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Superfund Today

FOCUS ON RISK ASSESSMENT: *INVOLVING THE COMMUNITY*

This Issue...

- ✔ Explains Superfund's human health risk assessment process
- ✔ Discusses your participation in the risk assessment process
- ✔ Gives you some tips for getting involved
- ✔ Provides sources you can go to for more information and help

What is Human Health Risk Assessment?

How dangerous is that Superfund site near you? Past activities at the site, such as wood treating, metal plating, dry cleaning, or waste disposal may have left hazardous substances in the buildings or soil. In many cases, these substances have moved into the ground water, surface water, or air. Every time you come into contact with these substances you face some risk.

Risk assessment is the process of estimating how dangerous a particular situation is. Superfund's risk assessors seek to determine whether the hazardous substances at a site present a danger to you and your family. They also do separate studies to evaluate threats to the environment. Therefore it is important that they have as much information about the site as possible. You and other people who live and work near the site may have important knowledge and insights to share that can help the risk assessors. Your involvement is useful throughout the risk assessment, but it is most helpful early in the process. The notepad to the right shows some of the information you may have.

Each Superfund site is unique, so risk assessments are done on a site-by-site basis. The risk assessment estimates the current and possible future risks to your health from the site. The goal is to understand what levels of cleanup will be necessary to make sure you and your family are protected. The site manager uses the information provided by the risk assessors to choose a good cleanup strategy.

Living near a Superfund site doesn't mean your health is threatened. The danger to you will depend on the substances present and the ways you may be exposed to them. You have a right to be informed about the possible threats and what EPA plans to do to protect you. The information in this issue will help you understand how EPA measures human health risks at Superfund sites and how you can be involved in the process. ❑

You or your neighbors may be able to provide information about:

1. *What has gone on at or around the site*
2. *Possible ways people can be exposed to hazards at the site*
3. *Who is likely to be exposed to material from the site*
4. *Community concerns, cultures, and values*

How Does Superfund Evaluate Risk?

A human health risk assessment estimates the "baseline risk." This is the likelihood of health problems occurring as a result of the hazardous substances at the site. Risk assessors make this determination through the following four-steps:

Step 1: Data Collection & Evaluation
Step 2: Exposure Assessment
Step 3: Toxicity Assessment
Step 4: Risk Characterization

Before beginning, the risk assessors prepare a work plan. The work plan identifies: 1) what data are needed; 2) what assumptions are being made; and 3) what technical models will be used (models are tools used to predict site specific outcomes such as how ground water moves away from a site or how substances in soil become airborne). Your input during the development of the work plan can help the risk assessors to better understand the circumstances at the site and to avoid missing important information.

Key questions risk assessors should ask you during work plan development:

- What do you know about how the site has been used?
- Who might be exposed to materials from the site?
- How might people be exposed? for *example: fishing, gardening, playing*
- What are your concerns about dangers posed by the site?

Data Collection & Evaluation

The collection of adequate and appropriate data is critical for evaluating the potential risks posed by the site. Some data may already be available from the first investigation of the site. These data are supplemented by more samples of soil, air, water, sediment, plants, fish and/or animals as described in the work plan. The samples are analyzed in laboratories to reveal the types and levels of hazardous substances present. The samples collected are directly related to what the risk assessors understand to be the problems. This is why your input is so important. When the samples are analyzed, hundreds of substances may be detected. Some of these chemicals are naturally occurring or are present at levels that will not cause harm. Risk assessors identify those substances which could pose a danger to your well-being. These are called "chemicals of potential concern."

Key questions risk assessors should ask you about data collection and evaluation:

- What are the current and future uses of the site?
- Are you concerned about specific hazardous substances?
- On which parts of the site are hazardous substances most likely to be found?
- Do you have suggestions about the best times to conduct sampling?
- Do you have questions about how samples are collected and analyzed?

Exposure Assessment

After the risk assessors have the results of the data analysis, they look at the ways you might be exposed to any chemicals of potential concern. You may come into contact with them in a variety of ways: breathing, touching, or consuming contaminated air, water, soil, or food. For each of these "exposure pathways," the risk assessors estimate quantities that could reach a person's lungs, digestive system, or skin.

Using this information, risk assessors calculate the "Reasonable Maximum Exposure (RME)." The RME is the highest level of human exposure to the substances that is likely to occur. Exposures are calculated for different groups of people, such as children, site workers, residents, and the elderly. The calculations take into account how long, how often, and in how many ways people could be exposed to the hazardous substances. The RME also factors in the number of years exposure could occur if the site were not cleaned up. Both current and likely future uses for the site are considered. The exposure assessment gives the risk assessors information about who is vulnerable to the substances that are present.

During this step you can contribute information about behaviors and activities that could lead to increased risk of exposure.

Key questions risk assessors should ask you about exposure assessment:

- Who may come in contact with the site? for example: children, the elderly, pregnant and nursing women, people with chronic illnesses
- How do people use the site? *for example: fishing, gardening, hunting*
- Where are children likely to play or trespass?
- How often are people exposed?
- What types of animals are hunted?
- Do people fish here?
- Do people garden or gather food from the site?

Toxicity Assessment

While the exposure assessment is underway, the risk assessors are also looking at the toxicity, or harmfulness, of each chemical of potential concern. They want to determine what kind of health effects may result from various levels of exposure to the hazardous substances at the site. Risk assessors usually do not do their own toxicity testing, but rely on previous scientific studies of the effects of the substances on animals and, when available, on humans. They evaluate both the cancer and non-cancer effects for each substance, if enough scientific data exist.

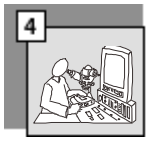
The likelihood of some cancer resulting from a Superfund site is expressed as a probability; for example, a "1 in 10,000 chance" (sometimes expressed as $1x10^{-4}$ or 1e-04). This means that for every 10,000 people exposed to the RME, one extra cancer may occur, beyond what would be expected from all other sources.

Non-cancer health effects can range from rashes, eye irritation, and breathing difficulties to organ damage, birth defects, and death. Risk assessors calculate the level of exposure above which non-cancer health effects begin to occur (this is called the "hazard quotient").

Community input during the toxicity assessment is limited because it is a very technical, science-based process. You should tell the risk assessors about any concerns you have about potential health effects. This will help them give you clear explanations of the conclusions they are reaching about possible health hazards.

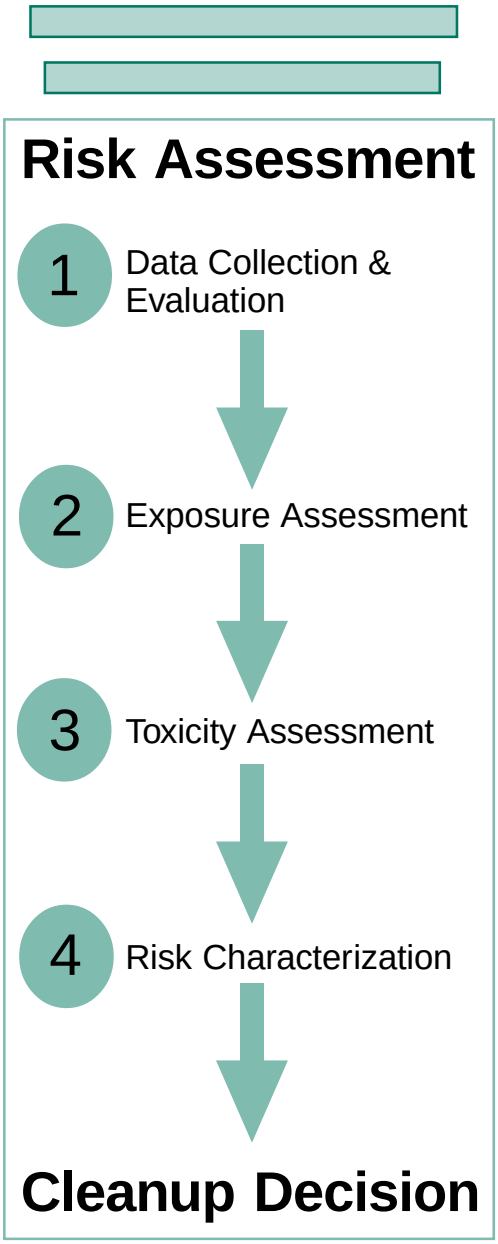
Key questions risk assessors should ask you about the toxicity assessment:

- Have you discussed any unusual health problems with local public health officials?
- What do you not understand about the toxicity assessment process or the results?



Risk Characterization

Finally, the risk assessors combine the results of the first three steps and come up with their estimate of the risks posed by the site. This is known as "risk characterization." In reaching their conclusions they take into account the types and amounts of hazardous substances present, the ways in which people are exposed, and the effects of the substances on human health. The risk assessors are very careful to make sure their work will not lead to results that understate the level of threat posed by the site. Their results will be used by the site manager, who decides what cleanup actions must be taken to protect you and your family. During this last part of the risk assessment, the risk assessors should provide you with a clear explanation of what their conclusions mean for your health.



Key questions risk assessors should ask you during risk characterization:

- Have your concerns been adequately answered?
- Do you believe any substances, kinds of exposure, or any vulnerable persons have been missed?
- Do you understand the results of the risk assessment? ❑

ATSDR's Role in Risk Assessment

The Agency for Toxic Substances and Disease Registry (ATSDR) is part of the U.S. Public Health Service. ATSDR may conduct a Superfund **public health assessment**, which is an independent evaluation of whether exposure to a site poses a danger to the people who live and work near it. This helps to ensure that EPA does not overlook or underestimate any threats. Both a human health risk assessment and a public health assessment study overall hazardous substance threats to people. Neither is a substitute for a personal medical exam to determine your own health status. To find out more about public health assessments, call ATSDR toll-free at: 1-800-442-8737. ❑

How The Risk Assessment Results Are Used

The risk assessors explain their conclusion to the managers responsible for cleaning up the site. The risk assessment is just one of the things the managers look at when deciding what actions must be taken to protect your health and welfare. Other things that play a role in the decision are state and federal regulations, technology alternatives, costs, and community acceptance. If the level of risk is low, the site managers may decide that some or all of the substances may remain safely at the site. Sometimes cleanup workers can simply put a cap over the site or build underground walls to keep hazardous substances from reaching you or others. The site manager's goal always is to keep the community safe. Until all site actions are completed, workers continue to check the conditions to make sure that you are not in any danger. ❑

REMEMBER...

- ✔ Your input to the risk assessment is important. You need to realize, however, that risk assessors must follow certain regulations and technical procedures. While all your concerns will be considered, the risk assessors may not always be able to do all of the things you want. But they should be responsive and give you clear explanations for what they are or are not doing.
- ✔ Risk assessment is not an exact science. Risk assessors use the best available data on what is occurring, or could occur, at the site. They apply their scientific judgment to calculate the likelihood of exposure to hazardous substances and the health consequences of such exposure. While the results are probabilities, not certainties, the risk assessors are careful not to underestimate any threats. The risk assessment is one of many inputs to the decision of how to protect your health and welfare. ❑

Tips for Getting Involved

How Do I Get Started?

Seek out and talk to the risk assessors about becoming involved in the process.

Review the key questions in this document and begin to think how you will answer them.

What Should I Keep In Mind?

Be Prepared...
To be involved in a meaningful way you must make some commitment of time and energy. You can prepare by:

1) Learning about the risk assessment process and the site history;
2) Participating in meetings and talking with risk assessors; and
3) Following up on key issues.

Take Initiative...
Look for ways to get involved. Raise concerns in a constructive manner and contribute fully and responsibly during the risk assessment.

Ask Questions...
Don't be afraid to say you don't understand something. Be sure to ask for clarification of technical concepts.

Recognize Constraints...
The Superfund law and accompanying policies and regulations establish a framework within which the risk assessment and all other activities must be conducted. There are also professional and technical guidelines and funding restrictions that affect what risk assessors can do. ❑

The Rest of the Story: Superfund Cleanups

EPA uses the results of a risk assessment to help decide whether any long-term cleanup is needed at a Superfund site. If the answer is "yes," the risk assessment also guides decisions on the type of remedy and cleanup levels that would protect your health and the environment. After the risk assessment, EPA continues to seek your opinions on proposed cleanup approaches, which are thoroughly investigated before any decision is made.

There are two basic types of cleanup technologies in use at Superfund sites: treatment and containment. **Treatment** technologies use engineering approaches to reduce the amount of hazardous substances present, their ability to move off the site, or the hazard they present. Treatment technologies include destroying substances by burning them at high temperatures while controlling the fumes; allowing substances to evaporate into an air stream that is then treated and released; and injecting soils with micro-organisms that digest substances and result in less harmful materials. **Containment** approaches build barriers that isolate hazardous substances and keep them from coming into contact with people and the environment. Containment technologies include constructing a protective barrier, or cap, over the contaminated area; excavating the substances and disposing of them in a securely designed landfill; and building an underground barrier that blocks, diverts, or captures polluted ground water.

In many cases, a combination of treatment and containment is the best solution. Engineers design the long-term cleanup approach. As cleanup work progresses, the levels of the hazardous substances are constantly measured to make sure the cleanup goals are being achieved and that there is no immediate danger to you. If chemical materials are left at a site, EPA re-examines the site every five years after cleanup to make sure it is still safe. ❑

For More Information...

on EPA's risk assessment process, or about a Superfund site in your neighborhood, please contact the toll-free Superfund/RCRA Hotline at **1-800-424-9346** or the Community Involvement Coordinator in the EPA regional office for your state; their numbers are listed below. Your local EPA office can tell you where you can go to review files on every Superfund site in your area. This information may include the results of a risk assessment. Often, EPA conducts community meetings to keep people who live near a site informed about site activities. You may also find useful information on the Superfund home page (www.epa.gov/superfund) under the Community Tools and Technical Resources subheadings. ❑

Region 1 - *CT, ME, MA, NH, RI, VT*
JFK Federal Building , Room RPS-74
Boston, MA 02203
(617) 565-3425 or (888) 372-7341

Region 2 - *NJ, NY, Puerto Rico, Virgin Islands*
290 Broadway St.,
New York, NY 10007
(212) 637-3671 or (800) 346-5009

Region 3 - *DE, DC, MD, PA, VA, WV*
1650 Arch St.,
Philadelphia, PA 19103
(215) 814-3245 or (800) 553-2509

Region 4 - *AL, FL, GA, KY, MS, NC, SC, TN*
Waste Management Division, Atlanta,
Federal Center, 61 Forsyth St.,
Atlanta, GA 30303
AL, FL, GA, MS (800) 435-9234
KY, NC, SC, TN (800) 435-9233

Region 5 - *IL, IN, MI, MN, OH, WI*
Metcalfe Federal Bldg., 19th Floor,
77 West Jackson Blvd.,
Chicago, IL 60604
(312) 886-6685 or (800) 621-8431

Region 6 - *AR, LA, NM, OK, TX*
Tower & Fountain Place
1445 Ross Ave., 12th Floor
Dallas, TX 75202
(214) 665-8157 or (800) 533-3508

Region 7 - *IA, KS, MO, NE*
726 Minnesota Ave.,
Kansas City, KS 66101
(913) 551-7003 or (800) 223-0425

Region 8 - *CO, MT, ND, SD, UT, WY*
999 18th St., Ste. 500
Denver, CO 80202
(303) 312-6600 or (800) 227-8917

Region 9 - *AZ, CA, HI, NV, U.S. Territories*
75 Hawthorne St.,
San Francisco, CA 94105
(415) 744-2178 or (800) 231-3075

Region 10 - *AK, ID, OR, WA*
1200 6th Ave.,
Seattle, WA 98101
(206) 553-1272 or (800) 424-4372

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