Closing the Deal: Data-Driven Due Diligence

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Proper environmental due diligence is critically important in transactions involving real estate or the acquisition of ongoing industrial or manufacturing operations. The due diligence process is the foundation for mitigation of environmental risk. Real estate deals are getting more complex as development is trending back to the waterfront, inner-city, and at retired and mothballed power and industrial facilities. These types of transactions all present complex environmental challenges. Understanding the nature and extent of these challenges at a site is a first step for buyers considering an acquisition. It also is important for sellers to have a realistic understanding of the environmental issues at their property to be able to negotiate the best divestiture deal possible. However, many possible transactions involving contaminated sites don't close due to environmental issues discovered during the due diligence process. A common refrain often heard from real estate professionals is that "environmental issues killed the deal." Other transactions are significantly delayed as the parties work through environmental issues, risking the loss of financing and business opportunities that made the deal attractive in the first place, as well as increasing transaction costs. So, what's the problem with these types of transactions? Why don't they close?

The short answer often is a lack of meaningful due diligence information and the proper interpretation of that information, leading to an inability of the parties to effectively identify, quantify, and mitigate environmental risks to the satisfaction of all stakeholders. Parties often disagree on the evaluation and quantification of environmental contamination and resulting costs or the cost allocation. These disagreements then are used to leverage other concessions, making the deal less attractive than originally anticipated or resulting in the death of the deal. Prior to negotiating a deal, the parties typically rely solely on available engineering and consulting reports and data with only qualitative interpretation. These reports often are old and were not prepared in anticipation of a transaction. Risk modeling is rarely performed to quantify the likelihood of environmental liabilities, required remedial actions, and the cost of same.

The solution to this problem is to perform integrated due diligence and risk modeling focused on the appropriate technical and cost evaluations at a site and identification of possible risk transfer mechanisms and allocations as solutions for the environmental impediments to closing the deal. This article will describe how qualitative and quantitative due diligence can be integrated with the use of sophisticated risk modeling. This approach to due diligence supports a three-legged stool of risk management: contract language, insurance, and performance of environmental actions. Proper execution of all three can lead to better-informed transfers of liability and allocation of costs that ultimately get the deal done.

To illustrate some of the concepts outlined in this article, we'll use an example of a typical transaction as a case study. In this case study, Buyer is considering the purchase of a former manufacturing facility for redevelopment as a townhouse/condominium complex with some ground-floor commercial space. Buyer is unwilling to accept any environmental liability or assume any cleanup obligations associated with contamination that occurred prior to closing. Buyer's lender requires a "no further remediation" letter or other state-approved closure for all known environmental issues. Seller is aware of releases from petroleum underground storage tanks, as well as hydraulic lifts and a TCE-containing degreaser. The site has historic fill that has not been sampled. While some of these incidents have been reported to the state authorities and have received "closure" letters, others are still being addressed or have not been required to be reported since they are a result of historic operations, not specific spills. For its part, Seller must close within ninety days.

Buyer has sent standard environmental due diligence requests to Seller, seeking such things as all permits, all prior Phase I and Phase II reports, all sampling data, notices of violation and other correspondence with regulatory agencies, and hazardous material storage and waste disposal records. Based on its review of this information, Buyer wants to perform its own additional Phase II investigation focusing on the former tank and degreaser areas. Seller does not want to allow Buyer to perform a Phase II, claiming access and liability issues.

As in the case study, due diligence commonly starts with a potential buyer requesting all environmental information from a seller. Rarely do buyers receive complete responses to these requests, and what is provided may give little meaningful or current information about the environmental status of a property. For example, common information may include a Phase I and "closure" reports on a specific tank or spill, which is "episodic" and not a true characterization of sitewide conditions. The buyer then typically hires his environmental consulting firm to perform an independent Phase I environmental site assessment, which often also is required by the lender. The scope of a standard Phase I investigation is set forth in ASTM E 1527-13. If conducted in compliance with this standard, the Phase I may satisfy the All Appropriate Inquiry (AAI) rule (40 C.F.R. Part 312) under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). If all AAI requirements have been satisfied, a buyer of contaminated property will have a defense to "owner liability" under CERCLA. This is the only legal protection that may be derived

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from a Phase I, assuming it was performed and documented correctly. However, according to one audit of Phase I reports conducted by the US Environmental Protection Agency (EPA), all of the Phase I investigations reviewed failed to satisfy the AAI requirements. US EPA Office of Inspector General, Evaluation Report No. 11-P-0107 (Feb. 14, 2011). This common due diligence failure leaves a buyer exposed to liability as a current owner under CERCLA immediately upon closing.

It also is important to understand the scope of a Phase I investigation conducted pursuant to the ASTM standard and the limitations of such an investigation. Unless supplemented, a compliant Phase I will not address asbestos, lead paint, the potential for PCBs in caulks or concrete, or ongoing compliance issues. Moreover, information on these issues that is available to a buyer may be meaningless for the buyer's purpose. For example, a prior asbestos survey only may have identified the presence of readily accessible asbestos-containing materials inside the facility for use by seller as a tool in managing such asbestos-containing materials as part of its operations and maintenance activities. This type of survey is not sufficient for a buyer—like the one in our case study—that will be demolishing site buildings as part of a redevelopment plan, because there are no guarantees all asbestos has been found and no cost information associated with abatement of the materials. Further, the Clean Air Act regulations governing asbestos require performance of a comprehensive predemolition survey to identify asbestos.

The requirements of a potential buyer's lender also may impact the scope of a Phase I, possibly either increasing or decreasing the required scope. The lender's interests are not necessarily aligned with the buyer's. A lender may require that a buyer enter into a liability transfer contract, so that the scope, schedule, and cost of any required cleanup is guaranteed prior to financing a transaction. Or, a lender may believe that it will be sufficiently protected by CERCLA's lender liability protections and available collateral, so it may not insist on an AAI compliant Phase I. Consequently, the ability of a Phase I to adequately inform the buyer as to the real environmental issues at a property may vary widely across various types of transactions.

When a Phase I identifies "recognized environmental conditions" (RECs) at a property, a buyer often will ask its consultant to perform a Phase II investigation, which may comprise both soil and groundwater sampling. Sellers may want to limit the scope of Phase II sampling or bar it entirely. Sellers may be afraid of what will be found, and if they do allow sampling they frequently will do so with an agreement that the potential buyer may not disclose the results to seller and may walk away from the purchase without providing any reason for doing so. Sellers often take this "ostrich approach" to avoid gaining actual knowledge of issues that may trigger reporting and cleanup obligations or require disclosure to the next buyer if the current deal falls apart.

Assuming that a seller will agree to Phase II sampling on its property as part of the due diligence process, that sampling typically will focus only on the RECs identified during the Phase I. Such sampling is insufficient to determine the actual nature and extent of contamination at a property and the extent of associated liabilities. It also cannot be used to determine an accurate estimate of likely remediation costs. In addition, Phase II sampling usually is not integrated with development plans or constructability analysis.

A More Comprehensive Approach to Due Diligence

Many of the environmental "unknowns" and unanswerable "what ifs" that stall or kill deals result from the lack of specific due diligence activities designed for the actual deal and anticipated development being contemplated. Due diligence actions should be different for an acquisition where the buyer intends to continue with the same operations or use at a property and a deal where the buyer will demolish existing structures and redevelop the property for a different use. The traditional approach to due diligence generally described above often fails to integrate with the future plans for the property.

An integrated due diligence approach will focus the Phase I and II investigation with the reuse plan in mind. It also will address from the outset any specific requirements of the lenders or investors involved in the deal. For example, redevelopment of a housing complex funded by HUD/Fannie Mae may require that a guaranteed maximum price (GMP) contract for any required environmental remediation be in place before closing. Due diligence actions will need to be tailored to that requirement, so that a reliable GMP can be developed in the short time frames often required by the purchase and sale agreement. This type of integrated approach will require in many cases an expanded-scope Phase I that includes appropriate asbestos and lead paint surveys, analysis of demolition hazards, and/or a compliance audit. Phase II sampling also likely will be expanded to areas beyond those identified as RECs in a Phase I. Often sellers will balk at allowing any Phase II sampling, let alone expansive sampling. However, knowledge really is power and this type of sampling will provide necessary data for accurately characterizing the waste for anticipated disposal, which is essential in quantitative risk modeling. In turn, that risk modeling will support the parties in getting the transaction closed with minimal risk to all parties. The purpose of integrated due diligence is to actually obtain the information that the parties need to make this happen.

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Once the comprehensive Phase I and II investigations are complete, the first step in risk management modeling is to conduct *qualitative comparisons* that describe the probability and consequences of risks on project objectives. Various risk events are assigned a probability of occurrence from high to low. Then, the severity of the consequences flowing from each risk event is qualitatively evaluated on the high to low scale. From this, decision makers may learn that a highly likely to occur risk event may have only low severity consequences. This approach often is adequate to assess the risk associated with more straightforward projects.

However, for more complex and sophisticated projects or decision events where possible outcomes could have a major impact on the success of the venture, *quantitative risk* *management* modeling should be performed. This modeling involves analysis with specialized software by a subject-matter expert using Monte Carlo simulations that show many possible outcomes from numerical models. In these models, each variable is described as a range of possibilities as well as likelihood of occurrence. The results then quantitatively show the likelihood of an outcome occurrence. This means judgments and recommendations can be made with a quantitative degree of certainty as to which risks are acceptable and which ones to avoid. This type of risk modeling can help answer questions such as "What is the probability of remediation costs exceeding $10 million?" or "What is the likelihood of this project being complete before the scheduled end date?" This approach to due diligence allows for data-driven decision making.

Monte Carlo simulations are used widely in insurance and reinsurance for premium pricing and loss reserves modeling. Specifically, they can be used to determine claims payout by accounting for the uncertainty in both the total number of claims (frequency) and the dollar amount of each claim made (severity). In project cost estimating involved with a proposed property transfer, two key questions are (1) What is the probability that the project will actually be delivered within budget? and (2) How much contingency should be included in order for the project to be completed with a certain degree of confidence? The risk modeling can address quantitatively these two questions based on realistic assumptions and the ability to compute thousands of iterations and simulations of the budget and (graphically and statistically) analyze the probable outcomes. Included in this modeling is a sensitivity analysis identifying the variables and assumptions that have the most influence on the budget outcomes. Examples of such variables might include tons per cubic yard, contaminant type, disposal costs, transportation distances and costs, groundwater impact, interest rates, tax rates, labor, or materials. This allows for more management control and informative decisions about these influential variables. This same type of analysis also can be applied to project schedule estimates.

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Risk modeling allows calculation of the aggregate impact of many possible yes/no type events. For example, it is often important to answer questions such as "What is the total project cost amount that will not be exceeded in 95 percent of cases?" Simulations usually are run in this type of model where the "yes/no" events are modeled using binomial distributions. This also can be used to model decision trees under uncertain conditions.

Additionally, optimization modeling can be performed in uncertain conditions, which combines simulation and optimization. Through the application of powerful genetic algorithm-based optimization techniques and Monte Carlo simulation implemented by a subject-matter expert, this modeling can find optimal solutions to problems that are "unsolvable" for standard linear and nonlinear scenarios. An example use of optimization techniques is to determine the optimal number of asbestos workers in a containment area in order to maximize production rate or to determine how many cubic yards need to be excavated per day to achieve the schedule.

Once all risks have been identified and the probability of various outcomes quantified, a Critical Path Method (CPM) cost-loaded project schedule can be produced. The CPM schedule will identify all tasks and subtasks needed to address all environmental issues and assign a risk probability and cost to each task/subtask. The CPM schedule is used for prioritizing tasks, planning, managing, and executing the project.

With the risk model providing accurate costs, the expanded Phase II providing a more definitive scope, and the CPM schedule providing the scope and timing for environmental work in conjunction with planned redevelopment actions, parties are well-positioned to obtain financing and insurance for the project. The integrated due diligence results now provide the type of information needed for underwriting both.

What Type of Deal Can Get Done with Traditional versus Integrated Due Diligence?

In our case study, Seller is unwilling to allow Buyer to perform any Phase II sampling. Consequently, Buyer must rely on its environmental consultant's qualitative interpretation of the limited information provided in the Phase I, facility permits, and other "desktop documentation" available to it. The consultant is asked to extrapolate from this limited information an estimate for additional environmental actions that may be required to obtain regulatory closure for the RECs. The consultant's gross order of magnitude estimates provides a range of costs from $300,000 to $2.5 million with a range of qualifiers and assumptions given the unknown extent of contamination at the site.

Seller believes that Buyer's environmental cost estimates are excessive but is willing to escrow the amount of the low estimate, $300,000 for performance of the work post-closing. Buyer is not willing to accept the risk associated with costs exceeding the low range estimate. In addition, Buyer's lender will require Buyer to escrow 1.5 times of the highest range estimate, significantly impacting its redevelopment funds. The parties eventually reach the following deal: (1) Seller will accept financial responsibility for achieving comprehensive environmental closure to applicable commercial standards; (2) this work will be performed postclosing by Buyer's consultants with review and comment (but not approval) by Seller and its consultants; (3) Seller will escrow an amount equal to the mid-point of Buyer's order of magnitude estimate ($1.1 million), which if not fully used for environmental actions, will be distributed upon closure 40 percent to Buyer and 60 percent to Seller; (4) Seller provides Buyer with an indemnification for any unknown issues (i.e., issues not identified in the Phase I); (5) Buyer's lender will withhold full funding of Buyer's loan until final regulatory closure is achieved; and (6) Buyer's redevelopment of the property will be delayed until postclosing regulatory closure is achieved by Seller and Buyer's lender fully funds.

This deal creates an ongoing, postclosing remediation relationship between the parties. Such relationships often are painful and expensive. Seller will want to make sure Buyer's consultants don't spend recklessly or try to "over-remediate" beyond what is required for commercial land-use regulatory closure. Seller's oversight of Buyer's consultants has the potential to lead to extended disagreements concerning the remediation scope, schedule, and budget. In addition, Buyer will have to pay for additional remedial work (beyond regulatory closure) that may be required for its proposed mixed residential/commercial redevelopment. The deal structure may limit Buyer's ability to integrate redevelopment actions with closure actions, causing lost efficiencies and increased costs and time. So, while the transaction closed, there remain significant cost, schedule, and regulatory risks for both parties moving forward.

Using a due diligence approach that integrates the consultant's qualitative interpretation of the available information with quantitative risk modeling of remediation variables (such as the quantity of impacted soils or conduits for migration to groundwater or off-site) and the probability of certain outcomes (such as whether the escrow amount will be exceeded, or whether regulatory closure can be achieved within a certain time frame) will increase the information available to the parties. This, in turn, should allow for negotiation of more realistic contract terms, as well as the acquisition of more favorable lending and insurance options.

In our case study, Seller is motivated to close the transaction quickly and Buyer's redevelopment strategy benefits from moving quickly. The parties agree that greater understanding of environmental impacts must be obtained to close quickly, while avoiding post-closing obligations that may limit the economic benefits they both seek. Buyer's consultant performs quantitative risk modeling that identifies three key variables that most impact the remediation estimates confidence factor: (1) the extent (quantity and levels) of TCE contaminated soil; (2) the presence or absence of metals in the historic fill, both of which will drive; and (3) the amount and extent of dewatering and treatment required. Lack of data on these three variables cause the remediation cost estimate to have a wide range of between $900,000 and $1.9 million with only a 75 percent confidence factor that the cost will actually fall in that range. As a result, Buyer is able to suggest a more limited Phase II scope of sampling to obtain better information on these key variables. Seller agrees. Risk modeling is then performed including data from the results of this focused sampling. The modeling results indicate that the most likely cost estimate, with a confidence factor of 95+ percent, is between $1.2 and $1.4 million. Impact to groundwater is also indicated to be likely, but off-site migration is not. Given this information, the parties in our case study are able to reach the following agreements: (1) Seller reduces the purchase price by $1.3 million, and has no ongoing remediation/escrow obligations; (2) Buyer will control remediation of property, with indemnification from Seller for unknown conditions; (3) environmental insurance is readily obtained, given the underwriting support provided via the risk modeling, that covers known and unknown conditions and back stops Seller's indemnity; (4) Buyer's environmental construction manager provides a GMP for regulatory closure; (5) there is a firm cost and schedule for the work; (6) the planned work integrates closure work with redevelopment actions for greatest efficiency in cost and schedule; and (7) the GMP contract and insurance provides sufficient comfort to Buyer's lender to allow for closure of all necessary redevelopment financing.

Proper identification and quantification of all risk factors in a transaction allows for the greatest protection integrating contracts, insurance, and performance.

There is far less risk to the parties with this deal given the greater certainty provided via the integration of qualitative expertise and quantitative risk modeling. This integration allows for greater clarity in the transaction and financing agreements; appropriate insurance coverage for the real risks facing the project; and control over the scope, schedule, and budget of the remedial work. These elements—contracts, insurance, and performance—are a three-legged stool of environmental risk management and all are needed in equal measure. Proper identification and quantification of all risk factors in a transaction allows for the greatest protection integrating contracts, insurance, and performance.

In addition to providing environmental risk-management support to parties engaged in real estate transactions, the comprehensive, integrated due diligence approach discussed in this article may be used in many other applications, such as aiding parties in allocating environmental costs and validating proposed settlement/buy-out offers. The integrated due diligence modeling can help identify and validate sources of contaminants. It may also be used to support reserve and contingency valuations.

In conclusion, how environmental information is analyzed—qualitatively and quantitatively—can provide a more accurate identification of transaction and other risks and more realistic estimates of a project's scope, schedule, and cost. This transforms due diligence information into true understanding, allowing for data-driven, risk-specific decision making. That kind of knowledge really is powerful and will not only get the deal done, but will get the best deal done.