



Non-Time-Critical Removal Risk Evaluation

BACKGROUND: This Information Brief, which is one of a series of briefs addressing the planning components necessary in support of removal action decision making, outlines the requirements for and application of risk evaluations for non-time-critical removal actions.

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the enabling regulation, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) authorize two types of response actions for uncontrolled releases of hazardous substances: removal actions and remedial actions. Remedial actions involve field investigation followed by design and implementation of remedies should baseline risks prove unacceptable. Removal actions involve activities, such as removal of released hazardous substances or other means to limit or eliminate exposures, in order to intervene quickly at sites where immediate or acute threats to human health and the environment are identified. Removal actions can be conducted on an emergency, time-critical, or non-time-critical basis.

Removal actions (or removals) provide an avenue for expedited response to immediate site problems. Although, removals require less study and pre-planning as compared to remedial actions, they must be based on a finding that human health or the environment are at immediate risk. Potentially significant benefits to health and the environment could be realized from an increased use of removal actions. A GAO report concluded that "More extensive use of removal actions would provide a means for speeding the planning process and devoting more environmental restoration dollars to actual remediation at sites" (Reference 1). In addition, one potential benefit of performing a removal action could be a determination of "no further remediation planned" (NFRP) by the U. S. Environmental Protection Agency (EPA).

STATUTE: The Comprehensive Environmental Response, Compensation, and Liability Act of 1980

REGULATION: 40 CFR Part 300, National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 55 *FR* 8666, March 8, 1990.

- REFERENCES:**
1. *Greater Use of Removal Actions Could Cut Time and Cost for Cleanups*, U.S. General Accounting Office, GAO/RCED-96-124, May 1996.
 2. *Streamlined Site Characterization Approach for Early Actions: Impact on Risk Assessment Data Requirements*, U. S. Department of Energy, Office of Environmental Policy and Assistance, RCRA/CERCLA Division (EH-413), EH-231-025/1294, December 1994.
 3. *Site Conceptual Exposure Model Builder (Beta Version)*. U. S. Department of Energy, Office of Environmental Policy and Assistance, RCRA/CERCLA Division, EH-413. This PC software tool is accessible by logging onto the OEPA Internet site, URL <http://tis-nt.eh.doe.gov/oepa/>.
 4. *Guidance on Conducting Non-Time-Critical Removals Under CERCLA*, U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, EPA 540-R-93-057, PB93-963402, August 1993.
 5. *CERCLA Removal Actions*, U. S. Department of Energy, Office of Environmental Policy and Assistance, RCRA/CERCLA Division (EH-413), and Office of Environmental Restoration, Regulatory Integration Division (EM-431), DOE/EH-0435, September 1994.
 6. *Phased Response/Early Actions*, U. S. Department of Energy, Office of Environmental Policy and Assistance, RCRA/CERCLA Division (EH-413), and Office of Environmental Activities (EM-22), DOE/EH-0506, November 1995.
 7. *Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part A, Interim Final)*, U. S. Environmental Protection Agency, Office of Emergency and Remedial Response, Publication EPA/540/1-89/002, P-155581, December 1989.

What Type of Risk Evaluation should be performed for a Non-Time-Critical Removal Action?

The NCP mandates that a formal evaluation process, termed the Engineering Evaluation/Cost Analysis (EE/CA), be conducted prior to implementation of a non-time-critical removal. This provides a minimum of a 6-month planning period. [40 CFR 415(b)(4)(i)] As part of that process, an evaluation is made of any risks associated with activities of the removal action to be taken. To support removal decision making [55 FR 8704], EPA recommends conducting a “**Streamlined Risk Evaluation**” (SRE) which focuses on the specific problem or the existing or imminent health or environmental threats that the removal action is designed to address rather than addressing all potential exposure pathways (Reference 2).

The SRE should be based on available site-specific information to include data gathered or generated during any initial site characterization activities such as preliminary assessment or site reconnaissance visits. The specific focus of the SRE should be to provide an understanding of:

- Contaminant source(s) and locations, and any media contaminated as a result of releases from the source(s),
- Physical structure and integrity of available hazardous substance containment,
- Degree of site contamination (quantity, concentration, etc.),
- Physical and chemical properties of the contaminants, and
- Potential human and ecological receptors, and valuable natural resource such as groundwater and surface water).

The site conceptual exposure model tool (SCEM; Reference 3) can be used to integrate the above information when conducting the SRE.

The streamlined risk evaluation is intermediate in rigor between a full baseline risk assessment and the limited risk evaluation undertaken for emergency removals (References 4 and 6).

How does an SRE aid in making the decision to perform a Non-Time-Critical (NTC) Removal?

The NCP states that removal actions can be taken at any uncontrolled release site with hazardous wastes or hazardous substances, regardless of whether they are on the National Priorities List, where there are threats to human health or the environment. [40 CFR 300.415(b)(1)] For a NTC removal action, evaluations are needed to determine whether existing or imminent health and or environmental threats exist, and if so, the impacts of potential removal actions on health or the environment. The decision to implement a NTC removal can be based on a variety of factors (removal action objectives), including threat to human health or the environment as reflected by actual or potential exposure or contamination, the presence of hazardous substances or pollutants, and release potential. [40 CFR 300.415(b)(2)] The SRE results provide risk managers with the information they need to understand the existing or imminent threats by identifying the nature, extent and location of the release, the pertinent exposure pathways of contamination migration and the human and/or ecological receptors that may be exposed to the

contamination. Also, any potential risks resulting from the removal action itself could be evaluated by the SRE (References 4 and 5).

What specific objectives should an SRE be designed to accomplish?

The primary objectives of the SRE are to evaluate existing and imminent risks to human health and the environment in the absence of a response to the releases at the site, and to present information on the potential impacts from the removal action alternatives. Other objectives include:

- Identification of principal threat chemicals and migration pathways that should be removed, and the needed intervention measures to prevent existing or imminent threats; Estimation of the likelihood of success of the removal action alternatives in reducing threats, based on current understanding of the SCEM;
- Identification of types of impacts resulting from the removal alternatives and whether they are significant (do they outweigh the benefits of risk reduction?);
- Support of a “no further remediation planned” (NFRP) determination. (e.g., an NFRP determination might be supported on the basis of a subsequent Hazard Ranking System scoring, which might reflect the lower volumes of hazardous substances present, the interruption of contaminant migration pathways and/or lack of receptors, all of which could result from a well planned and executed removal).
- Documentation of the need for removal action in the Action memorandum.

When should a SRE be used, and how detailed should the SRE be?

A SRE need not be complex; however, it must be concise and informative and should identify existing or imminent threats. If standards for one or more contaminants of concern are clearly exceeded, removal is appropriate, and additional risk evaluation is not necessary. One approach of the SRE is the comparison of contaminant concentrations with Applicable or Relevant and Appropriate Requirements (ARARs), which are promulgated federal or state environmental standards [40 CFR 300.415(i)]. In the absence of ARARs, EPA-published risk-based concentrations, preliminary remediation goals, soil screening levels (SSLs), etc. can be used for the comparison. In the absence of published risk-based values, the values can be developed based on relevant EPA guidelines or methodologies. For example, values for contaminated soils could be developed using EPA’s soil screening levels (available on EPA’s Internet site, <http://www.epa.gov/superfund/index.html>, select “Products”). Another approach involves simply identifying media-specific contaminants of concern, their concentrations, and the toxicity associated with those concentrations.

EPA default exposure assumptions could be used in a SRE when they are well suited to the site. Use of fact sheets, graphics (SCEM diagrams), tables, etc. to communicate risk information is recommended. Any uncertainties associated with the SRE should be identified and prominently displayed. The implications of the uncertainty analysis for the risk assessment should be discussed.

There are cases when a more thorough risk evaluation may be warranted. When standards are not clearly ex-

ceeded, or where data are limited or of questionable quality, or in the case of a DOE-lead early action, when no formal Remedial Investigation/Feasibility Study is planned and there is little likelihood of subsequent remedial ac-

The following example case study illustrates how the SRE can support the non-time-critical removal action:

A site had two above-ground storage tanks containing solvents and polychlorinated biphenyls (PCBs). Vandalism caused a fire at the tanks, releasing solvents and PCBs into the soil. The site is upgradient to a tributary of a major river. The site was listed in the CERCLA Information System (CERCLIS) and was about to be scored for NPL listing. Residuals in the tank showed PCBs at concentrations over 50 parts per million (ppm).

The SRE showed that potential pathways existed for incidental ingestion and dermal contact with PCBs and spent solvents, and that runoff from the release could impact the river tributary. The SRE also expressed concern for byproducts of PCB combustion. Potential removal activities include immediate diking of the tank area to prevent surface runoff before and during the removal action, physical removal of the tanks and piping and soil removal/disposal, and resampling. After removal actions were taken, resampling using a grid method showed that the maximum contamination of residual PCBs in the soil was 5 ppm for this industrial site. There were no detectable PCBs on the path or swale leading to downgradient locations of the river tributary. Solvents and chlorinated dibenzofurans (byproducts of PCB combustion) were not detected in surface soil and representative borings up to 5 feet at acceptable detection limits. The SRE documented that the removal actions were complete and that the residual PCB level was within the 2 to 25 ppm standard allowable for PCB-contaminated CERCLA sites.

Consultation with the EPA removal program coordinator concluded that the site was an NFRP candidate. An NFRP determination was subsequently granted by the EPA.

This example case study shows how an SRE is used to determine the need for removal action to reduce human health and environmental risks. It demonstrates the pathways and principal threat chemicals to be removed (and verified for the success of the non time-critical removal action). It also shows how the SRE documents the basis for an NFRP request.

tion, a more rigorous risk evaluation would be warranted before performing the NTC removal action. Such risk evaluations would likely need to consider the potential for synergistic effects of multiple contaminants, and/or multiple exposure pathways (Reference 4 and Reference 7).

How will the SRE be used to aid in the selection of a NTC removal alternative?

The SRE identifies principal threat chemicals, their migration pathways, and the exposed receptors, including natural resources. The information is essential to decide what type of removal actions will be needed and whether available technologies can be successful in interrupting the exposure pathway and sufficiently reduce the risks. Also, the short-term risks of implementing the NTC removal action will be evaluated in the SRE, specifically in regard to four factors: (1) the affected adjacent community; (2) on-site workers, taking into account the effectiveness and reliability of any protective measures that will be implemented; (3) environmental impacts, considering the effectiveness of planned mitigative measures; and (4) the time frame necessary to achieve removal objectives. The SRE provides information about the basis for the environmental impacts (e.g., fugitive dust emissions) so that the appropriate preventive measures can be used to mitigate risks from the removal action.

Evaluation of risk after the response action is taken is also important factor in determining the long-term effectiveness of an action. This includes consideration of: (1) the severity of risk; (2) the adequacy and reliability of controls; and (3) the extent to which the removal action contributes to future remedial activities on site. In considering the severity of risk, treatment residuals and wastes remaining after completion of the NTC removal should be evaluated by comparison of media concentrations with risk-based concentrations or remediation goals for long-term exposure. If the removal is an interim step to be followed by remedial action, a long-term risk evaluation might be less necessary, or perhaps eliminated altogether (provided that any longer term risks are planned to be evaluated as part of the subsequent remedial action).

What about documenting the SRE ?

The outcome of the streamlined risk evaluation is documented in the Action Memorandum or the equivalent DOE removal project documentation (References 5 and 6). Documentation of the streamlined risk evaluation results serves three key purposes:

- The SRE supports the need for a NTC removal action to protect public health and/or the environment, and
- The SRE constitutes part of the basis (i.e., effectiveness) for choosing the selected alternative
- The SRE provides a baseline for comparing risks after the response action is taken.

The Action Memorandum or equivalent DOE removal project documentation becomes part of the administrative record for the NTC, and as such is available for public review and comment.

Questions of policy or questions requiring policy decisions will not be dealt with in EH-413 Information Briefs unless that policy has already been established through appropriate documentation. Please refer any questions concerning the subject material covered in this Information Brief to John Bascietto, RCRA/CERCLA Division, EH-413, (202) 586-7917, or john.bascietto@eh.doe.gov.

