

TSERAWG Technical Guidance



This paper has been technically reviewed and endorsed by the Tri-Service Environmental Risk Assessment Working Group for use by Army, Navy, and Air Force Personnel

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Tri-Service Position Paper on Background Levels in Risk Assessment

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PURPOSE. This position paper presents technical considerations on how to use background levels in the identification of sites for remedial action or no further action (NFA) and in the determination of cleanup levels. The position paper also describes the consideration of background levels in identifying and evaluating site-related chemicals and non-site-related chemicals. The U.S. Air Force, U.S. Army, and U.S. Navy (i.e., the Tri-Service Environmental Risk Assessment Working Group [TSERAWG]) has developed this position paper to establish a consistent approach that could be used in both human health and ecological risk assessments.

APPLICABILITY. Procedures contained herein apply to site investigations funded under the Defense Environmental Restoration Program (DERP).

DEFINITIONS. For the purpose of this position paper, the following definitions are used:

1. **Background levels** – Concentrations of chemicals that are not site-related or attributable to releases from the site. Background levels include both naturally occurring and anthropogenic substances present in the environment, but do not include chemicals that have migrated onto the site (e.g., a release from a continuing source).
2. **Naturally occurring background levels** – Ambient concentrations of chemicals present in the environment that have not been influenced by human activities (e.g., aluminum and manganese). Under Section 104(a)(3)(A) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a removal or remedial action shall not be undertaken in response to a release of a naturally occurring substance in its unaltered form.

3. **Anthropogenic background levels** – Concentrations of chemicals that are present in the environment due to human-made, non-site sources (e.g., atmospheric deposition, industry, automobiles, the proximity of roadways, railways, and parking lots). In accordance with CERCLA Sections 101(22) and 103(e), standard applications of chemicals that are applied according to manufacturer’s directions (i.e., pesticides and fertilizer) are to be considered anthropogenic background levels.
4. **Chemical** – An element, chemical compound, or mixture of elements and/or compounds (29 CFR 1910.1200(c)).
5. **Site-related chemicals** – Chemicals that are present in the environment due to Department of Defense (DoD) sources, releases, or activities.
6. **Chemicals of Potential Concern (COPCs)** – Potentially site-related chemicals that are detected at concentrations that exceed screening levels (risk-based or background) and are evaluated in the risk assessment.
7. **Chemicals of Concern (COCs)** – Site-related hazardous substances, pollutants, and contaminants that, at the completion of the risk assessment, are found to be the risk drivers or those that may actually pose unacceptable human or ecological risks. The COCs typically drive the need for a remedial action (EPA, 2002a).

TECHNICAL POSITION. This technical position requires a scientifically defensible characterization of background levels of chemicals that are potentially present at the site due to background conditions (naturally occurring and anthropogenic). The approach is consistent with the U.S. Environmental Protection Agency’s (EPA’s) Role of Background in the CERCLA Cleanup Program (EPA, 2002a), the EPA’s Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (EPA, 2002b), and the U.S. Navy’s Policy on the Use of Background Chemical Levels (Navy, 2004). This shall include:

1. Evaluation of background conditions: There should be a clear understanding of the chemicals released from a site and site background conditions to ensure any remediation is focused on a release caused by a site-related source.
2. Identification of site-related chemical concentrations:
 - a. Site chemical concentrations should be compared to risk-based screening levels.
 - b. Site chemical concentrations should be compared to background levels.
 - c. Chemicals that are above risk-based screening levels and background levels should be identified as site-related COPCs.
 - d. Chemicals that are above risk-based screening levels, but below background levels should be identified as non-site-related COPCs.
3. Evaluation of risk:
 - a. Site-related COPCs should be quantitatively and qualitatively evaluated in the risk assessment.
 - b. Non-site-related COPCs should be evaluated qualitatively in the risk assessment.
 - c. Site-related risk and non-site-related risk should be considered separately during the risk assessment.

4. Development of cleanup levels:
 - a. Site cleanup levels should be established for COCs. Consistent with CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and the DERP Management Guidance, the DoD will not address chemicals that are not from DoD releases or that are present at or below background levels.
 - b. Cleanup levels should not be established below background levels (naturally occurring or anthropogenic). Consistent with CERCLA and the NCP, the DoD will not remediate COCs below background levels.

EVALUATION OF BACKGROUND. To implement this technical position, it is necessary to distinguish between releases caused by site activities and releases caused by non-site-related sources. Both naturally occurring and anthropogenic background levels of chemicals should be established and considered as early as the Preliminary Assessment/Site Inspection (PA/SI) phase of the CERCLA process or the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) of the RCRA process. Establishing scientifically defensible background levels early in the process can provide evidence that supports a NFA determination. In accordance with EPA guidance, background sampling is conducted to distinguish site-related contamination from naturally occurring or other non-site-related levels of chemicals (EPA, 1989). Background chemicals can be either localized or widespread and should be evaluated during site investigations in order to differentiate between DERP cleanup responsibilities for site-related releases and background conditions.

IDENTIFICATION OF SITE-RELATED CHEMICALS. A comparison of site chemical concentrations with background levels is used during the identification of COPCs to eliminate non-site-related chemicals from the quantitative risk assessment.

RISK ASSESSMENT. A comparison with background levels should be performed during the data collection and data evaluation portion of the human health risk assessment and during Step 3A of the ecological risk assessment process. Chemicals that are determined to be background chemicals will not be identified as site-related COPCs and will not be included in the quantitative risk assessment. However, these chemicals will be identified as non-site-related COPCs and will be qualitatively assessed in the risk characterization. Any estimation of non-site-related risk should be evaluated and considered separately from site-related risk since this information may be used to make risk management decisions.

CLEANUP LEVELS. Chemical-specific cleanup levels for the site remediation should not be below background levels. Cleanup levels should only be developed for COCs.

SUMMARY.

1. Evaluate background conditions so site releases can be distinguished from background conditions.
2. Perform a comparison with naturally occurring background levels and anthropogenic background levels to identify site-related and non-site-related chemicals.

3. Identify chemicals that are above risk-based screening levels and background levels as site-related COPCs. Identify chemicals that are above risk-based screening levels, but below background levels as non-site-related COPCs.
4. Discuss both site-related COPCs and non-site-related COPCs in the risk characterization.
5. For risk management purposes, consider any estimation of non-site-related risk separately from site-related risk.
6. Develop cleanup levels for COCs only.
7. Do not establish cleanup levels that are below background levels.

REFERENCES.

- EPA, 1989. U.S. Environmental Protection Agency, Risk Assessment Guidance for Superfund (RAGS): Volume I, Human Health Evaluation Manual (Part A), Interim Final, Office of Emergency and Remedial Response, Washington, D.C., EPA/540/1-89/002, December.
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