



# RISK ASSESSMENT

## Shaw Air Force Base, S.C.

Risk assessment is a scientific process for evaluating the chance that health effects could result from exposure to substances in the environment. It is one tool used to make risk management decisions.

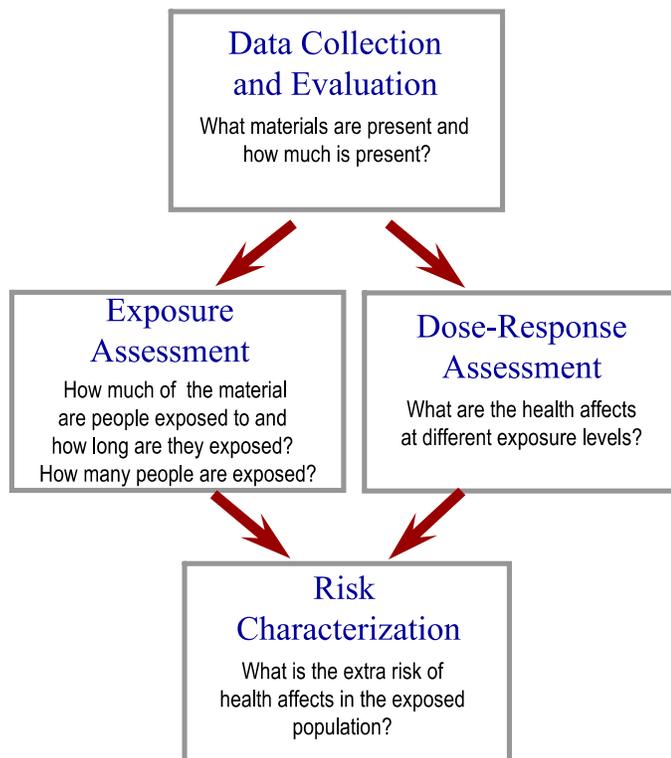
Risk assessments combine:

- Information from environmental testing;
- Results of studies on the health effects of substances found in the environment and;
- Information and/or models that determine the level of exposure to environmental substances.

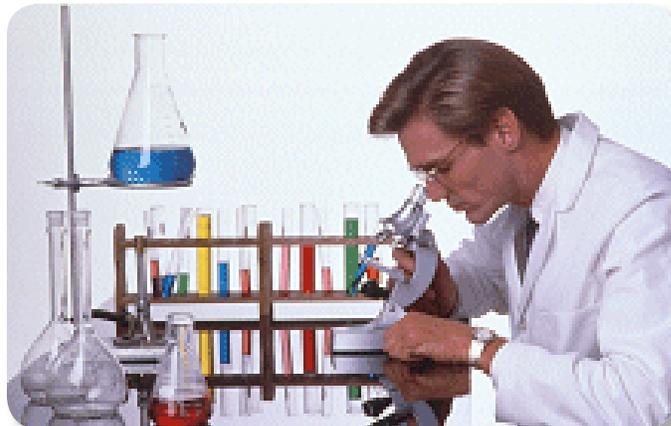
Here, very conservative risk assessments have been completed for nearly all local sites applying the details that follow.

### THE FOUR-STEP RISK ASSESSMENT PROCESS

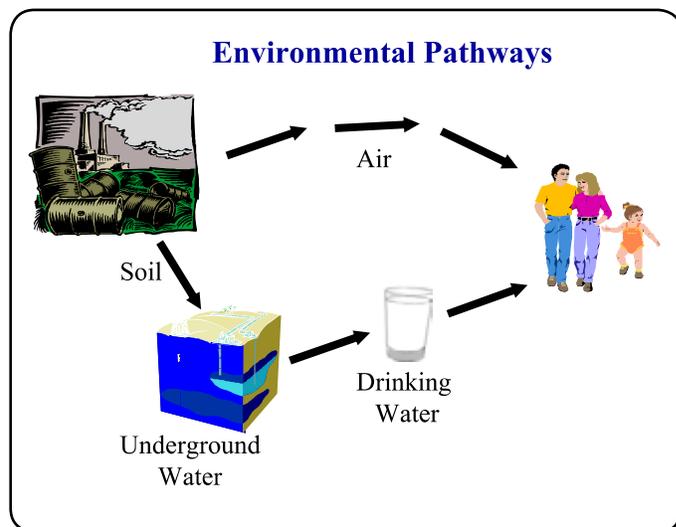
There are four steps in the risk assessment process:



- **Data Collection and Evaluation** – Identifies what materials have been released in the environment and how much was released and to which environmental media (air, soil or water). This step defines the potential for materials released into the environment to move within the environment through pathways.



- **Exposure Assessment** – Determines who is exposed and by what environmental pathways. This step estimates the range of possible exposures and determines the maximum exposure that is likely to occur at a site.



- **Dose-Response Assessment** – Determines what health effects a substance may cause in people and how much is required to cause those effects. This step evaluates both cancer and non-cancer outcomes.

### Sources of Dose-Response Information



Laboratory Animal Studies



Industrial Accidents



Epidemiological Studies

- **Risk Characterization** – Summarizes the risk assessment process. It combines information from the previous three steps to determine the likelihood that health effects could occur in people who come in contact with substances present at a site.

There are two stages in characterizing risk: quantifying risks and analyzing uncertainty.

- **Quantifying Risks** – The calculation for cancer risk determines the increased risk of getting cancer over a lifetime. Individual calculations are made for each substance present and for all environmental pathways. These individual values are added to arrive at the overall risk for the exposed population.

Non-cancer risk is evaluated by calculating risks called hazard quotients. Hazard quotients are calculated by comparing levels of substances found at a site to known safe levels of these substances. Individual calculations are made for each substance present and for all potential routes of exposure. These individual values are added to produce an overall hazard index for the exposed population. A hazard index greater than “1” indicates a possible increased health risk.

- **Analyzing Uncertainty** – Uncertainty exists in assessing health risks because scientists do not have complete information. When information is missing, scientists make assumptions that will prevent them from underestimating the health risk. When uncertainty analysis is performed, the scientists’ assumptions and key site-related variables that contribute to uncertainty are identified. This is done so that risk estimates can be placed in proper perspective for risk managers. 6-4073 / poolerd@dhec.sc.gov



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#### FOR MORE INFORMATION

U.S. Environmental Protection Agency: [www.epa.gov](http://www.epa.gov)  
South Carolina Department of Health & Environmental Control: [www.scdhec.gov](http://www.scdhec.gov)

