the impaired value. Because comparative sales data for impaired properties are generally unavailable and, if available, only of limited and questionable applicability to any individual situation, the final impaired value opinion will be developed in the form of impact cost liabilities to the unimpaired value opinion of Task 1.

The products of this task are:

- a) An environmental risk inventory in an auditable and trackable format for performance measurement purposes.
- b) A management plan of action for dealing with the environmental risk inventory in both the short and long term.
- c) Budget estimates for the implementation of the management plan of action and a financial risk estimate given the long-term presence of environmental risks (essentially the basis for a self-insurance or internal risk management financing program).

Key Incremental Budgets:

Operations and maintenance

Planned response action

Training and notification

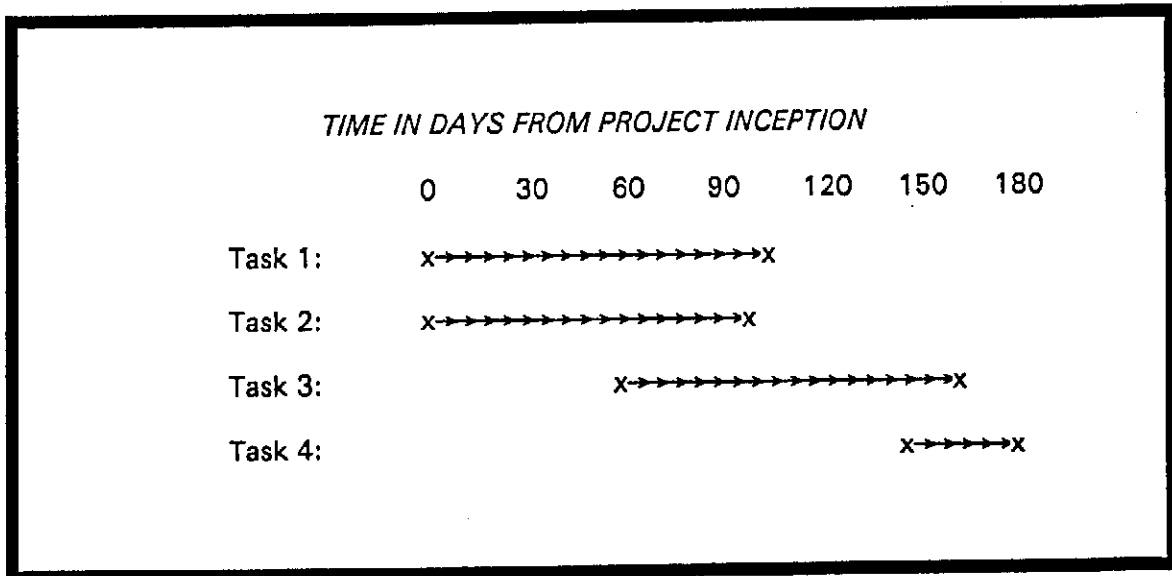
Emergency response action (may be viewed as a form of self-insurance)

- d) An estimate of any incremental CERCLA/SARA or other environmental liabilities.
- e) An estimate of the stigma impact given the existing marketplace.
- f) An opinion as to the impaired value of the property.

Task Timing

The following chart represents the general time needed to complete each of the tasks.

**EXHIBIT 3
GANTT CHART FOR TASK COMPLETION TIMING**



VALUATION TEAM PROFESSIONAL DISCIPLINES

To develop all of the task products noted above a very wide range of professional disciplines must be brought together in the valuation team. Some of these disciplines and the reasons for their participation in the valuation team are outlined below.

Appraisal. The appraisal professional is both the beginning and end of the valuation process, providing the unimpaired value opinion from which all of the adjustments to value are made and providing the marketplace insight and technical value adjustment skills required to arrive at the impaired value opinion. Generally, the valuation team will be composed of two appraisal professionals, one with specific and extensive experience in the local marketplace and one with extensive experience in dealing with environmental impacts.

Accounting. Accounting professionals are often included on the valuation team for several reasons. Among these reasons is the need to analyze operating costs to ascertain the existing expenses associated with current environmental risk mitigation efforts and to develop budgets and operating cost impact estimates for management plan implementation.

Engineering. Engineering has many subdisciplines such as civil, mechanical, electrical, and geotechnical. On any given project, one or more of these disciplines may be required, although in most circumstances the civil and geotechnical disciplines are utilized for the analysis and estimation of remediation costs.

Finance. The value of the environmentally impaired property can be strongly influenced by the availability and terms of financing and for this reason specialists in finance are regularly included on the team. Experience in commercial lending analysis and investment banking skills are needed to develop the unimpaired and impaired financing analyses in particular.

Historical Research and Investigation. Careful historical analysis by professionals will often prove to be the most cost-effective method for identifying suspect environmental risks and, frequently, the sources of those risks. The historical data for a particular area or subject property are not generally organized for this purpose. Phone books and commercial directories, for example, can provide extremely important information regarding the likelihood of environmental risks and their sources, but such documents are organized alphabetically rather than geographically. Fire insurance maps, censuses of manufacturers, subject property histories, business historical data, and industrial process history must all be consulted to prevent the misapplication of extremely expensive geotechnical search methods and resources. Without the direction supplied by historical analysis, these geotechnical methods have a substantially higher chance of missing important risks. The standard governmental lists currently contain less than 20% of all environmental risks.

Hydrogeology. The primary mechanisms for the transport of environmental risks are surface and groundwater flows, hence the inclusion of the hydrogeologist on the valuation team.

Industrial Hygiene/Toxicology. Industrial hygienists—particularly in association with toxicology and medical professionals as well as remediation experts—provide the basis for environmental risk analyses of hazardous substances leading to restrictions in highest and best use, construction, and property operation that can substantially affect value. Inclusion of these specialists on the team is a normal part of the approach to value impact analysis taken by the valuation team.

Management Science. Development of the optimum feasible risk control strategy for a particular situation will often involve the decision sciences in such areas as multi-objective programming. It is becoming possible to develop a scientifically defensible minimum risk/minimum cost environmental management strategy on which to base decisions and measure performance. When such an approach appears to be necessary and cost-effective, the valuation team will include the appropriate management decision science specialties in support of the effort. The bottom line

EXHIBIT 4

IMPAIRED VALUE OPINION BALANCE SHEET: SAMPLE			
UNIMPAIRED VALUE OPINION			\$100,000
ENVIRONMENTAL LIABILITIES:			
Cost to Determine Suspect Impairments		\$5,000	
Cost to Identify Magnitude of Impairments and Course of Action		\$55,000	
Present Value of Action Plan Components:			
Operations and Maintenance Programs	\$5,000		
Planned Response Actions	\$75,000		
Notification, Training, and Recordkeeping	\$5,000		
Emergency Response Actions	\$0		
SUBTOTAL—Present Value of Action Plan		\$85,000	
Estimated Additional CERCLA/SARA Liabilities		\$0	
Estimated Negative Intangible (Stigma) Impact		\$5,000	
TOTAL ENVIRONMENTAL LIABILITIES			\$150,000
OWNER'S IMPAIRED POSITION:			
Impaired Property Value Opinion*		\$0	
Owner's Equity**		(\$50,000)	
TOTAL OWNER'S IMPAIRED POSITION			(\$50,000)
TOTAL OWNER'S IMPAIRED POSITION AND ENVIRONMENTAL LIABILITIES			\$100,000

* The *GREATER* of: zero or unimpaired value *less* environmental liabilities.

** The *LESSER* of: zero or unimpaired value *less* environmental liabilities.

in terms of value impact will be to minimize the environmental risk offset to value and provide solid scientific support for the decisions of management.

Public Relations. Experience indicates that it is very rare for environmental risks to be as serious in reality as they are in perception. The federal environmental laws lay extremely heavy emphasis on the need to reveal risk information to the various concerned publics. A well designed and executed public relations program as a rational and objective part of the environmental risk management program can act to significantly reduce the perceptive impacts of the perceived presence of such risks. Given the nature of environmental risk impacts on value, such a program can act to significantly reduce the magnitude of the offsets to value and reduce the owner's liability exposure.

Regulations and Regulatory Relationships. Environmental rules and regulations are deliberately designed to bring environmental risks under control and to maintain that control in most circumstances. Although there are notable exceptions, the rules and regulations do not require the absolute removal and destruction of environmental risks. The implication is that the regulatory authorities have considerable latitude in decision making that can have considerable impact on value. Valuation teams regularly incorporate regulatory and regulatory relationship specialists as part of the process.

Specialized Investigative Services. Analysis of environmental impacts on property value often includes specialized areas that require additional investigation. For example, research and investigation may be required to establish the "state-of-the-art" at the time of the occurrence of past events or to locate and identify specialized experts knowledgeable in the circumstances surrounding a particular industrial process at the time in question.

A VALUATION TEAM'S EXPERIENCE AND GUIDANCE

The following discussion is based on EAV's experience in developing full-blown impaired value opinions and the methods and problems of bringing together a valuation team and causing it to function in a manner that will produce the desired results. In this case a hypothetical problem will be posed, the valuation of an operating solid waste landfill for acquisition by an investor group.

In a case of this type, there are usually two objectives to be addressed that are inextricable from each other: 1) the value of the subject property and business at the current time to allow for a purchase decision by the investor group; and 2) the development of the information required to provide full disclosure to all potential investors (debt and equity). The second objective will not be treated here, but it should be kept in mind because the two objectives work "hand in glove." They are both developed from the same basic data.

The first issue to be addressed is the recognition of the specific professional skills required to deal effectively and competently with the valuation problem. It should be obvious that the skills of an appraiser will be involved to establish the value of the land and improvements and to analyze several other factors that will be discussed later. The skills of a competent engineer/hydrogeologist/landfill design expert also will be required to determine the ultimate capacity and thereby the upper limit of total future earnings for the landfill.

Other skills are less obvious, but nonetheless critical to the analysis. For example, among the questions to be answered concerning the past and future performance of the landfill are the following.

- 1) Has the landfill been operated in compliance with all applicable health, safety, and environmental rules and regulations? If not, what is the incremental net income adjustment required to restate earnings to reflect operations that would have been in full compliance with those rules and regulations?

- 2) Has there been any deposition of unpermitted—particularly hazardous—wastes on the site? Have there been any uncontrolled releases of hazardous substances into the environment? If so, given that the Hazard Ranking System for Superfund sites underwent changes in December 1990, will this result in a listing on the CERCLIS or National Priority List for the site, and in what category? What will be the legal liability and economic impacts associated with these issues?
- 3) Looking at the surrounding properties and community (neighborhood and area analyses), what are the specific areas of environmental risk? What will the future development of surrounding properties likely mean to the future development and operations of the landfill? What capital investments may be required of the owners to develop the public perception that the landfill is a valuable community resource?
- 4) What are the likely impacts of probable future environmental regulations on the financial operations of the landfill? What additional business opportunities may be available that can be associated with the landfill operation? What are the Resource Conservation and Recovery Act closure requirements and how can they be met? What is the financial impact of the posting of a noninterest-bearing closure bond?

There are other questions, but the above should serve as a reasonable sampling and adequately demonstrate that health and safety, engineering, hydrogeologic, accounting, site management, and legal professionals must all be involved in the valuation team. For example, why an accountant? The answer lies in the question of how many appraisers would feel comfortable in adjusting the income stream to deal with some of the financial issues noted above and producing a set of acceptable pro forma statements for investor disclosure.

This brings us to the second and, in many ways, major problem of valuation team management: communications. Although all of the professionals likely to be involved in the valuation team speak English, unfortunately not all speak the same dialect. An engineer will commonly state that the cost to implement a control method is X, but the accountant will view X in a different context, the net impact on the income stream. If both do not understand how X has been arrived at and its meaning, an incorrect statement of the income stream is likely to result. A subtle additional problem is that the engineer is perfectly comfortable in dealing with the fact that X is a statistically probable value, not an absolute value, and the engineer, accountant, and appraiser will often fail to explore the full consequences of a statistically valid number that actually represents a range of values.

Consider, for example, the following engineering statement: It will cost \$20 per square foot to remediate the semi-volatile organic compounds that exist on 15% of the total site. First, does this mean that the \$20 must be spent today, over a long period of time, or sometime in the future? Second, what happens if additional investigation reveals that 20% (or 10%) of the site has the problem? These questions are substantively different. The first is a pure accounting problem, understanding the context of the value in order to properly account for it in the income stream. The second goes directly to the issue of uncertainty and the stigma component of value impact and requires a sensitivity analysis.

The problem of communications among the various professions must be addressed from the very beginning of the project in the design of the work plan to be followed. Generally three to four full valuation team meetings and the appointment of a team leader conversant with all of the professional disciplines involved are essential elements in the work plan in order to deal with the communications problem adequately.

In the context of the landfill valuation problem, I would select a team having the following primary members.

- 1) **Local Appraiser:** No project of this type should be undertaken without the skills of a local appraiser. If that appraiser has environmental experience, the environmental appraisal consultant may not be needed, but the knowledge of local economic, public attitude, and real estate market conditions is vital. This individual may or may not sign the impaired value opinion report but with assistance should be fully capable of developing the unimpaired value opinion that is critical to the success of the project. The local appraiser also will provide needed insights into local market conditions that result in adjustments to the unimpaired value opinion.
- 2) **Environmental Appraisal Consultant:** If the local appraiser does not have environmental experience or is uncomfortable signing the impaired value opinion report, the services of an environmental appraisal consultant are required. Such an experienced individual may be required in any event to fully evaluate all of the factors associated with the problem.
- 3) **Historian:** Surprised? The need for a trained historian to locate and evaluate records of the subject and surrounding properties back to virgin land status is vital to the success of the total project. An 1870s version of a street map can provide significant data on the location of transport mechanisms that may determine the site to be worse than valueless for the present purposes, and the search of the documentary records is a far from trivial task.
- 4) **Hydrogeologist:** Hydrogeologists perform a number of functions ranging from defining the surrounding property for environmental analysis purposes to evaluating hydrologic and geologic data about the site risks resulting from an uncontrolled release of substances.
- 5) **Certified Public Accountant (CPA):** The services of a CPA from the very beginning will allow for the adjustment of historic income streams to reflect deficiencies in the operating practices and the development of pro forma income, expense, and balance sheet data required for investor disclosure.
- 6) **Professional Engineer:** The professional engineer, experienced with landfill design, construction, and operation will be required to provide expert guidance on the ultimate capacity of the site (and hence the ultimate cap on income) and the current construction and design of the landfill (and hence the risks associated with past dumping and the capital improvements required to deal with any deficiencies). The engineer will also provide information on capital requirements and possibilities for the future earning streams from the landfill.
- 7) **Health and Safety Expert:** This expert will be needed to perform an audit of the health and safety aspects of past operations, identify and provide cost analyses of any deficiencies, and develop operating plans and budgets that will place the operation in full compliance. This individual will also provide important insights into the liabilities and health risks associated with both past practices and future operations, which will be vital to establishing value.
- 8) **Client's Attorney:** The client's attorney may in fact be the official client of the valuation team's work, particularly if there is a reasonable possibility of litigation or the confidentiality of the proceedings need to be protected. Normally (and despite the fact that the American Bar Association lists 13,000 attorneys as practicing environmental law) the client's attorney will often not be environmentally experienced, and a second attorney with a strong environmental background must also be included in the valuation team.
- 9) **Environmental Attorney:** The retention of a highly qualified environmental attorney with significant years of experience in the field is essential. Such counsel must be retained by

the client but must be readily accessible to the valuation team and made a part of it at the earliest possible date.

- 10) **Valuation Report Reviewer:** To review the final draft report for clarity and technical content, this individual should be a competent appraiser with environmental experience who is willing to question virtually anything written by anyone. The valuation report reviewer will be a part of the first and last team meetings, but should otherwise be left out of the communications loop. The reason is that the reviewer should be aware of the general scope of the project but must not be so familiar with the project as to overlook the forests for the trees. In other words, the reviewer should take the position of a knowledgeable but uninformed recipient of the final report.

The development of an impaired value opinion has been successful along the following lines. First, the team leader spends some time developing a cross section of the data available on the problem, including the more obvious sources of data such as topographic area maps, basic area demographic and economic information, exact site legal descriptions, an outline of the subject property's history, an outline of the surrounding area history, basic financial information on the subject property, and whatever other pertinent local information is readily available. The purpose is to provide the data necessary for the first meeting of the valuation team at which a briefing by the team leader on the specific problem, the outline of the work plan, identified specialized issues, and team member initial work assignments and delivery dates are discussed, and a detailed initial work plan and work assignments are outlined.

The underlying purpose of the first valuation team meeting is to forge communications links between the various team professionals, leading to a common understanding of the issues of concern to other members of the team. Without this understanding between team members, a unified impaired value opinion cannot be arrived at, and the purpose for which the valuation work is being performed—sound financial and environmental advice to the client—will not have been served. It is the unified opinion of all of the professional members of the valuation team that will provide maximum value to the client, not the summary opinion of any one individual, no matter how highly qualified or experienced. The unified opinion depends on the communication between team members.

After the first team meeting, project execution begins in earnest. The team leader must remain in constant communication with all team members. Particular care must be exercised to achieve two often conflicting goals. The team leader must be fully informed of the work progress of all of the team members and remain in control of the work in order to coordinate their efforts. No one else should direct the activities of an individual team member. In conflict with these requirements is the need for the individual team members to comfortably talk with each other and exchange information, ideas, and opinions. The team is not designing a bridge and often does not even know what the real scope of the problem is until relatively late in the process. A high level of intra-team communications is required, but it cannot and must not be allowed to lead to the misapplication of resources.

A second team meeting should take place approximately midway through the work plan. Its purpose is to allow all members of the team to be briefed on the information discovered to date by the individual team members and to allow for the team as a whole to evaluate the information. This meeting can begin with a discussion of the preliminary unimpaired value opinion by the local appraiser, and the local environmental and economic context of the subject property. This provides a common background and theme for all of the specific professional discussions that follow.

For example, an historian may discover that a river channel, now long buried and unrecorded in the contemporary geologic information, once ran through the site. The historian may not immediately recognize the environmental consequences of that piece of information, but the

hydrogeologist and the engineer will and will react to it accordingly. This type of information exchange is critical and must take place in a relatively formal atmosphere of prepared presentations and discussions. Because risks are often revealed at this stage, as a result of the second meeting the project may be dropped because the investors do not wish to pursue a more risky venture. Alternately, the work plan may be altered to more thoroughly investigate specific questions raised by the information.

A third team meeting will often take place as a formal oral presentation—backed by factual graphics and tables—to the client or client's counsel. It must be emphasized that often a requirement of the work will be that no opinions will have been previously placed in writing, and for reasons far more important than ominous. Specifically, professionals begin to dig in their heels when they put something in writing, and the environmental evaluation of a property is far too complex to allow anyone to form a final opinion in isolation from the thoughts and points of consideration of other professionals.

A simple example will serve to illustrate the real point of this third meeting. Suppose that a single-use property has been appraised based primarily on its value in use to a manufacturer of gizwatches, a highly specialized niche-market product for which the company has absolute market dominance. During a meeting just before the appraisal report is sent to the client, the appraiser hears from a friend that he has just invested in a new manufacturing operation that will make a substitute for the gizwatch, making the gizwatch completely obsolete. Need anything further be said? The equivalent of this situation will often occur during this third team meeting.

This meeting is critical to the formation of a unified opinion for the team as a whole. After this meeting the writing of opinions may take place for final editing by the team leader into a set of report volumes for circulation in draft form among the team members. After editorial comments have been received from each of the team members and the reviewer, a final draft is prepared and its discussion is the subject of the fourth team meeting where issues of language will be the primary topic. The valuation report reviewer should take a leading position in this meeting. As a result of this fourth meeting, the final report will be prepared and circulated for signature by each of the primary team members providing opinions.

Before someone labels this as valuation by committee, consider the language used to describe the functional group—valuation *team* and *leader*. The impaired value opinion is formed by a process equivalent to that required by the Chicago Bulls in winning championships—a team effort, not a committee product. Committees design camels when they want horses; teams get thoroughbreds *provided* that they can communicate with each other, are properly led, and have the right membership.

Language is often the issue in the proper functioning of the valuation team and in the value of the impaired value opinion to the client. Each of the professionals involved in the development of the impaired value opinion will have a particular dialect, and agreement on the definitions of specific terms will facilitate the development of a unified opinion. It is probably a good idea to construct two glossaries for the project, which are then included in the final report for circulation among the team members.

The first glossary is general in nature and should spell out such things as the definition of "encumbrance" or "impaired" for all of the team members. Also, definitions for the numerous acronyms used in environmental analyses (an often overlooked set of definitions) should certainly be included. All individuals in the team must have some means of deciphering the everyday working dialects of the other team members. Just because the terms are in common use in one profession does not mean that they are used *or* have the same meaning for another profession.

The second glossary is compiled for the project itself and is normally specific to that project. For example, the legal name of the subject property may be quite lengthy and cumbersome. There

is nothing wrong with shortening or abbreviating the name, so long as the shortened name is clearly and concisely identified as representing the correct legal name.

One of the best report-writing principles to follow is to assume that the report is for someone who will never be met by the author and who has no specific knowledge of the situation. The glossaries are intended to provide the detailed information necessary to a clear understanding of the valuation team's opinion, without cluttering up the body of the report with unnecessary details or irritatingly long and endlessly repeated names or descriptions.

The Final Report

It is unfortunate that not all professionals can join together in writing a single report, but the impaired value opinion for an environmentally impacted property is for the benefit of the client, not the professionals contributing their knowledge and skills to the report. As such, the report must lead logically and concisely to a specific set of conclusions that form a unified whole and are supported by all of the contributors. Only this type of report will allow the client to formulate a decision based on a clear understanding of the situation.

Providing a report in separate, stand-alone chunks can have two very undesirable consequences. First, the opportunity for errors in the form of different information in different sections of the report is multiplied. Suppose that the team initially agrees to use a 4% inflation rate and a 10% discount rate for present value analysis. At the final meeting the decision is made to change these values to 3.5% and 11%, respectively. The appraisal report section makes the appropriate corrections, but the engineering and accounting sections, while making the corrections to the numbers, fail to catch all of the places where the assumption is stated. Naturally, a question will arise in the mind of any report recipient. It is far better to have all of the present value analysis and assumptions stated in a single section.

The second problem arises with respect to the client, who deserves to receive a clearly and concisely stated report. Separate stand-alone sections means the repetition of information, distracting to the recipient and detracting from the value of the work. Blindly joining in the opinions of others has always been foolish, but insistence on strict adherence to artificial rules may produce only marginally better results.