Colorado Department
of Public Health
and Environment

Trust and Conflict
in Public Participation

Division of Hazardous Materials and Waste Management
Colorado Department of Public Health and Environment
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by
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1. Introduction

1.1 Background and Research Objectives

The Hazardous Materials and Waste Management Division (the Division) of the Colorado Department of Public Health and Environment (CDPHE) is responsible for regulating solid waste treatment, storage and disposal and storage, transportation, treatment and disposal of hazardous waste. It assists in the cleanup of hazardous waste sites under the Superfund Program and encourages the redevelopment of contaminated sites known as "Brownfields." The Division also provides technical assistance to the regulated community and to local agencies that handle waste management issues. In the execution of these responsibilities, the Division interacts with members of the public who are affected by hazards to public health and the environment. Many interactions are constructive and may lead to decisions and activities that receive broad support. In several cases, however, conflicts arise which jeopardizes the effective and efficient execution of the Division's responsibilities.

This study was initiated in an effort to further the understanding of the causes of conflict between a government agency and the public and to provide information on the possibility of either preventing conflict or dealing with conflict more effectively through improved approaches to public participation. The overall research objectives of this study are defined as follows:

1. To identify and characterize perceived causes of conflict between government agencies, the Division in particular, and the public.

2. To determine how these causes of conflict influence approaches to public participation.

3. To bring together current research and theory relevant to the identified causes of conflict and public participation.

4. To make recommendations for improvements in approaches to public participation within the Division.

1.2 Research Methodologies

Initial conversations with Division staff about their experiences with public participation gave direction to this research and provided topics for inclusion in this study. Attending public meetings and observing exchanges during these meetings provided additional topics. These topics are included in the literature study and were discussed with participants in environmental clean-up projects in Colorado.

1.2.1 Literature Study

The first step towards achieving the objectives of this study was to provide an overview of relevant research and theory. For each topic, recent literature was reviewed and reported with the goal of providing the necessary explanations and recommendations.

Chapters 2 and 3 address problems that were mentioned during many of the initial conversations, and seem to be of concern in many projects in which government agencies and the public interact. The first topic, discussed in Chapter 2, is how to build trust in government. A lack of trust is perceived by both government staff and members of the public as a potential cause for conflict. Chapter 3 discusses the influence of public health and environmental risks (for instance, soil contamination) on communities and the perceptions of these risks by individuals. Research on these topics can assist government agencies in anticipating the reactions of communities and individuals to particular risks.

Chapter 4 addresses the general question: What makes a public participation program successful? Several researchers have developed methods for the evaluation of public participation programs. Their evaluations provide insightful information. In addition, several topics related to preventing or dealing with conflict in the context of public participation will be addressed.

1.2.2 Interviews

In order to provide practical examples of the theories provided by the literature study, and to learn from the experiences of members of the public and government staff with public participation, interviews were conducted with active participants in the following six projects in Colorado:

The Pueblo Chemical Depot is an Army storage facility for conventional and chemical munitions in Pueblo county. Activities at the site have caused pollution, which is affecting nearby, rural communities. Both the environmental cleanup and the storage and planned destruction of munitions require public participation.

The former *redfield riflescope manufacturing site*, currently owned by brown group retail, inc., Is a source of groundwater contamination affecting a residential neighborhood in southeast Denver. After the contamination plume was identified in 1998, discoveries in 2000 showed that the contamination was spreading and was affecting other areas of the neighborhood.

Rocky Flats Environmental Technology Site has a long history of, both formal and informal, public participation. For nearly 40 years, the U.S. government manufactured plutonium components for nuclear weapons at the site. Large quantities of radioactive and hazardous wastes are stored at the site, and there are several areas that are contaminated with radioactive and other hazardous materials. The current owner, the U.S. Department of Energy, offers a wide range of opportunities for citizens to be involved in decisions regarding environmental cleanup, waste management and decommissioning.

Past operations by *Shattuck Chemical Company* resulted in the contamination of soil with radium and other low level radioactive components. The site is located in a mixed residential and light industrial neighborhood in Denver. A decision, taken in 1992 by CDPHE and the U.S. Environmental Protection Agency (EPA), to treat the contaminated soil and leave it on site caused much controversy. The site has been the topic of sustained opposition by local residents against the 1992 decision.

The *Summitville Mine Site* was abandoned by its operator in 1992. An Emergency Response action by the EPA was necessary to prevent a potentially catastrophic overflow of cyanide-contaminated water. Subsequently, the EPA and CDPHE have been working together to ensure long-term cleanup of the site. Parts of nearby communities have felt left out of the decision-making process and have been very critical of these government agencies.

Finally, *Vasquez Boulevard & I-70* comprises several ethnically divers neighborhoods in northeast Denver. Elevated levels of arsenic and lead have been found in the yards of a number of residential properties. These may be residues from past smelting operations in the area. Community representatives have been involved in the cleanup of other nearby Superfund sites and are actively involved in the decision-making process at this site.

More than sixty participants in these six projects were interviewed. The results of the interviews are reported in Chapter 5 "*Public Participation in Practice.*"

The literature study and the interviews resulted in a number of conclusions and recommendations reported in Chapter 6.

The Appendix contains an overview of consulted literature and provides information in addition to the bibliography.

1.3 Key Terms of Reference
In this report, I use the term "public participation" to conform to the nomenclature of most of the modern literature reviewed. "Public participation" is the term generally used to indicate a discipline that develops theories and conducts research into involving the public in the government decision making processes. Within the Division, other agencies, and literature, a variety of alternative terms are used, including "community involvement," "community relations," and "public involvement."

Considering the divergent views of what public participation is supposed to accomplish, I have used the term to indicate any or all of the activities undertaken by a government agency to interact with citizens about decisions or activities in relation to specific threats to public health or the environment. The term is meant to include all activities that allow citizens to share their views and concerns and to allow those citizens to participate in the decision making process.

In discussing public participation, many references will be made to "the public" and "the community." I have used these terms to indicate the diverse collection of individuals that are or are deemed to be affected by an existing situation or future activities. The public and communities are made up of a large variety of individuals with specific experiences and ideas about risk, and their own sets of norms and values about the protection of public health and the environment.

Finally, I will use the word "hazard" to indicate danger or perceived danger posed by situations or activities involving hazardous materials. The use of the term "hazard" in this report is not necessarily the same as the definition of "hazard" used by Professor Sandman in his theory on risk. Sandman's definition and use of the term hazard will be explained in Chapter 4.

2. Trust in Government

2.1 Background

In almost all conversations with government staff and citizens, the lack of trust or a perceived lack of trust in government agencies was raised as a cause for conflict. Citizens mentioned specific decisions they felt had been wrong and had led them to doubt the motives of government. Some government staff showed frustration with the fact that they were perceived as the bad guys, even if they were acting with the public interest in mind.

The absence of trust can cause citizens to question many aspects of government decision-making, including the results of scientific studies, or an agency's assessment of a particular health or ecological risk and the consequent proposals for cleanup or mitigation. One study showed a strong relationship between political trust and the perception of risk posed by a nuclear waste repository (Pijawka and Mushkatel, 1991/1992). The study also showed that the greater the trust in government institutions, the lower the perceived risk associated with the nuclear waste repository.

Trust, once lost, is very hard to regain. Trust is fragile because of psychological tendencies to notice, believe and give more weight to trust-destroying than to trust-building information. In addition, social factors, such as the tendency of the media to favor bad news and of some special interest groups and individuals to encourage distrust in order to influence policy debates, feed distrust once it exists. In Slovic's (1999) words: "When it comes to winning trust, the playing field is not level." It is tilted toward distrust for the following reasons:
– Negative events are more noticeable than positive events;
– When events are well defined and come to our attention, negative events carry much greater weight than positive events;
– Sources of bad news tend to be seen as more credible than sources of good news;
– Distrust, once initiated, tends to reinforce and perpetuate distrust.

Considering the fact that trust may be lacking, it is understandable that scientific analysis of risks alone cannot allay our fears of such complex issues as low-probability catastrophes or delayed cancers. In the absence of trust, science (and risk assessment) can instead feed public concerns, by uncovering more bad news. To a certain extent, the mere fact that risk assessments are carried out can increase perceived risk, even if these assessments indicate an absence of risk (Slovic, 1999).

Research by political scientists shows that trust in government has declined since the 1960's. It is a societal trend that has been going on for decades and that affects other institutions, like science, organized religion and corporations, as well as government. Studying these societal changes, political scientists have suggested that cultural changes in our society and in our economy, poor leadership (Nixon and Johnson), the realignment of political parties and the more negative role of the media, are causes for the diminished trust in politics and government (Nye, 1997).

Whatever the reason, government agencies are often confronted with members of the public who are cynical or distrustful of the agency. The following sections report on theories addressing the question: How can we improve trust in government?

2.2 Trust in Government as a Function of Fiduciary, Mutual and Social Trust
Literature dealing specifically with the issue of improving trust in government is limited. Literature on trust and improving trust in general is extensive. Well worth summarizing in the context of this report is an article by Thomas (1998). He reviewed the broad literature on trust in the social sciences and generated a model to help us think about how public officials can produce, maintain, and perhaps even restore public trust.

Thomas observes that trust exists along a continuum: The more we calculate the intentions of others, expect something specific in return, and subsequently monitor their performance, the less we are exhibiting trust. Conversely, the more others take our interests into account, putting their own interests aside in the process, the more they are worthy of our trust. He outlines three concepts of trust that generally include these characteristics. These concepts are: fiduciary trust; mutual trust; and social trust.

Fiduciary trust is an important component of public trust in government. Fiduciary trust can be found in relationships in which an individual places trust in another to act in his or her capacity. For example, in principal-agent relationships when principals are unable to monitor or control the performance of their agents and are therefore vulnerable to malfeasance. Government agencies are to act in the interest of the public in carrying out their legal and statutory duties, and citizens must trust government agencies to do so. The fact that it is often difficult for citizens to monitor the performance of their agents in government causes trust to be easily lost and hard to regain.

Mutual trust is always interpersonal. Whereas a public agency can be the recipient of fiduciary trust, individuals develop interpersonal relationships based on mutual trust. Mutual trust exists on a continuum between blind faith and total distrust. This type of trust must be distinguished from cooperative behavior, which is calculated and self-serving. Cooperative behavior is based on an assessment that conditions are ripe to build a stable pattern of cooperation with each other. Whereas trust increases the propensity for individuals to cooperate, the existence of cooperation does not imply that individuals necessarily trust each other. Thomas suggests that an increase in mutual trust, developed between a citizen and a government agent, improves the fiduciary trust that citizen has in the agent and the institution that agent represents.

Social trust is a form of social capital, which a society gradually accumulates through the micro-level interactions of individuals and which then becomes a public good on which others draw. Although social trust is not something we think about in our daily lives, it nevertheless permeates and eases our day-to-day existence. Humans need to trust to reduce the complexity of even the most routine decisions. A world of distrust is essentially senseless because events appear atypical, causally indeterminate, and arbitrary in occurrence, without a relevant history or future or moral necessity. Because all possible contingencies would have to be accounted for at every step, and because human rationality is bounded, pure distrust is impossible outside of a hermit's existence, even for routine social interactions. Therefore, people come to trust in trust - the idea that trust is indispensable and that we can assume it is so regarded by others. Because social trust provides a requisite basis for stable, concerted interaction in a society, we can assume that some degree of trust always exists.

Based on his description of social trust, Thomas states that the relevant question is not: "How can we produce trust?" It should be: "How can we produce more trust and maintain the trust we already have?" In this theory of trust, the distrust of government agencies is mainly a problem of a lack of fiduciary trust in that agency.

Thomas goes on to identify three modes of producing more trust. Characteristic-based trust is tied to personal characteristics, such as family background and ethnicity. Given that humans need to trust to interact, personal characteristics are a simple method for deciding whether other individuals share similar background expectations. Because it is difficult to change personal characteristics, the most viable means for building characteristic-based trust is to socialize with persons possessing similar characteristics. Accordingly, agency managers could strategically place staff in specific positions, such that staff characteristics match those of the community.

Pursuing only a characteristic-based strategy for building public trust would be rather shallow, because individuals in complex societies do not invest much energy in a trusting relationship based solely on ascribed characteristics. Process-based trust is produced through repeated exchanges rather than through ascribed characteristics and, thus, emerges over time. Through repeated exchanges, expectations are created that will govern subsequent exchanges. Exchanges will become increasingly governed by norms that are geared to the preservation of the relationship between the actors.

The value of these exchanges is also important for the development of process-based trust. These goods include symbolic or social exchanges. In addition to offers of food, drink and gifts, symbolic exchanges include attendance of formal ceremonies. Although public officials are limited in their ability to participate in gift exchanges, ceremonial attendance at various social functions is feasible and is a productive means for building trust with specific groups in the agency's environment. High level officials, whose time is greatly valued, can instill a great deal of public trust with a single exchange, whereas individuals at lower levels of the hierarchy would have to rely on repeated attendance to build a similar amount of trust. The importance of repeated exchanges makes tenure longevity particularly important for building process-based trust. They should also keep in mind that the refusal of a symbolic exchange is a gesture indicating distaste for entering into a trust-building relationship and could be interpreted as a sign of distrust toward the giver.

The third and final method of building trust discussed by Thomas, is the production of trust through formal institutional processes, such as professional certification and government regulation. Academic and professional credentials serve as a signal that the agency adheres to the same standards and codes of conduct as others in the targeted community. Another means for producing institutional-based trust is regulation. Agencies can call for increased regulation of their activities, additional legislative oversight or monitoring by trusted institutions.

2.3 Building Trust Through Public Participation

What Thomas calls the institutional-based method of building trust provides an argument for the use of public participation as a method for building trust. Depending on the methodologies used, public participation can provide the means for oversight or monitoring of a government agency's activities by the public. Research by Kasperson, Golding and Tuler (1992) seems to support this argument. These researchers studied writings in the fields of sociology and social psychology on trust. Based on these writings, they describe the importance of trust for the relationship between government agencies and the public. Trust in government seems to be influenced by the general social climate, which structures the conditions under which institutions must operate for gaining or sustaining trust. Trust also depends on the performance of government agencies. This is illustrated by insights into the nature of *distrust*.

Distrust appears to arise from violations of expectations that people have in social relations. Distrust reflects the suspicion that violated expectations in one exchange may generalize to other transactions. Referring to the suggestion in literature that trust is hard to gain and easy to lose, Kasperson, Golding and Tuler conclude that trust is probably never completely or permanently attained, but rather requires continuous maintenance and enforcement. Drawing upon their review of writing they define "social trust" as a person's expectation that other persons and institutions in a social relationship can be relied upon to act in ways that are competent, predictable and caring (N.B.: this definition is different from Thomas' definition of social trust). Key dimensions of social trust are: commitment; competence; caring; and predictability.

Kasperson, Golding and Tuler apply their theoretical reasoning to initiatives to site hazardous waste facilities. They assume that high levels of social distrust will continue to confront these initiatives despite the best of efforts to restore trust. They list several reasons. The loss of social trust is a broad, fundamental societal phenomenon. The burden on social trust is unusually demanding in hazardous waste facility siting because of the inevitable technical uncertainty, expert disagreements and deep-rooted concern over risk. And while the dynamics of trust building are not well understood, it appears that the rebuilding process, once trust is lost, may require a lengthy process of confirmatory experience (this confirmatory experience is comparable to Thomas' explanation of a process-based method of building trust). In overcoming conflict over the siting of hazardous waste facilities, the approach should accommodate for the fact that the recovery of social trust is probably impossible within the time frame of the project. In such circumstances, the goal of a risk communication or public participation program cannot be the mere transmission of factual information, or the narrow aim of enlightenment, or the promotion of behavioral change. Instead agencies should seek broad public participation. The key task is to foster the growth of an environment in which exchanges of information and ideas can take place in a meaningful fashion, and interested participants can make their own evaluations and judgments.

Key elements in the design of a broad public participation program according to Kasperson, Golding and Tuler include the following five aspects:

− Conducting a needs assessment. The assessment must be sufficiently flexible and broad based to accommodate the full range of public concerns, which do not necessarily relate narrowly to risk and are often neglected in traditional, technical risk assessments. They include such issues as losses in property values and quality of life, erosion of the sense of community, disrupted social relations and stigma.
− Assessing the content of the debate. This content may go beyond even these broad issues of risk and impact, and include issues of public participation as a means to an end or as an end in itself.
− Designing the public participation process. This should explicitly recognize the levels of distrust that exist. The key to the design of a process geared to distrust is the sharing of power. Those who bear the risk need to be empowered in the management of the risk or facility.
− Designing the strategies and techniques. Since many different publics exist, a variety of strategies will be necessary to reach the full spectrum of social groups.
− Adopting an ongoing monitoring and evaluation system. In environments of high distrust, interpreting what is happening and how multiple interests are responding is highly problematic and prone to failures. Thus, it is essential to mount an ambitious program of participatory evaluation that begins even before the initiation of the program, so that appropriate baseline information and broadly agreed-upon procedures can be established.

It seems that such a program of public control over the process and the decisions implies monitoring of the government agency's activities and decisions by the public and would therefore contribute to institutional-based trust building (Thomas, 1998).

Literature on trust in government is limited and inconclusive as to what methodologies will have the effect of improving trust. The theories quoted above are based on extensive reviews of literature, but there is limited empirical data that either refutes or supports these theories. However, a study conducted by Covello and Peters (1996), using empirical data from a national survey, provides data about the determinants of trust and credibility in government agencies, industry and grassroots organizations. The study supports the hypothesis that trust and credibility are based on three factors: knowledge and expertise; openness and honesty; and concern and care. In relation to government agencies, the study shows that trust and credibility in government are especially influenced by a show of commitment. Commitment in this study is understood as commitment to a goal (for instance, commitment to protecting public health). In turn, commitment to a goal is dependent on perceptions of objectivity, fairness and information accuracy.

Sandman (in Davies, Covello and Allen, 1986) supports an approach of broad public participation based on his observations as a risk communication researcher and consultant. He thinks it will provide for an effective way of communication in the face of high levels of distrust. He makes the following comment:

> "In a sense, when we ask to be trusted, we are really saying, "Listen carefully and do whatever we say." Well, if people are going to do whatever we say, they do not have to listen carefully. When the public has power, an opportunity to meaningfully contribute to a decision as to what is to be done, then it becomes extraordinarily good at understanding probability and uncertainty, at grappling the complexities of risk. In asking to be trusted we make a serious mistake. If we would trust the public more and ask to be trusted less, citizens would understand a great deal more of what we have to say."

Further support for building trust through public participation can be derived from a study by Berman (1997). However, his study was limited to local governments and is based on interviews with city managers and chief administrative officers. Berman found that cities that use strategies to inform citizens about what the city is doing to help citizens (rather than to harm them or be indifferent), and incorporate citizen input into public decision-making (public participation), generally have a less distrustful citizenry than cities that do not apply such strategies.

In addition to this limited number of academic studies, an examination of the experiences of the U.S. Department of Energy yields information about improving trust in government agencies. The U.S. Department of Energy (DOE) has faced much public opposition, especially in relation to managing nuclear waste. Several studies indicate that a lack of trust has been a key component of public opposition to DOE activities (for instance, Pijawka and Mushkatel, 1991/1992, on the proposed siting of the high-level nuclear waste repository at Yucca Mountain, Nevada).

2.4 Department of Energy Investigation into Public Trust

In an extensive study of causes of public distrust, the Task Force on Radioactive Waste Management (Secretary of Energy Advisory Board, 1993) investigated how DOE might strengthen public trust and confidence in its radioactive waste management activities.

The Task Force states that public trust and confidence are generally essential for agencies to effectively carry out their missions. It also notes the fundamental argument that trust and confidence make a central contribution to sustaining the legitimacy of public organizations within the American system of governance.

One of the Task Force's findings was that the existing lack of trust and confidence was a direct consequence of various publics' experiences with DOE. It was not an irrational reaction nor could it be discounted merely as a manifestation of the "not-in-my-backyard" (NIMBY) syndrome. The Task Force expected that this distrust would continue to exist for a long time, and would require sustained commitments from DOE leadership in order to overcome this distrust. Measures to strengthen public trust must be an outgrowth of agency-wide recognition that most programmatic choices have consequences for institutional trustworthiness. These measures cannot be a mere add-on to existing programs. The Task Force noted that the existing lack of trust forced DOE to act in ways that consistently and unambiguously demonstrate an interest in strengthening trustworthiness. This may not appear cost-effective, and may not be necessary for organizations that have sustained trust and confidence.

The Task Force advanced an elaborate set of detailed recommendations. Many are specific to activities of DOE. The following recommendations, however, may be useful to other agencies. The recommendations are divided in recommendations for interactions with external parties, and recommendations for internal operations and programmatic choices.

The relevant recommendations for interactions with external parties can be summarized as follows:
−   Early and continuous involvement of state and/or local advisory groups as well as advisory bodies on which a broad range of stakeholders is represented. That involvement should be characterized by frequent contact, complete candor, rapid and full response to questions, use of at least some suggestions and assistance in increasing the technical and oversight skills of the community;

- Carrying out agreements unless these agreements are modified through an open process established in advance;
- Consistent and respectful efforts to reach out to state and community leaders and to the general public for the purpose of informing, consulting and collaborating with them about the technical and operational aspects of agency activities;
- Active, periodic presence of very high-level agency leaders making themselves visible and accessible to citizens and their representatives; and
- Assuring the availability of negotiated benefits for the community along with the resources to affected host and corridor communities that might be needed to detect and respond to unexpected costs.

These recommendations are consistent with Thomas' (1998) theory on building trust through repeated, symbolic exchanges and with Kasperson, Golding and Tuler's (1992) theory on creating a workable environment through broad public participation in situations of high distrust.

The recommendations for internal operations and programmatic choices can be summarized as follows:
- Maintain a high level of professional and managerial competence, continually honed by rigorous training;
- Establish and meet reasonable technical performance measures and schedule milestones that are dictated by a project's intrinsic scientific requirements;
- Pursue technical options and strategies whose consequences can be persuasively communicated to broad segments of the public;
- Reward honest self-assessment that permits the organization to get ahead of problems by identifying them and airing them and resolving them before they are discovered by outsiders;
- Develop tough internal processes that include stakeholders for reviewing operations and discovering potential and actual errors; and
- Institutionalize responsibility for promoting and protecting the internal viability of efforts to sustain public trust and confidence throughout the organization.

These recommendations provide more detailed examples of what Thomas (1998) calls: institutional methods of building trust.

One of the broadly applicable aspects of the Task Force's recommendations is the necessity for complete candor and rapid and full response to questions from the public, non-governmental and other organizations. The Openness Advisory Panel reports on Responsible Openness (1997) and Community Relations (draft, 2000) further explore the necessity of openness and the necessity for good relationships with communities neighboring DOE facilities. In "Responsible Openness," the Panel lays out a concept of openness that requires narrowing the scope of classified information, improving document control systems and methods for information dissemination and the development of a culture in which openness is a core value.

In its Community Relations Pilot Review Report (Draft Report, 2000), the Panel assesses how DOE is perceived as a neighbor, what it is doing well, and what it can do better in its approaches to community relations. The report emphasizes the importance of good community relations, because it can help DOE achieve its missions. The report relates several examples of methodologies that were used to address the legacy of public distrust in DOE. These methodologies included: the use of independent expert review and analysis; being responsive to all elements in the community and avoiding the temptation to exclude those who are critical and distrustful; establishment of advisory groups (see also: Federal Facilities Environmental Restoration Dialogue Committee, 1993); and learning to trust the community.

2.5 Concluding Remarks

Although it seems likely that government agencies will be facing public skepticism, both theory and practice reveal ways of working with a distrustful public and suggest approaches that can assist agencies and project management in building trust. This is not to say that these approaches do not have problems of their own. For instance, in relation to increased openness and early participation by the public, Kasperson, Golding and Tuler (1992) indicate that scientific research often proceeds through incomplete results, false starts and gradually developing databases, which could affect citizens' trust in a government agency's capability or competence, especially if scientific uncertainty remains. However, researchers and experts seem to agree on the fact that past practices of secrecy and excluding the public from decision-making have contributed to existing levels of distrust. It seems, therefore, worthwhile to attempt to implement the suggested approaches to improving trust in government agencies.

The issue of trust in government will be mentioned in several of the following chapters. The next chapter, however, deals with potential causes for conflict of a different nature, namely the differences of impact of environmental hazards on individuals and communities, and the related differences in individual opinions and values.

3. Relevant Characteristics of the Community and its Citizens

This chapter provides information on the causes of differing characteristics between communities affected by existing hazards and those threatened by proposed hazards, and it provides information on different perceptions of and reactions to hazards and risks by individual citizens. The information provided in this chapter will assist in anticipating and understanding the reactions of a community and the reactions of individuals to particular types of risks. This information will also be helpful in understanding the importance of topics, such as "conflicts concerning risk" and selecting participants in a public participation process," which are discussed in relation to public participation (Chapter 4).

3.1 Sociological Effects of Contamination and Other Types of Hazards
In anticipating the reactions of a community to a certain hazard, and in assessing the need for broad public participation, research by Couch and Kroll-Smith (1990, 1994) is illuminating. They compared the effects of two different types of environmental or technological hazards on two communities. Both communities were comparable in the sense that they were rural communities, were similar in size, and similar in economic development. The first community, Centralia, PA, was threatened by an existing underground coal mine fire, which caused a serious environmental and public health hazard to the community. The other community, Beaver Township, which is 27 miles north of Centralia, PA, was confronted with the proposed siting of a sanitary landfill.

The existing hazard in Centralia caused severe divisions within the community. These divisions eventually led to the development of eight grassroots organizations that were strongly opposing one another. The divisions within the community were caused by the following circumstances:
1. Because many toxic agents are invisible to the senses and are carried by groundwater, surface water channels, wind and so on, exposure pathways are not likely to affect everyone in a community in the same way. In Centralia, the differential impact of the hazard caused neighbors to experience and interpret the same world (our community) in divergent ways.
2. While perceptions of threats are individual reactions to possible dangers, threat beliefs are socially constructed responses that receive the sanction and power of group creation and reinforcement. The high degree of uncertainty embedded in these hazards ensures that people will attach variable meanings to any number of cues in an attempt to make sense of their experiences with the hazard. When several interpretations of warning and threat signals are present in a community at one time, people are likely to seek out others whose interpretations are similar to their own. As a consequence, intensely-held opposing beliefs are created, which are likely to set in motion a process of destructive conflict within the community. The authors expect that this type of conflict is probably typical of all contaminated communities.

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3. The existence of multiple opposition groups encourages members of these groups to avoid members of other groups and to rely almost exclusively on one another for support. With high activity among like-minded believers and low exchanges with other groups, few people have a chance to survey the range of interpretations and responses others hold about the crisis.
4. It is likely that each opposition group seeks support outside the community. A group concerned with the threat to the environment, for instance, may seek sponsorship from a regional or national environmental organization. The authors point out that national organizations in contamination cases tend to underestimate the degree of community conflict inherent in the situation and mistakenly think that the victim group is representative of the community at large. Its involvement can amplify the animosity between this group and other community organizations.

Beaver Township had to deal with a different situation. Confronted with the proposal of the Beaver Valley Development, Inc, to site a sanitary landfill on township property, the community expressed concerns over the potential effects of the landfill on a nearby wetlands, over the increase in traffic and over the capability of the Beaver Valley Development company to build and safely operate a sanitary landfill. These concerns were shared by both the Township Board of Supervisors (TBS) and a large number of local citizens. Several citizens formed a grass-roots group (SOIL - Save Our Innocent Land), which grew from 7 to 404 members representing approximately 56 percent of Beaver Township's population in a matter of weeks. SOIL raised more than $ 10,000.00 to hire attorneys and experts. The collaboration between the TBS and SOIL proved effective in stopping the siting of the local landfill.

The cause of this different reaction and conflict pattern in the Beaver Township community can partly be attributed to the physical properties of the hazard, and the associated appraisal of danger by the community. In Beaver Township the hazard was not physically present in the community. The danger of the siting of a landfill is assessed in the context of existing stability in the community and the community's physical environment. It is the protection of that relatively stable system from an outside threat that serves as the basis for the construction of risk. It is characteristic of siting disputes that a majority of residents perceive the dangers of the proposed change in strikingly similar terms. Thus, a broadly shared threat-belief system develops that is representative of the community's beliefs. The process works towards community unity, not conflict within the community. "We" versus "them" becomes the community versus the outsiders, not one community group versus another.

The examples for the Couch and Kroll-Smith study were taken from small, rural communities, where the sociological impacts or potential impacts of the hazards were very serious. The authors indicate that the implications in an urban community may not be as severe, because the citizens in a city tend to depend less on one another for help in cases of serious threats to the community. In general, urban residents have better access to various levels of government that can provide help in addressing environmental problems.

Nevertheless, this research shows the potential differences in communities, depending on the type of environmental hazard they are confronted with. Its implications for public participation are clear: in cases of existing contamination, there is the potential for a strongly divided community and internal conflict over the appropriate actions to address the problem at hand. Such situations would call for strong and sustained efforts to seek out the different concerns and interests existing in the community, and there may be a need for a conflict resolution and consensus building approach to public participation. Conversely, in the face of strong opposition by a unified community, there may be a need for an approach that shares power and builds trust, an approach that has been shown to provide positive results in disputes over hazardous waste facility siting (for examples see: Aronoff and Gunter, 1994).

Couch and Kroll-Smith (1994) suggest that intervention strategies in contamination cases should focus on preventing destructive social conflict and community breakdown where possible and on healing social and cultural, not only environmental, wounds during recovery.

3.2 Individual Attitudes and Behavior Concerning Risks
The previous section dealt with the effects of contamination or other hazards on the structure of a community. The following section looks into research on individual responses to contamination. The existence of widely divergent opinions of risks between scientists and lay-persons, but also among scientists themselves, and among lay-persons has been shown by a number of studies. The extensive body of research on risk perception is particularly relevant to this topic. Risk perception research provides insight into the causes of conflict over the danger of particular activities to public health and the environment.

Risk perception research builds on the theory in psychological research that individuals use certain mental strategies to make sense out of an uncertain world. This research has shown that people use a number of mental strategies to judge risks, including the risks posed by contamination or other technological hazards. Some of the relevant mental strategies (as described by Farago, 1999, Gowda, 1999, Renn, Webler and Kastenholz, 1996, and Slovic, 1993 and 1987) are:
- *Availability* - people judge the probability of an event based on the easiness with which they can recall or imagine it. It is not the frequency of an event that determines this method, but rather the vividness of the event or the recentness of its occurrence which makes it seem more likely.
- *Overconfidence* - this results in people being unwarrantedly confident about their own judgments. It means that people do not realize how little they know and how much additional information they need to make a sound judgment about risk. This bias affects expert judgment as well, for example exaggerated faith in scientific knowledge, failure to recognize the role of human error and human response to safety measures.

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- *Desire for certainty* - risk includes uncertainty, and uncertainty entails anxiety. To reduce anxiety, people tend to deny it, selectively choosing and evaluating evidence.
- *Anchoring effect* - probabilities are adjusted to the information available or the perceived significance of the information.
- *Avoidance of cognitive dissonance* - information that challenges perceived probabilities that are already part of a belief system will either be ignored or downplayed.

Using this theory on mental strategies, researchers have attempted to find out what makes people think of a particular activity or event as high or low risk, in other words: how do people perceive risk. Slovic (1987, 1993) found that several factors, which he grouped into the categories, "dread risk" and "unknown risk," determine whether an activity or technology is perceived as hazardous. A "dread risk" means that people have a perceived lack of control, they dread the consequences (for instance, cancer, death), the risk has catastrophic potential, and the costs and benefits are inequitably distributed. An "unknown risk" means that the hazards are judged to be unobservable, unknown, new and delayed in their manifestation of harm. When an activity or technology is perceived as a "dread risk" and an "unknown risk," it is perceived as very dangerous and very bad. People want that risk reduced. Risks associated with hazardous materials possess many of the characteristics of dreaded and unknown risks. Writers in the fields of risk perception and risk communication widely accept these factors as determinants of a lay person's perception of risk. Based on the findings of these researchers, conflicts between citizens and government experts over the seriousness of a particular risk are viewed as caused by differences in risk perception. Where scientists' judgments of risk seem to be in line with the scientific risk assessment of determining probability and magnitude, lay people take into account a large number of other aspects as well. Several authors, for instance Cutter (1993), Daggett (1989), Farago (1999), Hadden (1989), and Sandman (1989), have expanded the literature on risk perception and illustrated its applicability in cases of controversy over technological risks.

There are several other causes for differences in risk perception, which are related to gender, world views, and socio-economic circumstances. Research quoted by Slovic (1999) shows that white women, African-American and Hispanic men have similar perceptions of environmental risks. A sub-group of white men, however, showed a considerably lower perception of the same risks. These findings could indicate that the differences found depend on socio-economic status. The sub-group of white males possibly sees less risk in the world because they create, manage, control and benefit from many of the major technologies and activities. Perhaps women and non-white men see the world as more dangerous, because in many ways they are more vulnerable, because they benefit less from many of its technologies and institutions, and because they have less power and control over what happens in their communities and their lives. Other researchers, however, theorize that there may be a biological cause for the noted differences (Bennett, 2000).

World views and political beliefs also affect an individual's perception of risk. Research has shown that world views are strongly related to perception of risk. Individual values and world views are influenced by cultural biases. Dake (1991) identifies the cultural biases of "hierarchy," "individualism," and "egalitarianism" as having an important impact on individual attitudes towards risk. For example, those holding an egalitarian view are more likely to oppose nuclear power, while those holding an individualistic view are more likely to support nuclear power (Cutter, 1993, Slovic, 1999).

An example of research indicating that values and worldviews are active in shaping responses to risk, is a study reported by Poumadere (1995). He reported on the results of a large study of risk perceptions in the USA and France (1500 subjects in each country participated in the study), which showed that risk perceptions in the two countries were highly similar. Risks posed by radioactive wastes, AIDS, street drugs and tobacco were associated with similar levels of risk by participants in both countries. However, considerable attitude differences were shown to exist. French respondents were significantly more apt to agree that "Health risk decisions should be left to the experts," that "I have little control over risks to my health," and that "We can trust the experts and engineers who build, operate and regulate nuclear power." Thus, similar degrees of nuclear risk perception were measured, but differing degrees of acceptance and political response to the nuclear power program existed.

There is research that shows that employees of polluting firms have a lower perception of risk than others do (Roberts, 1997). However, there is little research about the effect of these employees on their families' and the community's risk perceptions.

In a study of available research on the link between ethnicity and risk perception, Vaughan and Nordenstam (1991), did not find conclusive evidence that the perception of risk posed by hazardous waste contamination is different among ethnically diverse groups. Their study showed that socio-economic status was the primary determinant of perception of risk presented by air and solid waste pollutants. Poverty was found to be the variable most prominently associated with heightened risk perceptions.

Another relevant factor that influences public attitudes is the distance between the hazard and the public. Distance, of course, has a direct bearing on the objective risks that the public is exposed to during and/or immediately following a hazardous event (the closer to the plant, the greater the risk). In addition, known or estimated distance serves as a psychological method for judging risks and individual vulnerability to the threat. The closer a person lives or works to the hazard, the higher the perceived risk associated with the hazard is (Cutter, 1993).

The results of risk perception research reported in the previous paragraphs illustrate the influence of many factors on public attitudes to risk. However, research on how these perceptions of risk influence behavior is limited (Cutter, 1993, Lober, 1995). Cutter (1993) states that in the social psychological research all too often no correlation is found between attitudes and behavior. Behavior appears very hard to predict.

Lober's study of attitude and behavior in relation to a dispute over the location of a recycling center (1995) provides some insight into the relationship between attitude and behavior. Lober attempted to determine who will respond to a proposal to locate a potentially hazardous facility, why these people will respond, how they will respond and how this response differs from attitudes. His study did not set out to determine whether the attitudes produced the behavior or the behavior produced the attitudes.

Lober showed that people who live closest (within .5 miles in this case) to the proposed location for a recycling center are more likely to sign a petition against the location, join an action group or attend public meetings than those living further away. He also showed that those who perceive the decision making process as fair are less likely to sign a petition against the facility, join an action group or attend a public hearing. Lober also found that attending a public hearing is a different political action than signing a petition or joining an action group. The latter two activities are closely related to direct costs feared by the individual (such as noise and property devaluation). Attending a public hearing is correlated with a need to obtain more information on the proposed plan and with a feeling that the decision making process is not fair, in addition to direct costs feared by the individual.

In his study, Lober found that negative attitudes towards the location of a recycling center decline much less quickly with distance than behavior would suggest. Lober concludes that, although people who live further away may not sign petitions, join an action group or show up at public meetings, they may still be opposed to locating a potentially hazardous facility in their community. This means that policy that responds only to antagonistic behavior and not to public opinion may underestimate the degree of opposition by the public.

Furthermore, Lober's research showed that opposition to a proposed hazardous facility is not strictly determined by perceived costs to the individual, such as noise and property values. Other values, such as trust in local government, perception of fairness of the process and perception of need for the facility play an important role in determining both attitudes and behavior. Unfortunately, Lober's study does not provide insight into what a fair process would be.

Considering the differences between communities dealing with an existing hazard and communities facing a proposal to locate a potentially hazardous facility in their community, the results of Lober's research may not be fully relevant to the former situation.

The research reported here provides much information that can help predict the public's attitudes and behavior concerning risks to public health and the environment. It underscores the importance of getting to know the characteristics of the public that is affected by a specific hazard in order to have an effective risk communication and public participation program. Much of this research has been influential in the development of theories on how to deal with conflicts over the nature of risks. These theories and their practical implications will be discussed in Chapter 4, which deals with public participation. In the context of this chapter it suffices to note the potential differences in risk perception between government staff and citizens, and among government staff and citizens.

3.3 Psychological Effects of Contamination

Research reported in the preceding sections shows that contamination can cause divisions within the sociological structure of communities and individuals may have quite divergent attitudes and opinions about the risks associated with the contamination. Contamination can have further psychological and physiological effects on individuals. Research conducted about the Three Mile Island accident found elevated levels of psycho-physiological effects from stress in the people living near Three Mile Island (Tucker, 2000a and 2000b). The psychological effects found in many community members included elevated levels of psychological distress, feelings of perceived threat and subclinical anxiety and depression. The physical signs of increased stress consisted of small increases in blood pressure and higher than normal levels of urinary cortisol and norepinephrine metabolites, which are indicators of physical arousal due to psychological stress. This pattern of subclinical and physical symptoms of stress remained elevated for six years after the incident and only returned to normal levels after 10 years. The same researchers looked at this pattern of chronic stress in a community located near a hazardous waste site. The findings were the same. Subsequent research carried out by researchers in California and Texas indicated that experience of exposure to hazardous substances and the resulting psychological changes might result in adverse physical and psychological health effects (referred to by Tucker, 2000a).

The critical factors and underlying causes that result in these types of effects from stress are still not understood. The research done at Three Mile Island and at the toxic waste sites and spills concludes that the effects may be largely related to event characteristics and the individual responses. These responses can range from little concern to extreme agitation. Individual reactions are affected by many factors, including the event itself, the imagery associated with the episode, media coverage, and the individual's circumstances, including his or her perception of the situation, appraisal of the degree of threat and perceived sense of control over the circumstances.

Further research is being conducted into the psycho-physiological effects on communities affected by contamination. The implications for public participation are not quite clear, but Aronoff and Gunter (1994) did find that in communities where a technological disaster has occurred, top-down government interventions disenfranchised residents and produced greater stress than the disaster event itself. Taking an approach to public participation as suggested by Aronoff and Gunter (reported in Chapter 4) should prevent the unwanted outcome of increased stress due to the approach taken by a government agency responding to a technological disaster.

Both risk perception research and research on psychological effects of contamination show the considerable differences among individual reactions to a case of contamination or other risks to public health and the environment. These different views and reactions indicate a potential for conflict that should be taken into account when designing a public participation program.

4. Public Participation

4.1 Background

Many government agencies have experience with public participation programs, and many innovative approaches to public participation have been suggested and implemented. However, many questions as to the most effective methodologies for public participation remain, and there seems to be a general need for more systematic knowledge about keys to making public participation successful. Despite the widespread interest in public participation, no consistent method has emerged for evaluating the success of individual participatory processes or the desirability of the many participatory methods concerning environmental issues. Consequently, there is little systematic knowledge about what works in public participation (Davies, 1998, National Research Council, 1996, Kasperson, 1986).

This chapter describes different approaches to evaluating public participation programs, and examples of results of these different approaches. Furthermore, research that may provide insight into specific components of a successful public participation program will be discussed.

4.2 Evaluating Public Participation Programs

Davies (1998) suggests two barriers to consistent evaluation of approaches to public participation. The first is a lack of consensus on what public participation is supposed to accomplish. Are participatory programs intended to empower disenfranchised groups or to make it easier for government agencies to implement their programs? Is a program successful if it simply involves more of the public, or should it have to result in demonstrably better decisions?

A second barrier arises from fundamental differences of opinion on the nature of democracy. Most people would not dispute that, in a democracy, citizens have a right to participate in the decisions which affect them. However, there are wide-ranging views on what form that participation should take. Should the public participate directly (through referenda, for example)? Does the involvement of interest groups in decision-making adequately reflect public concerns? Are surveys and focus groups sufficient for allowing government managers to make decisions that are responsive to public opinion?

Different perspectives on the nature of democracy and the purpose of participation have led to divergent approaches to evaluating participatory programs. To encourage further thinking about evaluation of environmental public participation programs by government agencies, Chess (2000) discusses some of the basic issues related to evaluating public participation programs.

Chess identifies three general forms of evaluations and reasons for carrying out evaluations that follow from each form of evaluation. Summative evaluation is the evaluation of a program after its completion to judge whether the public participation program furthered progress towards environmental results (for example, better clean-ups), and satisfaction of the participants.

Formative evaluation is aimed at improving programs in progress. They provide managers with feedback during program development and implementation. Formative evaluation considers complex issues such as how well agencies are cooperating, where resources are flowing and how implementation differs among sites. This kind of evaluation can also look at more obvious concerns, such as the relationships among stakeholders, perceptions of agency communication, the effectiveness of meetings, etc.

Impact evaluation is used for accountability and focuses on long-term results of programs and has the potential to inform policy decisions and track social learning. Such an evaluation is more difficult to conduct because of cost, need for commitment over an extended period of time and the problem of showing results from the public participation program under evaluation when there are many variables at play.

What should be evaluated? An evaluation can explore how public participation activities take place (the process), or it can assess the results of the public participation processes (the outcome). Whether evaluating process or outcome, defining process or outcome goals is highly contentious. Public participation goals are often difficult to define in clear, specific and measurable terms, and there is no general agreement about what the goals should be. Evaluators have tried a variety of approaches to deal with the difficulty of defining goals, including user-based evaluation, theory-based evaluation and goal-free evaluation.

The premise of *user-based evaluation* is that different participants will have different goals. Instead of trying to reconcile these goals researchers have developed evaluations based on a questionnaire that includes the conflicting goals of citizens and agency staff. Other researchers selected goals that reflect consensus or majority views.
Theory-based evaluations rely on criteria that are based on theories and models to evaluate public participation efforts.
Goal-free evaluation is designed to gather information on the program effects and effectiveness without being constrained by a narrow focus on stated goals. It assesses needs and effects, seeks payoffs from well-designed research aimed at problem-solving, and is policy-oriented rather than theory-oriented.

Who should carry out the evaluations? Some researchers are of the opinion that evaluations should be carried out by outside observers with as little involvement of agency staff and citizens as possible. Interaction with project participants would lead to bias in the evaluation and loss of validity. Other researchers take a perspective in which agency staff and citizens are actively involved in the design and implementation of the evaluation. This approach would lend credibility and usefulness to the evaluation because the diverse needs of participants are more likely to be fulfilled.

Given that public participation practice is still not well-defined, Chess suggests a form of evaluation she calls "adaptive participation," comparable to adaptive management. According to the concept of adaptive management, because our understanding of ecosystems is imperfect, interactions with nature should be viewed as experimental. If we assume that variables tied to participation in environmental management are at least as complex, uncertain, and poorly characterized as variables that explain ecosystems, there will be a similar need for explicit innovation, evaluation and change in management of participatory processes. Thus, evaluation of public participation practices should be part of on-going program improvement. This recommendation is partly based on experiences quoted by Chess, that suggest that evaluations do not lead to programmatic cures. Instead, smaller elements of programs are more likely to change incrementally and in ways that may be difficult to detect.

Part of the evaluation of "adaptive participation" is evaluating community interests and agency interests, evaluating process and outcome, evaluating theory-based criteria and goals articulated by stakeholders, sponsors, and agency staff and combining studies conducted by academic observers with evaluations by stakeholders, sponsors and agency staff participate.

Finally, Chess suggests collecting data as part of routine implementation, using a computerized template to minimize reporting burden, and these data (for example, numbers of participants at meetings, minutes of meetings, names of stakeholder groups, etc.) could provide a beginning for researchers' evaluation of public participation efforts.

The different methods for evaluating public participation programs, described by Chess, have been put into practice by researchers and government agencies alike. The results of these evaluations lend valuable information, and are discussed in the following section.

4.3 Results of Evaluations of Public Participation Programs

This section describes the results of several evaluations of public participation methodologies, to illustrate the use of different types of evaluations and to learn from the results of these evaluations. The results of four evaluations will be described: a User-Based Evaluation carried out by Rosener (1981), two examples of Theory-Based Evaluations, and a Goal-Free Evaluation carried out by Aronoff and Gunter (1994). The first example of a Theory-Based Evaluation uses a "social goals" framework, and was selected because it is currently being applied to evaluate a large number of public participation methodologies in the U.S. The second example of a Theory-Based Evaluation, based on "fairness and competence," is presented here because it provides a good example of the work of researchers in the U.S. and Europe, and offers insight into the results of experiments with novel approaches to public participation.

4.3.1 Results of User-Based Evaluation

Rosener (1981) developed a user-based evaluation to evaluate "task-oriented workshops" that were used by the U.S. Army Corps of Engineers (the Corps) at two different sites. The task of the workshops was to determine whether or not the district engineer should issue a "general permit" for development in a specific wetland area over which the Corps had jurisdiction. The Corps felt that the workshop environment would allow for the kind of interchange that could produce consensus among the affected parties, including developers and environmental groups. At least it would increase participants understanding of the "general permit" concept. A unique aspect of the workshops was that the Corps actually shared decision power with the participants by agreeing to have the workshop participants write the general permit, should one seem appropriate, and the conditions that would be attached to it.

The evaluation was set up to find out if the workshops were an effective way to involve citizens in the Corps' regulatory decision-making process. A second purpose of the evaluation was to find out if this approach to evaluation would yield information about participatory effectiveness that was comparable and generally applicable.

The evaluation of the workshops was based on the notion that in order to generate reliable data, it is necessary to have clearly stated participation goals and objectives and a way to indicate a relationship between their achievement and the participation being assessed. A sample of prospective participants was surveyed prior to the workshops to ascertain goals (defined as "general, abstract, desired ends") and objectives (defined as "concrete, specific achievements"). Using the information gathered from initial interviews, a questionnaire was developed that required workshop participants to identify their goals and objectives prior to the workshop. Then, at each workshop participants filled out questionnaires providing data on whether or not they felt their goals and objectives were being achieved. Data were further gathered by observing the workshops and analyzing the content of Corps documents before, during and after the workshops.

It should be noted that this evaluation methodology implies that goals, and the values underlying them, are static. This is not necessarily so. Goals and values change as participants learn about the reality of goal achievement. Nonetheless, in this evaluation it was thought that assessing the achievement of the original goals of the workshop participants provided a measure of the perceived value of the participation.

The evaluation of both sets of workshops showed that different groups of participants had different goals and objectives. Using the user-oriented methodology clearly delineated the differences between the groups and data were generated to support the differences. There were two general kinds of goals: process goals (having to do with the workshop process) and outcome goals (having to do with the desired specific outcomes). The Corps and public officials seemed to be concerned with process goals, while environmentalists and developers seemed concerned with outcome goals. In both cases, all of the process goals were achieved. The process goals were related to building confidence in the Corps and educating the public and Corps personnel about the use of the general permit. In one case all of the outcome goals were met, in the other case not all of the outcome goals were met. The outcome goals that were not met were related to the Corps' expectation that sharing regulatory power would lead to support for the general permit. The main difference between the cases was that the successful case had involved all stakeholders, including strong environmental interests, in the workshops. In the other case strong environmental groups had decided not to participate in the workshops. It was suggested that these groups decided not to participate out of fear of being co-opted. Building trust in the intentions of the Corps should be helpful in overcoming this fear. At the successful site, the Corps had used an environmentalist with experience in citizen involvement as a consultant. She convinced environmentalists that the Corps was committed to the workshop process and that the District Engineer would use the product of the workshops. A third-party intermediary was not used in the other case.

The user-oriented evaluation provided information on whether or not the participation goals and objectives of all participants were achieved in the workshop process. The information was also used to develop an overall effectiveness measure for judging the workshop. This measure focused on goals that were shared between participating groups. If all the shared goals were met, the participation activity was judged effective. According to Rosener, the evaluation resulted in information that was comparable and that allowed for generalizations about the workshop process.

4.3.2 Results of Evaluation Using a Social Goals Framework

An example of theory-based evaluation is research conducted by the research organization "Resources for the Future." Beierle (1998) presents the framework for this organization's evaluation of public participation programs in his Discussion Paper "Public Participation in Environmental Decisions: An Evaluation Framework Using Social Goals." The framework described in his paper is designed with three objectives in mind: identify the strengths and weaknesses of a number of different participatory methodologies; be "objective" in the sense of not taking the perspective of any one party to a decision; and measure tangible outcomes to the extent feasible. This evaluative framework seems very useful, in that it can determine whether participatory programs are working, how they can be improved, which methodologies work best for particular needs, and, ultimately, whether participatory programs justify the commitment of public and private resources.

Social goals, according to Beierle, are those goals which public participation ought to be expected to achieve but which transcend the immediate interests of parties involved in a decision. The six goals that form the basis of this evaluative framework are:
1. Educating and informing the public;
2. Incorporating public values into decision-making;
3. Improving the substantive quality of decisions;
4. Increasing trust in institutions;
5. Reducing conflict;
6. Achieving cost-effectiveness.

The goal of an *educated and informed public* is derived from the normative argument that, in a democracy, citizens have a right to be involved in the decisions which affect them. To be effectively involved, the public should know enough about the relevant issues to be able to formulate alternatives and discuss outcomes with government representatives and experts. At a minimum, the public should have enough information to make intelligent choices if called on to do so, through, for example, a referendum.

The goal of *allowing the incorporation of public values and knowledge* into decision making is derived from the insights of the risk perception and communication literature that outline dramatic differences between lay and expert perceptions of risk. These findings support an argument that differences over values, assumptions, and preferences should be deliberated in a process that assigns value to public perceptions of risk.

A related goal, *increasing the substantive quality of decisions,* recognizes the public as a legitimate source of knowledge for improving the technical rigor of decisions and increasing political support for them.

The goal of *fostering trust in institutions* is based on the dramatic decline in public trust of government and other major institutions over the last thirty years. It recognizes that such loss of trust is a legitimate reaction to scandals and mismanagement, but that its restoration is crucial to cooperation between the government and public in managing the environment.

In addition to rebuilding trust, public involvement ought to *reduce conflict among competing interest*s. This goal is based on the argument that collaborative decision-making is more likely to result in lasting decisions which increase aggregate benefits for the parties involved.

The final goal, *cost-effectiveness*, acts as the resource constraint on the achievement of the other goals. It argues that the selection and implementation of public participation methods ought to be the most appropriate given the issues and interests involved.

Beierle's article reviews a number of public participation methodologies and describes which goals each method could achieve. Matching methodologies to goals is useful for government agencies, because it assists in selecting the type of method which is most likely to achieve the goals of interest. In order to match methodologies to goals, Beierle breaks down the various methodologies into four component characteristics. These characteristics are: information flows, the degree of interaction among potentially opposing interests, the type of representation and the decision making role of the public. Each characteristic is linked to the six social goals by way of hypothesized relationships:

Methodologies which *provide information about the public to the government* (surveys, focus groups, public comment) will mainly be useful for providing decision-makers with public values, assumptions, and preferences (Goal 2) and substantive information to improve decisions (Goal 3). Methodologies which *provide information from the government to the public* (right-to-know, public education, public notice) will be mainly useful for increasing public knowledge (Goal 1) and, to the extent that they increase transparency, increase trust in institutions (Goal 4). Methodologies which allow for *two-way flows of information* (public hearing, citizen jury/panel, consensus conference, advisory committees, mediation, regulatory negotiation) ought to be expected to achieve all of these first four goals.

The greater the degree of *interaction among potentially opposing interests*, the greater will be the opportunity for reducing conflict among stakeholders (Goal 5). This applies mainly to methodologies such as public hearing, citizen jury/panel, consensus conference, advisory committees, mediation, and regulatory negotiation.

All else being equal, methodologies in which *the public represents itself* (through direct participation) will be better at achieving the goals of education (Goal 1) and trust formation (Goal 4) than those where *the general public is represented* by "representative" members or professionals (such as lobbyists, etc.).

All else being equal, methodologies which give the public a direct *decision-making role* will be better at achieving the goal of trust formation (Goal 4) than those which do not. This applies mainly to methodologies such as public hearing, citizen jury/panel, consensus conference, advisory committees, mediation, and regulatory negotiation.

One important relationship between methodologies and goals should be highlighted. For methodologies such as public hearing, citizen jury/panel, consensus conference, advisory committees, mediation, and regulatory negotiation there is an evident trade-off between the control the public has over decision-making and the extent to which the members of the public represent themselves in the process. This has its greatest implications for issues of trust. According to Beierle's assumptions, trust formation will be greatest where the public is both self-represented and plays a decision-making role. However, none of the methodologies he discusses have both of these characteristics.

Although useful in explaining how the connection between goals and methodologies can be made, the approach represented by Beierle is based on theory and may be oversimplified in the sense that the connection between methodologies and the four characteristics used may be more complicated than represented in this study.

Beierle continues with a relatively comprehensive evaluation of public participation methodologies, the results of which should prove useful to government staff. His review of specific methodologies is summarized as follows:

Non-deliberative methodologies for obtaining information from the public include statutory procedures for soliciting public input through comments on proposed rules or environmental impact statements. They also include non-statutory methodologies, such as surveys and focus groups, that help governments incorporate information about the public into decision making. As a group, these methodologies provide one-way flows of information from the public to the government. Little to no deliberation among different stakeholders takes place, and input is rarely binding on decision-makers. The source of public input differs among methodologies. Surveys collect the views of individual citizens, focus groups use "representative" citizens as a proxy for public opinion, and comments on permits and proposed rules have come to be dominated by those with a professional stake in the outcome.

The primary goals against which surveys, focus groups, and public comments should be judged include the degree to which they facilitate the incorporation of public values into decision making (Goal 2) and foster the generation of policy alternatives (Goal 3).

Non-deliberative methodologies for providing information to the public are at the other end of the information spectrum. They are one-way flows of information from the government to the public in forms such as public education campaigns, the provision of right-to-know information and public notices. Although these methodologies are relatively passive, the intent is often to inspire more active participation. For some of these methodologies intermediaries, such as the media or community groups, play important roles in identifying and disseminating information to a wider public.

These methodologies should be expected to create a better informed and educated public (Goal 1), and to increase trust (Goal 4) by making government and the regulated community more accountable and transparent to citizens. Whether information provision informs a large number of people or educates a small number will depend on the method and how it is used.

Public hearings remain the most common form of face-to-face public involvement in spite widespread criticism of their ability to provide meaningful participation. Most are used to defend agency decisions rather than to involve the public in the decision-making process itself. Agencies often hold hearings late in the process, present technical information beyond the understanding of the lay public, and seek to do little more than fulfill administrative requirements. The two-way flow of information would suggest that public hearings ought to be able to achieve the first four goals: increasing public knowledge, providing decision-makers with public values, assumptions, and preferences, providing substantive information to improve decisions, and, to the extent that hearings increase transparency, increase trust in institutions. However, the lack of real deliberation leads to Beierle's prediction that most public hearings will do a poor job of achieving these goals. Hearings might best be thought of as active forms of notice and comment procedures, with the government contributing summary information and the public responding with comments for the record. The outlook for trust formation is particularly bleak. Public hearings include all of the active and concerned public who choose to attend, but the non-binding nature of public input works against trust formation. Moreover, a number of studies have determined that the majority of those who choose to attend hearings actually represent organized interests with significant economic stakes in the outcome (Fiorino, 1990 as quoted by Beierle). This latter point also suggests that the educational value of public hearings will be limited, except insofar as they educate the government about the political array of forces on an issue.

Because they offer an opportunity for government and the active public to interact, public hearings ought to be expected to reduce conflict. However, since the process is not deliberative; it may encourage participants to take more extreme positions, and the opportunities for conflict reduction are likely to be limited.

Citizen advisory committees come in many forms and perform many functions. Federally endorsed committees established under the Federal Advisory Committee Act follow strict requirements regarding representation, transparency and government involvement (for more information on the effect of the Federal Advisory Committee Act on public participation, see Long and Beierle, 1999). Citizen Advisory Committees (CACs) may also be quite informal, including groups which were established without government involvement but that have come to represent public views in policy making. Advisory committee members are intended to serve as the voice of the larger public, although in practice this has been interpreted to include elected officials and other elites as well as "typical" members of the community. Even in the latter case, a number of studies Beierle refers to have shown that participants are often not representative of the wider community in terms of income and education. CACs often present members with the opportunity to engage in discussions with a number of other interests, either internally in committees with "balanced representation" or externally with other organized interest groups. They typically play only an advisory role, but ideally their input is explicitly incorporated into the decision-making process. Where committees are balanced, the CAC can act like a voluntary negotiating body where each participant represents broad constituent interests. In such cases, consensus agreements may carry considerable weight in forming the basis for government decision-making.

The deliberative and representative nature of advisory committees suggests that they ought to achieve the first four goals: increasing public knowledge, providing decision-makers with public values, assumptions and preferences, providing substantive information to improve decisions and increasing trust in institutions. To the extent that the committees are "balanced" they ought to provide opportunities for conflict reduction between the stakeholders represented. Balance may also make it more likely that recommendations will be acted on. If this is the case, trust formation gets an additional boost.

The two primary *alternative dispute resolution methodologies* in environmental decision making, according to Beierle, are regulatory negotiations and stakeholder mediations. Regulatory negotiations provide a formal process for stakeholders to negotiate the content of federal regulations. Stakeholder mediation describes a far more diverse, and often non-governmental, set of approaches for bringing together opposing interests to settle divisive issues. Some of the most successful mediations have been over resource issues in the western United States. Beierle mentions, a grass roots effort to seek consensus on water management issues in Montana's Clark Fork River Basin brought miners, ranchers, municipal officials and environmentalists together after decades of acrimonious conflict to successfully resolve disputes over water use.

Regulatory negotiations and stakeholder mediations offer substantial opportunity for two-way deliberations among a variety of opposing interests. Their explicit purpose is to reduce conflict and reach consensus, often in cases where other forms of agreement or dispute settlement have failed. If parties reach a decision, they are generally bound by it. Participants - particularly those representing the public interest - are often professional representatives rather than members of the lay public. One of the principal criticisms of regulatory negotiations, in particular, is that they only involve the "usual suspects" of lobbyists, NGOs and government officials.

The deliberative nature of alternative dispute resolution methodologies would suggest that they would be likely to achieve the first four goals. However, to the extent that participants are "the usual suspects," this limits opportunities for public education. In spite of this trait, the methodologies are still likely to be excellent forums for providing decision-makers with public values, assumptions, preferences and substantive information to improve decisions. The binding nature of many agreements would suggest opportunities for trust formation, however, the "usual suspects" issue once again may be a roadblock to achieving this goal. The explicit attention to consensus building and conflict resolution among a wide range of stakeholders suggests that negotiations and mediations provide ample opportunities to reduce conflict among stakeholders.

Citizen deliberations include citizen juries (or the related "citizen panels") and consensus conferences. Many of the examples of these methodologies in the U.S. have been non-governmental experiments in participatory policy analysis on complex issues such as education policy, energy planning and public spending priorities. Some states have used these methodologies to inform decisions about risk prioritization, water quality planning and sludge disposal. Although the format varies across different methodologies, their purpose is to help non-expert citizens, acting as "value consultants," analyze technically complex subjects. Organizers provide a group of selected citizens with access to expert information and sufficient time to engage in deliberative analysis with experts and among themselves. They are expected to combine the technical facts with public values into a set of conclusions and recommendations. These methodologies are explicitly designed to allow two-way communication between experts and the public, and sometimes government. However, experts and the government are mainly information resources, and most of the actual deliberation takes place among the citizen members of the group. Participants are not interest group representatives, although they are regarded as representative of the public. In some citizen juries, they may even be selected through random sampling.

All of these factors would suggest that deliberative forums ought to be particularly good at educating participants, providing decision-makers with public values, assumptions and preferences and generating substantive information to improve decisions. In the past, many of these methodologies have had public or media outreach programs which extend educational opportunities beyond those who actually participate.

The methodologies involve a limited number of opportunities for interaction between interest groups (other than the extent to which participants identify themselves with various groups in their daily lives). Opportunities to reduce conflict are therefore minimal. Trust formation is also unlikely, as the results of the efforts are purely advisory, and many have had no formal tie to government decision making processes.

The "social goals" framework is useful in that it identifies strengths and weaknesses of public participation methods. In turn, this information is helpful in selecting methods that suit the needs of government agencies and the public.

Beierle adds an additional observation related to building trust in government agencies. No public participation method included in his evaluation is ideal for building trust. He quotes Schneider, et al. and Slovic (Beierle, 1998, page 24) as suggesting that the ideal method for improving trust would be one which provided individual citizens with binding decision-making authority. It is quite unlikely, and often illegal, for government to cede this authority to citizens except through voting. The only possible methodologies to meet this goal may be the direct democratic processes of referendum, initiative and recall. However, these are born of a profound mistrust of government and are not processes which government can explicitly utilize in decision-making.

It is noteworthy that "Resources for the Future" is in the process of evaluating hundreds of public participation case-studies across the U.S., using this "social goals" approach. The results of this evaluation will be published in a report that will become available in the early months of 2001. The results were not available at the time of completion of this report.

4.3.3 Results of Evaluation Based on "Fairness" and "Competence"

Another theory-based approach to evaluation was developed by Webler (1995). This approach focuses more on the process than on the outcome of public participation. Using German philosopher Habermas' theory of communicative action, Webler developed a normative theory of public participation. His theory focuses on the micro-level of communication between individuals, as opposed to Beierle's theory that focuses more on the macro-levels of the function of public participation in maintaining social and political order. Webler defines two goals for public participation: fairness and competence. Fairness is key to producing a forum where equality and popular sovereignty can emerge and personal competence can develop. When participation is fair, everyone takes part on an equal footing. Competence refers to the ability of the decision making process to provide the participants with the procedural tools and knowledge to make the best possible decision.

For each of the major elements of fairness and competence, Webler defines criteria and accompanying indicators that evaluate fairness and competence in participatory methodologies. Based on Webler's theory, a number of researchers evaluated eight public participation methodologies: citizen advisory committees, citizen initiatives, citizens juries, compensation, the Dutch Study Groups, mediation, negotiated rule-making and planning cells.[1] These methodologies were selected for their novel and innovative approaches to public participation.

The shortcomings in terms of fairness and competence of c*itizen advisory committees* (CACs) are related to their restricted attendance and limits to discussing issues outside of the prearranged charge. They lack structural features such as a peer-reviewed educational program or adversarial hearings, and participants are usually chosen from the same "class" as the agency staff and experts. However, within the confines of the agenda, discussions within CACs are usually fair, and their structure promotes consensual decision making. To function more fairly and competently, CACs would need a budget, the freedom to allocate it and more autonomy over specifying its charge. They also work best when the problem under consideration is not wholly technical, but includes different types of tradeoffs spread over several interest positions which are represented in the panel. Another improvement could be made by adopting some method to solicit feedback from the non-participating public.

The *citizen initiative* evaluated by Renn, Webler and Wiedemann took place in Germany and was characterized by full disclosure of available information by the government agency involved, revealing information gaps, and engaging an outside mediator who was responsible for communicating with the public, advising the government agency, and organizing the participatory process. A consensus-building round table forum was organized in which government agencies, citizens, and two teams of experts (selected by government with input from citizens) participated. There are some limitations to fairness and competence in this model. In practice the agenda for deliberations was imposed by the government agency, and the moderator, who was paid by the government agency, heavily influences the process. Furthermore, the focus on technical issues and lack of peer review methodologies provides limits in certain areas of competence.

Citizen juries rely on a randomly selected pool of citizens, who are paid to attend a series of meetings (usually conducted over a three or four day period) to learn about and discuss a specific policy issue and make public their conclusions. The participants are selected to represent the general public, not specific stakeholders. They work better on value questions than technical issues.

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[1] Many of the reported experiments with these eight approaches to public participation have taken place in European countries. In relation to the citizen initiative model, Linnerooth-Bayer (in Renn, Webler and Wiedemann, 1995) points out that differences in political traditions among European countries and the U.S. are important in order to appreciate this model. She describes the political culture of the U.S. as individualistic and competitive, that of Germany as more hierarchical and consensual. The political culture in the Netherlands can be described as consensual. These differences in political cultures limit the direct transferability of new approaches to public participation from one country to another. It is likely that adaptations will have to be made.

The major difference between the citizen jury and the planning cell is that citizen juries are much more focused, because they are asked to express a preference among three or four pre-selected policy options. The ambiguity with respect to fairness is that government staff sets the charge and imposes the principal of majority vote as the means to resolve conflict. Citizens juries do well in the area of competence.

Compensation is mainly studied in relation to the siting of noxious facilities. The community hosting such facilities carries most of the costs, while the benefits are shared with a much larger region. Compensation is seen as a component of a fair process for siting noxious facilities. Several problems in the areas of fairness and competence are related to the model evaluated by Renn, Webler and Wiedemann.

The *Dutch Study Groups* refers to an approach taken in the Netherlands to develop a large national debate on energy policy. Due to its scale this national debate can be considered a rather unique form of public participation in policy and decision making. It is used for issues that are large scale and where decisions are made at a national level. It is characterized by a public information program and small discussion groups. The result is advisory in nature. Final decisions are left to politics. Due to the fact that a steering committee sets the agenda, fairness was not as high as initially expected. Competence of this approach was considered high.

Mediation is considered a fair process, because all aspects of the negotiation are open for discussion. However, only those interests are included that have enough political clout to interfere with decision implementation. There are limitations in the area of competence, because of the limited possibilities for technical assistance, and due to the fact that not all value positions and interests are represented.

In *negotiated rule-making*, administrative agencies bring together representatives of the interests that are affected by proposed rules before the agency makes decisions on the content of the rule. The goal is to enable the representatives of these various interests to reach agreement on the substance and, if possible, the language of a proposed rule. Its purpose is less to resolve specific disputes than to define general rules. There are several problems relating to fairness and competence. Usually, participants are representatives of organized interests and not necessarily representative of the general public. Meetings are held in private, which allows for strategic maneuvering. This aspect also affects the information presented at the negotiations. Furthermore, the negotiations focus on technical issues and there is little room for normative issues outside the technical context.

Planning cells are groups of about 25, previously uninvolved people who are released from their everyday work obligations (for a week or at least three days) and are asked officially to prepare recommendations on problems of assessment, planning, or control. The objective is to provide these citizens with the opportunity to learn about the technical and political facets of the decision options and to enable them to discuss and evaluate these options and their likely consequences according to their own set of values and preferences. They are a means to acquire informed recommendations about a specific policy or decision problem from a group of representative citizens. This approach is considered highly competent. Its fairness depends on the success of the random selection process and is limited by the fact that a moderator is usually forced on the participants. Planning cells are not suitable for all types of problems and all contexts.

Renn, Webler and Wiedemann (1995) have developed a classification scheme to assist in the characterization of a problem related to public participation and match this characterization with the most appropriate, available participation methodologies. They assume that public value differences are tied to factual uncertainties and trust in public institutions. The classification scheme differentiates three levels of environmental debates.

The first kind of debate involves factual arguments about probabilities, causal relations and the extent of potential damage. Not only is it important to have clear understandings about facts, it is also important that estimates of uncertainty accompany this information. If expert authorities disagree about facts, a way of representing that disagreement is needed. Factual debates become most problematic when experts hold opposing opinions about the validity of facts, or when forecasts or projections are highly uncertain.

A second, more controversial, level of debate concerns public confidence in institutions to deal with environmental threats. At this level the focus of the debate is on the trust or confidence that the public has in the decision making body to give adequate consideration to each party's concerns, to distribute costs and benefits equitably, and to fulfill promises and expectations. This type of debate does not rely on technical expertise, although reducing factual misunderstandings and reducing uncertainty may help. Instead, the emphasis is on achieving mutual awareness of each other's expectations and a commitment to the principle of reciprocity. Agreement in this discourse is gained by clarifying mutual expectations, demonstrating good will and a commitment to fulfill those expectations, and providing pathways for retribution or punishment if one party fails to live up to its promises. Government agencies have a responsibility to give well intentioned, thorough consideration to each interest position. In response, citizens and interest groups must not withdraw support if the consequences of the decision are within the range of expectations promised.

In the third kind of debate the conflict is defined along competing social values, cultural lifestyles and world views. In this case neither technical expertise nor institutional competence and openness are adequate conditions for reaching collective agreement. Decision making here requires a fundamental consensus on the issues that underlie the debate. The nuclear debate in the 1970s in Sweden leading to a national referendum on the future of nuclear power plants is an example of conflict resolution at this level. A referendum was the culmination of an extensive debate about the desired direction of technological development in which nuclear power served as a symbol for large centralized technologies and its impacts on economics and society. The final vote to continue nuclear power for a limited period of time defined the legitimate role nuclear power was supposed to play within the larger technological scenario. The majority considered nuclear power plants as undesirable but necessary technologies that should be kept operating until alternative technologies could replace them. Replacement was estimated to be completed by the year 2010, after which all nuclear power plants were scheduled to be phased out. The agreement moved the issue from the third to the second level, where technical and organizational solutions could be discussed without the debate expanding into a conflict over the moral implications of nuclear power and its symbolic meanings.

Renn, Webler and Wiedemann conclude that for each of the three problem types, two models of participation (out of the eight discussed) seem well-suited. For problems that can be handled mainly through expertise, negotiated rule-making and compensation are appropriate. For problems that involve more than disputes over facts, but deal directly with trust in government, mediation and citizen juries are useful. When debates concern fundamental value differences, the citizen initiative and the Dutch Study Groups have the best potential to succeed. Finally, there are two models that lie on the boundary lines between two areas. Citizen advisory committees are appropriate for both disputes over facts (especially the technical advisory committee) and disputes over trust. Planning cells also lie on a boundary. They have worked to solve environmental problems, both about trust and about value discrepancies.

Although public meetings are not included in the evaluations, their extensive use solicited a brief comment by Webler and Renn (in Renn, Webler and Wiedemann, 1995). They observe that public hearings are perhaps the cheapest, easiest, most common, and least studied form of participation, and that both government agencies and the public usually have negative images of public hearings.

What research has been conducted illustrates the shortcomings of public hearings. Public meetings are undemocratic, because they are dominated by stakeholders with economic stakes. They are usually held late in the process which limits public impact. Only a very small proportion of the population has an opportunity to speak and hearings are primarily held to satisfy legal requirements, rather than to promote public input. Low rates of public participation can be attributed to poor and overly technical presentations of information, a bias of outcomes favoring participants with economic stakes and minimal evidence that participation affects policy. On the other hand, public hearings do offer citizens an opportunity to get first hand information about government and project proponents' intentions. They also offer government staff an opportunity to hear about contending interpretations and interests directly from people (see also: Steelman, 1999), and offer a stage for political posturing.

Not all of the public participation methodologies reviewed by Renn, Webler and Wiedemann are appropriate for activities by the Division. However, the previous review adds valuable information to other evaluations of the effectiveness of public meetings, citizen advisory groups, mediation and citizen juries. Furthermore, it illustrates some innovative approaches to public participation.

4.3.4 Results of Goal-Free Evaluations

The goal-free evaluation was designed to gather information on public participation program effects and effectiveness without being constrained by a narrow focus on stated goals (Chess, 2000). Many published case studies of public participation do not specify the goals of a public participation effort, or they may acknowledge that the agency holds vague or conflicting aims.

For example, Aronoff and Gunter (1994) examined case studies of seven locally based hazards to public health and the environment to clarify factors that contribute to effective public participation. They identified four serious consequences of a lack of participation. The first consequence is that existing policies maintain long-term inequities in the distribution of risk. The second consequence is that regulatory agencies' decisions, based on scientific conceptions of risk defined narrowly in relation to the statistical probability that particular events will occur, may not be acceptable to community residents or the general public. The third consequence is that, in those communities where a technological disaster has occurred, top-down government interventions disenfranchise residents and reportedly produce greater stress than the disaster events themselves. Finally, without channels for genuine communication, citizen response may often be expressed through reactive and locally divisive "not in my backyard" movements, which make resolution of societal waste disposal questions more difficult.

In all seven cases studied, conflict existed over existing or impending hazards to public health and the environment. The authors focused on three factors that were expected to influence the outcome of participatory efforts. The first factor is the relationship between the public and the government agencies, which was reflected in the agencies' willingness to negotiate collaboratively with the public or its representatives. The second factor is the community's characteristics. This includes background experience in problem solving and negotiation and the level of representation of the community by local organizations and institutions. The final factor is the broader political-economic character of the particular dispute. This factors indicates the inclusion of other state and regional stakeholders and other players outside the community that may influence the outcome of the negotiation process.

Aronoff and Gunter report several relevant findings based on their analysis of the case studies. They found that even in cases where government staff work for timely solutions to local technological crises, without opportunities for local participation in decision making, community disenfranchisement is likely. This seems to be an inherent outcome of interactions between government agencies and communities. It is not necessarily caused by the failings of individual staff members. Government agencies respond to community problems from a limited resource base and within the confines of their bureaucratic mandates. Community residents are likely to experience these problems as complexly interwoven local needs. Under these circumstances, even agencies that successfully address problems within their mandate may actually exacerbate other area concerns, leading to local frustration with agency activities. This occurs frequently when agency efforts to resolve contamination-related problems interfere with broader community economic development strategies.

Furthermore, ambiguous communication is found to be a characteristic outcome of outsider interventions. It creates pervasive local problems in disputes over hazards to public health and the environment. The level of risk posed by a given technological hazard is often neither known at the outset nor readily established later on. Scientists' inability to provide clear-cut answers to risk-related questions and the tremendous burden placed on community residents who must endure years of uncertainty in the face of contradictory evidence on the public health and environmental risks posed by contaminants are additional reasons why resolution of these problems should not be left solely in the hands of experts.

They also found that past community efforts to resolve local problems and previous public participation experiences facilitate early and sustained mobilization when a dispute over an existing or proposed hazard arises. Communities that lack an effective citizen infrastructure and are unable to communicate their concerns about a particular hazard may need assistance in getting organized and may need the help of a neutral evaluator to articulate and communicate their concerns.

Of the seven cases studied, the communities that were most effective in resolving disputes were those that succeeded in representing the range of concerns present in their local area. Communities that were able to develop consensual response strategies and propose broadly acceptable resolutions in disputes were able to confront government agencies and other outside actors more effectively than communities already divided by internal conflict. To develop consensus a method must be created to ensure that the broad range of local interests that may be differentially affected by a hazard are represented in its resolution as well.

Several of the seven cases studied demonstrate the importance of including external actors in the dispute resolution process. One contribution outside interests may make is to help local groups develop perspective on their own place in the range of stakeholder groups affected by the hazard, and to modify their own concerns, demands, and strategies in light of this knowledge. Including a wide range of stakeholders in decision making produces a second advantage by reducing the likelihood that excluded groups, representing either internal or external interests, will oppose locally negotiated resolutions and disrupt the public participation process.

Based on these findings and the characteristics of successful approaches to resolve conflict in their case-studies, Aronoff and Gunter support a model for public participation that was developed by Guba and Lincoln (as quoted by Aronoff and Gunter, 1994, p. 248) to resolve educational controversies. Aronoff and Gunter slightly modified this model to be applicable to environmental controversies. The recommended process is designed to encourage the kinds of outcomes achieved in the more successful resolutions that Aronoff and Gunter discussed. The process consists of the following steps:

1. Identify and attempt to involve the full array of stakeholders placed at risk by an existing or proposed technological hazard.
2. Elicit from each stake-holding group their claims and concerns about the hazard and the issues they want to raise with respect to it. This may involve extensive work with at least some of the stakeholder groups, utilizing a process whereby the claims, concerns and issues held by different group members are raised and critiqued, so that a group consensus may emerge. After a consensus has emerged, it may also be desirable to attempt to further enlarge or raise to new levels of sophistication groups' positions by introducing new or additional information and having them deal with it.
3. After the position of each stake-holding group has become well articulated, circulate reports summarizing the claims, concerns, and issues of each group. Set up meetings and / or utilize alternative formats where each group must confront and deal with the issues and concerns raised by all other stakeholder groups.
4. Generate consensus on as many claims, concerns, and issues as possible.
5. Negotiate items for which there is no, or incomplete, consensus. Part of this negotiation may involve the development of a loose consensus, or an agreement to disagree on certain issues.

6. Develop reports that communicate to each stakeholder group those issues on which consensus has been reached and the unresolved issues raised by each stakeholder group.
7. Further iterations of the above process as needed.

This model for public participation contains many of the elements suggested by Kasperson, Golding and Tuler (reported in Chapter 2), indicating it may be particularly suitable in situations where high levels of distrust are present. The cases studied by Aronoff and Gunter provide examples of activities that have suffered from high levels of distrust, such as the proposed siting of hazardous and nuclear waste facilities.

Other examples of evaluations are provided by government agencies that have evaluated their public participation efforts. Examples of these evaluations and their results are discussed in the following section.

4.4 Agency Experiences with Public Participation

The following conclusions and recommendations are taken from a study conducted by Cole and Stevens (1996) on behalf of the Boston University School of Public Health, the Association of Schools of Public Health, the Centers for Disease Control and Prevention, and the Agency for Toxic Substances and Disease Registry. Cole and Stevens carried out three in-depth case studies and eight shorter case studies into health agencies' community involvement programs in different parts of the country. The significance of the general findings of Cole and Stevens' case studies is underscored by the reported experiences of the Division and several other agencies (Mohr, Arnold, Silva, and McMillan, 2000; Morin and Lockhart, 2000; Hodgson and Swanson, 1999; Galant and Lockhart, 1998; Lockhart, et al., 1998; Law-Flood, 1997; Langton, 1996; Applegate and Sarno, 1996; Lockhart and Julin, 1995).

Cole and Stevens included sites in their case studies that were identified as "success stories" by both agency staff and community members. The authors determined that public participation at a site was successful if it met one or more of the following four criteria:
1. The agency succeeded in reaching, educating, and encouraging active participation of community members;
2. The agency involved community members in key decisions;
3. The agency enhanced the community's understanding of potential health risks and their own capacity to address these risks;
4. The agency took tangible actions that responded to community health concerns in order to reduce risks.

Cole and Stevens generate five general conclusions and overall lessons based on the case studies.

They recommend making use of agency staff and community members who have experience with successful public participation programs. It was found that many staff members have made important contributions to building successful relationships and have improved the quality of agency response and public participation practices. This experience can be used at specific sites, but can also be applied to assist the agency in developing public participation policies and strategies.

Furthermore, public participation should be viewed as a dynamic and developing relationship between community members and agencies in which a variety of players and stakeholders have a role. This conclusion is based on the observation that in successful cases community members played important roles in initiating activities to address specific issues, lobbying for agency involvement and uncovering public health threats. In addition, community leaders served as health educators to the broader community and taught government staff about the community.

Cole and Stevens stress the importance of building relationships, showing respect and being responsive. This includes: being sensitive to community concerns from the beginning; clearly explaining agency roles and limitations; setting realistic expectations; getting to know "citizens" as "real people"; ensuring that the "most affected" community members are included; being open and fair; doing what you say you will do; being accessible, etc.

Cole and Stevens integrate many of their findings into an approach to health agency involvement in a community they call a "community guided" approach. In this approach, government agencies are guided by listening to citizen needs and preferences and by providing citizens with choices and resources. It views public participation as a central pillar of an agency's work in the community, not as an add-on. This approach should help agencies recognize and anticipate community needs. By actively soliciting community concerns and input, agencies could do a great deal to eliminate rancor, controversy and adverse publicity, and could deliver services that better suit the needs of the community at a lower cost.

In cases where federal and state agencies have major responsibilities, local government departments can play an important role in providing public participation services, because they are in the best position to know the communities and are often more trusted than federal and state agencies. Often, they have long term relationships with community institutions, and they can help match the resources of various agencies to local needs.

Cole and Stevens' case studies reveal a large variety of successful involvement practices, which they summarize in nine categories.

Accessibility, Relationships, and Trust. A key ingredient to good public participation is the accessibility of agency officials to community members. Accessibility includes respectful treatment of community members and their requests, and adequate responses to these requests. Furthermore, community members value dealing with a person whom they have come to trust over an extended period of time. Onsite government staff is in the best position to maximize accessibility, relationship-building and continuity. Accessibility can be increased by the involvement of a citizen advisory committee.

Effective outreach often involves more than announcements on radio, or in newspapers or holding public meetings. Community members can assist in designing outreach programs that reach the greatest number of people in the most effective way.

Communications and Expectations. Evidence from several sites indicates that setting realistic expectations is critical. Being clear about limitations and not setting unachievable expectations can be of great importance. Furthermore, community members need to be kept continually informed of any changes in activities, reports, consultations, etc.

Agencies build trust by *soliciting, acknowledging, and following-up on community concerns*. These concerns may also indicate sources of knowledge on local problems. A careful and visible analysis and providing good communication at every step can help the agency and the community reach consensus decisions on which concerns are significant.

Encouraging Community Input. Community members value the opportunity to provide comments prior to decisions, and they value seeing at least some of their recommendations adopted by agencies. Community members' trust in agencies increased when they believed that they have the power to affect agency actions.

Community members greatly valued *clear and decisive actions* on the part of health agencies to evaluate potential threats, reduce risks and protect community health. Such actions reinforce the perception that the agency is a strong advocate of community health.

Methodologies such as *steering committees or citizen advisory committees* can provide excellent forums for soliciting community concerns, promoting dialogue, presenting new information, providing health education and obtaining advice from community members.

Agencies should allow opportunity for *participation and communication by all who want to participate* and share their concerns and views. It is very important to include adequate representation for groups that have often been excluded, such as African-Americans, Hispanics, Native Americans, Asian Americans and people with low income or low literacy rates. When selecting members for citizen advisory committees, agencies should attempt to include strong representation of the affected community, include additional interests and viewpoints, and include local officials, but sparingly and not at the expense of the most affected community members.

The case studies demonstrate that the lead agency's *relationship with regulatory or other agencies* can affect that agency's relationship with the affected community. Effective coordination between agencies has advantages to communities, because, for instance, more resources are available to address problems and respond to community needs. Furthermore, there is less room for confusion if agencies put forth a single message. However, the agency should consider the community's attitudes towards various agencies and should develop a strategy for situations where the community strongly distrusts another agency operating at the site.

The results of case studies yield a lot of valuable information that can assist in selecting appropriate public participation methodologies and successfully implement these methodologies. Apart from the case studies and literature reported here, there is a vast amount of additional literature that deals with specific aspects of public participation. A sampling of this literature will be discussed in following paragraphs.

4.5 Relevant Topics Related to Public Participation
In addition to the literature on the evaluation of public participation methodologies in the preceding sections, there is much more research and theory on specific methodologies and approaches to public participation. To report on all this literature would go beyond the scope of this study, but it is important to note that project managers, community involvement coordinators and other government staff responsible for developing and implementing approaches to public participation can use existing literature to develop and/or apply methodologies that are appropriate to the situation they are dealing with. For instance, Arnstein's article "A Ladder of Citizen Participation" (1969) is often mentioned as one of the early articles describing the level of citizen power associated with specific methodologies. Another influential article was Rosener's "Matching Method to Purpose: The Challenges of Planning Citizen-Participation Activities" (1978), which stressed the importance of planning for the success of a citizen-participation program. She describes the planning phase and provides an elaborate matrix in which public participation methodologies are linked with specific functions of public participation.

Another valuable source of information on public participation and public participation methodologies is the International Association for Public Participation (IAP2). IAP2 has developed principles and policies for public participation, as well as a Code of Ethics for public participation professionals. IAP2's website (www.iap2.org) provides a vast number of useful hyperlinks to other websites that provide information on public participation projects, research, and organizations.

4.5.1 Conflict Management and Conflict Resolution

Conflict management and conflict resolution may be or may become specific goals of a public participation program. Many disciplines have contributed to the development of conflict management and conflict resolution methodologies. Such methodologies include: negotiation, facilitation, partnering, consensus-building, and mediation. These methodologies can all be part of a public participation program when conflict is likely to arise or already in existence (Crowfoot and Wondolleck, 1990, U.S. Army Corps of Engineers, 1996). Depending on the level and type of conflict, different approaches to conflict management or conflict resolution may be applicable. Usually, parties will be engaged in unassisted negotiations. When they find that they need help focusing or moderating their discussions, they can solicit the assistance of a facilitator. In case of further polarization which prevents effective communication, they may resort to mediation in order to have a mediator assist in devising and introducing alternatives (Baughman, 1995).

The level of conflict may be difficult to assess, and deciding on the appropriate methodology may be even harder. A conflict assessment is an information gathering exercise that produces recommendations on who the stakeholders in a conflict are, what issues are important to these stakeholders, what constraints (institutional, financial, etc.) to particular methodologies exist, and under what circumstances the key parties would agree to participate in a conflict resolution effort (Susskind, McKearnan, and Thomas-Larmer, 1999).

Some conflict resolution efforts may need the assistance of professional facilitators or mediators. However, there are many sources of information that can be helpful to project managers and others who may not have specific training in the field but are looking for a way to deal with conflict. For instance, "The Consensus Building Handbook" by Susskind, McKearnan, and Thomas-Larmer (1999) sets out to make practices in the consensus building field accessible and useful to anyone who has to solve problems or make decisions in a group setting.

Most approaches to conflict resolution focus on interest-based conflicts. It is likely that many causes of conflict over environmental issues can be attributed to conflicting interests. They are usually concrete and clearly defined. However, many other conflicts may exist that are relatively intangible and deeply rooted in the more abstract and interpretive dynamics of history, psychology, culture, values and beliefs. These are identity conflicts because they derive from existential and underlying psychocultural concerns that are perceived as threatened or frustrated as a result of, or resulting in, intransigent conflict. This type of conflict requires special efforts to ensure accurate analysis, definition, and amelioration because they are not as tangible as interest-based conflicts.

An approach to resolving this type of conflict is provided by Rothman (1997). He developed a framework that consists of four steps. The first step, antagonism, requires parties to a conflict to express their differences and analyze the causes for their animosity. This often leads to accusations of the other parties behavior. The second step, resonance, moves the parties away from antagonism, and towards reflecting on their own behavior and their common interests. During the third step, invention, parties work towards solutions that are mutually beneficial. The final step, action, moves the parties toward implementation of a solution.

In order to assist in determining whether a conflict is primarily an identity conflict or one that is mainly interest-based, Rothman suggest looking at three aspects of the dispute: intransigence, conflict motivations and characteristics. Intransigence refers to the fact that a conflict has existed for a long time (it may disappear and frequently resurface). Conflict motivations may not be limited to competition over tangible benefits, but may be related to threats to or frustration over human dignity, safety, control and identity issues. Finally, Rothman looks at the characteristics of the conflict by assessing whether it is focused more on historical and psychocultural factors than on finite goods or services, whether it is based in values and belief systems or in socioeconomic factors, and whether the goals of the parties are intangible, complex and abstract or tangible, defined and concrete.

Rothman combines theory and personal experience in conflict resolution in his approach to resolving identity-based conflict.

4.5.2 Conflicts Concerning Risk

As indicated in Chapter 3, differences between individual assessments of risk can be causes for conflict. It is often reported that experts and lay persons have different ideas about the level of risk posed by a particular activity or hazard. These diverging ideas about the level of risk can lead to conflict. Risk perception research provides insight into the causes for differences in perceptions of risk posed by a hazardous situation or activity. According to this research, individual perceptions of the danger posed by a particular risk are influenced by the characteristics of such risk, but also by gender, worldviews, and socio-economic circumstances.

Sandman (1989, 1994) has developed a theory called "Risk = Hazard + Outrage" which he uses to explain the differences between experts' and lay persons' perceptions of risk. This theory is based on research by Sandman, Slovic, and others (as mentioned in Chapter 3), which identifies characteristics of a risk which cause that risk to be perceived as more or less dangerous. In Sandman's theory, risk is a function of "hazard" and outrage. Thus, an individual's assessment of the seriousness of a risk depends on his assessment of the "hazard" (magnitude and probability) associated with the risk, and the outrage that individual feels over the particular risk. There are a number of factors that can cause outrage:
− The exposure to the hazardous material or activity is involuntary;
− The hazard is industrial, as opposed to natural;

- The individual is unfamiliar with the hazard;
- The individual remembers high-profile events related to the hazard;
- The consequences of exposure to the hazard are dreaded, such as the risk of getting cancer;
- The risk of being exposed is related to a catastrophic event. For instance, the loss of many lives in a train or plane crash causes more outrage than the many individual deaths caused by car crashes;
- The hazardous material or activity cannot easily be detected, or is otherwise unknowable, because of, for instance, existing scientific uncertainty over the risks associated with the material or activity;
- The individual has very limited control over the activity;
- The distribution of cost and benefits is unfair;
- The moral relevance of the hazard. For instance, society considers the protection of the environment to be important, which makes it morally relevant. It should, therefore, not be downplayed;
- The sources of information are distrusted;
- The process is unresponsive.

Risk assessments, according to Sandman, focus on hazard as the function of magnitude (how serious is it when it happens) and probability (how likely is it to happen). Experts' personal assessments of a particular risk generally coincide with the "hazard" posed by that risk. Citizens' assessment of risks, however, are usually strongly affected by the outrage factors. Sjoberg (1999) and Renn, Webler and Kastenholz (1996) demonstrated that lay people do understand "hazard" information and can integrate probabilities in their decision-making process. However, this information is only one of many factors used to form their own attitudes and judgments.

Sandman's theory is useful, because the identification of outrage factors also indicates what measures can be taken to lower outrage, and address the causes of conflict. Sandman recommends changing the outrage factors that can be changed, and acknowledging the existence and importance of outrage-factors that cannot be changed. As part of the public participation process, the hazard can be made more familiar by organizing tours, media events, etc. The hazard can be made more knowable by informing citizens of the levels of contamination, exposure, consequences of exposure, and by managing expert disagreement. Citizens can be given more control over the decision making process, and this process can be made fair and responsive.

It is important to note that there may be other causes for the differences in opinion between experts and lay persons when it comes to the level of risk perceived. These causes can be: different levels of information about the risk, socialization of values and risk perception in professional training and work, and differences in levels of trust in information sources (Sjoberg, 1999).

When exchanges over risk are taking place, it is likely that either government, industry or another party responsible for managing the risk will be responsible for making decisions concerning risk assessment and risk management.   Many value-based decisions are made in the process of conducting a risk assessment. These are decisions about, for instance, the definition of the particular risk, about structuring the problem and the research, about the information that goes into developing models for calculating future risks, and about making assumptions about the influence of future, unknown events. Furthermore, society and individuals do not just determine how to assess and evaluate risk, they also have to decide on how to cope with it. This leads to questions about topics such as the acceptability of risk, the dispersal of risk through society and the amount of effort that should be made to control risk. These are not true or false questions about facts, but questions about the desirable or the undesirable, right and wrong. This has caused several researchers to state that any conflict over the nature of a particular risk is ultimately due to a conflict over values (Cutter, 1993, Farago, 1999, Slovic, 1999).

These authors suggest that, in order to overcome conflict caused by different values, ways should be identified of arriving at a common perception concerning the nature and the acceptability of risks (Farago, 1996, Slovic, 1999). Slovic (1999) proposes to introduce more public participation in order to facilitate creating consensus on both risk assessment and risk decision making. This should make the decision process more democratic, improve the relevance and quality of technical analysis, and increase the legitimacy and public acceptance of the resulting decisions.

The National Research Council (1996) addressed the fact that participants in a risk decision process often have divergent perspectives on the decision at hand. Differences of perspective cause problems because efforts to inform decisions necessarily proceed from some implicit formulation of the problem. The National Research Council concludes that a risk characterization, which traditionally followed a risk assessment, that deals selectively with only one perspective on a problem will be inadequate for those with significantly different perspectives. The National Research Council calls for a system in which the risk assessment and characterization is directed toward informing decisions and solving problems, by creating broad understanding of the relevant losses, harms, or consequences to the affected parties.

According to the National Research Council, risk assessment and risk characterization should be the outcome of an analytic-deliberative process. The objective of this method is to improve risk characterization, inform decisions, and make those decisions more acceptable to affected parties. It addresses uncertainty about risk, control over the process and decisions that affect peoples lives, and responsiveness of the process. It allows for deliberation on concerns that are sometimes overlooked, like fairness, prevention, economic and social effects, ecological effects, effects on future generations, ripple effects, and effects on democracy, governance and ethical beliefs.

The analytic-deliberative process requires systematic analysis that is appropriate to the problem, responds to the needs of the interested and affected parties and treats uncertainties of importance to the decision problem in a comprehensible way. Deliberations among the stakeholders should focus on formulating the decision problem, guiding analysis to improve decision participants' understanding, seeking the meaning of analytic findings and uncertainties and improving the ability of affected parties to participate effectively in the risk decision process.

The process must have an appropriate diverse participation or representation of the spectrum of affected parties, of decision makers and of specialists in risk analysis, at each step. The appropriate breadth of participation in an analytic-deliberative process depends on the situation. One of several factors may be the level of trust the parties have in the commitment and ability of the technical experts and the decision-making organizations to protect them, with lesser public trust calling for broader public participation. Levels of trust change of course, and inappropriate decisions to limit participation sometimes contribute to loss of trust.

4.5.3 Participants in the Public Participation Process

In projects where citizen groups (such as Citizen Advisory Boards, Site-Specific Advisory Boards, etc.) have been convened to deliberate with and advise government agencies, the question is often raised whether the participants in these groups are representative of the concerns and interests in the affected community. This question touches upon two basic issues: what are the concerns and interests of the community, and the selection of community representatives.

With reference to the literature discussed in Chapter 3, it is clear that a wide variety of potentially conflicting interests and concerns may be present in a community. Not all of these interests and concerns may come forward to participate in the process. Therefore, a need may exist for the government agencies to seek out information about the interests and concerns in the community. Methodologies for acquiring information about the community can be found in the U.S. Environmental Protection Agency "Community Relations in Superfund: A Handbook" (1992), and "RCRA Public Participation Manual" (1996). More information can be found in "Risk Communication: A Handbook for Communicating Environmental, Safety, and Health Risks" by Lundgren and McMakin (1998).

The next step in convening a citizen group is selecting the participants in such a group. Renn, Webler and Wiedemann (1995) address some of the problems associated with the selection of representatives for participatory bodies. They identify three methods of selecting participants:

- Selecting representatives of groups or organizations that have shown interest in the issue.
- Asking for volunteers within the affected population (for example, through public announcements or advertisements).

- Random selection or equivalent method to accomplish a statistical representation of a given population.

The experiences with citizen advisory committees based on the first two selection methods tend to show that deliberate selection of group representatives as well as volunteering lead to serious distortions of public values and interests. This bias can partially be compensated for by making sessions open to public scrutiny. If such openness is not possible or undesired, control and feedback by the public are both in jeopardy.

Furthermore, if participation is left up to voluntary selection or appointment, onlookers may be cynical of the participants because either they appear privileged or too ambitious. Random selection - combined with a sense of citizenship and duty - is an attempt to gain the sympathy and support of outsiders, by virtue of the fact that they can picture themselves in that role. Random selection should create an entirely different impression of the motives of the citizens, thereby increasing the process's legitimacy.

Ideally, random selection assures that all values and preferences of the affected population are given an equal opportunity to be brought into the process. In theory, people who are not selected should be satisfied that their interests will be protected because there essentially is a guarantee that another person with similar interests will be selected. In practice, of course, such satisfaction is not forthcoming. People who are immediately affected and not selected in the random sampling feel deprived of a fundamental democratic right to protect their own interests. As a consequence, they may decide to seek other avenues to make their voices heard.

Another problem with random selection is: will enough of the randomly selected people agree to participate? The answer lies in how the problem is perceived in the community, how appropriate random selection is perceived and how strong the commitment to public responsibility is among those chosen. It is also possible that, as a problem is brought to public attention, the attitudes of the public may shift during the time that elapses between the selection and the process' end. The randomly selected participant may not represent the greater community. Random selection also works only on the condition that impacts are evenly distributed.

Although random selection theoretically guarantees everyone an equal chance to participate, there are additional conditions to be met: the sample size must be large enough, there should not be too many different value or interest positions, and the population needs to be informed of the problem and the possible impacts of alternative decisions. Achieving these conditions may be difficult, especially in cases of technological risk or environmental resource management, because the value differences are so broad, but also because the extent of local impacts is typically high.

These considerable problems have been dealt with in different ways by the Division and other agencies. In several cases the citizen advisory committee is made up of representatives of groups or organizations that have shown an interest in the process, and volunteers from the affected population. In an effort to verify whether all interests are represented and all concerns heard by the government agency, ongoing advisory committees are occasionally supplemented by interviews with randomly selected citizens. Some citizen advisory committees actively reach out to the broader community by organizing public update meetings, by publishing broadcast newsletters or newspapers, or by organizing speakers bureaus.

Another approach is suggested in consensus-building literature, which recommends involving stakeholders in identifying and selecting participants in a consensus-building process (Susskind, McKearnan and Thomas-Larmer, 1999). It is likely that this recommendation would hold true for convening citizen advisory groups.

4.5.4 Crisis Communication

Another topic to be mentioned in relation to public participation programs is that of *communication with the public in emergency situations*. The field of risk communication has provided extensive information on the methods for crisis communication. Two very practical and well-researched documents are: "Improving Dialogue With Communities", by Hance, Chess and Sandman (1991), and "Risk Communication" by Lundgren and McMakin (1998). Also, Susskind and Field's (1996) theory of a mutual-gains approach to dealing with an angry public contains useful tips and examples for communication in emergency situations.

The following three sections address specific problems associated with the activities of the Division. Problems which seemed of particular interest to the Division staff. These topics are: Conflicts concerning risk; Selecting representatives of the public; and Dealing with an angry or aggressive public.

4.5.5 Dealing with Public Anger and Aggressive Behavior

This section deals with a variety of situations government staff can face when interacting with angry members of the public or personal hostility and conflict. A number of relevant causes for conflict between government agencies and the public have been discussed in the preceding chapters. The instances of angry people standing up during public meetings and directing their anger at the government representatives at the meeting are numerous. The following sections contain a discussion of a sample of relevant literature that offers methods for dealing with an angry public, dealing with angry or hostile individuals, and dealing with personality-based conflict.

Dealing with an Angry Public

Sandman's theory "Risk = Hazard + Outrage," as described earlier in this report, offers an approach to reducing outrage. Sandman recommends changing the outrage factors that can be changed, and acknowledging the existence and importance of outrage factors that cannot be changed. As part of the public participation program, the hazard can be made more familiar by organizing tours, media events, etc. The hazard can be made more knowable by informing citizens of the levels of contamination, exposure, consequences of exposure, and by managing expert disagreement. Citizens can be given control over the decision making process, and this process can be made fair and responsive. Taking these measures could assist government staff in dealing with an angry public by lowering outrage.

Susskind and Field (1996) offer an approach to dealing with an angry public they call the "mutual-gains approach." This approach consists of six guidelines that provide a framework for dealing more effectively with an angry public. These six guidelines are: acknowledge the concerns of the other side; encourage joint fact finding; offer contingent commitments to minimize impacts if they do occur and promise to compensate knowable but unintended impacts; accept responsibility, admit mistakes, and share power; act in a trustworthy fashion at all times; and focus on building long-term relationships. Susskind and Field contrast their approach with the traditional approaches dominated by public relations and legal counsel. This traditional approach is characterized as an approach in which information is withheld, the angry public is characterized as extremist activists who should not be legitimized by meeting with them and critics should be discredited. Susskind and Field contend that this approach has undermined public trust in institutions. The approach they suggest would help restore that trust. Their approach contains many elements that are mentioned by other authors in relation to building trust and reducing outrage.

However, neither Sandman's nor Susskind and Field's theory addresses the challenge of facing and communicating with an angry public during, for instance, a public hearing. We have to turn to other authors for guidance on managing confrontations with an angry public. Weisinger (1995) writes on anger at work, but the knowledge he has brought together offers insight in the possible causes of anger and how to communicate with groups of angry people. Weisinger gives suggestions for actions that can be taken to manage the anger of a group or a mob. He points out that it is important to first manage yourself, which implies knowing your cognitive and emotional reactions to anger and managing these reactions. Then the following actions can be tried to manage the group's anger:

− Quickly identify a common goal, as this is one way to unite with the group.
− Clarify expectations as to what the group can realistically expect to happen in the immediate future. Do not mislead, as this will create expectations, that, if not met, will result in increased anger and a loss of credibility.
− Get the group involved by listening. Give them plenty of time to vent their feelings, which you can summarize and reflect as a means to keep the anger at a manageable level.

- Help the group problem solve. Identify what actions would help and what actions would make their situation worse.
- Provide opportunity to follow up. Let the group know that resolution can take place only when there is a commitment by the parties involved. If the issue is unresolved, schedule a follow-up meeting and ask people to come to that meeting with more workable plans and less anger.

Weisinger explains the importance of using communication skills effectively to manage anger and help reduce or prevent conflict. Weisinger makes a distinction between "*Anger Management Communication Skills*" and "*Conflict Resolution Skills*". Anger is an emotion, and certain communication skills can help manage that emotion. Weisinger describes conflict as a situation in which one party's goals and perceptions are incompatible with or in opposition to those of another. Often, anger creates conflict. Managing anger can prevent conflict or it can create a situation in which it becomes easier to resolve conflict.

The following communication skills are important to anger management:
- *Assertiveness* is the ability to express ones feelings in a socially appropriate manner. Its chief function in managing anger is that it helps a person stand up for him or herself, and protect self-esteem. This is particularly important when that person is being abused or mistreated by the angry group.
- *Listening* is needed if communication channels are to be opened up. This in turn is necessary if anger is to be resolved. Weisinger discusses this skill in some detail, because it plays such an important role in many anger scenarios. Listening requires the ability to hear the content of the message and the feelings that often accompany it. Dynamic listening allows one to understand and clarify the issues at hand and it prevents anger from escalating because it makes the listener receptive to hearing the other's side rather than attacking him. Most important, listening serves as a validation of the other's feelings and thoughts, which has been found to reduce anger, even if the provoking situation or behavior does not change.
- *Negotiation* as a communication skill is the process of two people modifying their positions for the purpose of coming to a mutually satisfying agreement. It is a valuable anger management skill because it is the process that takes each person to the point that is needed to resolve the cause of the anger.
- *Productive criticism* is a crucial skill for anger management, because it becomes the means by which one person can help another to improve or change a vexing behavior.
- The purpose of *confrontation* is to acknowledge that a situation or behavior is not acceptable and cannot continue. The skills necessary for constructive confrontation include: taking responsibility for feeling that a situation or behavior is unacceptable; being specific in describing the unacceptable behavior or situation; and stating clearly the tangible effects of the situation.
- *Praise* is a valuable anger management communication skill, because it protects the other's self-esteem, giving him or her less reason to be defensive and remain angry. It is also a method for maintaining positive changes that will prevent anger-provoking behavior from occurring in the future.

Communication is an important dimension and tool for managing anger. Unfortunately, anger and conflict distort the communication process. Anger management by the communicator should be the first step to resolving the causes for anger, which, in turn, should contribute to preventing and / or resolving conflict.

4.5.6 Dealing with Difficult Individuals

Apart from confrontations with angry and emotional people, government staff may find themselves interacting with aggressive and hostile individuals. In some cases, aggressive, accusatory behavior may not just be caused by anger. It may be partly attributed to the personality of the individual(s) involved.

Numerous books describe the characteristic behavior of hostile and aggressive people. Many of these books address the issue of dealing with hostile and aggressive people in the workplace (for instance, Solomon, 1990), but these books may provide information that is applicable outside the scope for which they have been written. A useful book, specifically addressing the question of how to deal with difficult personalities, is Bramson's "*Coping with Difficult People*" (1981). Bramson describes a range of difficult behavior, of which three types seem particularly relevant. They are the are the personalities that show hostile-aggressive behavior attributed to three types of personalities: Sherman Tanks, Snipers, and Exploders. Bramson describes their behavior, reasons for that behavior and ways to cope with their behavior.

Sherman Tanks are described as being abusive, abrupt, intimidating, and overwhelming. Their behavior often causes confusion, mental or physical flight, or a sense of helpless frustration. Coping with this type of personality requires behavior that is self-asserting and directed at the issues, not the personal attacks.

Snipers' behavior is characterized by personal attacks that are accompanied by nonverbal signals that say "Pretend that what I am doing is nice or neutral, or that you don't even hear me." The method of coping with a Sniper's attack is one that will provide a constructive way of discussing their criticism.

The behavioral peculiarity of the Exploder is the adult tantrum. Exploders appear more out of control of themselves than the other two types. Coping with a person having a tantrum is chiefly a matter of helping him or her regain self-control.

Bramson gives extensive information that will help understand the different characteristics of difficult people and he gives advice on concrete steps that can be taken to cope with their behavior. He does warn, however, that to people who are not themselves aggressive, even a moderate and productive use of such behavior, for instance as part of political posturing by activist groups, can seem excessive. Treating such aggressiveness as if it were hostility may incite angry responses that may be much harder to deal with than the initial behavior was.

4.6 Concluding Remarks

A range of literature relating to building trust in government, effective approaches to public participation and dealing with conflict in the context of public participation have been addressed in this and the preceding chapters. In order to illustrate the applicability of the theories and research reported, the following chapter contains the results of interviews conducted in six projects in which the Division is currently involved.

5. Public Participation in Practice

5.1 Background
The Hazardous Materials and Waste Management Division (the Division) devotes significant amounts of time and resources to involving citizens in the decision-making process. Approaches to public participation vary, depending on a number of variables, which include the wishes of the community, the agencies involved, the type of technical problems, etc. The review of literature in the preceding chapters addresses some of the problems associated with public participation as experienced by the Division. In addition to the literature study, interviews were conducted with members of the public and with government staff. The purpose of these interviews was twofold: first of all, the interviews were aimed at providing examples of the issues addressed in the literature study. Secondly, the interviews provided an opportunity to learn from members of the public and government staff experiences with the public participation programs.

This chapter reports the results of more than 60 interviews with government staff, citizens, consultants and facilitators. Most interviews were conducted face-to-face, some were conducted over the phone. The interviewer used open questions, and questions were targeted to specific activities that the interviewed individuals were involved in. Questions were asked about the individual's experiences with the public participation program in general, whether he or she thought there were specific problems in relation to the program, the perceived opportunities to influence decisions and the effectiveness of communication.

The interviews were conducted for six projects. The projects were selected to illustrate the variety of situations in which the Division and other government agencies operate, and the variety of current approaches to public participation. The projects were: Pueblo Chemical Depot, former Redfield Rifle Scope Company, Rocky Flats Environmental Technology Site, Summitville Mine Site, Shattuck Chemical Company, and Vasquez Boulevard & I-70.

For each project, background information is provided about the hazards caused by the site, the affected community and the activities of the government agencies to address the hazards and involve the community in the decision-making process. Following this background information is an overview of the results of interviews with community members who are actively involved in the project, with government staff who are working or have worked on the site and with consultants and facilitators who are working or have worked on the project. The results are presented in the following categories: trust, public participation and information. It is important to note that the interviews were limited to only a selection of people who have been actively involved in the public participation process. Therefore, the opinions summarized here are not necessarily representative of the opinions of all government staff or of all citizens.

5.2 General Comments on Public Participation

Before discussing the results of interviews conducted at the six sites, this section reports on comments of participants in the interviews and observations by the author which pertain to public participation in general.

Based on their experiences, most government staff believed that each site and each community requires a specific approach to public participation. Most also believed that public participation is important. But ideas about why public participation is important and what it should achieve were varied. Even within teams working on one site, ideas about public participation could be very different. The Division could consider whether there is a need for clarifying policies and guidance in the area of public participation.

Circumstances and needs in relation to public participation will change during the course of a project. Regularly assessing and clarifying those needs should help both government agencies and communities improve the effectiveness of public participation programs. For instance, assessments can identify areas of conflict that need to be resolved for the project to progress, and a needs assessment may assist in choosing the public participation methodologies that are most likely to achieve the goals of the program.

CDPHE (and other agency) staff are well aware of the differences in ideas about public participation and constantly changing needs and conditions. However, many also indicated conditions that are obstacles to public participation becoming further integrated into project management. Such obstacles included the fact that public participation is not part of performance standards, the circumstance that many staff members have a science or engineering background and limited training in public participation and communication, and lack of research-based information on successful approaches to public participation. Furthermore, some government staff members were frustrated with the results of public participation efforts. These staff members felt that no matter how hard they try to work with a community, it is never going to be good enough.

In order to enable the Division to further improve effectiveness, it would be helpful to develop systematically the knowledge base on public participation methodologies, on how to conduct needs and conflict assessments, etc. Further assistance to Division staff could be provided by developing clear Division-wide, or even Department-wide policies or guidance documents on public participation. It should be mentioned that the handbooks issued by the EPA on community involvement in Superfund or RCRA projects provide guidance, also in projects where Superfund or RCRA play a limited or no role.

An insightful document that offers some valuable ideas about how improvements can be made is the assessment of U.S. Army Corps of Engineers' public involvement practices carried out by Langton (1996). Langton is a respected researcher in the field of public participation and he offers recommendations in the areas of clarifying public participation policy, strengthening capability, promoting quality, reinforcing commitment and assuring leadership in the area of public participation.

Many community members who were asked to participate in these interviews, participated gladly. Many thought it was a valuable initiative to have such open conversations and were somewhat surprised that the Division was interested in hearing their opinions. Periodically interviewing community members in an informal evaluation of public participation activities could be helpful in improving strained relationships and should assist in identifying areas of the public participation program that can be improved.

One government staff member thought informal communication was an important, but often neglected, opportunity of public meetings. When the formal part of these meetings is limited to an hour, there is time and opportunity for informal conversations which can help improve relationships and may provide useful information about individual concerns, about the community, etc.

Considering the theory on public trust in government as developed by Thomas (Chapter 2), such an approach should help build mutual trust between government staff and citizens. Thomas mentions that government staff may be afraid that mutual trust may raise the impression that they are being co-opted into a specific community group. Thomas points out that developing mutual trust and cooperation with communities should be possible without co-optation. Staff members clearly communicating their roles and responsibilities should help maintain a balance between building mutual trust and the necessity of remaining impartial.

5.3 Pueblo Chemical Depot

5.3.1 Background
Since 1942, the U.S. Department of Defense (DOD) stored, maintained and disposed of conventional and chemical munitions at the Pueblo Chemical Depot (the Depot). In 1988 the facility was included on a list of more than 100 DOD facilities to be closed or realigned. The current mission of the Depot is the storage and destruction of chemical munitions, and the remediation of environmental contamination resulting from prior missions. The Depot stores considerable amounts of chemical munitions, and treats or disposes of other chemical agents and chemical waste. The chemical munitions are slated for destruction on-site.

Historically, the facility has generated, treated, stored and disposed of hazardous and solid wastes onsite. Types of waste included: propellants, pyrotechnics, and explosives; hazardous and solid wastes; spent hazardous waste solvents, such as trichloroethene (TCE), tetrachloroehthene (PCE), and dichloroethene (DCE); hazardous waste characteristic metal (cadmium, chromium, zinc, etc.); lead based paints and paint thinners. Facility activities resulted in the on-site contamination of soil, ground water, sediments and structures, and off-site migration of contamination via ground water. This environmental contamination creates a potential hazard to workers on the site and potential exposures off the site to nearby residents.

The facility is owned by DOD and is under the operating authority of the Army Materiel Command (the Army). The Division is involved through two environmental programs operating simultaneously: the RCRA Corrective Action Program and the Chemical Stockpile Disposal Program. The EPA assists the Division in carrying out its tasks. The Depot is located in Pueblo county. Nearby communities are Avondale, North-Avondale and Boone, which are predominantly agricultural communities. Several (former) employees of the Army live in these communities. Part of the population is mono-lingual, Spanish speaking. There are many different perspectives concerning the operations at the Depot present in the community.

Since the early 1990's, the Army has been carrying out activities to involve the affected communities in the activities and decisions for the facility. Initially, these activities consisted of conducting public meetings, producing written materials and issuing news releases. However, in 1995 the facility opened the Community Learning Center, containing a community outreach office. In recent years many activities have taken place, including: depot-wide tours, production of a site-wide video, semi-annual update meetings, representation at the Colorado State Fair, numerous fact sheets and a quarterly environmental newsletter. Two ongoing citizen advisory groups are in existence: the Restoration Advisory Board and the Citizens' Advisory Committee. Furthermore, Team Pueblo was developed to provide a foundation for collaboration among all community stakeholders to pursue community education and development, and installation reuse options.

5.3.1 Results of Interviews

Interviews were conducted with community members of the Restoration Advisory Board (RAB), community members of the Citizens' Advisory Commission (CAC), local government staff, Division staff and Army staff. Many of the comments by community members and local government staff focused on the role of the Army, since the Army is chiefly responsible for informing and involving the public.

5.3.1.1 Trust

Many participants in the interviews, including Division and Army staff, think that the public does not trust the Army. Several causes for this lack of trust were mentioned. Some felt that the Army was not putting public health first, but that the Army was mainly concerned with cost and meeting the schedule for demilitarization and remediation. For instance, the refusal by the Army to supply bottled drinking water or a carbon filter on the Avondale drinking water well, was perceived by residents to be mainly motivated by cost concerns. Army staff pointed out that, at the time, there was insufficient data to verify that the well was contaminated, but an incidental test result showing possible contamination of the groundwater with explosives caused the community to be concerned. Residents did not feel that the Army was responding to those concerns.

On the other hand, some community members were convinced the Army could be trusted to clean up the site and responsibly destroy the chemical agents. It is interesting to note that all individuals who explicitly expressed their trust in the Army had some connection with the Army, as either (former) armed forces employees, or being related to (former) armed forces employees.

Some community members, including several who were distrusting of the Army, did believe that the current Commander and several staff members were technically competent and dedicated to cleaning up the site, even though they did not believe they were really committed to involving the community.

Community members also pointed out that each Commander only stays at this post for only two years. The community will have to wait to see what the intentions of the next Commander will be.

5.3.1.2 Public Participation

One of the main frustrations on the part of community members was the fact that the Army does not allow them to provide meaningful input into the decision making process. The community is briefed about activities and decisions after they are made. Even if the Army informs the community about proposed activities or decisions, it was felt that the input from the community would not change anything: the Army was going to do what it wanted to do anyway. The community members who felt that way said that the Army only changed its mind if the community got outraged at what the Army was proposing. An example of the Army changing its proposal, was the proposal to till treated, formerly contaminated soil into the prairie topsoil. According to the community, this would have caused a dust bowl. Only very vocal and strong opposition by community members and government agencies could change the Army's decision.

Individual motivation to participate in the RAB or the CAC varied. Those who were very skeptical, felt it was the only way to get an idea about what the Army is up to. Those who were more trusting of the Army, felt that this was a way to contribute to the well-being of the community and future generations living in Boone and Avondale.

Attendance at public hearings at the Depot is low, and it is difficult to find people who are willing to become members of either RAB or CAC. Community members had varying ideas about the cause for this. Some attributed this to the lack of trust in the Army and the related expectation that attending a public meeting, or participating in a citizens advisory board, would not have any effect.

There were a couple of people who thought that most people in the community did not attend public hearings, because people do not expect to hear anything that will be helpful to them. Public meetings are generally conducted in a format in which the Army conducts a presentation and people have an opportunity to ask questions. Most people thought these presentations were far too technical for lay people to comprehend, and recommended modifying these presentations to be better understandable to lay people.

Some people were convinced the Army purposefully made public meetings boring in order to discourage community members from attending meetings.

On the other hand, some community members thought that most people in the community do not care enough about what is happening or will happen at the Depot, and are too busy with other matters to invest time in attending meetings or joining the RAB or CAC.

It was pointed out that recent meetings in the communities of Avondale and Boone had attracted many more attendants than public meetings held at the Depot, and that citizens attending the meetings at Avondale and Boone were much more open in expressing their concerns.

5.3.1.3 Information
Most participants in the interviews, both in the agencies and the community, appreciated the efforts the Army puts into providing information to the community. Several people thought the Army was very forthcoming with information, and responded well to requests for more information or answers to questions.

However, community members also pointed at the large amount of complex, technical information one needs to process in order to be able to understand decisions that are being made and contribute meaningful input. Furthermore, those who were distrustful of the Army pointed out that citizens can not validate technical information provided by the Army.

When asked if providing funding for the RAB or CAC to hire a consultant would help, different opinions were voiced. Some thought it would be helpful because a consultant could make technical information more accessible and understandable. A consultant would also be able to validate technical information. Others, however, thought that spending more money on consultants should not be necessary. They felt that the Division should play a bigger role in helping community members understand technical information. They also saw it as the Division's main task to oversee the Army's operations and make sure public health and the environment are protected. Generally, community members felt that the Division was adequately performing this role of "watchdog."

5.3.2 Concluding Remarks
It is suggested that "caring" is an important part of fiduciary trust (Thomas, 1998 and Covello and Peters, 1995). The comments of several community members seem to indicate that the perceived lack of care for the community's concerns and well-being is a cause for distrust in the Army. It was suggested that the first step the Army should take to improve relations with the community is to come to the towns of Avondale, North Avondale and Boone and get to know the people and their concerns.

The comments of several people illustrate that there may be a lack of trust in the Army as an institution, but some trust in the competence and motives of individual staff (Thomas, 1998). It also seems clear that the brief tenure of the Commander limits the possibility to build trust.

The results of the interviews suggest several changes the Army could make to improve public participation. Allowing the communities to have more influence over the location of public meetings, the agenda for those meetings and facilitating deliberations early on in the decision-making process would give the community more control over the process and over the outcome. Based on the evaluations of successful public participation programs reported in Chapter 4 of this report, these changes could make the activities at the Depot more effective.

Involving the directly affected communities in the decision-making process is complicated by a number of practical issues, including the fact that a significant part of the community is involved in seasonal agricultural businesses. During certain periods of the year parts of the community simply do not have the time to participate. In addition, most people are not available for meetings during regular working hours. This makes it impossible for many to participate in Team Pueblo. Team Pueblo was designed to provide an opportunity for collaboration between the Army and the public.

As Aronoff and Gunter's study (1994) suggests, the communities' limited experience with collaborating with government agencies and participating in environmental decision-making may be an obstacle to successful public participation. This circumstance may require efforts to organize and empower the community to participate.

CDPHE has taken position as the agency conducting independent oversight of the Army's activities. Members of the public are aware of CDPHE's approach, which may have contributed to the relatively high level of trust. This finding would be consistent with the findings of Cole and Stevens (1996).

5.4 Redfield

5.4.1 Background
Redfield Rifle Scopes, Inc. operated a manufacturing facility from 1967 until it went out of business in June 1998. In the manufacturing process used by Redfield Rifle Scopes, Inc., and possibly in the manufacturing processes of previous owners, degreasers and other chemicals were used. In 1994 a limited environmental site investigation was conducted as part of a real estate transaction. Cleaning solvents and other chemicals were discovered in the ground water under the building, and it was discovered that the contamination was moving into the surrounding residential neighborhood.

Since drinking water in the neighborhood is supplied by Denver Water, there is no danger to water supply. People do not use well water in the area. Therefore, the only way residents can be exposed to the material is by breathing vapors that move from the ground water, through the soil, and into the basements or lower levels of homes. Unless there is adequate ventilation, these vapors can collect inside a house or building.

The Redfield manufacturing site is located in a residential neighborhood in southeast Denver. Brown Group Retail, Inc. is the current owner of the property. The Division is regulating and overseeing the remediation and public participation activities. The Division has set a maximum allowable concentration in air for the contaminants. When indoor air tests in the basements of homes in the neighborhood show results above that action level, these homes are remediated by installing a ventilation system identical to the type used to remediate radon.

In 1998, Brown Group Retail, Inc. notified the Division that the contour of the contamination plume in the neighborhood had been determined and that all affected homes had been identified. In the early months of 2000, however, through follow-up testing, it became clear that the contamination plume had extended and that many more homes were affected.

Brown Group Retail, Inc., has hired a professional community relations consultant to carry out public participation activities. Examples of public participation activities at this site include: public meetings, availability sessions, face-to-face meetings with residents, provision of fact sheets and other printed information, information on a website, and a 24-hour information phone line with pre-recorded information.

5.4.2 Results of Interviews
Interviews were conducted with residents in the affected neighborhood, with Brown Group's consultant, and with Division staff.

5.4.2.1 Trust
Most people who participated in the interviews recognized the role of the Division as the regulatory agency, and thought the Division was doing a good job of overseeing the remediation activities. The Division's oversight seems to lend credibility to the information put forth by Brown Group Retail. Brown Group Retail was seen as open and forthright with information pertaining to the contamination. The selected remedy was perceived as adequate.

A number of people who had been highly critical of Brown Group Retail and the Division, have stopped attending the public meetings. The suggestion was raised that a change in the format of the public meetings may have partly caused this. Initially, most meetings were held the "old-fashioned" way: Brown Group Retail and/or the Division would do a presentation, and there would be the opportunity for questions. More recently, public meetings were held in the form of "availability sessions." In this format, experts from Brown Retail Group, its consultants, and the Division are available for one-on-one conversations with residents. This meeting format does not seem suitable for political posturing by members of the public (see: Renn, Webler and Wiedemann, 1995). This may have contributed to the fact that a certain group of people no longer shows up at meetings.

5.4.2.2 Public Participation
Most participants in the interviews indicated that active participation by local residents was limited to those who were directly affected by the ground water contamination, i.e., contaminants were found to affect their homes. It was thought that only these people would attend public meetings, but that even part of this group of residents was not really interested in attending meetings and getting actively involved, perhaps out of anxiety over what they would learn.

Efforts are made by Brown Group Retail and the Division to reach the broader community. Residents in an area much larger than currently known to be affected receive information about the site and the contamination by mail. Community members who participated in the interview thought this was an effective way to reach this urban, middle class community.

An interesting anecdote indicates the importance community members attach to knowing whether they are actually affected by the contamination. At a very early stage of the project, a number of residents were offered the ventilation system even before their homes were tested for vapors. That did not satisfy these residents. They wanted to know whether their homes were directly affected by the pollution.

5.4.2.3 Information
Information is provided to the community in many different ways. The availability sessions were considered helpful by residents, as well as the website and the fact sheets. Generally, residents thought that Brown Group Retail and the Division are open and forthcoming with information. The residents who were interviewed knew whom to contact at Brown Group Retail or the Division if they had specific questions.

In relation to the "availability sessions," however, community members pointed out that information provided by one expert was sometimes different from information provided by another. Thus, there seems to be confusion over the method used to decide which homes get tested and which do not. They also pointed out that these types of meetings only satisfy people who have specific questions. They do not allow people to learn about other people's concerns and learn from answers to other people's questions.

5.4.3 Concluding Remarks

The comments of consultants, government staff and members of the public indicate that the use of availability sessions at this site is a successful method of informing members of the public who choose to attend these meetings. However, attendance depends on self-selection by members of the public, which makes it necessary to use other methods of public education in order to inform community members who choose not to attend.

Members of the public who participated in the interviews were relatively trusting of the Division and of Brown Group Retail. The proactive approach taken by those parties to inform the public and address the environmental hazard seems to have contributed to this. However, citizens who were critical of the Division and Brown Group Retail were not interviewed.

5.5 Rocky Flats Environmental Technology Site

5.5.1 Background

Beginning in 1952 and continuing for nearly 40 years, the U.S. government manufactured plutonium components for nuclear weapons at Rocky Flats in Colorado. In 1992, with the end of the "Cold War," the U.S. government decided not to resume production of nuclear weapons parts at Rocky Flats. This decision followed an FBI raid and investigation of the site.

The Rocky Flats site, renamed the Rocky Flats Environmental Technology Site, is located on 6,500 acres in Jefferson County, 16 miles northwest of downtown Denver. Approximately 300,000 people live within 10 miles of Rocky Flats. Operators conducted all manufacturing activities in a 300-acre area at the center of the site known as the Industrial Area. The surrounding property is called the Buffer Zone.

Rocky Flats stores the largest quantity of radioactive and hazardous wastes in Colorado. Rocky Flats contains the second largest stockpile of plutonium in the country. Much of the plutonium is in liquid form contained in deteriorating piping systems. It is stored in many locations at Rocky Flats. Leaking storage drums, unlined disposal trenches, surface water impoundments, leaky pipelines, leaky underground tanks and two on-site landfills all contributed to the contamination of soils and groundwater at the site. High levels of volatile organic compounds (VOCs) contaminate shallow ground water in the central section of the site. The radioactive elements plutonium, uranium and americium contaminate soil on the eastern side of the site. The most contaminated soils are located on the east edge of the Industrial Area. The potential for radionuclides (radioactive particles) to become airborne during strong winds is a concern, as is the potential for plutonium in soils to be washed into the two streams that flow on either side of the Industrial Area.

The current mission of the plant is environmental cleanup, waste management and decommissioning. About 6,000 people work at the plant. The Rocky Flats Environmental Technology Site is owned by the U.S. Department of Energy (DOE). The site is operated by a contractor, Kaiser-Hill. CDPHE and the EPA share oversight for decisions on environmental cleanup at Rocky Flats. The regulatory framework for this oversight is contained in the 1996 Rocky Flats Cleanup Agreement between CDPHE, EPA and DOE.

In addition to its responsibilities in the environmental cleanup, CDPHE was involved in a study of cancer incidence and mortality among Rocky Flats workers and a study of the potential health effects of past chemical and radionuclide releases from Rocky Flats to surrounding communities.

Public participation at Rocky Flats has a long history, including the protests during the 1970s and 1980s against nuclear arms production. Since the late 1980s, DOE has been providing more formal opportunities for public participation. Several documents record the evolution of public protest and public participation at the site (for instance, The Handbook on Rocky Flats, published in 1993 by the Colorado Council on Rocky Flats). Guidelines for and further information on public participation at Rocky Flats can be found in the following documents: Rocky Flats Public Participation Guidance (August 1995), and the Rocky Flats Site-Wide Integrated Public Involvement Plan (March 1998).

Many complicated technical and policy decisions have been made and remain with regard to the cleanup of Rocky Flats. The government agencies and other organizations coordinate their public participation activities in the Public Participation Focus Group, so as not to overburden staff and members of the public with meetings and information. Current public participation activities include: tours of the site, a website, written materials, public meetings and so-called pizza meetings. There are several ongoing forums for deliberation, including the Citizens Advisory Board (CAB), which was the first CAB developed in Colorado, the Rocky Flats Coalition of Governments (the Coalition), and the Rocky Flats Cleanup Agreement Stakeholder Focus Group (Stakeholder Focus Group).

5.5.2 Results of Interviews
Interviews were conducted with CDPHE staff, EPA staff, DOE staff, local government staff, CAB staff, members of the CAB and other active citizens.

5.5.2.1 *Trust*
Many participants in the interviews pointed at the history of secrecy surrounding the manufacturing of nuclear weapon components as a major cause for distrust in DOE. During the late 1980s more information started to become available about past incidents and how these incidents may have affected neighboring communities. Such information was harmful to public trust. Further information about potential causes for distrust can be found in the study of causes of public distrust conducted by the Secretary of Energy Advisory Board, Task Force on Radioactive Waste Management (1993).

Despite changes in DOE policies and despite efforts to earn trust, many citizens still distrust DOE. Several community members indicated that they were highly distrustful. Most acknowledged the positive changes in DOE's policies and expressed faith in the intentions and competence of locally based DOE, EPA and CDPHE staff. These community members stressed the importance of developing working relationships with locally based staff for the purpose of sharing information and concerns. However, they pointed out that local DOE staff may not have final decision making authority, and that political, financial and other constraints may assert strong influence over the final decision.

Several community members indicated a specific event that damaged efforts to build trust. The interim Radionuclide Soil Action Levels (RSALs) were negotiated by the agencies. There was no or limited opportunity for the public to be involved in the development of the decision about what these Soil Action Levels would be. Several citizens pointed out that they were not happy with the results (the actual interim Radionuclide Soil Action Levels) and were not happy with the process, which had been exclusive.

This example also illustrates that distrust is not limited to DOE, it includes EPA and CDPHE. Many community members indicated that they thought the three agencies appeared to be operating closely together, and EPA and CDPHE were not seen as advocates for community interests.

A positive development that is helping to build trust, is the open and responsive process of the Stakeholder Focus Group. Questions to the agencies are answered and information is provided quickly and generally satisfactorily.

5.5.2.2 Public Participation
The Stakeholder Focus Group was convened, not to be a decision-making body, but as a forum for open discussions between the agencies and the public of issues related to the closure of the site. Most participants in the interviews were relatively optimistic about the process of the Stakeholder Focus Group. Many participants see it as an opportunity to influence decision making, because the agencies hear the public's concerns early in the decision-making process when adaptations are relatively easy to make. They felt that the agencies are trying hard to be responsive to public concerns. Requests for information are resolved quickly, public comments on draft documents or proposals are responded to clearly and quickly.

However, several limitations to the current process were indicated. Several people thought the concept of the Stakeholder Focus Group was very appealing at first, but initial execution of the concept was not great. They indicated that hiring a well-respected facilitator has been helpful in building trust in the process.

Furthermore, attendance of the Stakeholder Focus Group is based on self-selection. Many participants also attend other public meetings or CAB meetings. Certain groups, especially environmental groups, have either chosen to remain outside the process, or feel forced out of the process (the meetings are held late afternoon, according to some this is too early for many people to attend). The question was raised whether the process provides DOE with the information it needs to really take all interests into account when the final decisions are made.

Several people thought the Stakeholder Focus Group provided a more efficient way of influencing government decision making than the Citizens Advisory Board (CAB).

The CAB has the authority to make formal recommendations to DOE. Recommendations are based on consensus among the Board members. Several people were skeptical about this process. They felt that consensus-based decision making did not allow the CAB to be a strong advocate of community concerns, because recommendations were often watered down.

However, many saw value in the fact that deliberations within the CAB inform government agencies about public concerns. They also pointed out that the CAB has been successful in certain areas. For instance, recent collaboration with the Coalition has led to the development of joint opinions about the topic of stewardship. It was felt that the work of the "Stewardship Committee" has put this topic on the agencies' agenda.

Several highly contentious issues are not being sufficiently addressed in the deliberations in the Stakeholder Focus Group, the CAB or other ongoing groups. These issues include: the use of controlled burning of vegetation in the buffer zone, and the use of explosives in decommissioning. There are members of the public who strongly oppose both controlled burns and the use of explosives. It seems that representatives of the strongest opposition groups are not currently included in the deliberations with the government agencies.

5.5.2.3 Information
Most of the government and public participants in the interviews indicated the importance of changes in DOE policies that have allowed information to be shared. Active participants in the deliberations with the agencies, commended the agencies for being proactive in providing information and responding to requests for information.

The development of a working relationship with government staff was seen as important. Several members of the public indicated that being able to contact government staff and ask questions was very helpful to them.

Participants in the ongoing community groups explained that support of technically competent CAB staff, technically competent CAB members and peer review of technical information has been helpful in developing understanding of and trust in technical information.

They did point out that only a small part of the potentially affected community attends public meetings on a regular basis and is informed about issues relating to the clean-up of Rocky Flats. An attitude survey carried out in 1998 showed that, although a large percentage of people is aware of Rocky Flats' existence, most people included in the survey felt they did not know much about the clean-up efforts at Rocky Flats. The survey does indicate that many people know where to get information if they would choose to look for it. The newspaper seems to be the main vehicle for informing the broader community.

5.5.3 Concluding Remarks
Activities at Rocky Flats illustrate the importance of openness and being proactive in sharing information. Many community members were aware of the changes in policy concerning openness over the past decade and indicated that it was important in developing trust in the government agencies involved. However, many community members are still highly distrustful and building trust will require a sustained effort.

DOE provides several opportunities for deliberations between government staff and members of the public, and there are efforts to involve the public early in the decision-making process, for instance in the Stakeholder Focus Group. Based on the evaluations of public participation programs reported in Chapter 4, these deliberations should lead to final decisions that receive public support. However, there is a concern that strong opponents of the use of explosives in demolition, controlled burns of vegetation and perhaps other contentious issues, are not involved in the deliberations or that these issues are not being adequately addressed, which may eventually lead to conflict.

Rocky Flats is one of the largest sites requiring public participation in Colorado. Over the past decade, many different public participation methodologies and approaches have been implemented at this site: clear public participation guidelines were developed, several efforts to develop consensus (for example, developing consensus on clean-up priorities) have been made, etc. These experiences provide valuable lessons for agency staff who are working at this and other sites.

5.6 Shattuck Chemical Company

5.6.1 Background
From 1917 to 1984, S.W. Shattuck Chemical Company and its predecessor owners or facility operators engaged in mineral processing operations. This included the processing of tungsten ores, carnotite ores for uranium and vanadium, radium slimes, molybdenum ores and depleted uranium. These operations resulted in the contamination of the soil with radium and other low level radioactive components. The principal threats to public health were posed by the inhalation of radon gas or exposure to gamma radiation emanating from radium-contaminated site soils.

The Shattuck site is located in Denver, near a number of businesses and residences. The EPA and CDPHE decided in 1992 to clean up the site by on-site stabilization of the waste (solidification). Several community groups opposed this remedy. These groups sustained their opposition, and over the years kept organizing activities to try and overturn this decision.

The on-site cleanup was essentially completed in 1999 by the S.W. Shattuck Chemical Company under an order from the EPA. However, new information collected in 1999 called into question the effectiveness of the remedy and the required 5-year showed a number of uncertainties about the safety of the remedy. The EPA decided that the remedy deserved to be reevaluated and proposed a new clean-up plan in December 1999. The new plan called for removal of the materials to an off-site, licensed facility.

5.6.2 Results of Interviews
Interviews were conducted with EPA staff, Division staff, a professional facilitator and community members.

5.6.2.1 Trust
The lack of trust is a major issue in the relationship between CDPHE and the EPA on the one hand, and the community on the other. A number of circumstances were identified by community members as causes for the absence of trust in both CDPHE and the EPA. It started with the process leading to the decision in 1992 to solidify the low level radioactive waste at the site. Prior to this decision, the EPA had developed a proposed plan in which alternative remedies were presented and evaluated. As required by law, the EPA indicated a preferred alternative, which was removal of the waste to a licensed radioactive waste repository. This proposed plan was presented to the public. The community was in favor of EPA's preferred alternative. In the experience of the community, several months of silence followed until the final decision was made and presented. That decision was the opposite of what the preferred alternative had been. The waste would not be removed, but would be treated on-site. The fact that the final decision was influenced by comments from the site owner, and that, even much later, little or no documentation could be found that contained information about the negotiations with the site owner or an evaluation or re-evaluation by the agencies of the technical merits of solidification, contributed to the feeling that the EPA and CDPHE "were in bed with" the site owner. It went against the expectation that these agencies' primary goal was to protect the public against health and environmental hazards.

During the period following the final decision, the agencies stated and publicly explained their opinion that the selected remedy was protective of public health. An already skeptical public started to collect information which indicated the possibility of health problems associated with low-level radioactive waste. Members of the community who presented this information to the agencies were not satisfied with the agencies' replies, which further undermined their faith in the competence of the agencies. Community members also referred to health warnings (for example, not to drink water from wells or water gardens with well water) issued by the EPA before the 1992 decision.

The feeling that the agencies did not have the public interest foremost in mind was exacerbated by the fact that government documentation was made inaccessible. Because the EPA was involved in a number of court cases, many documents were classified. However, community members felt that the EPA had implemented a blanket classification of documents relating to Shattuck, without considering if classification of all these documents was really necessary.

These and other circumstances led to the overall conclusion on the part of community members that CDPHE and the EPA were not working to protect public health and the environment, that the agencies were not listening to the public's concerns, and that they were not willing to look critically at the technical merits of their decision.

Many government staff were aware of these public perceptions. Most do believe that the remedy of solidification was as protective of the community as removal of the waste. Some government staff doubted that a different approach to public participation would have made a difference in the outcome. Most believed that much of the damage to trust in their agencies was caused by the process that led to the decision for solidification of the waste at the site. The lack of involvement of the community leading up to that decision was identified by many as a factor contributing to the loss of trust. In addition, public fear of and unfamiliarity with radioactivity was thought to play an important role in causing public opposition against the solidification remedy.

5.6.2.2 Public Participation
The recent decision by the EPA to remove the waste from the site has changed the dynamics of the discussion between the agencies and the public. The main item of contention has been resolved: the waste will be removed. However, community members feel the EPA was forced to change its decision, and still has to prove that it is really taking the community's interests into account.

Much of the discussion between the agencies and the community takes place during the meetings of the Citizens Advisory Board (CAB). These interactions are generally respectful. Hiring a facilitator who was trusted by the CAB members was helpful in building trust in the CAB process. During one of the recent meetings, CAB members expressed their appreciation for the fact that the EPA calls in subject experts to answer specific, technical questions from the CAB.

However, there was some dissatisfaction with EPA's attitude concerning the CAB's comments on draft technical documents. EPA responds to the CAB's comments in writing, and the CAB wanted to have an opportunity to comment on these responses. Somehow this opportunity was denied or it was felt that this opportunity was being denied. It was suggested that such issues should be discussed.

5.6.3 Concluding Remarks

Shattuck Chemical Company provides an example of the potential results of decision-making without public participation. After the EPA and CDPHE decided for solidification of the low-level radioactive waste, the community spent eight years fighting this decision. The community's persistence and some changes in circumstances, eventually led the EPA to overturn the original decision.

When Sandman's theory on hazard and outrage (Sandman, 1994) is applied to this site, it is understandable that public outrage increased, rather than decreased. The presence of the waste itself caused outrage, because the exposure was involuntary, the hazard was industrial, most people were unfamiliar with the hazards of low-level radioactive waste, consequences of exposure were dreaded, etc. The activities of the agencies did not reduce outrage. The decision-making process was not responsive to community concerns, the community was not given power over the process or the outcome, and only after the final decision was made, were extensive efforts taken to familiarize the community with the hazard. These circumstances probably made acceptance of the chosen remedy highly unlikely.

Much has changed since the early 1990s. Government agencies have much more experience with public participation and have developed more flexibility in decision-making, for instance in relation to financing or co-financing remedies with other parties. Such changes make approaches to conflict resolution and consensus-building viable options.

5.7 Summitville

5.7.1 Background

The Summitville Mine is an abandoned gold mine that was leaking cyanide, acid and metal-laden mine water into the headwaters of the Alamosa River. Gold and silver mining began at Summitville around 1870. The latest mining operator was Summitville Consolidated Mining Corp., Inc. (SCMCI), which mined the site from July 1986 through October 1991 and abandoned the site in December 1992. Mining operations deforested and greatly disturbed most of the land area at Summitville.

When SCMCI declared bankruptcy in December 1992, the EPA initiated an Emergency Response action at the mine to prevent a potentially catastrophic overflow of cyanide-contaminated water. After this time-critical action was completed, the EPA began working on long-term cleanup. Since 1992, the EPA and CDPHE have initiated several interim projects designed to slow the amount of acid mine drainage coming from the site. CDPHE is leading the evaluation of the effectiveness of the interim measures that have been completed, or that remain on-going at the site, and is carrying out activities to determine what final construction projects or long-term measures must be added in order to wrap up the Summitville cleanup in the future. The EPA is providing management support and financial assistance for CDPHE's leadership of the final remedial phase.

The mine site is in the San Juan Mountains at an elevation of 11,500 feet, surrounded by the Rio Grande National Forest. The Alamosa River and its tributaries flow from the site through forest and agricultural land in Rio Grande and Conejos Counties and past the San Luis Valley towns of Capulin and La Jara. The Terrace Reservoir, used for irrigation of farmland, is on the Alamosa River 18 miles downstream from the site.

Public meetings, site tours, public availability sessions, media releases, the Summitville Advisory Committee, several EPA Technical Assistance Grants for a citizens group, information repositories and informational workshops have been part of the public participation program.

5.7.2 Results of Interviews
Interviews were conducted with Division staff, EPA staff, community members and other stakeholders present at the November 3, 2000, meeting in Alamosa, CO.

5.7.2.1 Trust
The relationship with the community is strained due to high levels of distrust in several community members. To a certain extent, the roots of this strained relationship can be traced back to the siting of the mine. The Summitville mine is located in Rio Grande county. This community reaped the benefits from mine operations. The communities downstream from the mine, in Conejos County and Alamosa County, did not receive any of the benefits, but they were impacted by the contamination resulting from the mining operations.

The emergency response activities and ensuing activities did not help to improve relationships. Community members perceived project-managers as arrogant and unresponsive to the community. Some felt that it had been very difficult to receive information and felt that they were not listened to.

Many participants in the interviews indicated that the relationship between government agencies and the community is improving, partly as a result of efforts to provide information openly and proactively. It was suggested that further improvements could be made if the Division would show it takes community concerns serious.

5.7.2.2 Public Participation
In the near future, important decisions have to be made about finalizing the environmental remediation of the site. An important decision will be the selection of a so-called engineering alternative. In an effort to develop a decision that receives broad public support, the Division has opted to engage all known stakeholders in an open discussion of possible alternatives. The first meeting was held on November 3, 2000, in Alamosa. The Division has hired a facilitator to guide the discussion. During the meeting on November 3, representatives of a variety of stakeholder groups were asked to develop their preferred alternative, based on currently available data and within the constraints of the Superfund cleanup.

The distrust present in the community was illustrated at the beginning of the meeting when one group challenged the approach presented by the Division. They felt they were being pressured into this process, they felt that insufficient data was available to base any decisions on, and they felt that they had had insufficient opportunity to review the information on possible engineering alternatives.

Most groups present at the meeting expressed their appreciation for the fact that the agencies were willing to engage the stakeholders in open deliberations early on in the decision-making process. Some felt that they had not been very vocal in formal public meetings, and this process gave them an opportunity to have their voice heard.

However, the more critical participants took a "wait and see" approach. They felt that they had tried to give their input many times before and nothing had come of it. It is up to the Division to prove that this time it is taking this process and citizen input seriously.

5.7.2.3 *Information*
Representatives of the community have made use of several EPA Technical Assistance Grants. These grants enabled them to hire a technical consultant who assisted community members in processing and validating technical information. These community members found this most helpful in understanding technical aspects of the site.

5.7.3 Concluding Remarks
As in the case of Shattuck Chemical Company, the Summitville Mine Site provides an example of how top-down government has strained relationships between government agencies and the public. The perceived arrogance of the emergency response project-managers has left a lasting legacy. Aronoff and Gunter (1994) point out that top-down government may increase stress-levels in community members, and that this approach is unlikely to manage or resolve conflict.

As would be suggested by the findings of Covello and Peters (1996) and the Task Force on Radioactive Waste Management (1993), the recent policy of openness and sharing information has helped increase trust in the agencies.

Currently, stakeholders are actively involved in open deliberations and have an opportunity to participate in the process to reach decisions on finalizing the clean-up of the site. However, one citizen group in particular was skeptical about the process. If final decisions are to be reached by consensus, or at least receive broad public support, it is important that all stakeholders participate. Rosener's (1981) evaluation of task-oriented workshops illustrates the importance of having all stakeholders participate, and convincing stakeholders that the government agencies are committed to the process and its outcome.

The inclusion of all the stakeholders is especially important, because different community groups have very different opinions about the desired clean-up levels and the function of the rivers that were polluted by the mine site.

5.8 Vasquez Boulevard & I-70

5.8.1 Background
The Vasquez Boulevard & I-70 (VB/I-70) site includes all or portions of several distinct neighborhoods in northeast Denver. Historically, this area was a major smelting center for the Rocky Mountain West. Three smelting plants operated in the area, from the 1870s through the present, refining gold, silver, copper, lead and zinc. Only the Globe plant is still in operation today, refining high-purity metals.

The EPA and CDPHE sampled soil in residential yards in these neighborhoods to determine if arsenic, cadmium, zinc and lead residues from past smelting operations posed a potential threat to the health of the community. Sampling results showed elevated lead and arsenic concentrations in some yards. Residents may be exposed to metals through ingestion of contaminated soil particles or by inhalation of contaminated airborne particles. The site was added to the National Priorities List of Superfund Sites on July 22, 1999.

The communities affected by this site represent some of the least affluent communities in Denver. They are ethnically diverse, with some of the neighborhoods predominantly African-American and others predominantly Hispanic. In addition to the soil contamination, they are dealing with the emissions of several industries neighboring the communities. The communities are receiving support from EPA's Environmental Justice Program.

The EPA has joined with CDPHE, the City and County of Denver, the Agency for Toxic Substance and Disease Registry (ATSDR) and representatives of the affected neighborhoods to sample all residential properties and identify clean-up options. Long-term clean-up levels will be based on the results of the risk assessment.

Public participation activities to date include: community interviews, Site Information Repositories, notification of availability of the technical assistance grant, public comment on NPL proposal, fact sheets and activity updates, press releases, briefing of local officials, updates through newsletters and an accurate mailing list, a number of public meetings and open houses have been held, and the EPA attends neighborhood association meetings. The Working Group provides a forum in which federal, state and local government agencies, as well as neighborhood representatives, discuss clean-up activities and decisions.

5.8.2 Results of Interviews
The participants in the interviews were CDPHE staff, EPA staff, ATSDR staff, local government staff, citizen members of the Working Group and individual citizens.

5.8.2.1 Trust

Most community representatives in the Working Group have experience dealing with the EPA and CDPHE in relation to Superfund cleanups. They were involved in the cleanup of another Superfund site. Their previous experiences have made them suspicious of government agencies, but was also instrumental in the community pushing for the development of the Working Group. Most of the community members who were interviewed expressed their appreciation for the EPA's willingness to engage in the Working Group process and thought this was an important vehicle for cooperation between the community and the agencies. However, previous experiences in dealing with the EPA and CDPHE have resulted in a remaining level of distrust.

There is an ongoing discussion between ATSDR and the EPA on certain technical issues, such as indoor sampling. Most citizens who were interviewed would like to see these discussions resolved, but they said it did not affect their trust in the agencies. In fact, they perceived ATSDR as taking a stand on behalf of the community, and they saw the discussion as proof of the fact that this agency was willing to be an advocate for the community.

5.8.2.2 Public Participation

The neighborhoods involved in this site have relatively distinct boundaries. Most are characterized by strong internal cohesiveness. The distinct boundaries caused an interesting reaction to initial sampling conducted by the EPA. Sampling included some neighborhoods completely, and others partly. A neighborhood that was only partly sampled reacted angrily, suspecting the EPA of trying to divide their community (divide and conquer). This anecdote provides an example of the importance of getting to know the potentially affected communities as early as possible. It was suggested that contacting community leaders would have yielded the information necessary to avoid the angry reaction in this case.

An important vehicle for public participation at this site is the Working Group. The group meets on a regular basis and is a forum for open discussion between government agencies and representatives of the public of issues related to risk assessment and clean-up of the site. Most participants in the interviews were positive about their experiences in the Working Group. They thought the dynamics of mutual respect had been conducive to the representatives of the public learning about the site and the agencies involved learning about the affected communities. They indicated that the Working Group has made collaboration between agencies and the community possible, for example, community leaders assisted the agencies in reaching out to the broader community. The community representatives also thought that deliberations in the Working Group allowed them to influence decisions. An illustration of such influence was provided by the EPA adapting its soil sampling methods to address community concerns over "hot spots".

Despite the somewhat positive comments of many community members, concerns over the effectiveness of the Working Group were voiced by agency staff. Working Group meetings seem to have become a forum for community members to raise concerns over (industrial) impacts on their environment that fall outside the scope of the Superfund clean-up. The discussion of concerns that cannot be addressed by the Superfund clean-up seems to delay progress in the decision-making about the clean-up.

Government staff was also concerned that relying solely on the Working Group for hearing community concerns and providing communities with information might not be sufficient. The EPA attends many neighborhood meetings and events in order to hear community concerns and provide community members with information. These efforts should go a long way to ensuring that all community members' opinions and concerns are heard. These activities can also assist in developing trust (Thomas, 1998).

5.8.2.3 *Information*
Community members have recently received an EPA Technical Assistance Grant to enable them to hire a technical consultant. The opportunity to use this grant was appreciated as an opportunity to better understand technical information and more effectively contribute to decision-making.

An active community member felt that the current efforts to provide information and involve the public were insufficient, because they did not really empower citizens to participate.

5.8.3 Concluding Remarks
The process of open communications within the Working Group has contributed to increased trust (especially mutual trust) in government staff.. The Working Group also allows the community some control over the process and influence in decision-making. The Working Group concept has resulted in community leaders cooperating with the agencies to inform the community of agency activities, and the EPA changing some of its sampling methods to accommodate for community concerns.

However, practical problems are associated with the fact that the community sees the Superfund clean-up in the context of other issues it is facing. Some conflict exists where issues of concern to the community cannot be addressed by the Superfund clean-up.

5.9 General Observations Based on Interview Results
The following general observations are based on comments of government staff and community members who participated in the interviews. Many of them relate to building trust.

The lack of trust in government agencies seems to be an important issue at many sites. Many citizens did not trust government agencies to take their concerns into account when making decisions. Consequently, they felt the need to be on top of decisions these agencies are making. Many community members felt the need to have government information validated, for instance through peer reviews.

Community members felt that they actually had some influence over decisions in cases where they were given the opportunity to be involved early in the decision-making process. However, comments by community members need to be followed up on, for instance by quickly and adequately responding to questions and concerns, for community members to feel that their concerns have been heard and incorporated in the decision-making process.

Openness, which includes proactively sharing information, seems to be important in building trust. This is illustrated by experiences at Rocky Flats and at Shattuck Chemical Company where community members pointed out that holding back information had been detrimental to developing trust, and that changes in policies regarding openness were making a positive impact on trust.

It was suggested that showing interest in the community, especially by making the effort to visit the community and meet with individual citizens, may further assist in developing trust.

Several citizens felt that they were not respected and that their input and their concerns were being treated as insignificant or unimportant by government staff. In some cases, such as Pueblo Chemical Depot, this was still the case. At other sites, for instance Summitville Mine Site, this had been the case in the past and people felt that government staff attitudes were improving. Allowing the community more control over the process and influence over the decision should be helpful in addressing these feelings.

Many community members pointed out that it can be useful to involve citizens in identifying the range of values and opinions concerning public the health and environmental problems facing that community. Community leaders and other community members can be of assistance in getting to know the variety of interests and values that are present in the community.

Citizen advisory boards, focus groups, and informal working groups may be useful methods for building trust, exchanging information between agencies and representatives of the public (Vasquez Boulevard & I-70), soliciting public input in the decision-making process (Rocky Flats), and building trust (especially mutual trust as illustrated by Vasquez Boulevard & I-70 and Rocky Flats). However, the comments of citizens involved at Pueblo Chemical Depot illustrate that the lead agency has to be committed to the process in order for such groups to achieve any of these goals. It is likely that these goals will not be achieved if the agency is merely convening a citizen group as a token effort of public participation.

6. Conclusions and Recommendations

The results of studies in many different scientific and professional disciplines are relevant to the development of effective approaches to public participation. Depending on the needs of a particular project, different approaches can help build trust, accommodate the diverse values, opinions and experiences of the public, and prevent or resolve conflict. The objective of this report was to provide an overview of literature relevant to conflict-related problems encountered by Division staff in their everyday interactions with the public. The following recommendations combine the findings of the literature study with the observations made during interviews with government agency staff and members of the public.

Recommendations regarding trust
– Approaches to public participation should be adopted, which accommodate for existing levels of public distrust. In situations where high levels of distrust exist, broad public participation and the sharing of power over process and outcome may be necessary.
– Public trust in agency staff can be developed by, for instance, matching staff characteristics to those of the community, ensuring tenure longevity and making symbolic exchanges.
– Public trust in the agency can be developed by, for instance, demonstrating that it cares for community concerns, that it is competent to handle its responsibilities and by allowing for public monitoring of its activities.

Recommendations regarding dealing with a variety of values and views
– Getting to know the variety of concerns and values of a community as early as possible will help prevent conflict from arising. Meeting with local leaders may be helpful in avoiding problems and developing an awareness of the composition of a community.
– Effectiveness of public participation can be improved by adopting approaches that accommodate for the specific characteristics of the community involved. In situations where an agency is dealing with an internally divided community, effective public participation may require extensive outreach to the community and community organizing in order to engage a variety of values and opinions in the decision-making process. In cases of conflict between an agency and a united community, allowing early public input in the decision-making process and sharing power over this process and the outcome may be required for successful public participation.

Recommendations for effective public participation
- Public participation can be made more effective by adopting methods that are best suited to achieve the identified goals. For instance, public meetings may be useful in informing the public or soliciting public statements. However, experience and evaluations have shown that they may not be very effective in educating the public or incorporating public values in decision-making, let alone build trust or resolve conflict. Workshops, on the other hand, can be successful methods for educating representatives of the public. In situations of conflict, facilitation or mediation may be required to develop solutions
- Continued effectiveness may be ensured by periodically assessing the effectiveness of the public participation program and adapting it to the changing circumstances and needs. For instance, interviews with community representatives and community surveys can be used to obtain information on the effectiveness of the program and of the changing circumstances that may require changes in the public participation program.
- Assessing the effectiveness of the public participation program should include assessing the existence or development of conflict. In situations of conflict, traditional public participation methods, such as public meetings or convening a citizen advisory group, may not be effective. A conflict assessment by an impartial third party may be required to assess the type, level and substance of the conflict. Facilitated meetings with all stakeholders or stakeholder mediation may be appropriate methods to resolve conflict.
- It is recommended that the Division records and shares its experiences and uses them to improve its public participation methods. Several government agencies working on sites in Colorado are attempting to build consensus, or are otherwise engaging a broad range of stakeholders in ongoing deliberations with the intent of reaching final decisions that receive broad public support. Activities at Rocky Flats, Summitville Mine Site and Vasquez Boulevard & I-70, will provide experience with consensus-building and with public participation early on in the decision-making process.

It is important to note that often no definitive answer exists to the problems encountered by Division staff. However, it is encouraging to hear that scientists and professionals in the field of public participation have noticed an increase in the amount of attention to and research in this field. As a result, more research- and experience-based information on public participation is expected to become available to assist government agencies in further improving their public participation policies and methods. For example, the research organization "Resources for the Future" will finalize an extensive evaluation of public participation methodologies in the early months of 2001.

Another interesting development is the use of technology in public participation. Both researchers and professionals predict that technology will play an increasingly important role in public participation (see, for instance, McGovern and Beierle, 1997). The use of e-mail lists and websites for information sharing has been introduced in the methods used by several government agencies. Other applications of technology exist that may be useful tools for public participation (for example: Bonnickson, 1996).

For those who are interested in further reading, the literature overview in the Appendix to this report provides a starting point for finding literature that may provide answers to questions arising after reading this report.

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Appendix
Overview of Consulted Literature

TRUST IN GOVERNMENT

Author	Title	Date	Summary	Publisher / Source
Berman, E.M.	Dealing With Cynical Citizens	1997	Presents a theory of citizen cynicism concerning local government and, based on a national survey, examines the extent of cynicism, and the extent to which public officials can reduce the level of cynicism.	Public Administration Review, 57(2): 105-112
Boulard, G.	Applause, Sweet Applause	1998	A Pew report shows that trust in state government (compared to local and federal government) is rising. Increasing trust is probably related to the booming economy.	State Legislatures, 24: 18-21
Covello, V.T.	Trust & Credibility in Risk Communication	1992	Similar in content to Covello and Peters' "The Determinants of Trust and Credibility in Environmental Risk Communication".	Health & Environment Digest, 6(1):1-3
Covello, V.T. and Peters, R.G.	The Determinants of Trust and Credibility in Environmental Risk Communication: An Empirical Study	1996	This study examines the determinants of trust and credibility. The study supports the hypothesis that trust and credibility are based on 3 factors: knowledge and expertise; openness and honesty; and concern and care.	Sublet, Covello and Tinker (Eds.), Scientific Uncertainty and Its Influence on the Public Communication Process, Kluwer Academic Publishers, Dordrecht, The Netherlands
Frewer, L.J., Howard, C., Hedderley, D. and Shepherd, R.	What Determines Trust in Information About Food-Related Risks? Underlying Psychological Constructs	1996	Research indicates that sources of risk information which possess moderate accountability are more trusted than completely independent sources.	Risk Analysis, 16(4):473-485
Kasperson, R.E., Golding, D. and Tuler, S.	Social Distrust as a Factor in Siting Hazardous Facilities and Communicating Risks	1992	Proposition of a multidimensional conception of trust, including cognitive, emotional, and behavioral aspects, and involving themes of expectations about others, subjective perceptions of situations, and awareness of taking risk.	Journal of Social Issues, 48(4): 161-187
Kass, H.D.	Stewardship as a Fundamental Element in Images of Public Administration	1990	Argues that no matter what image or metaphor is used to think of the role played by American public administrators, that image must be built on the concept of stewardship if it is to be accepted as legitimate by the American public.	Kass and Catron (Eds.), Images and Identities in Public Administration, Sage Publication, Inc., Newbury Park, CA

Author	Title	Date	Summary	Publisher / Source
Kemp, R.	Social Implications and Public Confidence: Risk Perception and Communication	1992	Brings together socio-psychological research on risk perception, public confidence, social stigma and risk amplification.	Stewart-Tull and Sussman (Eds.), The Release of Genetically Modified Microorganisms-REGEM 2, Plenum Press, New York and London
Mann, T.	Governance in America 2000	2000	Notes several fundamental shortcomings in US politics and governance, that have resulted in low levels of public trust.	Brookings Review, Winter 2000: 4-7
Nye, Jr., J.S.	In Government We Don't Trust	1997	Explores possible explanations of dissatisfaction with government in the United States.	Foreign Policy, 99-111
Pijawka, K.D. and Mushkatel, A.H.	Public Opposition to the Siting of the High-Level Nuclear Waste Repository: the Importance of Trust	1991/1992	Examines several dimensions of public opposition to the proposed siting of the high-level nuclear waste repository at Yucca Mountain. Suggests that lack of trust in DOE was key component of public opposition.	Policy Studies Review, 10(4): 180-194
Secretary of Energy Advisory Board, Openness Advisory Panel	Responsible Openness: An Imperative for the Department of Energy	1997	Openness is an important aspect of efforts to build trust. Gives recommendations that will assist in effectively sharing information and balancing security concerns with the necessity of openness.	http://www.hr.doe.gov/seab/
Secretary of Energy Advisory Board, Task Force on Radioactive Waste Management	Earning Trust and Confidence: Requisites for Managing Radioactive Waste	1993	Extensive assessment of causes for existing levels of public distrust in DOE. Gives detailed recommendations for building trust.	http://www.hr.doe.gov/seab/
The Economist	American Politics	1998	Describes potential causes for growing trust in (federal) government.	The Economist, 346:19-21
Thomas, C.W.	Maintaining and Restoring Public Trust in Government Agencies and Their Employees	1998	Explores the question: How can we create, maintain, or restore public trust in government agencies and their employees? The article reviews several concepts of trust and lays out a series of hypotheses.	Administration & Society, 30: 166-193

RISK PERCEPTION AND RISK COMMUNICATION

Author	Title	Date	Summary	Publisher / Source
Baum, A., Fleming, I., Israel, A. and O'Keeffe, M.K.	Symptoms of Chronic Stress Following a Natural Disaster and Discovery of a Human-Made Hazard	1992	Research on the acute and chronic effects of victimization by disaster. Differences in effects are found between natural disasters and man-made hazards.	Environment and Behavior, 24(3): 347-365

Baum, A., Fleming, R. and Davidson, L.M.	Natural Disaster and Technological Catastrophe	1983	Effects of natural disasters and those of technological disasters on individuals are compared.	Environment and Behavior, 15(3): 333-353
Bennett, R.	Risky Business: the Science of Decision Making Grapples with Sex, Race, and Power	2000	Addresses the white male finding that a sub-group of white men has significantly lower perception of risk than white women, African-American men, and Hispanic men.	Science News, 158:190 -191
Bratic Akin, E.	Translation of Risk Information for the Public: Message Development	1989	The message development process must encompass how the public perceives health risk messages, characteristics of the target audiences and selected communications channels, principles for message design, and message testing.	Covello, McCallum and Pavlova (Eds.), Effective Risk Communication, Plenum Press, New York
Brockner, J., Chen, Y., Mannix, E.A., Leung, K., and Skarlicki, D.P.	Culture and Procedural Fairness: When the Effects of What You Do Depend on How You Do It	2000	Evaluates whether cultural differences in people's tendencies to view themselves as interdependent or independent moderate the interactive relationship between procedural fairness and outcome favorability.	Administrative Science Quarterly, 45:183-159
Brown, J.	Evaluating Communications about Nuclear Energy: the Case of Sizewell "B"	1990	Reports the findings of an attitude survey of a representative sample of the population living within a 30 kilometer radius of a nuclear power station.	Handmer and Penning-Rowsell (Eds.), Hazards and the Communication of Risk, Gower Publishing Company, London
Brown, P.	Popular Epidemiology Revisited	1997	Popular Epidemiology represents 2 related phenomena: (1) a form of citizen science in which people engage in lay ways of knowing about environmental and technological hazards, and (2) a type of social movement mobilization.	Current Sociology, 45(3): 137-156
Callaghan, J.D.	Reaching Target Audiences with Risk Information	1989	Explains the necessity of analyzing the nature of the message and the nature of the audience that is the target of that message. Gives guidelines.	Covello, McCallum and Pavlova (Eds.), Effective Risk Communication, Plenum Press, New York
Covello, V.T.	Educating Young People about Environmental Health Risks: Results from National Field Trials of the Environmental Health Risk Module	1996	After testing the ability of instructional material to improve students' understanding of risk assessment and management, it was concluded that significant changes in environmental knowledge and comprehension can be achieved relatively quickly.	Sublet, Covello and Tinker (Eds.), Scientific Uncertainty and Its Influence on the Public Communication Process. Kluwer Academic Publishers, Dordrecht, The Netherlands
Covello, V.T., McCallum, D.B. and Pavlova, M.	Principles and Guidelines for Improving Risk Communication	1989	Summary of principles and guidelines for risk communication that were agreed upon during a Workshop on the role of government in health risk communication and public education, held January 21-23, 1987, Washington, D.C.	Covello, McCallum and Pavlova (Eds.), Effective Risk Communication, Plenum Press, New York

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Author	Title	Year	Description	Publisher
Cutter, S.L.	Living with Risk; the Geography of Technological Hazards	1993	Introduction into the risk and hazards literature. Chapter 1 gives an explanation of the nature and character of technological hazards. Chapter 2 describes risk perception. Chapter 3 describes how risks are managed.	Routledge, Chapman and Hall, Inc., New York
Daggett, C.J.	The Role of Risk Communication in Environmental Gridlock	1989	Examples of environmental gridlock and brief analysis of how poor risk communication has contributed to these examples.	Covello, McCallum and Pavlova (Eds.), Effective Risk Communication, Plenum Press, New York
Dake, K.	Orienting Dispositions in the Perception of Risk	1991	Shows that cultural biases of Hierarchy, Individualism, and Egalitarianism are predictive of distinctive rankings of possible dangers and preferences for risk taking at the societal level.	Journal of Cross-Cultural Psychology, 22(1): 61-82
Davies, J.C., Covello, V.T. and Allen, F.W. (eds.)	Risk Communication; Proceedings of the National Conference on Risk Communication, held in Washington D.C., January 29-31, 1986	1987	Gives brief overview of problems encountered in risk communication. Describes proceedings of the panel discussions on trust and credibility, case studies of risk communication, and future challenges for risk communication.	The Conservation Foundation, Naperville, IL
Farago, K.	Reality Versus Perception, and Values Versus Science in Risk Assessment and Risk Perception	1999	Describes risk perception in individuals and communities.	Briggs, Stern and Tinker (Eds.), Environmental Health for All: Risk Assessment and Risk Communication for National Environmental Health Action Plans, Kluwer Academic Publishers, Dordrecht, The Netherlands
Fischhoff, B.	Helping the Public Make Health Risk Decisions	1989	Describes research and identifies areas of further research relating to communicating information about risks in such a way that they can be effectively processed by lay people.	Covello, McCallum and Pavlova (Eds.), Effective Risk Communication, Plenum Press, New York
Gowda, M.V.R.	Heuristics, Biases, and the Regulation of Risk	1999	Describes key heuristics and biases and discusses their effects on policy outcomes in the area of risk regulation.	Policy Sciences, 32: 59-78
Hance, B.J., Chess, C. and Sandman, P.M.	Improving Dialogue With Communities: A Risk Communication Manual for Government	1991	A well-researched and practical guide on risk communication.	New Jersey Department of Environmental Protection and Energy, Trenton, NJ
Hance, B.J., Chess, C. and Sandman, P.M.	Industry Risk Communication Manual	1990	Guidelines, checklists, examples and quotations from interviews with nearly 30 practitioners in the field of risk communication.	Lewis Publishers, USA

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Author	Title	Year	Description	Source
Hattis, D.	Scientific Uncertainties and How They Affect Risk Communication	1989	Describes problems flowing from poor communication of risk and uncertainties about risk, and the subjective judgments by experts carrying out a risk assessment.	Covello, McCallum and Pavlova (Eds.), Effective Risk Communication, Plenum Press, New York
Helmericks, S.G.	Risk Perception of Low Probability Hazards	1988	Examination of the relationship between demographic and stake factors to spatial, generic, and temporal risk perception.	Colorado State University, Masters Thesis.
Henry, R.A.	You'd Better Have a Hose if You Want To Put Out the Fire	2000	A complete guide to risk and crisis communications. Targeted to private industry.	Gollywobbler Productions, Windsor, CA
Kasperson, R.E. and Palmlund, I.	Evaluating Risk Communication	1989	Evaluation provides a central means for assuring appropriate goals, content, and outcomes of risk communication programs. Authors explore possibilities and limitations for evaluation.	Covello, McCallum and Pavlova (Eds.), Effective Risk Communication, Plenum Press, New York
Lum, M.R. and Tinker, T.L.	A Primer on Health Risk Communication; Principles and Practices	1994	Tips and guiding principles for risk communication.	U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Washington, D.C.
Lundgren, R. and McMakin, A.	Risk Communication; a Handbook for Communicating Environmental, Safety, and Health Risks	1998	Explains approaches, mandating laws, constraints, ethical issues, and principles of risk communication. Provides detailed steps for planning, carrying out and evaluating risk communication efforts. Well researched. Received good reviews.	Battelle Press, Columbus, Ohio
Mays, C. and Poumadere, M.	Uncertain Communication: Institutional Discourse in Nuclear Waste Repository Siting	1996	Different means of communicating with the public and distributing decision authority are observed: Britain's Sellafield Repository Project and France's Mediation to site an underground laboratory are studied.	Sublet, Covello and Tinker (Eds.), Scientific Uncertainty and Its Influence on the Public Communication Process, Kluwer Academic Publishers, Dordrecht, The Netherlands
Nordenstam, B.J.	The influence of Environmental Uncertainty on Lay Perceptions of Risk and Safety	1996	A hypothetical risk assessment was presented to 170 university students. Respondents indicated their preferred degree of safety by selecting the level of monetary sources they were willing to invest in environmental remediation methods.	Sublet, Covello and Tinker (Eds.), Scientific Uncertainty and Its Influence on the Public Communication Process, Kluwer Academic Publishers, Dordrecht, The Netherlands
Oliver-Smith, A.	Anthropological Research on Hazards and Disasters	1996	Describes developments in anthropology concerning the effects of hazards on populations. It describes the theories on behavioral and organizational responses; social change; and a political economic/ environmental approach.	Annual Review of Anthropology, 25: 303-328

Author	Title	Year	Description	Source
Poumadere, M.	Enjeux de la Communication Publique des Risques pour la Sante et l'Environnement	1995	Presents a comparative study of risk perception in France and the U.S.	Revue europeenne de Psychologie Appliquee, 45(1):7-15
Regester, M. and Larkin, J.	Risk Issues and Crisis Management: A Casebook of Best Practices	1997	The public relations approach to crisis communications.	The Institute of Public Relations, London
Rickart, B.J.	Corporate Response to Perceived Environmental Risk	1993	After reviewing data on 54 Bay Area businesses, organizational resources and perceptions were found to have an impact on response to (earthquake) risk.	Colorado State University, Masters Thesis.
Roberts, J.T.	Negotiating Both Sides of the Plant Gate: Gender, Hazardous Facility Workers and Community Responses to Technological Hazards	1997	Argues that the workers at hazardous facilities potentially influence a community's response to technological hazards. Limited research on the topic.	Current Sociology, 45(3): 157-177
Sandman, P.M.	Hazard versus Outrage in the Public Perception of Risk	1989	Expert risk assessments focus on hazard and ignore outrage, but citizen risk assessments are more a product of outrage than of hazard. Descriptions of components of outrage. Suggestions for more successful risk communication.	Covello, McCallum and Pavlova (Eds.), Effective Risk Communication, Plenum Press, New York
Sandman, P.M.	Responding to Community Outrage: Strategies for Effective Risk Communication	1993	Explanation of "Risk = Hazard + Outrage" theory, which is based on research on risk perception and risk communication.	American Industrial Hygiene Association, Fairfax, VA
Sandman, P.M.	Risk=Hazard+Outrage: A Formula for Effective Risk Communication	1994	Video-presentation by Prof. Sandman in which he explains the practical application of his theories on risk perception by experts and the public.	American Industrial Hygiene Association, Fairfax, VA
Sjoberg, L.	Risk Perception by the Public and by Experts: A Dilemma in Risk Management	1999	Explains that citizens have a relatively good understanding of risk. In combination with Protector and Promoter roles of scientists, and scientific uncertainty the stage is set for conflict. Suggests the use of an elected Ombudsman.	Human Ecology Review, 6(2): 1-9
Slovic, P.	Perception of Risk	1987	Overview of some of the results obtained from psychometric studies of risk perception.	Science, 237(4799): 280-285
Slovic, P.	Perceptions of Environmental Hazards: Psychological Perspectives	1993	Presents psychological research on risk perception. Explains the psychometric paradigm and a case study in which the notions of risk perception, social amplification of risk and stigmatization are applied.	Garling, T. and Golledge, R.G. (Eds.), Behavior and Environment: Psychological and Geographical Approaches, Elsevier Science Publishers B.V., Amsterdam, The Netherlands

Slovic, P.	Trust, Emotion, Sex, Politics, and Science: Surveying the Risk-Assessment Battlefield	1999	Risk management has become increasingly politicized and contentious. The limitations of risk science, the importance and difficulty of maintaining trust, and the complex, sociopolitical nature of risk point to the need for a new risk management approach.	Risk Analysis, 19(4); 689-701
Tesh, S.N.	Citizen Experts in Environmental Risk	1999	In light of risk perception research, conflicts between administrators and the public are often seen as a conflict between experts and citizens. This overlooks the fact that citizens often express their perception of risk through "expert" NGO's.	Policy Sciences, 32: 39-58
Ting-Toomey, S.	Communicating Across Cultures	1999	Handbook on intercultural communication theory.	The Guilford Press, New York, NY
Tinker, T.L., Collins, C.M., King, H.S., and Hoover, M.D.	Assessing Risk Communication Effectiveness: Perspectives of Agency Practitioners	2000	Presents the results of an evaluation study of the Agency for Toxic Substances and Disease Registry's risk communication process.	Journal of Hazardous Materials, 3(2): 117-127
Vari, A.	Uncertainties about the Health Effects of Heavy Metal Contamination: the Case of Metallochemia	1996	Concludes that scientific uncertainties about the degree of pollution, human exposure, health effects, remedial actions, and preventive measures are important factors of successful communication.	Sublet, Covello and Tinker (Eds.), Scientific Uncertainty and Its Influence on the Public Communication Process, Kluwer Academic Publishers, Dordrecht, The Netherlands
Vaughan, E. and Nordenstam, B.	The Perception of Environmental Risks among Ethnically Diverse Groups	1991	Review of available studies involving ethnic differences in risk perception. Considers 3 hypotheses that could explain why ethnicity would be predictive of dissimilarities in judgments for many environmental risks.	Journal of Cross-Cultural Psychology, 22(1): 29-60
Viscusi, W.K.	Fatal Tradeoffs: Public and Private Responsibilities for Risk	1992	Presents a series of related questions pertaining to the tradeoff rate between added safety and greater cost and the consequences for regulatory policy.	Oxford University Press, New York and Oxford
Wilkins, L. and Patterson, P.	The Political Amplification of Risk: Media Coverage of Disasters and Hazards	1990	Article gives an overview of amplification of risk by media coverage and offers a theory for improved reporting to assist in public education on environmental risks.	Handmer and Penning-Rowsell (Eds.), Hazards and the Communication of Risk, Gower Publishing Company, England and USA
Wilson, C.	Education and Risk	1990	Article outlines theories on learning, perception, information processing, models of communication, and models of educational systems relevant to risk education.	Handmer and Penning-Rowsell (Eds.), Hazards and the Communication of Risk, Gower Publishing Company, England and USA

SOCIOLOGICAL AND PSYCHOLOGICAL RESPONSES TO ENVIRONMENTAL HAZARDS

Author	Title	Date	Summary	Publisher / Source
Couch, S.R. and Kroll-Smith, S.	Environmental Controversies, Interactional Resources, and Rural Communities: Siting versus Exposure Disputes	1994	Compares differences in the types of social conflict occurring in facility siting disputes and toxic contamination cases. Overall, community solidarity appears likely to be enhanced in siting disputes and undermined in exposure situations.	Rural Sociology, 59(1): 25-44
Couch, S.R., Kroll-Smith, S. and Wilson, J.P.	Toxic Contamination and Alienation: Community Disorder and the Individual	1997	Reviews literature on contamination and institutional stress. Introduces the concept of alienation to connect contamination and community disruption to individual stress.	Research in Community Sociology, 7: 95-115
Freudenburg, W.R.	Contamination, Corrosion and the Social Order: An Overview	1997	Describes the differences between natural and technological disasters. Focuses on the social disruptiveness of technological disasters.	Current Sociology, 45(3): 19-39
Freudenburg, W.R. and Gramling, R.	Community Impacts of Technological Change: Toward a Longitudinal Perspective	1992	Describes and calls for more research into the long-term effects and social change as a result of technological development.	Social Forces, 70 (4): 937-955
Gramling, R. and Krogman, N.	Communities, Policy and Chronic Technological Disasters	1997	Using the Exxon Valdez disaster as an example, the authors discuss the fact that there is often a lack of preparation for technological disasters. Authors call for policies that stimulate prevention and preparation.	Current Sociology, 45(3): 41-57
Kroll-Smith, S. and Couch, S.R.	The Real Disaster is Above Ground: a Mine Fire & Social Conflict	1990	Describes the research conducted in Centralia, PA concerning the effect of a mine fire on the community.	The University Press of Kentucky, Lexington, KY
Kroll-Smith, S., Couch, S.R. and Marshall, B.K.	Sociology, Extreme Environments and Social Change	1997	Looks at international research on the social construction of risk, and the effects of risk on social structure.	Current Sociology, 45(3): 1-18
Tucker, P.	ATSDR's Psychological Effects Program Addresses Stress-Related Health Concerns	2000	Summary of the Expert Panel Workshop on the Psychological Responses to Hazardous Substances, held in September 1995.	http://www.atsdr.cdc.gov/HEC/v10n1-1.html#Scientific Research
Tucker, P.	Scientific Research Continues on the Psychological Responses to Toxic Contamination	2000	Overview of quantitative studies of psychological stress associated with environmental contamination.	http://www.atsdr.cdc.gov/HEC/v10n1-1.html#Scientific Research

Author	Title	Date	Summary	Publisher / Source
Altman, J.A. and Petkus, Jr., E.	Toward a Stakeholder-Based Policy Process: An Application of the Social Marketing Perspective in Environmental Policy Development	1994	Suggests that the application of social marketing principles in the public policy process can facilitate the efforts of governmental policy-makers and non-governmental stakeholders to articulate their policy desires.	Policy Sciences, 27: 37-51
Anderson, R.F.	Public Participation in Hazardous Waste Facility Location Decisions	1986	Describes the role and modes of public participation in the hazardous waste facility siting process and the influence this has had on siting decisions. Differentiates between informal participation and institutionalized modes of participation.	Journal of Planning Literature, 1(2): 145-161
Applegate, J.S. and Sarno, D.J.	Citizens Get Involved in Cleaning Up Fernald	1996	Describes the ingredients of success of Fernald's Citizens Task Force in developing consensus recommendations for cleanup levels, waste disposal, priorities and future use.	Forum for Applied Research and Public Policy, 11:122-124
Arnstein, S.R.	A Ladder of Citizen Participation	1969	Defines citizen participation and describes 8 types of Participation and "NonParticipation".	Journal of the American Institute of Planners, 35: 216-224
Aronoff, M. and Gunter, V.	A Pound of Cure: Facilitating Participatory Processes in Technological Hazard Disputes	1994	Examination of 7 case studies of locally based technological hazard disputes. Clarifies factors that contribute to more effective public involvement strategies.	Society and Natural Resources, 7: 235-252
Beierle, T.C.	Public Participation in Environmental Decisions: An Evaluation Framework Using Social Goals, Discussion Paper 99-06	1998	Defines six social goals and explains its application to evaluating public participation methods.	http://www.rff.org
Beierle, T.C. and Konisky, D.M.	Values, Conflict, and Trust in Participatory Environmental Planning	2000	Presents an evaluation of public participation in several cases of environmental planning in the Great Lakes region. Measuring success against three social goals.	Journal of Policy Analysis and Management, 19(4):587-602
Bonnickson, T.M.	Reaching Consensus on Environmental Issues: The Use of Throwaway Computer Models	1996	Explains a method based on understanding and cooperation for quickly and easily building a computer model to assist in understanding complex environmental issues.	Politics and the Life Sciences, 15: 23-34
Busenberg, G.J.	Collaborative and Adversarial Analysis in Environmental Policy	1999	Explores the theoretical and practical implications of two approaches to dealing with scientific uncertainty: adversarial and collaborative analysis.	Policy Sciences, 32: 1-11

Author	Title	Year	Description	Source
Cass, K.	Close-Ups of Cleanups: Focus on Community Partnerships	not dated	Describes Missouri Health Department experiences with public participation.	Missouri Resources, 2-7
Chess, C.	Evaluating Environmental Public Participation: Methodological Questions	2000	Encourages further thinking about evaluation of environmental public policy programs. Discusses some of the basic issues raised by evaluators of social programs that have served as methodological proving grounds for evaluation.	In press, Journal of Environmental Management and Planning
Cole, H.S. and Stevens, M.A.	Learning from Success: Health Agency Effort to Improve Community Involvement in Communities Affected by Hazardous Waste Sites	1996	Case studies provide insight in elements of successful public participation.	U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, Washington, D.C.
Crowfoot, J.E. and Wondolleck, J.M.	Environmental Disputes: Community Involvement in Conflict Resolution	1990	Explores experiences with involving citizen groups and government agencies in environmental dispute settlement processes.	Island Press, Washington, D.C. and Covelo, CA
Daniels, S.E. and Walker, G.B.	Collaborative Learning: Improving Public Deliberation in Ecosystem-Based Management	1996	Explains collaborative learning as an innovation in public participation theory and practice.	Environmental Impact Assessment Review, 16: 71-102
Davies, J.C.	Public Participation in Environmental Decision-Making and the Federal Advisory Committee Act	1998	Testimony before the U.S. House of Representatives, Government Reform and Oversight Committee about Resources for the Future's research on public participation.	http://www.rff.org
Federal Facilities Environmental Restoration Dialogue Committee	Recommendations for Improving the Federal Facilities Environmental Decision-Making and Priority-Setting Process	1993	Provides recommendations for improving the process of disseminating and exchanging information with affected stakeholders, recommendations for improving the process of involving stakeholders, and recommendations for improving accountability.	Office of Federal Facilities Enforcement, Washington, D.C.
Galant, M.M. and Lockhart, A.J.	Tips from the Trenches: 16 Years of Public Involvement	1998	Slides for a Presentation to the Colorado Chapter of the International Association for Public Participation	Colorado Department of Public Health and Environment, Denver
Hadden, S.G.	A Citizen's Right to Know	1989	Chapter 7 describes research in the fields of risk perception and risk communication. Chapter 10 describes the need for effective public participation.	Westview Press, Boulder, CO
Hampton, G.	Environmental Equity and Public Participation	1999	The principles and practice of public participation can serve to promote environmental equity for disadvantaged social groups. Describes criteria for evaluation of equitable, fair and just policy making processes.	Policy Sciences, 32: 163-174

Author	Title	Year	Description	Publication
Hodgson, J.L. and Swanson, J.R.	"Real Partnering": Former Lowry Bombing & Gunnery Range Arapahoe County, Colorado	1999	Describes approaches that led to effective collaboration between DOD, the Colorado Department of Public Health and Environment and the public.	Proceedings of UXO Forum held in Atlanta, GA, May 25-27, 1999, Department of Defense, Washington, D.C.
Kasperson, R.E.	Six Propositions on Public Participation and Their Relevance for Risk Communication	1986	Six major propositions address such themes as means/ends differences in expectations, timing of the program, credibility and trust, need for technical and analytical resources, differing thresholds of public involvement, and limited current understanding.	Risk Analysis, 6(3): 275-281
Kraft, M.E. and Clary, B.B.	Citizen Participation and the NIMBY Syndrome: Public Response to Radioactive Waste Disposal	1991	Analysis of key theoretical components of the NIMBY syndrome. The authors test whether the traditional view of NIMBY is accurate. The most important conclusion is that public response to the radioactive waste problem is complex.	The Western Political Quarterly, 44(2): 299-328
Kraft, M.E. and Kraut, R.	The Impact of Citizen Participation on Hazardous Waste Policy Implementation: the Case of Clermont County, Ohio	1985	Case study of the impact of citizen participation in a rural community in 3 distinct periods over a twelve-year period, 1972-1984.	Policy Studies Journal, 14(1): 52-61
Langton, S.	An Organizational Assessment of the U.S. Army Corps of Engineers in Regard to Public Involvement Practices and Challenges	1996	An assessment of the Corps' practices and recommendations for improvements.	U.S. Army Corps of Engineers, Washington, D.C.
Law-Flood, A.	Public Involvement: Going Beyond the Minimum	1997	Slides for a Presentation on Public Involvement by the Massachusetts Department of Environmental Protection	
League of Women Voters	Nuclear Waste Digest	1994	A reader on issues relating to nuclear waste. Chapter X contains readings on public participation.	League of Women Voters Education Fund
Lighthart, S.S.H., Kersten, P., Pleijte, M. and Kuindersma, W.	Communicatie over de Reconstructie: een analyse van communicatiestrategieen.	2000	Draft document evaluating strategies for participatory decision-making in relation to designing new agriculture policies.	Alterra, Wageningen, the Netherlands
Ligthart, S.S.H. and Neven, M.G.G.	Implementatie van de Habitat-en Vogelrichtlijn op de Waddeneilanden	2000	Draft report exploring participative decision-making methods for the implementation of EU Regulations in The Netherlands. Authors brought together theoretical studies and apply them to a specific case.	Alterra, Wageningen, the Netherlands

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Author	Title	Year	Description	Source
Lockhart, A.J., et al.	Involving Skeptical Citizens in a Soil Sampling Study: How Citizens Measured Soil Radioactivity Levels near a Former Nuclear Weapons Plant	1998	Describes process and results of allowing a citizens' group sample and test soil near Rocky Flats. The approach was a response to high levels of distrust in DOE and the results of prior studies.	Chemical Health & Safety, 5(5):19-24
Long, R.J. and Beierle, T.C.	The Federal Advisory Committee Act and Public Participation in Environmental Policy	1999	FACA raises several barriers to broad public participation in federal projects.	http://www.rff.org
McGovern, M.H. and Beierle, T.C.	E-Part: The Future of Public Involvement?	1997	Describes developments in the application of technology in public participation.	Center for Risk Management Newsletter at http://www.rff.org
McLeod, J.M., et al.	Understanding Deliberation: The Effects of Discussion Networks on Participation in a Public Forum	1999	Examines direct and indirect effects of discussion network characteristics on willingness to participate in a deliberative forum.	Communication Research, 26(6):743-774
Mohr, R., Arnold, S., Silva, L. and McMillan, M.	Development of Community Based Air Quality Programs: Experiences from Colorado "Have You Seen the Mountains Today"	2000	Describes the community based process to address air quality issues as developed by the Air Pollution Control Division of the Colorado Department of Public Health and Environment.	Proceedings of 93rd Air and Waste Management Association National Conference and Exhibition held in Salt Lake City, June 18-22, 2000. A&WMA, Pittsburgh, PA.
Morin, N.C. and Lockhart, A.J.	Public Involvement in a Dose Reconstruction Study: the Colorado Story	2000	Public participation was critical for building awareness, trust, and credibility for a dose reconstruction study at Rocky Flats.	Proceedings of 10th International Radiation Protection Association Conference held in Hiroshima, Japan, May 14-16, 2000. IRPA, Fontenay-aux-Roses, France
National Association of County and City Health Officials	Improving Community Collaboration: A Self-Assessment Guide for Local Health Departments	1997	A practical guide to public participation for local government staff.	National Association of County and City Health Officials
National Research Council	Understanding Risk: Information Decisions in a Democratic Society	1996	National Research Council study into methods for improving risk characterization so as to better inform decision making and resolution of controversies over risk.	National Academy Press, Washington, D.C.
Oliver, P.	"If You Don't Do It, Nobody Else Will": Active and Token Contributors to Local Collective Action	1984	Research reveals that active members of neighborhood associations were significantly more pessimistic than token members about the prospects for neighborhood collective action.	American Sociological Review, 49: 601-610

Author	Title	Year	Description	Source
Pelletier, D., Kraak, V., McCallum, C., Uusitalo, U. and Rich, R.	The Shaping of Collective Values Through Deliberate Democracy: An Empirical Study From New York's North Country	1999	Examines the effects of democratic deliberation on participants' viewpoints of the policy domain (the local food system), based on two-and-a-half day participatory planning events in each of six rural counties.	Policy Sciences, 32: 103-131
Powell, J.D.	Assault on a Precious Commodity: the Local Struggle to Protect Groundwater	1985	Explore political dynamics in local communities which have dealt with groundwater contamination threats and actual incidents in different ways.	Policy Studies Journal, 14(1): 62-69
Renn, O., Webler, T. and Kastenholz, H.	Perception of Uncertainty: Lessons for Risk Management and Communication	1996	This case study demonstrates that people understand risk information and can integrate probabilities in their decision-making process. However, probabilistic information is only one among other for them to form their own attitudes and judgments.	Sublet, Covello and Tinker (Eds.), Scientific Uncertainty and Its Influence on the Public Communication Process, Kluwer Academic Publishers, Dordrecht, The Netherlands
Renn, O., Webler, T. and Wiedemann, P.	Fairness and Competence in Citizen Participation: Evaluating Models for Environmental Discourse	1995	The structure of the book follows the procedure of a workshop held in Morschach, Germany. Eight models of citizen participation are evaluated. Each model is discussed by both a proponent and a critical reviewer.	Kluwer Academic Publishers, Dordrecht, The Netherlands
Rosener, J.B.	User-Oriented Evaluation: A New Way to View Citizen Participation	1981	Evaluation of a series of task-oriented workshops initiated by the Army Corps of Engineers.	The Journal of Applied Behavioral Science, 17(4): 583-596
Rosener, J.B.	Matching Method to Purpose: The Challenges of Planning Citizen-Participation Activities	1978	Stressing the importance of planning for the success of a citizen-participation program. Describes the planning phase and gives an elaborate technique/function matrix describing different types of citizen-participation.	Langton, S. (Ed.), Citizen Participation in America: Essays on the State of the Art, Lexington Books, Lexington, MA
Secretary of Energy Advisory Board, Openness Advisory Panel	Community Relations Pilot Review Report	2000	Emphasises the importance of good relationships with communities neighboring DOE facilities. Gives recommendations for developing good relations.	http://www.hr.doe.gov/seab/
Steelman, T.A.	The Public Comment Process	1999	Public comment is a commonly used method for obtaining public input in national forest planning. Case study to determine what the public actually contributed to the decisionmaking process.	Journal of Forestry, 97(1): 22-26
Steelman, T.A.	Community Based Environmental Management: Agency- and Community-Initiated Efforts	2000	Draft of paper presented at the 21st Annual Research Conference of the Association for Public Policy Analysis and Management. Review of community based efforts to protect Cheat River watershed (WV) and Animas River watershed (CO).	Graduate School of Public Affairs, University of Colorado at Denver

Author	Title	Date	Summary	Publisher / Source
Steelman, T.A. and Ascher, W.	Public Involvement Methods in Natural Resource Policy Making: Advantages, Disadvantages and Trade-Offs	1997	Authors identify 4 broad types of public participation and compare examples of 2 of these types: non-binding direct involvement, and binding direct policy making by non-governmental representatives.	Policy Sciences, 30: 71-90
Steelman, T.A. and Maguire, L.A.	Understanding Participant Perspectives: Q-Methodology in National Forest Management	1999	Demonstrates how Q-methodology can contribute to better problem identification and definition, by better understanding values and subjective viewpoints.	Journal of Policy Analysis and Management, 18(3): 361-388
U.S. Army Corps of Engineers	Partnering, Consensus-Building, and Alternative Dispute Resolution: Current Uses and Opportunities in the U.S. Army Corps of Engineers	1996	Explores the past, current, and potential uses of three techniques for preventing and managing disputes.	U.S. Army Corps of Engineers, Washington, D.C.
U.S. Environmental Protection Agency	Draft Public Involvement Policy	2000	A revision of the 1981 Public Participation Policy.	Federal Register, FR-6923-9
U.S. Environmental Protection Agency	RCRA Public Participation Manual	1996	The RCRA public participation handbook.	Office of Solid Waste, Permits Branch, U.S. Environmental Protection Agency, Washington, D.C.
U.S. Environmental Protection Agency	Community Relations in Superfund: A Handbook	1992	The Superfund community relations handbook.	Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C.
United Nations Economic Council for Europe	Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters	1998	International Treaty done at Aarhus, Denmark on June 25, 1998.	http://www.unece.org/env/pp

CONFLICT MANAGEMENT AND CONFLICT RESOLUTION

Author	Title	Date	Summary	Publisher / Source
Barsky, A.E.	Conflict Resolution for the Helping Professions	2000	A conflict resolution handbook.	Brooks/Cole Thomson Learning, Canada
Dukes, E.F.	Resolving Public Conflict	1996	Develops two conceptions of public conflict resolution: the ideology of management and the transformative practice.	Manchester University Press, Manchester, UK

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Author	Title	Date	Summary	Publisher / Source
Dunlop, J.T.	Dispute Resolution: Negotiation and Consensus Building	1984	Describes the role of dispute resolution in industrial relations.	Auburn House Publishing Company, MA
Fischer, J.	Consensus-Building Case Focuses on Used-Oil Changers	1997	A case-study of the Massachusetts Executive Office of Environmental Affairs in developing regulations through a process of consensus building.	Public Management, April 1997: 16-20
Fisher, R. and Ury, W.	Getting to Yes: Negotiating an Agreement Without Giving In	1997	Describes a methodology for finding solutions to problems by moving parties away from issues that could lead to conflict.	Arrow Business Books, USA
Heron, J.	The Complete Facilitator's Handbook	1999	A handbook on facilitation.	Kogan Page Limited, London
Karni, E.	Decision Making under Uncertainty: The Case of State-Dependent Preferences	1985	Presents analytical tools that can be applied in the study of decision making under uncertainty.	Harvard University Press, Cambridge, MA
National Research Council	Understanding Risk: Information Decisions in a Democratic Society	1996	National Research Council study into methods for improving risk characterization so as to better inform decision making and resolution of controversies over risk.	National Academy Press, Washington, D.C.
Rothman, J.	Resolving Identity-Based Conflict in Nations, Organizations, and Communities	1997	Describes identity-based conflict and a framework of "antagonism", "resonance", "invention", and "action" (ARIA) for resolving such conflict.	Jossey-Bass Publishers, San Francisco, CA
Susskind, L. and Field, P.	Dealing With an Angry Public: The Mutual Gains Approach to Resolving Disputes	1996	Develops and explains an approach to dealing with an angry public and with the media.	The Free Press, New York
Susskind, L., McKearnan, S., and Thomas-Larmer, J.	The Consensus Building Handbook: A Comprehensive Guide to Reaching Agreement	1999	1100 Pages of valuable information.	Sage Publications, Inc., Newbury Park, CA, London, New Delhi
Wondolleck, J.M.	Public Lands Conflict and Resolution: Managing National Forest Disputes	1988	Describes the nature and causes of conflict over public lands management/forest planning, and offers an approach to overcome conflicts.	Plenum Press, New York and London

NIMBY

Author	Title	Date	Summary	Publisher / Source
American Planners Association	Planners' Alchemy Transforming NIMBY to YIMBY	1993	Three authors analyze NIMBY politics. The first article gives a cost benefit analysis. The last 2 articles discuss New York City's Fair Share principles.	APA Journal, 87-100

Author	Title	Year	Description	Source
Benford, R.D.	In Whose Backyard?: Concern About Siting a Nuclear Waste Facility	1993	Assesses the extent to which the NIMBY label and the strategies of industry proponents to reduce opposition function on a reasonable set of assumptions. Finding that levels of concern are greater for people under imminent threat.	Sociological Inquiry, 63(1): 30-48
Freudenburg, W.R. and Pastor, S.K.	NIMBYs and LULUs: Stalking the Syndrome	1992	Testing of 3 viewpoints: the public as ignorant/irrational, selfish and prudent in their response to technological risks.	Journal of Social Issues, 48(4): 39-61
Groothuis, P.A. and Miller, G.	Locating Hazardous Facilities: The Influence of NIMBY Beliefs	1994	The NIMBY syndrome is analyzed in economic decision making. Analysis identifies demographic characteristics of individuals likely to exhibit tolerance beliefs and avoidance beliefs.	The American Journal of Economics and Sociology, 53(3): 335-346
Kasperson, R.E.	Hazardous Waste Facility Siting: Community, Firm, and Governmental Perspectives	1986	Characterizes the key problems in facility siting, examines adequacy of approaches to facility siting, and suggests some ingredients of an improved approach.	National Academy of Engineering, Hazards: Technology and Fairness, National Academy Press, Washington, D.C.
Kraft, M.E. and Clary, B.B.	Citizen Participation and the NIMBY Syndrome: Public Response to Radioactive Waste Disposal	1991	Analysis of key theoretical components of the NIMBY syndrome. The authors test whether the traditional view of NIMBY is accurate. The most important conclusion is that public response to the radioactive waste problem is complex.	The Western Political Quarterly, 44(2): 299-328
Mank, B.C.	The Two-Headed Dragon of Siting and Cleaning Up Hazardous Waste Dumps: Can Economic Incentives or Mediation Slay the Monster?	1991	Proposes the use of negotiated compensation to encourage developers of new waste disposal facilities to reuse or at least clean up abandoned waste sites.	Environmental Affairs, 19: 239-285
O'Hare, M.	"Not on My Block You Don't": Facility Siting and the Strategic Importance of Compensation	1977	Explores possibilities for auctioning off hazardous facilities to a community.	Public Policy, 25(4): 407-457
Portney, K.E.	The Potential of the Theory of Compensation for Mitigating Public Opposition to Hazardous Waste Treatment Facility Siting: Some Evidence From Five Massachusetts Communities	1985	How useful is the theory of compensation in case of hazardous waste facility sitings? Author concludes that the theory probably underestimates the role of people's risk assessments in the overall benefit/risk calculation.	Policy Studies Journal, 14(1): 81-89
Walsh, E., Warland, R. and Smith, D.C.	Backyards, NIMBY, and Incinerator Sitings: Implications for Social Movement Theory	1993	Analysis of factors determining the success of grassroots protests in siting disputes. Special focus on relevance of theories on "equity" and "technology" movements. Identifies a number of variables that may be influential.	Social Problems, 40(1): 25-38

DEALING WITH ANGRY AND DIFFICULT PEOPLE

Author	Title	Date	Summary	Publisher / Source
Bramson, R.M.	Coping with Difficult People	1981	Describes the hostile-aggressive trio: sherman tanks, snipers, and exploders. Gives suggestions for dealing with these types of people.	Anchor Press, New York
Solomon, M.	Working With Difficult People	1990	Practical Guidebook to dealing with difficult people in the workplace.	Prentice Hall, Upper Saddle River, NJ
Susskind, L. and Field, P.	Dealing With an Angry Public: The Mutual Gains Approach to Resolving Disputes	1996	Develops and explains an approach to dealing with an angry public and with the media.	The Free Press, New York
Weisinger, H.	Anger at Work	1995	Well researched book on understanding and managing anger.	William Morrow and Company, Inc., New York

GENERAL RESEARCH

Author	Title	Date	Summary	Publisher / Source
Koller, G.	Risk Assessment and Decision Making in Business and Industry	1999	A practical guide to risk assessment applications in business.	CRC Press, New York
Krauss, C.	Community Struggles and the Shaping of Democratic Consciousness	1989	Explores the impact of grass-roots protest activities on the larger political economy or movements for social change. Describes social political theory and explains the relevance of community struggles.	Sociological Forum 4(2): 227-239
Miller, G.J. and Whicker, M.L.	Handbook of Research Methods in Public Administration	1999	Describes all aspects of research in public administration, including questionnaire construction, sampling and data collection, statistics, modeling, and clustering techniques.	Marcel Dekker, Inc., New York
Morgan, D.L.	Successful Focus Groups	1993	A handbook on focus groups.	Sage Publications, Inc., Newbury Park, CA, London, New Delhi
National Research Council	Science and Judgment in Risk Assessment	1994	Assessment of the methods used by the EPA to determine carcinogenic risk associated with exposure to hazardous air pollutants.	National Academy Press, Washington, D.C.
O'Riordan, T.	Hazard and Risk in the Modern World: Political Models for Programme Design	1990	About the importance of empowering communities to be their own risk appraisers.	Handmer and Penning-Rowsell (Eds.), Hazards and the Communication of Risk, Gower Publishing Company, London

Pepitone, A. and Triandis, H.C.	On the Universality of Social Psychological Theories	1987	Describes a universal theoretical model comprising variables of habit, intention, Self, and identity that is universal. These variables operate to determine social behavior in all individuals everywhere.	Journal of Cross-Cultural Psychology, 18(4): 471-498
Rice, T.W. and Sumberg, A.F.	Civic Culture and Government Performance in the American States	1997	Application of Putnam's methodology to test the relationship between civic culture and government performance.	Publius: The Journal of Federalism 27(1): 99-114
Rohrschneider, R.	Citizens' Attitudes Toward Environmental Issues: Selfish or Selfless?	1988	Examines the degree to which psychological dimensions and the perceived ecological problems contribute to the rise of environmentalism in Western Europe.	Comparative Political Studies, 21(3): 347-367
Weimer, D.L.	Comment: Q-Method and the Isms	1999	Comments on the discussion between positivists (those looking for generalizations that can be subjected to empirical tests), and postpositivists, and the role of Q-method.	Journal of Policy Analysis and Management 18(3): 426-429