

# Strategic Alliances *for the* **Hazardous Waste Remediation Market**

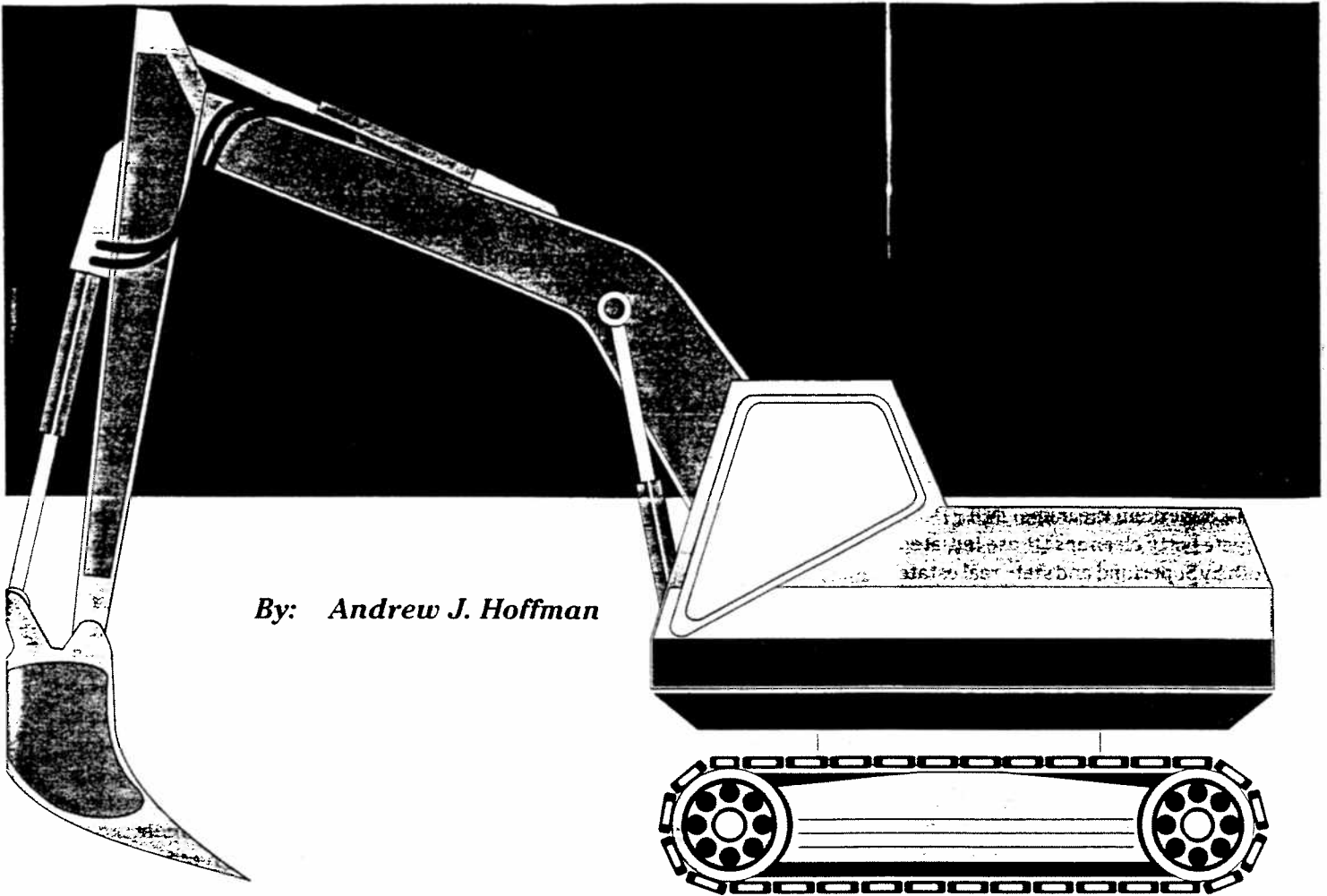
**A** sleeping giant is beginning to stir, and it will be fully awake soon, presenting an opportunity the construction industry has long been waiting for. Access to the highly lucrative hazardous waste site remediation market is now in sight.

For the past decade, the Environmental Protection Agency (EPA) has been focusing its attention and its money on the Superfund program and the first two phases of site cleanup — undertaking lengthy remedial investigations and feasibility studies and deciding the ultimate cleanup method through the Record of Decision (ROD). Now, remedial action plans are emerging from the regulatory pipeline at a rate that warrants full scale entry of the construction industry.

Waste remediation may be a solid shot in the arm for construction firms who have been hard hit by the current

recession and it offers to provide substantial payoffs for years to come. The Office of Technology Assessment (OTA) estimates that the cost to clean up the EPA National Priority List (NPL) sites alone stands at more than \$500 billion over the next 50 years.

Related markets within the Department of Energy (DOE) and the Department of Defense (DOD) offer further potential profits. James Watkins, the U.S. Secretary of Energy, has stated that DOE may eventually spend \$150 billion to achieve its goal of cleaning up all of its contaminated waste sites and bringing its aging facilities into full environmental compliance by the year 2019. Secretary of Defense, Richard B. Cheney, has suggested that complete environmental restoration of DOD facilities may cost more than \$14 billion.



**By: Andrew J. Hoffman**

What is the best strategy for market entry by construction firms? Although the project management and construction/earth moving skills that construction companies possess are precisely the skills necessary for the action phases of remediation, waste remediation is completely unfamiliar territory for contractors. In order to

successfully implement hazardous waste cleanups, firms must first develop some new technical skills.

Several options are available. Construction companies can develop the necessary technical capabilities in-house through individual personnel acquisitions or through the purchase of existing companies. The environmen-

tal industry as it exists today was built on corporate consolidation through buyouts and mergers, and this trend will probably continue. However, another option may offer more advantageous results: strategic partnerships with environmental design firms may result in strongly competitive coalitions through the sharing of complementary assets. As more and more clients look for complete design-build services, organizations that dominate the market will manage all three aspects of the cleanup process: contamination identification, remedial design, and cleanup implementation. To successfully offer skills in each one of these areas, partnerships between construction management and environmental firms are crucial.

### **A NEW INDUSTRY**

The cleanup of hazardous waste disposal sites has been a growing market of enormous proportions for engineering and contracting firms in this coun-

Year	0-\$10M	\$10-20M	\$20-30M	+\$30M	Total
1982	4	0	0	0	4
1983	12	1	0	0	13
1984	33	3	2	0	38
1985	50	9	4	3	69
1986	56	13	6	8	83
1987	59	6	5	5	77
1988	118	15	14	6	153
1989	100	20	7	19	143
<b>TOTAL</b>	<b>422</b>	<b>67</b>	<b>38</b>	<b>41</b>	<b>580</b>

Source: U.S. EPA Office of Emergency and Remedial Response

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try. Under the 10 year old Comprehensive Environmental Response and Liability Act (CERCLA or Superfund) EPA has listed 1,246 sites on a National Priority List. That does not include the 26,000 sites listed in EPA's Hazardous Ranking System. GAO estimates that this list could grow to 368,000 sites if a more comprehensive inventory is taken. Add to that the growing list of State Superfund cleanups, DOE, DOD, private party cleanups (those initiated both by Superfund and state real estate development cleanup laws such as Massachusetts law 21E and the New Jersey ECRA), leaking underground storage tanks and RCRA corrective action cleanups, and the numbers are overwhelming.

Historically, the pace and cost of cleanups under the Superfund program has been less than impressive. Since it's inception in 1980, \$10 billion has been spent with a net result of only 63 sites being fully remediated. However, the pace of actual cleanup work can be expected to increase in the coming years. Having completed the initial developmental stages of the cleanup process, EPA is moving more towards the physical implementation of Remedial Action Plans as dictated by the Record of Decision (ROD). Since 1982, 580 RODs have been signed. Over 50 percent of total RODs were signed in 1988 and 1989 alone. This is attributed to the mandatory cleanup deadlines outlined under the Superfund Amendments and Reauthorization Act of 1986. Due to a time lag between the ROD signing and the development of a remediation action plan and subsequent contract award, construction activities can be expected to emerge from the Superfund pipeline in large numbers in the coming years.

However, the window of opportunity for ramping into this market is widest now, and will not remain open indefinitely. EPA has set clear objec-

tives to finish a total of 140 cleanups by the end of 1992, 200 by the end of 1993, and a minimum of 650 by the end of 2000. Since incumbent players from the hazardous waste market as well as new players, such as defense contractors, are gearing up to attack this market, construction companies must consider market entry now.

## MARKET PLAYERS

In 1981, the first firms to capitalize on the \$400-600 million hazardous waste market were solid waste disposal firms since hazardous waste was originally treated in the same fashion as solid waste. The extent of services was primarily that of hazardous waste handling, transportation and disposal. Disposal was carried out either through landfilling, deep-well injection or incineration. A 1981 Frost and Sullivan business report cited seven companies as

Corp. (IT) and Chemical Waste Management, Inc. (CWM).

During the 1980s, Superfund created opportunities for a wider range of hazardous waste service industries. In particular, geotechnical and engineering design firms experienced rapid growth to meet the demand for consulting services in the remediation field. By 1984, 37 engineering firms had focused their corporate strategies on this market, found Frost and Sullivan. Today, the numbers are much greater.

Some construction companies have already begun to gear up to compete in this market. Since they are already prepared to provide sophisticated construction management services, many believe that the construction companies will dominate. Thomas Thurston, Program Manager for Sverdrup Environmental, a newly formed subsidiary of the construction firm Sverdrup Corp., feels that Sverdrup, as a design-construction organization, is better positioned for this market than the traditional environmental consulting firm. He believes that environmental consultants have become complacent by charging high fees for exhaustive studies and environmental contracting firms are ill-equipped for the project management requirements of a construction project. "They are not results oriented like a construction company."

Michael Skriba, Technical Director of the environmental services unit for construction giant Fluor Daniel Inc., agrees. Although he does not believe that construction companies will push environmental contractors out of the business, he does feel that they will dominate and that the environmental firms will subcontract to them. He feels so sure of this prediction that he left the Environmental Division of Westinghouse to join Fluor Daniel.

One construction company, Summit Constructors, Inc., has already successfully capitalized on this market opportunity. The firm took its experience in

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being responsible for 40 percent to 60 percent of the hazardous waste management business in 1989. Today, only two of this original field of seven are still in the hazardous waste remediation business: International Technology

water and wastewater facilities and applied it to the environmental cleanup of groundwater. Summit Vice President, Walter J. Bacer, is reported as saying last year that 1991 was the company's best year ever, with an expected \$100 million in revenue. The company plans to add 80 more people to its 400 person staff soon.

However, construction companies face competition from another newcomer to the remediation market. Major defense contractors can be expected to redirect their management capabilities towards the growing DOD and DOE cleanup markets as the present "peace dividend" continues to shrink their traditional markets. Their experience with government procurement procedures coupled with their growing reserve of underutilized project management skills will almost force them into competing with construction companies for lucrative cleanup contracts. For example, Lockheed was recently awarded a \$30 million contract to provide technical and management assistance to EPA laboratories.

Traditional environmental consultants are also gearing up for capturing this construction market by developing project management skills of their own. This could be considered as both an aggressive and a defensive move. Aggressive, because it could be able to offer greater profits by opening up new markets. Defensive, because the markets presently open to consultants may diminish in the future. As industry experience in remediating sites increases, the need for brand new approaches to remediating each site may become less prominent. Not that engineering design services will become a commodity, but that the contract price for individual site engineering plans can be expected to decrease. EPA Administrator, William Reilly, admits that the program is at a point where "some standardized procedures and guidance can be developed." This may necessitate entry into new markets.

Is a confrontation between construction companies and environ-

mental incumbents necessary? Construction companies and environmental contractors offer completely different types of services. An alternative perspective for differentiating the services offered by both market players may reveal that there exists distinct complementarities. Rather than entering the market as opposing competitors, perhaps a more strategically planned response would involve an alliance between players allowing each to practice what it knows best. This will allow each firm to increase profits.

firms already possess. These assets include vertical integration into the wide range of services necessary to investigate and develop a cleanup plan; familiarity with cleanup technologies; understanding risk management procedures; public relations skills; understanding of environmental law; and a knowledge of the regulatory procedures and requirements for hazardous waste management.

The construction company, on the other hand, holds certain complementary assets that environmental firms

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not by controlling a bigger portion of each site cleanup but by commanding a higher volume of cleanups.

### COMPLEMENTARY ASSETS

There is little doubt that construction companies offer construction management services that are far superior to those offered by the present players in the field. This gives the construction company a distinct competitive advantage when bidding the construction portion of a project. However, this offers little competitive advantage when a client wishes to contract the cleanup as a design-build project.

The construction company will need to acquire, or gain access to, certain complementary assets which environmental engineering and contracting

will need to acquire in order to access the construction portion of the remediation market. These include, first and foremost, the knowledge and capability to offer complete construction management services such as project scheduling, project estimating, project management, labor relations, and contract preparation. Construction companies may also find that their pre-existing relationships with large industrial clients will allow more rapid market entry into this branch of construction services. This will be particularly true with construction companies, such as Badger Engineers, Inc., that focus on designing and building industrial process plants.

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The two industries' complementary assets in hazardous waste remediation include:

- *Vertical Integration.* The range of services that environmental incumbents offer can include well drilling, soil sampling, soil and ground-water analysis, geotechnical services, engineering design services, remediation technology development, waste transportation, off-site treatment and disposal services.

have the permit denied under intense public opposition. As a result, their stock value plummeted from 25 to 4 7/8 points.

- *Technical Understanding.* To date, 210 different technologies have been specified in EPA Record of Decisions. They can be classified into five basic categories – thermal treatment, solidification/stabilization, physical separation, chemical treatment and biodegradation. To offer complete remediation services, a firm must

project are of a completely different nature than those of a typical bridge, tunnel, or skyscraper construction project. Exposure to harmful chemicals not manifest itself in health effects for years or even decades. One might argue that a bridge collapse such as the section of I-95 in Greenwich, Connecticut, offers the same latent risk. However, the damages by such an incident are finite and tangible. Damages resulting from hazardous waste exposure are difficult to identify, let alone quantify. Cancer, or the potential of getting cancer has unlimited potential value in a courtroom, whether the risk is medically or psychologically supported. Despite the attempts to downplay these risks, many companies entering this market seek to "hide behind the corporate veil" by separating their hazardous waste services from their other service lines. Unfortunately, the corporate veil has been pierced with increasing frequency.

- *Public Relations.* Public opposition to traditional construction projects is not often as volatile and costly as that in the hazardous waste business. One example illustrates this point. CSX Transportation of Jacksonville, Florida remediated a contaminated site in Freeland, Michigan, after a train car carrying acrylic acid derailed. The contaminated soil was loaded into train cars and sent to be landfilled. In the process, members of Greenpeace and other environmental groups bird-dogged the train and at one point even chained themselves to it. The controversy scared off four landfill operators from accepting the waste, so the train cars began roaming the country looking for a disposal site while CSX was paying for transportation costs. To make matters worse, the company recently was fined \$21,975 by the South Carolina DEP for leaks from the

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and on-site technology services. Vertical integration may allow a firm the ability to undercut the bids of competitors who must subcontract these portions of the project. Although primarily an operations management company, Chemical Waste Management performs essentially all of these services. CWM has capitalized extensively in areas of off-site disposal and treatment which are very difficult market sectors to enter at this time. The RCRA "land ban" makes it extremely difficult to site new landfills, and public opposition can be so fierce that locating any kind of permanent facility may be nearly impossible. For example, Clean Harbors Inc. spent \$13-14 million over a period of years trying to site a hazardous waste incinerator in Braintree, Massachusetts only to

be able to analyze and understand not only the existing variety of cleanup techniques but also emerging techniques from research laboratories both nationally and internationally.

This area of expertise is of such critical importance that it may be necessary to incorporate a third member into the environmental/construction firm consortium. A company that focuses on the technical aspects of chemical process design and construction may offer valuable assets to site cleanup work. Such a company could be from the chemical processing field, such as Dow or DuPont, or from the process development field, such as Badger Engineers or United Engineers and Constructors.

- *Risk Management.* The risks of the hazardous waste remediation

train cars. Undoubtedly, public opposition turned this potentially profitable project into a financial failure.

- *Understanding of Environmental Law.* The hazardous waste field may be more restrictively regulated and litigious than other construction fields. Liability risks associated with hazardous waste remediation work arise out of the potential for accidental releases of hazardous substances during the remediation process as well as lawsuits from third party groups opposed to the cleanup action or agency actions for regulatory violations. An example of the former involved O.H. Materials, which was sued for an accidental release of an acid cloud during the cleanup of the Drake Chemicals site in Lock Haven, Pennsylvania, on March 23, 1982. Payment totalled \$133,296.27.

Some construction companies feel that the use of their law department as merely a support group will make the company better able to work efficiently. Is that the best approach for this field? One environmental "heavyweight," company maintains its competitive edge by employing 80 lawyers, a legal army that it terms the largest private environmental practice in the country. Furthermore, the company has paid fines and related settlements exceeding \$50 million. Some critics charge the company with a cavalier attitude towards such fines which are small compared to the company's huge profits. Ironically, the company appears to enjoy the publicity of the fines. They seem to feel that such actions only serve to make the business less attractive to competitors.

- *Regulatory Understanding.* The management of hazardous wastes is regulated by two statutes in this country: the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmen-

tal Response and Liability Act (CERCLA). These two acts cover a wide range of requirements such as permitting, cleanup procedures,

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and procurement practices to name a few. However, hazardous waste cleanups may also have an impact on air and surface waters. This necessitates an understanding of the full spectrum of federal, state and local environmental laws and ordinances in order to fully comply with the extensive legal requirements of offering remediation services.

- *Construction Management Services.* The relative value of this complementary asset for the remediation of a hazardous waste site varies with the size of the cleanup. For smaller projects, such as the cleanup of leaking underground storage tanks, existing environmental firms may have little use for the complex project management tools used by the construction firm. That is what Jeffrey Lawson, Principal of Environmental Project Control Inc., Grafton, Massachusetts, is counting on. His firm is offering construction management services

in the hazardous waste remediation field based on the premise that the management needs are considerably less than for other fields. According to EPC, one project manager could successfully oversee a site cleanup essentially single-handed. That is not to say that the small construction firm with experience in underground tank installation could not successfully capitalize on this vastly growing market.

For larger sites, the management asset clearly becomes more important. Presently, individual NPL site cleanups cost an average of \$20-30 million and the costs and complexity can be expected to increase. The largest Superfund settlement to date, at the Rocky Mountain Arsenal, is expected to be in excess of \$1 billion, with the U.S. Army and Shell Oil Company paying for the cleanup. Such cleanups often involve multiple "hotspots", and require extensive technical as well as managerial, coordination and procurement procedures in order to control costs. These are the types of sites that will require construction firm involvement.

### **SELECTING THE OPTIMUM STRATEGIC MECHANISM**

Three mechanisms exist for the acquisition of complementary assets by construction companies or environmental firms—corporate acquisitions, knowledge acquisitions and strategic alliances. Each mechanism has both advantages and disadvantages. But, in the hazardous waste remediation field, strategic alliances appear to hold the most promise.

Corporate acquisitions offer the advantage of allowing a company entry into a new market in a relatively short and less costly way than attempting to develop the necessary skills through internal development. This is the primary way in which the established en-

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environmental firms such as IT Corp. and CWM developed their vertical integration throughout the 1980s.

Corporate acquisitions have some distinct disadvantages, particularly if the organizational and management styles of the parent and acquisition are not compatible. A diversifying company cannot step in immediately after acquisition to manage a business it knows nothing about. It must set up a communication system that will permit it to understand the new business gradually. In the early stages, the acquisition must be allowed to continue with some of the same degree of independence it had before the acquisition. However, if the corporate cultures between parent and subsidiary are terminally incompatible, the ultimate outcome of the merger can be expected to be a failure.

Acquisitions of knowledge involve obtaining people familiar with the new business area. Drawbacks to this approach include the identification and acquisition of high caliber people who presumably already work for someone else. The salaries necessary to hire these people away from their present employers will be higher than salaries paid on the open market. This process could become time consuming, expensive, and fraught with mistakes as the parent firm tries to put together all of the necessary skills and personnel to make a cohesive organization. Since the resulting organization will be brand new, organization efficiency through communication lines and allocation of duties will be inefficient. Friction and conflict may result.

Despite the great potential for conflict, many companies successfully diversify and grow via joint ventures. When projects get larger, technology more expensive, and the cost of failure too large to be borne alone, joint venturing becomes more important. An important part of this equation in the hazardous waste field is the management of risk. In particular, under the

Superfund program the liability of a particular firm depends, not necessarily on the extent of its involvement, but rather on the depth of its pockets. Contracts between owners, environmental firms and construction companies should pay careful attention to the appropriation of risk for environmental liability.

In order to alleviate the high risks that cleanup contractors bear on hazardous waste cleanups, EPA has recently published guidelines in the Federal Register to offer indemnification to response action contractors (RACs) for negligent releases arising from response action activities at sites on the National Priority List and at sites of removal actions. Under this proposal, EPA will apply a strict underwriting program to its Superfund RACs and develop an award-fee plan that rewards contractors based on their performance. The success of this program to minimize risk remains to be seen.

The disadvantages to joint ventures must be carefully considered. There is always the risk that the partner won't perform according to the terms of the contract. There is also the danger that a partner may learn the skills of the other partner and attempt to use this newly gained knowledge to go it alone, possibly taking some valuable employees with them. However, given the potential advantages of successful coalitions and provided that carefully

drafted contracts protect all partners, strategic alliances offer the greatest opportunity to increase profits through maximizing market share.

## CONCLUSION

The final step in the process of cleaning up the nation's hazardous waste legacy is about to become incorporated into the remediation market. As more and more clients look for organizations that will offer complete design-build services in the remediation of their closed hazardous waste facilities, the successful organization must offer the capability to identify the type and extent of contamination on the site, develop a complete remediation plan that will consider all of the available techniques for remediation, and offer cost effective management capabilities for implementing the cleanup.

Incumbent environmental firms and new entrant construction firms both offer complementary assets that are crucial to the successful cleanup of a hazardous waste site. Instead of competing with each other in areas that neither are experienced, these two players should develop strategic alliances in order to offer the strongest, most efficient possible front for capturing market share in this vastly growing field. A third member of such a consortium could be the technology developer. In such an arrangement, the environmental firm can determine what's wrong, the technology developer can determine how to fix it and the construction firm can implement the repair. In this way, each player can maximize its share of the market, not by controlling a larger portion of each project, but by increasing the overall volume of work that only a coalition can capture and the firm, alone, cannot.



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