



US Army Corps  
of Engineers

## FUSRAP Formerly Utilized Sites Remedial Action Program

*"Public Health  
and Safety are the  
Army Corps  
of Engineers'  
Highest Priorities"*

# FACT SHEET

## Risk Assessment– Key Management Tool for the Formerly Utilized Sites Remedial Action Program

Risk assessment is used for the Formerly Utilized Sites Remedial Action Program (FUSRAP) to estimate the potential risks to human health and the environment posed by radioactive substances and chemicals. Information from the risk assessment is used to determine what action is necessary. Risk assessments are site specific and may vary in detail and in the degree of quantitative analysis used, depending on the site's complexity. The U.S. Environmental Protection Agency (EPA) developed the procedures that the U.S. Army Corps of Engineers (Corps) follows for the risk assessment process. These assessments are conservative estimates that ensure protection of human health and the environment.

### How are human health risk assessments performed?

Human health risk assessments are performed in four steps:

- **Data Collection and Evaluation:** In this phase, samples collected from the cleanup site are analyzed and the data evaluated to identify substances that will be the focus of the risk assessment. If substances have levels that are possibly harmful to humans, they are studied further in the risk assessment process.
- **Exposure Assessment:** The exposure assessment estimates the amount of actual and/or potential exposures to site chemicals or radioactive materials. Exposure is estimated by evaluating the ways that people might come into contact with these materials, and by considering the frequency and duration of potential exposures. Some exposure pathways commonly evaluated at program sites include exposures to radiation, inhalation of vapors or of small
- **Toxicity Assessment:** The toxicity assessment provides values for the amount of chemical or radioactive materials required to do harm and the types of effects that might result from exposure. Typically risk assessments use existing toxicity values obtained from EPA databases.
- **Risk Characterization:** In risk characterization the estimated exposure values from the exposure assessment are combined with toxicity values from the



*On site samples of wastes are routinely collected and tested for radiological and other materials.*

soil particles, incidental ingestion of soil, and ingestion of water. Typically the assessment will consider both current and reasonable potential future uses of the property when developing exposure assumptions. Conducting the exposure assessment involves: identifying potentially exposed populations; identifying all potential pathways of exposure; estimating the chemical and radioactive material concentrations at the point(s) of exposure; and estimating the intakes for each chemical and radioactive substance for each pathway of exposure.

Restoring the Environment is the U.S. Army Corps of Engineers' Ultimate Goal.

For more information, call (202) 761-1806, U.S. Army Corps of Engineers–Office of Public Affairs.

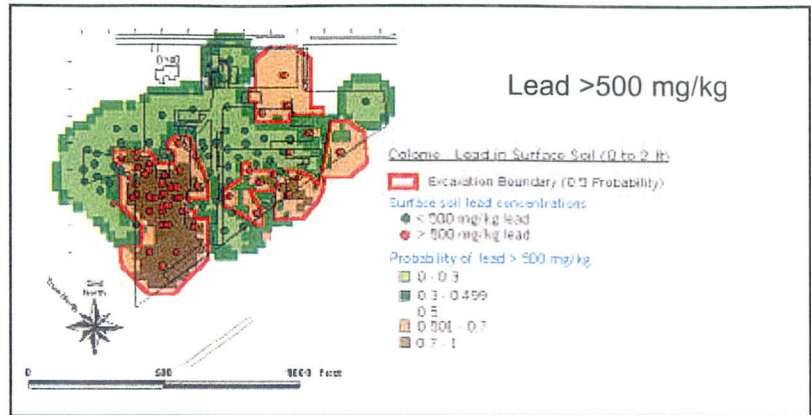
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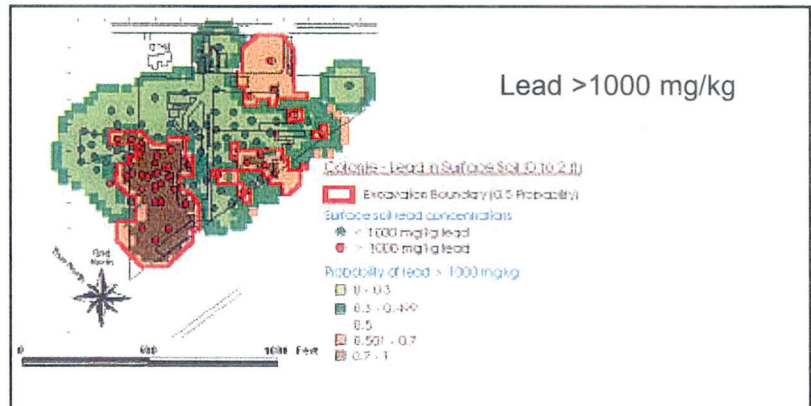
toxicity assessment to give risk values. Results given for each substance and each exposure pathway are combined for a sitewide estimate. Non-cancer causing effects are expressed as a "hazard index," which is a ratio of estimated exposure deemed acceptable. Cancer-causing effects are expressed as a probability of contracting cancer due solely to exposures to site chemicals and radioactive materials. The value does not factor in the lifetime cancer risk for the general public of one in two for men and one in three for women (American Cancer Society). Radiological risk may also be expressed as total effective dose equivalent to allow comparison to regulations that address such exposures. The risk characterization also identifies the uncertainties associated with the risk assessment so that decision-makers can have an understanding of what the results mean.

#### How are ecological risk assessments performed?

An ecological risk assessment is performed to determine whether site chemicals are causing adverse effects to sensitive ecological features found at the site. Ecological features considered for evaluation are chosen by surveying the site and identifying plants, animals and habitat of local, regional or ecological importance. Toxicity levels are identified and evaluated for specific ecological features. These levels are compared to estimated exposures to determine whether there is potential for harm to the environment. In some cases further study may be necessary, such as tissue analysis or onsite toxicity tests, to determine whether the site is posing a threat to the environment.



Detailed analysis helps to build models and maps to evaluate risks and cleanup strategies.



#### How are the results of the risk assessment used?

If results of the risk assessment indicate that the site poses an unacceptable threat to human health and/or the environment, safe levels for chemicals or radioactive materials will be established for the cleanup. Regulatory standards and assumptions from the risk assessment may be used to determine safe levels.