

ESTIMATING AND COPING WITH PUBLIC RESPONSE TO  
RADIOACTIVE WASTE REPOSITORY SITING

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ABSTRACT

The siting, construction, and operation of a radioactive waste repository is likely to be controversial in the communities being considered and at the state and national levels as well. Public response can be conceptualized at two levels: (1) individual and (2) group or organizational. At the individual level, public response is the behavior of people motivated by their attitudes, knowledge, and perceptions of radioactive waste and its hazards and risks. Groups or organizations provide a structure to public response through which to pool resources and talents, set up a division of labor, hire experts, develop a skilled leadership, take legal action, and so on. A broad range of organizations is possible: ad hoc, existing community groups with an added purpose, nationally-recognized organizations, or government offices and agencies. Two cases of response to radioactive waste disposal sites illustrate these sources and kinds of response and suggest indicators to estimate the nature and level of response. Specific coping strategies take different forms, depending on (1) the nature and level of response (either supporting or opposing) to the proposed siting, (2) the past experience of community members with similar projects, with federal agencies, and with citizens' action groups, and (3) sources and accuracy of information individuals and groups have. All strategies are based on a policy of honesty and straight-forwardness, with a sincere effort on the part of site evaluators and decision-makers to be attentive and responsive to the public's concerns.

INTRODUCTION.

As a result of the publicity given to such incidents as Love Canal and the accident at Three Mile Island, public awareness of issues regarding radioactive and other hazardous waste has increased. A larger proportion of the public has some information--whether or not accurate--on health risks associated with the disposal of these wastes. Fears are expressed more often that accidents cannot be avoided or that our technology is not sufficiently advanced to transport and store the wastes safely. Citizens have always been concerned about the preservation of their social and natural environments, and now they are becoming increasingly knowledgeable and sophisticated in expressing those concerns.

This paper has as its purpose the identification of ways to estimate public response to the siting and operation of a radioactive waste repository and to cope with that response. By "cope", I mean to develop communications channels, to identify concerned and active citizens who should be informed of and involved in the siting process, and to incorporate ongoing interaction with the public from initial site considerations through operation of a repository. Estimation of response means understanding the most effective way to develop this communication in a particular community. Ideas and theory are drawn from the academic sociological literature to aid in developing these topics.

Four assumptions about repository siting underlie what is presented here. First, waste repository sites are likely to be chosen in rural areas where land is available, the natural conditions are appropriate, and the population is sparse. Citizens and local governments in rural areas are likely to be overwhelmed by negotiation with large state and federal agencies. Tension in communication may exist because of this fact alone.

Second, in many cases, local residents and officials have little technical knowledge about radioactivity and radioactive waste management. In general, they cannot acquire the knowledge quickly and cannot afford to hire advisors they trust. Thus, when the community is initially informed that its region is being evaluated as a possible repository site, local citizens and officials immediately feel at a technical disadvantage. No amount of effort and information from siting officials can erase these initial feelings.

Third, regardless of the amount of care taken and the amount of planning and evaluation done in a community, a few residents will never be satisfied about the siting process. Decision-makers should promote open communication and participation by all interested individuals and organizations, and reach solutions satisfactory to the largest group of actors possible.

Fourth, communication through organized groups (e.g., citizens action groups or local clubs) is likely to be more effective than with individuals. This point will be elaborated on later, but for now let it suffice to say that experience and resources (such as legal staff financing) are pooled in an organization. In addition, statements and actions will be understood better if they are made or done by individuals representing organized groups who act and speak in ways state and federal agents are familiar with: lawyers speak to lawyers, scientists to scientists, administrators to administrators.

ORIGINS OF PUBLIC RESPONSE

Public response, for the purposes of this paper, is any attitude, perception, or behavior developed in response to, directed towards, or produced by the siting of the repository, hereafter called the "project", the project decision-makers,

the site, or other activities related to the project. A response may be positive or negative, e.g., a silent change of an attitude or development of a new one by an individual; the signing of a petition, or the organizing of an information meeting by a group of citizens or a rally in support of or opposition to the project. The "public" may be an individual citizen, a large national organization, or a local public official. Although attitude changes alone are difficult to tap, especially when dealing with controversial and constantly changing issues, the crucial point in the definition of public response is that it is focussed on, or developed from, experiences with project-related activities.

#### Individual

Public response can be conceptualized at two levels: individual, and group or organizational. At the individual level, response to a project is motivated by individual attitudes and perceptions, where attitudes are defined as opinion or position on the project, and perceptions as an individual's idea of reality. Clearly there are relationships between these two concepts. Attitudes are formed on the basis of past experiences, input from others who are important to the individual, and the relationship between current project issues and past issues on which an individual has formed an attitude. The nature of an attitude about a particular project or project impact will depend on such factors as the publicity about the project an individual is exposed to, the pertinence of the issues to the individual's life (e.g., proximity of the project site to home or work place), and the attitude toward those in authority over the project.

Perceptions are a person's idea of reality. Like attitudes, they are based on past experience as well as education. Individuals--even experts on the topic--may perceive differently what the "facts" about a project are.<sup>1</sup> Perceptions are also affected by attitudes. The persistence of a perception of the "facts" is likely to be stronger and less influenced by new information supporting another view if the attitude on those "facts" is strong. For example, the stronger an individual's attitude toward exposure to radioactivity of any kind, the less responsive he or she will be to any new information supportive of the opposing viewpoint.<sup>2</sup>

Relative to the siting of a high-level radioactive waste repository, the issues and forms of individual response are based on: (1) knowledge about radioactive material and risks associated with it; (2) experience with other radioactive or hazardous waste disposal sites; and (3) proximity of the proposed site to the individual's community, home, or work place. Another factor may be the experience of individuals and officials in the community in dealing with state or federal agencies or even with site evaluations by large private operations. This factor, however, cuts across individual and organizational levels of response.

#### Organizational

Attitudes and perceptions also determine individual priorities of issues and impacts. However, there may be little consensus among individuals on those priorities.<sup>3</sup> This makes it difficult for the siting evaluators and decision-makers to synthesize the interests of individuals in order to incorporate them into the decision-making process. This is the point in the response process at which the group or

organizational level becomes important. The organization can bring order to the different attitudes, perceptions, and priorities of its individual members. Regardless of the process used (by fiat or democracy), members of the group or organization will develop a list of important issues and place some priorities on them. Whether priority is based on expected success or on importance to the members is not important. When the organization communicates the issues and priorities to the decision-maker, the process of synthesizing and incorporating public input is simplified.

Organizations serve other purposes as communication mechanisms for their members. By forming groups or organizations, individuals can pool financial resources, expertise, and employ a division of labor to take advantage of individual skills and their complementarity.<sup>4,5</sup> Leadership develops, tasks are allocated, and members speak at public meetings identifying themselves as representatives of the organization. The organization can increase its membership and the awareness of issues, because its spokespersons are sought by the media. It can acquire a legally recognized role as an "intervenor" in the project consideration process. And it can pool resources to support legal actions individuals may wish to take. Individuals can make their input to the response through the group and without taking on activities in which they are less skilled. The group context also offers a supportive environment for expression of views by an individual who may be reluctant to speak at a public hearing.

#### FORMS OF PUBLIC RESPONSE

##### Individual

Individuals have several alternatives for expressing their attitudes and perceptions of the project. These include writing letters, attending and participating in hearings, exchanging views with others, filing legal action or joining organizations, and so on. Individuals can also appeal to their political representatives and agencies. Individuals make personal decisions about the level of involvement and time to commit to the response, depending on their depth of concern and on their feelings of efficacy.

Any project as controversial as the siting of a radioactive waste repository will, in the course of media coverage and public meetings, expose citizens in the proposed site area to information about the technology of radioactive waste management. Participation - whether active or vicarious through media coverage - in the public hearings required in the scoping process will educate citizens about government agencies, their jurisdictions and decision-making processes, and about the steps involved. Environmental information may also be acquired. The experience of the local community with the project will contribute to the development of new attitudes and perceptions on these topics or perhaps cause old ones to be adjusted. These attitudes and perceptions may well endure to affect future experiences of these citizens in similar situations. Thus, not only will individual response to the repository siting issue be constantly evolving, but the experience in the siting evaluation process will determine future responses.

## Organizational

Organized group response may come in three ways: through the formation of new organizations focussed exclusively on the project; through existing organizations; or through political structures, e.g., state agencies. Organizational influence and involvement in the issue will also depend on the community's past experience with such cases. The more experience, the greater a group's ability to influence decisions.<sup>6</sup>

The formation of new organizations around the siting evaluation is a form of organizational response in itself. These organizations may be short-lived and ad hoc, existing only as long as the local site is under consideration, or, once established, they may adopt new purposes or expand their activities to a regional or national level once their tasks on the local siting are over.<sup>5,7,8</sup> People Against Nuclear Energy (PANE) is an example of a new organization formed in response to a local issue that has taken on the issue nationally.

Organizations in existence before the siting issue may also be part of the public response. They can be grouped into two kinds: (1) branches of national organizations oriented to issues that may be raised in a repository siting case, e.g., the League of Women Voters, the Sierra Club, or the Chamber of Commerce; and (2) local organizations which reorient or change their purpose to focus on project issues, e.g., Rotary clubs, church groups, or farmer's granges. The news media can also be considered a group of existing organizations that use their resources as vehicles for public response.

Finally, another group of existing organizations is found in the political structure: local, state, and national representatives and agencies. These organizations are already structured to gather and interpret public response (both individual and organizational) and to attempt to influence decision-makers.

Organizational response is also a dynamic process that will change over the period of evaluation of an area as a repository site. The changes will vary with the previous experience of a community with organized response.<sup>9</sup> Some communities will have citizens experienced in organizing ad hoc groups on other issues, e.g., a school bond issue; others will have experience only within existing community groups, e.g., a church or a Rotary club, or will have residents who are active in national organizations, e.g., the Sierra Club, and who can call on these organizations to guide their activities. Through a controversial issue such as siting a radioactive waste repository, citizens will learn effective ways of developing leaders, recruiting members, attracting attention, being heard, and influencing decisions. This experience can be generalized to other situations for the community and individuals.

### EXAMPLES OF RESPONSES OF TWO COMMUNITIES

Two examples of community response to the clean-up of existing radioactive waste disposal facilities illustrate the concepts developed in this paper. The two communities had different levels of previous experience with government agencies, utilities, and citizen action. The effects gained by their responses and experiences varied, depending on the previous experience, but also shared many common features.

As stated earlier, individual and organizational response is a function of (1) knowledge of radioactive waste management, (2) experience with large government agencies or outside organizations (in this case, utilities), and (3) experience with organized citizen action.<sup>9</sup> In both these examples, the public was opposed to leaving the wastes, even isolated appropriately, in its geographical area. In the case of one site, the local public recently had had experience with a similar project in a neighboring area. In this case, many citizens were applying what they had learned - about radiological waste and its disposal, about government agencies, and about participating in a protest. It was clear in the case of the experienced community that the citizens were informed about public participation in evaluations of a site, knew what meetings to attend, and how and to whom to address their concerns. They also began the interaction over the new project with a perception that no level of exposure was safe, a bias against the federal agency handling the project, suspicion that they would not be listened to, and perceiving that decisions on the management of the wastes had already been made. Their previous experience is an example of how a project can affect public attitudes, perceptions, and responses.

The other site is located near a large metropolitan area where many political, conservation, social, and other organizations were established and active. Although only a few of these groups had experience with radioactive waste issues or working with government agencies, many were focussed on citizen concerns such as nuclear power, the environment, or minority rights. Recruiting members, lobbying, petitioning, acquiring information, educating, and attracting media attention were not new to these groups.

The level of impacts of the projects on public attitudes and perceptions, and the kinds of responses, was different in the two communities because their baseline states were different. In addition, the effects of public response on these two projects are examples of what can happen without effective attention to and incorporation of the public in decision-making. Major changes have occurred in original clean-up plans. The community with experience on a similar project became more informed about radioactive waste and its disposal and transport. The schedule for clean-up action in this community was cut in half as a result of public pressure (including local and national congressional representatives), appropriately applied, to clean up wastes at various sites. The citizens wanted the wastes taken care of as rapidly as possible and, once they were assured the waste would be moved, eased the clean-up process considerably for the contractor.

Residents of the other community gained knowledge about radioactive waste and experience in interacting with government agencies and the agency decision-making process. The schedule for the clean-up action in this community, on the other hand, was slowed considerably as citizens and organizations gained this experience. Permits for water and power use necessary for construction work were denied. Citizens and political representatives used legal means to make good their demands for assurance about the safety of construction procedures and about the integrity of the maintenance of the facility before construction activity was allowed to begin.

## ESTIMATING THE NATURE OF THE PUBLIC RESPONSE

Techniques of estimating the nature and level of public response are not unlike those used in socioeconomic impact assessment. The techniques are mostly qualitative and estimation must be an ongoing process, as individuals and organizations acquire knowledge and experience and as interaction between site evaluators and the community develops.

Indicators of community members' knowledge and experience, and of which individuals and organizations will be most active in response and, therefore, most important to involve in the communication process, are drawn from earlier discussion. They are mainly measures of baseline experience. However, one new element is added: the community context of the siting decision. The context is a combination of two factors: (1) potential benefits and costs of a waste repository to the community, and (2) local or state regulations on siting of radioactive or other hazardous waste repositories and transport of the wastes. These factors will be important in determining the baseline from which site evaluators can begin their interactions. Estimation techniques are:

- (1) Prevailing attitudes and perceptions can be assessed through sampling of newspaper articles, editorials, and letters to the editor; votes in the past, community-wide or by political entities, such as a town council, on related issues; interviews with citizens and officials representing a range of opinions; and attendance at meetings and hearings. Transcripts of hearings on other issues can be useful in characterizing opinion and perceptions as well as identifying active local residents and organizations. Care should be taken to discover the range of attitudes, perceptions, and experience across the community.
- (2) Knowledge and experience of community members, groups, organizations, and officials about relevant topics can be discovered through questions to local officials on educational resources and on the proximity of the area to operations similar to the project. Examples of similar operations are nuclear power plants or other hazardous waste disposal sites. Local officials can also be asked about the existence of schools that offer educational programs on relevant topics, as well as on the general educational level and employment areas of community members.
- (3) Potential for organizing can be assessed through questions to local community leaders on activity on recent community issues (e.g., a school bond issue), organizations which arose around these issues, estimates of attendance at local political meetings (e.g., of the town council) and at project-related meetings, public awareness of the project, and extremity of opinions on the project. The reason for using these indicators is that the stronger the feelings on an issue and the more representation of different viewpoints, the greater the likelihood of organized activity.<sup>10</sup> In the example of the experienced community discussed earlier, these questions presented to local officials produced the evidence that revealed the high degree of past community organization and political activity related to a similar

project proposal and to several state ballot initiatives.

- (4) Existing organizations and their activity can be uncovered through direct questions on the existence of local chapters of national and common local organizations, and by checking local phone books. Participation and activity level of these organizations can be discovered by talking to officials of the organizations, by questioning members, and by reading transcripts of public hearings where speakers gave identity and membership figures of the organizations they were representing.
- (5) Community benefits and costs of the siting proposal can be estimated by standard socioeconomic impact assessment of repository construction and operation employment, population changes, and infrastructure impacts. A search of local and state regulations and relevant legal cases will establish the existing regulatory context and attitudes.

The techniques for gathering information on public response factors and community context are mostly common sense. Yet, in approaching a community to evaluate it as a possible waste repository site, this information is not to be overlooked. Too often, in legally mandated public scoping hearings (e.g., as required under the National Environmental Policy Act), agency representatives are ineffective in stimulating active and constructive community response because they have not done the background work on the communities. Information is presented inappropriately, important and influential individuals and community groups are ignored. This situation serves to frustrate rather than involve citizens in the decision-making process, and motivate them to respond negatively to all aspects of the siting evaluation and the proposal.

## COPING

All the measurements and theory discussed here are directed toward developing appropriate public interaction methods. The purpose of this interaction is to incorporate public input into planning and decisions regarding the siting of a waste repository. It will mean compromises and tolerance on the part of the public and evaluators and decision-makers.

The form and timing of interaction is based on individual, organizational, and community characteristics and experience identified in the estimation process. On a community-specific level, the following items are derived from the earlier discussion.

- As soon as influential citizens, groups, and officials are identified, involve them in the interaction process, e.g., invite them to meetings or send representatives to talk to them.
- If the community has little previous knowledge about radioactive materials and handling, an informational program should be developed. The program should be implemented through existing organizations, using knowledgeable and trusted local people where possible, and in "neutral" settings.
- Include interest group representatives, influential citizens, and local officials in the

evaluation of alternative actions and sites, and in actual decision-making.

- Use community organizations, both ad hoc and ongoing ones, to educate and inform, as well as to invite input from citizens.
- Recognize newly organized interest groups by including their leaders.
- Constantly update lists of citizens and organizations to communicate with.
- Provide accessible liaison between site evaluators and the public and media.
- Where extensive knowledge has not been developed, put technical information in lay terms, avoiding underestimating scientific skills of individual citizens.
- Keep political representatives informed.
- Show openness to news media.
- Acknowledge and respond to community issues and suggestions.

There are a number of policy-level rather than community-specific items cutting across all major siting decisions to keep in mind. These include:

- Attention to attitudes and perceptions.
- Development of some sort of education program.
- Avoidance of the stereotyped public hearing that has taken on the style of adversarial proceedings.
- Development of community interaction plans.
- Development of incentives for communities.
- Presentation of alternatives and proposals as early as possible and before any specific plans are made.
- Continuous updating of political representatives and officials about activities.

Throughout the estimation and coping process, one policy should predominate: straightforward, honest responses from all evaluators and decision-makers associated with the siting decision. If trust is not developed with community members, little constructive and representative interaction will take place. Citizens and local leaders must know by the statements and behavior of evaluators and decision-makers that community members are being told the technical "facts" as well as those facts are known, that uncertainties remain, that differences of opinion exist among "experts" and the reasons for those differences, that community members and organizations will have active, acknowledged, and real input to the decision-making, and that the public will be informed why a decision is made one way or the other on a site. Citizens and officials should be able to expect timely responses to their questions and admissions of gaps in knowledge.

For site evaluators and decision-makers, maintaining this attitude and honesty will require constant, unremitting effort based on ongoing informal and formal monitoring of and understanding of the community's knowledge and perspective relative to their own. This is not an easy task and goes beyond basic conformity to most laws which require public participation in government decisions. It may mean greater financial and personal expenses - hiring respected educators or experienced meeting

moderators, holding numerous meetings with individuals and groups, establishing phone information lines, submitting themselves to occasionally emotional questioning and interchanges. But, as shown in the two examples, the long-term costs may be less in terms of effects on the development of a site. If a spirit of honesty and cooperation can be developed early in the site evaluation process, the outlook for maintaining good community relations during construction and operation of a site will brighten considerably.

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