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Risk Communication

Under RCRA, EPA developed regulations for the facilities and businesses that generate, manage, or dispose of hazardous waste. RCRA-regulated facilities must minimize the risks associated with hazardous waste management and make sure their activities are protective of public health and the environment. Risk communication is an essential component of risk management and decision-making. EPA defines risk communication as "the formal and informal processes of communication among various parties who are potentially at risk from or are otherwise interested in the site."

To regulators and industry, risk is based upon science. To the public, however, risk may be based on factors besides "scientific" data, such as values and previous experiences. Also, technical experts may not be able to communicate risks in plain language that can be understood by community members. Through effective risk communication, regulators and RCRA-regulated facilities can build trust with the public and avoid misunderstandings about risks that often lead to time-consuming and costly conflicts with community members.

This tool provides Resource Conservation and Recovery Act (RCRA)-regulated facilities and regulatory agencies with a brief overview of risk communication and effective risk communication strategies.

EPA's public participation guidelines for the RCRA risk communication are detailed in Chapter 2 of the 2016 Edition of the RCRA Public Participation Manual.

Required Activity?

No.

Making it Work

Risk is a complex term with different meanings for different people. Therefore, the challenge for agencies and RCRA-regulated facilities is to communicate effectively with the public and the media to deliver messages about risk that inform and educate without frightening or causing undue alarm.

Effective risk communication rests on an effective communication strategy. A communication strategy helps facilities and agencies think about and plan for community engagement and for site-related risk communication with the public, media, stakeholders, and colleagues. Communication strategies provide a structure to identify events (such as issues, problems, and actions) that require outreach; consider the audience and message; and develop a way to deliver the information. Good communication strategies can also help RCRA facilities and agencies receive information from stakeholders.

When to Use

During the RCRA process, instances for effectively communicating risk information to communities are:

- During the required public meeting, prior to permit application.
- In the required fact sheet explaining the draft permit application.
- At the public involvement steps of the corrective action, facility investigations and findings, and site cleanup or off-site cleanup processes.
- During a crisis, facility update, or if significant information emerges.

Potential Risk Communication Challenges

Regulatory requirements – Comply, at a minimum, with RCRA public participation requirements for RCRA Facilities.

Organizational requirements – These requirements can apply, for example, to the amount or type of data available to the public, especially if it relates to legal actions or proprietary information. Be careful not to release or promise to release information that is restricted.

Audience requirements – Sometimes certain audience characteristics may limit the manner chosen to communicate. For example, techniques for communicating with a transient population would differ from those used to communicate with a stable population.

- During the permit modification process.
- During closure and post-closure activities.

Effective risk communication is especially vital during emergencies such as after an accident or spill at a hazardous waste facility that releases pollutants that may impact health or the environment.

How to Use

At many sites, there are times when a human health or ecological risk assessment is performed to help understand how the impacts of a toxic release are affecting human health and/or the environment. Often, these assessments are complex and difficult to explain clearly to community members.

When communicating with the community it is important to communicate sincerely and in a way that is easily understood. For example, the statement:

"*The risk of you dying from drinking the TCE contaminated groundwater is 7x10E7, if we assume the worst case. You're more likely to be hit by lightning, so don't worry.*" Terms such as "7x10E7"," assume", and "worst case" all suggest the situation is bad. In addition, the term "7x10E7" is foreign to many. The comparison to lightning can be patronizing when they are told "not to worry". A better way to rephrase the statement would be to say:

"It is safe to drink the city supplied water. We know this because… Does that address your concern or should we have more of a discussion?"

Seven Cardinal Rules of Risk Communication

1. Accept and involve the public as a legitimate partner. The goal is to produce an informed public, not to defuse public concerns.
2. Plan carefully and evaluate your efforts. Different goals, audiences, and media require different actions. Analyze the audience; learn what works for each situation.
3. Listen to the public's specific concerns. People often care as much about credibility, competence, and empathy as they do about risk levels, statistics, and details.
4. Be honest, frank, and open. Trust and credibility are difficult to obtain; once lost they are almost impossible to regain.
5. Coordinate and collaborate with other credible sources. Conflicts among organizations make communication with the public more difficult.
6. Meet the needs of the Media. The Media are usually more interested in simplicity than complexity, danger than safety. Make sure they have what they need to portray the situation fairly.
7. Speak clearly and with compassion. Never let your efforts prevent acknowledgement of the tragedy of an illness, injury, or death.

EPA and ATSDR

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency that provides information to prevent harmful exposures and diseases related to toxic substances. EPA often relies on ATSDR to provide fact sheets on toxic substances such as polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs). Each fact sheet provides a summary of what the substance is and answers the most frequently asked questions about its health effects. Upon request, ATSDR interprets EPA-triggered environmental data (e.g. off-site community sampling) in terms of a "Health Consultation" that looks at the data in terms of health. They may also conduct "Health Assessments." (See the ATSDR website for more details.)

Components of an Effective Risk Communication Strategy

Keep the strategy simple; it should be a guide. Develop an overarching risk communication goal (i.e., "community understands site risk and the remedy"), and then work to select the pipeline-specific interim messages that must be delivered to achieve the goal (e.g., gaining permission to sample drinking water, distributing information on the health effects of the contaminants). Remember that the strategy should not remain static. It will evolve as the site progresses and should be revisited often and modified as necessary.

The first step is to determine the risk message. A risk message should contain no more than three to five points. If the message cannot be articulated that succinctly, it should be broken down into an overall message with several interim messages.

The next step is to determine how to deliver the message(s) to meet your goals. A basic template for developing the overall strategy is to follow the questions outlined in the Rutgers' University Center for Environmental Communication document, "Ten Questions Environmental Managers Should Ask." The ten questions are summarized below:

1. Why are we communicating?
2. Who are our target audiences?
3. What do our audiences want to know?
4. What do we want to get across?
5. How will we communicate?
6. How will we listen?
7. How will we respond?
8. Who will carry out the plans? When?
9. What problems or barriers have we planned for?
10. Have we succeeded?

Along the way, successes and lessons learned can be noted so that the strategy can be improved based on experiences.

Goals of Risk Communication

- Educate communities about potential risks, risk assessment and risk management.
- Inform communities about site-specific risks and actions taken to minimize risk.
- Encourage changes in individual behavior as part of risk reduction measures (such as no longer fishing in a polluted stream).
- Improve RCRA-regulated facilities' understanding of public values and concerns.
- Increase mutual trust and credibility between the authorities and the public.
- Resolve conflicts and controversies.

Example Communications Strategy Matrix

An example of some elements of a communications strategy is shown below using a communications strategy matrix, which is one method for compiling and visually presenting components of a communications strategy.

Message	Audience	Potential Ways to Communicate	Resources Required	Feedback Mechanism
Permit Application Submittal and Review	Facility mailing list; local and state government	• Workshop • Fact Sheets • Press Release • Public Meeting	Time and meeting space	• Survey at time of message delivery (e.g., random telephone survey) • Attendance list to make a few follow-up calls
Release of Proposed Remedy for Public Comment	Active citizen participants; public as appropriate	• Public Meeting • Public Notices • Select Media Vehicles • Workshop	Meeting space and workshop preparation	• Attendance list to make a few follow-up calls • Workshop evaluation form

Moving into Action: Risk Communication on the Ground

Once the communication strategy is in place, effective communication on the ground is essential. Providing effective communication requires the use of a variety of communication methods as well as a level of trust between the message deliverer and receiver. Suggestions for good communication for building trust and credibility in risk communication include:

- Discuss a simple message; present the message clearly.
- Be honest, frank, and open in discussing the level, type and seriousness of risk.
- Use non-technical language appropriate for community members.
- Use reliable information sources such as government agencies, scientific experts or reliable news sources.
- Accept and involve the public as a legitimate partner.
- Listen to the public's specific concerns and make sure their questions are answered and the message is understood.
- Speak clearly and with compassion.

Message Mapping as a Tool for Risk Communication

Preparing an appropriate, concise, effective message prior to an event occurring is probably the most crucial part of risk communication. One tool that may be helpful for developing a clear message for communicating risk is message mapping.

A message map is a concise description of ranked, organized answers to anticipated questions and concerns from stakeholders. It consolidates many rules of risk communications (such as speaking briefly, using three key messages) and can be applied to many situations. For a detailed description and instructions in how to develop a message map, see EPA's Risk Communication in Action guide listed in the Resources section.

- Keep a calm, professional and serious tone; take the audience seriously, which will avoid potential misunderstandings arising from flippant humor.
- Meet the needs of the media.

Outcomes and Benefits

Proactive effective risk communication creates the foundation for, and can have long-term benefits for the relationship between the EPA and the RCRA facility and community. On a practical level, effective risk communication can save time and money by maximizing information-sharing and minimizing misunderstandings. Effective risk communication results in a better educated public with an appreciation of limited resources and difficult choices. As communities become more engaged as participants in understanding risk, they can contribute valuable information leading to a safer environment and improved public health.

Ways to Communicate

- Public meetings
- Workshops
- Fact sheets
- Exhibits
- Internet
- Mailings
- Press notices
- Telephone
- Translations of documents into second languages
- Videos

Tips

- Plan risk communication carefully by integrating the risk assessment and management activities with other community involvement activities.
- Coordinate your efforts with those of other stakeholders.
- Make use of outside experts when appropriate, but continue to serve as the lead contact point for the communication of technical risk information.
- Remember that nothing is more important than seeing that citizens' fears, questions, and concerns are managed on their terms, not yours.
- Track your progress and evaluate your risk communication strengths and areas for improvement.

Related Tools/Resources

- EPA's Risk Assessment website provides basic information about environmental risk assessments for the public.
- More information on risk communication and developing message mapping is described in EPA's Risk Communication in Action: The Tools of Message Mapping.

Attached Items Within this Tool

- Attachment 1: *Useful Terms and Definitions for Explaining Risk*

Attachment 1: Useful Terms and Definitions for Explaining Risk

The glossary is intended to assist readers in understanding terms used by the U.S. Environmental Protection Agency. The definitions are not all-encompassing and should not be construed as official EPA definitions.

Acute exposure: Exposure to one dose or multiple doses within a short time - 24 hours to a few days.

Acute Toxicity: A term used to describe immediate toxicity. Its former use was associated with toxic effects that were severe (e.g., mortality) in contrast to the term "subacute toxicity" which was associated with toxic effects that were less severe.

Adverse Health Effect: Any change resulting in anatomical, functional, or psychological impairment that may affect the performance of the whole organism.

Aquifer: An underground geological formation, or group of formations, containing usable amounts of groundwater that can supply wells and springs.

Asbestosis: Scarring of the lung from inhaling airborne asbestos fibers. This disease is often fatal.

Bioaccumulate: To build up a large amount of a substance in the body by ingesting small amounts over an extended period of time.

Carcinogen: Any substance that can cause or promote cancer.

Carcinogenesis: The origin or production of cancer (very likely a series of steps). The carcinogenic event so modifies the genome and/or other molecular control mechanisms in the target cell that they can give rise to a population of altered cells.

Chronic Exposure: Multiple exposures occurring over an extended period of time, or a significant fraction of the animal's or individual's lifetime.

Chronic Toxicity: A term used to describe delayed toxicity. However, the term "chronic toxicity" also refers to effects that persist over a long time, whether or not they occur immediately or are delayed.

Congenital: A condition existing from birth. Congenital conditions are acquired during development in the womb. They are not inherited from the parents.

Cohort Study: An epidemiologic (human) study that observes subjects in different exposed groups and compares the incidence of symptoms. Although ordinarily prospective in nature, such a study is sometimes carried out retrospectively, using historical data.

Cumulative Risk Assessment: A process that involves the consideration of the aggregate ecologic or health risk to a target organism caused by the accumulation of risk from multiple stressors (any physical, chemical, or biological entity that can induce an adverse response) and multiple pathways of exposure.

Developmental Toxicity: Adverse effects on the developing organism (including death, structural abnormality, altered growth, or functional deficiency) resulting from exposure prior to conception (in either parent), during prenatal development, or postnatally up to the time of sexual maturation.

Dose: Administered dose is the mass of a substance given to an organism and in contact with an exchange boundary (e.g., gastrointestinal tract) per unit body weight, per unit time (e.g., mg/kg-day). Absorbed dose is the amount of a substance penetrating the exchange boundaries of an organism after contact.

Dose Response: How a biological organism's response to a toxic substance quantitatively shifts as its overall exposure to the substance changes (e.g., a small dose of carbon monoxide may cause drowsiness; a large dose can be fatal).

DNA (deoxyribonucleic acid): The carrier of genetic information in cells.

Ecology: The relationship of living things to one another and their environment, or the study of such relationships.

Endocrine Disruptors: Exogenous (outside the body) chemical agents that interfere with the production, release, transport, metabolism, binding, or elimination of the natural hormones in the body, which are responsible for the maintenance of homeostasis and regulation of developmental processes.

Enteric: Relating to the intestines, alimentary.

Exposure: Contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., gut, skin, lungs) and available absorption.

Exposure Assessment: The determination or estimation (qualitative or quantitative) of the magnitude, frequency, duration, and route of exposure.

Ground Water: Water that moves slowly underground in an aquifer.

Hazardous Waste: Waste defined by the Resource Conservation and Recovery Act (RCA) as those that may cause, or significantly contribute to illness or death, or that may substantially threaten human health or the environment when not properly controlled.

Health Advisory: An estimate of acceptable drinking water exposure to a chemical substance based on health effects information. A Health Advisory is not a legally enforceable standard, but serves as technical guidance to assist federal, state, and local officials.

Incidence: The number of cases of a disease or occurrence of an effect within a specified period of time.

Integrated Pest Management (IPM): A mixture of chemical and other non-pesticide methods to control pests.

Malignant: Tending to become progressively worse and to result in death if not treated; having the properties of anaplasia, invasiveness, and metastasis.

Maximum Contaminant Level (MCL): Maximum permissible level of a contaminant delivered to any user of a public drinking water system. An MCL is an enforceable federal regulation.

Metastasis: The transfer of disease from one organ or part to another one not directly connected with it.

Mitigation: Measures taken to reduce adverse impacts on the environment.

Morbidity: Sickness.

Mortality: Death.

Particulate Matter: Airborne materials that can, depending on their size and composition, lodge in various areas of the respiratory tract.

Pathogens: Microorganisms that can cause disease in other organisms or in humans, animals, and plants (e.g., bacteria, viruses, or parasites) found in sewage, in runoff from farms or rural areas populated with domestic and wild animals, and in water used for swimming. Fish and shellfish contaminated by pathogens, or the contaminated water itself, can cause serious illness.

Restoration: Measures taken to return a site to pre-violation conditions.

Risk: A measure of the probability that damage to life, health, property, and/or the environment will occur as a result of a given hazard or potential health risk that exists due to that agent. Major steps may include:

- **Hazard Identification:** Determines whether exposure to a substance can cause cancer, birth defects, or other adverse health effects.
- **Dose Response Assessment:** Determines the possible severity of adverse health effects at different levels of exposure.
- **Exposure Assessment:** Estimates the amount of contact individuals within a population, including potentially sensitive groups, such as children-could have with the substance.

Risk Characterization: Combines the information in the first three steps to determine the level of potential risk to humans and the environment.

Risk Management: The process of evaluating and selecting alternative regulatory and non-regulatory responses to risk. The selection process necessarily requires the consideration of legal, economic, and behavioral factors.

Smelter: A facility that melts or fuses ore, often with an accompanying chemical change, to separate its metal content. Emissions cause pollution. “Smelting” is the process involved.

Solvent: A liquid capable of dissolving a material and holding it in solution. For example, paint remover is a paint solvent.

Surface Water: Water at the surface of the earth, including lakes, rivers, ponds, and streams. It is the source of much groundwater through the larger hydrologic cycle as water moves from the surface to aquifers below ground.

Toxic: Poisonous.

Toxicology: The study of the adverse effects of chemicals in living organisms.

Volatile: Any substance that evaporates readily.