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## Overview of the Present Hazard Ranking System

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In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) establishing the Superfund program to respond to releases and threatened releases of hazardous substances. CERCLA Section 105 required the U.S. Environmental Protection Agency (EPA) to establish criteria for determining priorities among releases or threatened releases of hazardous substances for the purpose of taking remedial action. To meet this requirement, EPA developed the Hazard Ranking System (HRS) (47 FR 31180, July 16, 1982) to evaluate sites for the National Priorities List (NPL).

The Hazard Ranking System (HRS) is a screening tool used by the U.S. Environmental Protection Agency (EPA) to assess the relative threat that sites with actual or potential contaminant releases pose to human health or the environment. The HRS is the primary mechanism EPA uses to place a site on the National Priorities List (NPL). The sites on the NPL are then further investigated to determine the extent of the threat and whether cleanup of the site under EPA's Superfund Remedial program is warranted. This information sheet provides background information on the legal basis for the HRS and a general overview of the HRS evaluation process.

### **What is the Basis for the Hazard Ranking System?**

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was passed by Congress in 1980 and amended by the Superfund Amendments and Reauthorization Act (SARA) in 1986. This law was enacted in response to serious environmental and public health concerns regarding uncontrolled hazardous waste sites, such as Love Canal and Times Beach in the 1970s. SARA authorized EPA to clean up such sites and to require responsible parties to perform cleanups or reimburse the government for cleanups conducted by EPA. CERCLA, as amended by SARA, required EPA to establish a mechanism for identifying the highest priority sites – those posing the most immediate and serious potential threats to human health or the environment – and identified criteria that needed to be followed when developing this mechanism. Based on the criteria, EPA created the HRS to evaluate the relative threat of sites with known or potential contaminant releases. The HRS was promulgated in 1982 (47 FR 31180) and included three scoring pathways - ground water, surface water, and air. The HRS was amended in 1990 (55 FR 51532) to include a direct exposure pathway.

CERCLA also enabled the revision of the National Oil and Hazardous Substances Pollution Contingency Plan, or National Contingency Plan (NCP), which is the regulation that implements CERCLA. The NCP provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. Additionally, CERCLA established EPA's National Priorities List, which is a list of contaminated sites identified to have known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide EPA in determining which sites warrant further investigation to ascertain whether remedial action is needed to protect human health and the environment affected by releases from those sites.

The HRS is the principal mechanism EPA uses to place hazardous waste sites on the NPL. It is a numerically based screening system that uses information from initial, limited investigations to assess the relative potential threat that sites pose to human health or the environment due to contaminant releases. The HRS uses data that can be collected relatively quickly and inexpensively, thus allowing most Superfund resources to be directed to site cleanup. It is not a site-specific risk assessment.

## **How Does the Hazard Ranking System Work?**

The HRS score is based on an evaluation of up to four separate pathways: ground water migration, soil exposure, surface water migration, and air migration. Pathways are routes by which exposure to contaminant releases affecting human health or sensitive environments can occur.

The ground water migration pathway evaluates the likelihood that hazardous substances will travel through the ground below and contaminate aquifers and drinking water wells that draw on those aquifers. The surface water migration pathway evaluates the likelihood that hazardous substances can enter surface water and affect people or the environment. Threats to humans from this pathway include drinking water, the human food chain (i.e., contaminants build up in the aquatic organisms that humans in turn consume), and sensitive environments. The soil exposure pathway evaluates the potential threats to humans and terrestrial environments posed by direct, physical contact with hazardous waste or contaminated soil. This pathway includes threats to those living on property with hazardous waste or contaminated soils, and those living nearby with access to the property. Finally, the air migration pathway evaluates the likelihood of release of hazardous substances into the atmosphere and how many people and sensitive environments could be exposed to hazardous substances carried in the air, including gases and particulates.

The scoring system for each pathway is based on a number of individual factors associated with risk-related conditions at the site. These factors are grouped into three categories:

1. Likelihood of release/exposure (i.e., likelihood that a site has released or has the potential to release hazardous substances into the environment, or that targets can come into contact with hazardous substances)
2. Waste characteristics (i.e., inherent toxicity, mobility of the substances and the quantity of the hazardous substances that has been released)
3. Targets (i.e., people or sensitive environments actually or potentially exposed to the release)

The HRS site score, which ranges from 0 to 100, is obtained by combining the pathway scores. A site may be scored for one or more of the pathways depending on the nature of the release. Any site scoring 28.50 or greater is eligible for placement on the NPL. The HRS score does not represent a specified level of risk but is a cutoff point that serves as a screening-level indicator of the highest priority hazardous releases or potential releases based on the criteria identified in SARA.

## **For More Information**

- For information on the HRS, visit [http://www.epa.gov/superfund/programs/npl\\_hrs/hrsint.htm](http://www.epa.gov/superfund/programs/npl_hrs/hrsint.htm)
- For information on the National Priorities List, visit <http://www.epa.gov/superfund/sites/npl/>
- For information on Superfund, visit <http://www.epa.gov/superfund/index.htm>.