Property Rights, Protest, and the Siting of Hazardous Waste Facilities

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In 1980, the U.S. Environmental Protection Agency estimated that between 50 and 125 new sites for hazardous waste facilities (*HWF*s)[1] would be needed in the near future. Since that time no major *HWF* has been sited anywhere in the United States. The EPA had anticipated that local opposition would make finding these sites an "exceptionally difficult task." Their pessimism was well founded and, if anything, understated. According to the Hazardous Waste Counsultant's latest state-by-state review, the outlook for siting *HWF*s in the future is "even more bleak" than in the past, due in large part to what they term a worsening of the "emotional atmosphere" surrounding siting efforts. This failure to site any new *HWF* has come about in spite of assurances by government and company officials that new facilities built according to the present standards would pose negligible risks to the local residents. Attempts have been made to break the deadlock by instituting extensive public participation procedures, establishing state siting boards with the power to overrule local decision makers, and requiring facility owners to compensate local governments for safety services the latter provided.

In this paper, we argue that the ambiguous nature of the present property rights governing the siting of *HWF*s is an important cause of the stalemate. We offer a new approach to siting which recognizes the de facto property rights assumed by local communities. We propose a political market, via a referendum mechanism, for allocating *HWF*s. The referendum, supervised by the state, would be held at the request of the firm wishing to site the *HWF* with the developer, in effect, offering a comprehensive package of incentives for the community in exchange for a yes vote.

To understand the rationale for our approach, it is first necessary to examine the evolving nature of the property rights for siting a *HWF*. The driving forces are changing perceptions of the risks associated with toxic waste disposal and a social movement of considerable power which has raised the cry of "not in my backyard." We show that rational citizens have much to gain by opposing the siting of new hazardous waste facilities near them. Their resistance, however, imposes large costs on society as a whole, since as quantities of toxic chemicals are being held in temporary and deteriorating storage conditions as they await destruction, or a permanent home, strong incentives are created for illegal "midnight" dumping.

I. The Problem

Hazardous wastes are a by-product of the chemical revolution that followed World War II. Until recently, disposing of wastes was not considered to be a social problem and dumps with hazardous materials in them were treated by the public and planners as minor extensions of their garbage dump and sanitary landfill cousins. Opposition, if any, was based on their nuisance characteristics, not

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[1] These include waste treatment facilities, landfills, and incinerators.

on perceived safety risks. The property rights status quo was one in which the developer's entitlement to engage in waste handling activities was preeminent as long as the facility was located in an industrial area.

The passage of the Resource Conservation and Recovery Act (RCRA) by Congress in 1976 marked official recognition that these wastes, many of them disposed of improperly in the past, posed a potentially serious health threat. However, widespread public awareness of possible danger to local communities from this source did not take shape until two years later when the problems at Love Canal reached the national news media. Congress passed the Superfund legislation in 1979 to clean up existing toxic waste dumps. The entire town of Times Beach, Missouri, was abandoned after finding dioxin contamination in 1982, and news reports of contaminated drinking water wells have now become commonplace. Proposed *HWF*s quickly became the subject of widespread protest despite the fact that they had to meet the stringent federal design and operation safety standards imposed by RCRA and further augmented by additional state regulations. The Sand Canyon facility in Los Angeles County illustrates this situation. Four years of work and $1.5 million were spent on a proposed comprehensive treatment and land disposal facility before its corporate owner withdrew the proposal in the face of seemingly insurmountable public opposition. In Texas, a regional authority proposed a high temperature incinerator for toxic wastes from the area (a solution favored by environmentalists). Despite a well-demonstrated need for such a facility and initial support from surrounding local governments, citizen opposition caused the developer to withdraw the proposal after a 3-year battle when it became apparent that political approval was not going to be forthcoming.

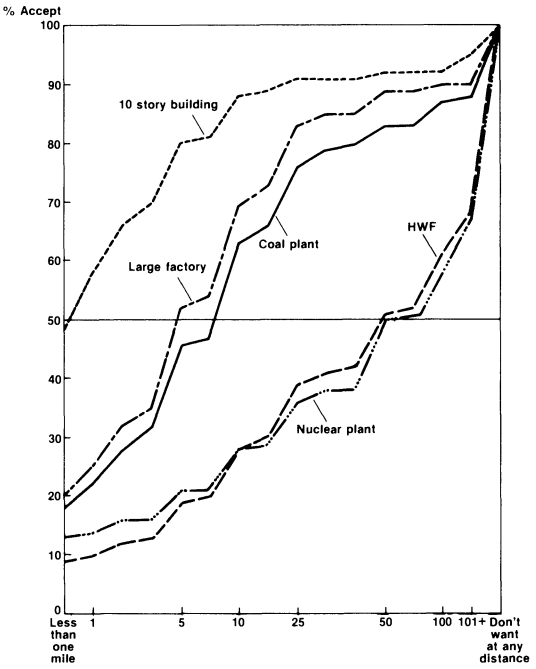

FIGURE 1. CUMULATIVE PERCENTAGE OF PEOPLE WILLING TO ACCEPT NEW FACILITIES AT VARIOUS DISTANCES FROM THEIR HOMES

II. Aversion Profiles

The NIMBY acronym (not-in-my-backyard) aptly captures the views of those who resist facility siting. The syndrome itself is not new—homeowners have long resisted the siting in their neighborhood of undesirable facilities. What is new is the scale and intensity of protests provoked by facilities perceived to be risky. The present high level of risk averseness is illustrated in Figure 1 which shows the percentage of the public in a national survey[2] willing to accept (without protesting or moving) each of five hypothetical facilities as a function of the distance of the facility from their residence.

Three distinct "siting aversion profiles" emerge, with corresponding "backyards" and protest constituencies. Reactions to a 10-story office building represent a useful baseline.

[2] These data are from a survey conducted by Resources for the Future (Mitchell, 1980). The general shape of the profiles has been found to be robust against alternative question wordings and the addition of other types of facilities.

Over half say they would accept such an edifice if it were at least a mile from their houses. Majority acceptance of either the industrial plant or the coal-fired electric power plant, facilities that are likely to be perceived as dirty and potentially obnoxious neighbors, occurs at approximately 9 miles. In contrast, the two facilities posing potentially catastropic but extremely low probability risks, a nuclear power plant and a new, well-regulated disposal site for hazardous wastes, reach majority acceptance only at the 50-mile mark, a distance "premium" of 49 miles from our arbitrarily selected baseline. This suggests a crucial difference between the siting of an ordinary industrial facility and a *HWF*: the "neighbors" affected by the latter involve entire communities. Another difference is the number of people who feel strongly about the issue. Whereas only 9 percent expressed the extreme view that they did not want the two industrial facilities as neighbors "at any distance," 29 percent expressed such a view about the two "risky" facilities.

III. Protest Mobilization

At the local level, the aversion to *HWF*s is translated into active protest whenever new facilities are proposed. Why do local residents protest? Mobilization is facilitated by: 1) the high cost perceived to be imposed on the local community by the *HWF*, 2) the low cost of protesting, and 3) the high probability of success.

First, *HWF*s are a prime example of a regulated entity whose costs and benefits are so distributed that the former are concentrated, while the latter are distributed, far beyond the local area. The principal costs believed to be posed by *HWF* are the health risks posed by groundwater and soil contamination in the case of landfills, and contamination of the air by cancer-causing substances in the case of incineration facilities. The high level of perceived risks may be attributed both to the institutional context in which these risks occur and to the nature of the risks themselves.

The news media have highlighted past failures to handle toxic wastes properly and scientific uncertainties about the risks they pose to the public. At the local level, the siting issue appears as an abrupt threat that involves a visible source (the site) for which clear responsibility can be ascribed (the developer)—characteristics that heighten public awareness of the perceived risk. In contrast to nuclear power plants or industrial plants, for which there is usually a local constituency, a *HWF* provides few benefits such as jobs or tax revenues (A. D. Tarlock, 1984). Finally, residents may fear the decline of local property values.

The degree of concern about the risk externality posed by *HWF*s is strongly influenced by the nature of the perceived risk. The risks posed by these facilities include characteristics which have been shown in other contexts to be strongly associated with risk aversion (Paul Slovic et al., 1980). They are perceived as: 1) involuntary (imposed on the community without its consent); 2) lethal; 3) memorable (due to being subject to arresting media coverage); 4) not susceptible to personal control; 5) persistent (having the potential to effect future generations); and 6) unfair (since most of the benefits accrue to those living far beyond the geographic area subject to risk).

Two characteristics of siting controversies help lower mobilization costs. First, the local character of the controversy makes it easy to identify and communicate with potential protesters. Geographic concentration also allows use of preexisting social networks and institutions (such as churches and neighborhood organizations) for leader and member recruitment purposes. This reduces organizational costs and makes free riding easier to manage through informal social control in the form of pressure to participate. Second, public participation procedures used in many siting processes, such as hearings, offer a focal point both for organizing and for news media coverage, and easy access to decision makers.

For individual participants, the cost of mobilization involves time and money. This includes time spent in activities such as recruitment, fund raising, and organizational maintenance, as well as time spent in protest activities such as writing letters, working on

lawsuits, and organizing and attending rallies. The time commitments necessary for a successful protest movement are lumpy: only a relatively small number of activists need to commit substantial amounts of time to the effort. For most participants, only occasional participation is necessary, because much is demanded of only a few.

The third factor affecting mobilization is the perceived likelihood that the protest activity will benefit the participant. Some people, usually highly committed activists, derive utility from the act of protest itself, which confirms their values and sense of self-worth. The efficacy calculus for ordinary participants normally involves a belief that their cause has some chance of achieving its goals. Factors that contribute to a sense of efficacy in siting protests include the widespread support for the protest in the affected community, the frequent sympathy or even support for the protest on the part of local elected officials, the availability of proven tactics (ranging from sit-ins and demonstrations to lobbying and legal interventions), expertise (from national organizations), and arenas in which to contest and delay the siting (such as local hearings, the courts, and, of particular importance, local zoning and permiting processes).

IV. Evolving Property Rights

Property rights specify how persons may benefit or be harmed and, therefore, who must pay whom to modify the actions taken by affected parties. In a now famous article (1960), Ronald Coase argued that the assignment of property rights to one party or another did not, in the absence of transactions cost, affect economic efficiency, although it did affect the distribution of wealth. Coase's insight was a deep one: resources would be put to their most efficient use regardless of how the political system initially chose to allocate property rights. The problem with the hazardous waste situation is that currently no one really has clear title to site a *HWF*—not the firm, not the community, and not the residents as individuals.

Harold Demsetz correctly saw that property rights were subject to change over time to "accommodate externalities associated with important changes in technology or market values" (1967, p. 350). Firms wishing to site a *HWF* lost their unfettered right to locate where they wished as the public and government officials became alarmed over the possible risks posed by the technology. Local residents have obtained increasing ability to delay (and thus effectively block) siting efforts in adminstrative and judicial hearings. Local communities have taken a leading role in stopping the construction of new *HWF* through the use of their extensive police powers to regulate zoning and safety matters. With a few exceptions, however, communities do not have the legal right to ask for sizeable payments in exchange for issuing the necessary licenses and permits.

The recent establishment of state siting boards with the power to preempt local governments represents an attempt to reassert the former property right regime. The concurrent establishment of schemes for compensating communities for the presence of a *HWF* represents a movement in the opposite direction—toward giving the property right to the community. The innovative Massachusetts' siting law (M. O'Hare et al., 1983) has both features, going further in the direction of bargaining for compensation and less in the direction of preemption (calling for binding arbitration only in the case of irreconcilable differences) than any law in the country. No facilities yet have been sited under this law, suggesting that compensation without ultimate local veto power over a facility may not be a successful strategy. But if local residents were *individually* to hold the property right, developers could not bargain efficiently with the large number of potentially affected residents and one holdout could block a well-conceived project.

V. Community Property Rights: A Proposal

One possible solution is to recognize a collective property right by having states pass a law specifying the use of referenda to determine local approval or rejection of a proposed *HWF* facility. Such a law would require the relevant political authorities to hold a referendum when requested by a qualified

developer meeting state requirements. The terms of the arrangement would be proposed by the developer and incorporated into the ballot proposal. Both the developer and the state, to the extent that it desired the siting, would have strong incentives to develop winning proposals. Developers obviously would aim at selecting potential sites where voters would be more likely to agree to the least expensive package of measures designed to compensate a community for accepting the *HWF*. Designing the package and promoting it would necessarily involve the equivalent of a public participation program. Naturally the costs of the package would be passed on to enterprises that wished to use the facility. In order for such a proposal to be viable, there would have to be enough technically acceptable sites available so that the political market could be sustained, and no single community would have a siting monopoly.

A large number of possible compensatory measures have been suggested in recent years. The contents of a developer's particular package could vary according to the nature of the facility, the characteristics of the site, and the community's concerns. The types of measures which might be included are: guarantees against property value declines, incentive payments to the community (which could be earmarked to reduce property taxes or for other purposes), outside monitoring,[3] accident insurance, credible guarantees of nonabandonment, donation of land for use as parks, and in-kind services such as free waste disposal for community residents and businesses.

Should the decision rule be a simple majority, or something larger, such as the often used two-thirds majority? Although a two-thirds majority requires a more expensive package, we argue that it is more likely to result in a Pareto-improving outcome and greater community harmony. Who would administer and enforce and contract established by the referendum? This would undoubtedly fall to the local political authorities first, and ultimately to the state. Doubts about enforcement would only increase the payments required to pass the referendum. There must be sufficient administrative flexibility to respond to new EPA regulations and to technological change. How should the boundaries defining who should be allowed to vote on the proposal be defined? This is an admittedly difficult political question which the state legislature would have to decide.

Assigning the right to refuse a risk externality to those who claim it, and exercising coercion only to the extent of requiring them to vote on legitimate offers to compensate them for accepting the risk, has several desirable properties in this case. The developer and the state have strong incentives to address the issues of most concern to the community, and the state's role is more consistent with its interest in the outcome. The community's incentive to be intransigent is minimized because it has the power to say no. The community is presumably protected from unwittingly accepting too great a risk because the facility would have to meet strict federal and state safety regulations. Moreover, the debate occasioned by the referendum should ensure close scrutiny of the developer's proposal. Paying for the compensation package transforms the hitherto concentrated costs on the local community into more equitably shared burdens that are borne by the ultimate beneficiaries of the facility. Finally, to the extent that this increases the costs of handling hazardous wastes, those who produce the wastes will have an incentive to engage in in-plant waste-stream modifications and resource recovery.

[3] If the developer or government is not trusted by the community to monitor the facility, the cost of a winning compensation package may be drastically increased. Monitoring by an outside agent, such as an environmental organization, might reduce the cost of the package's other elements.

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