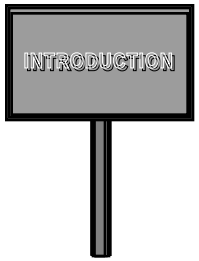
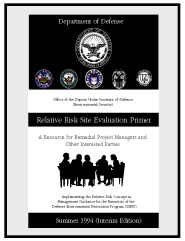
Relative Risk Site Evaluation within the Department of Defense Cleanup Program

Outline

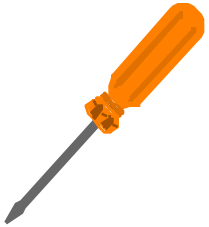
- Introduction
  - Origins of relative risk
  - Work group composition and products



- Description of framework
  - What it is and is not
  - Media and factors
  - Documentation
  - Example/benefits

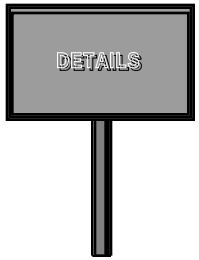


- Use of relative risk in program management



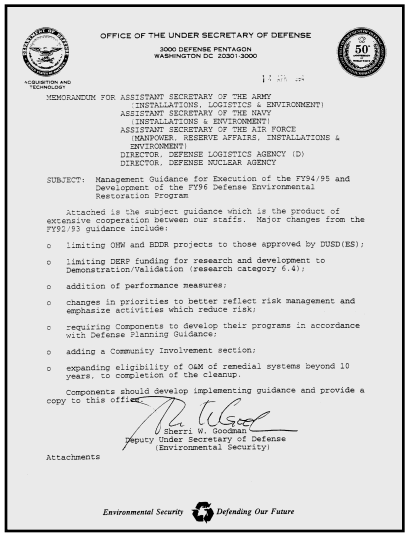
- Implementation

- Workgroup recommendations



- Detailed descriptions of each relative risk factor

Origin of Relative Risk within DoD



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3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND TECHNOLOGY

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS, LOGISTICS & ENVIRONMENT)
ASSISTANT SECRETARY OF THE NAVY (INSTALLATIONS & ENVIRONMENT)
ASSISTANT SECRETARY OF THE AIR FORCE (MANPOWER, RESERVE AFFAIRS, INSTALLATIONS & ENVIRONMENT)
DIRECTOR, DEFENSE LOGISTICS AGENCY (D)
DIRECTOR, DEFENSE NUCLEAR AGENCY

SUBJECT: Management Guidance for Execution of the FY94/95 and Development of the FY96 Defense Environmental Restoration Program

Attached is the subject guidance which is the product of extensive cooperation between our staffs. Major changes from the FY92/93 guidance include:

- limiting OHW and BDDR projects to those approved by DUSD(ES);
- limiting DERP funding for research and development to Demonstration/Validation (research category 6.4);
- addition of performance measures;
- changes in priorities to better reflect risk management and emphasize activities which reduce risk;
- requiring Components to develop their programs in accordance with Defense Planning Guidance;
- adding a Community Involvement section;
- expanding eligibility of O&M of remedial systems beyond 10 years, to completion of the cleanup.

Components should develop implementing guidance and provide a copy to this office.

Sherri W. Goodman
Deputy Under Secretary of Defense
(Environmental Security)

Attachments

Environmental Security Defending Our Future

- **Relative Risk guidelines specified in 14 April 1994 DERP Management Guidance**
  - **Proposed risk management concept for building FY96 program**
  - **For interim and remedial action projects Components will indicate “the number of sites, the current relative risk and expected risk reduction the project will achieve” (p. 16)**
  - **To measure performance, Components will report on the number of sites where relative risk has been reduced (p. 6)**

Work Group Objectives

- Prepare a method or procedure to group sites into high, medium, and low relative risk categories based upon the risk management concept in Management Guidance (May 1994)
  - Review methods used by Components
  - Develop a common methodology using consistent definitions
- Establish a peer review process to monitor and improve relative risk evaluation (August 1994)
  - Develop a consistent data format
  - Review and comment on relative risk data collected by Components

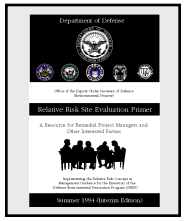
Work Group Participants

- DoD
- Army
  - Army Environmental Center
  - Army Center for Health Promotion and Preventive Medicine
- Navy
  - Chief of Naval Operations
  - HQ Navy Facilities Engineering Command
- Air Force
  - HQ Air Force Environmental Restoration Program Directorate
  - Office of the Deputy Assistant Secretary of the Air Force
  - Air Force Institute of Technology
- FUDS
  - HQ and HTRW Center of Expertise U.S. Army Corps of Engineers (COE)
- Defense Logistics Agency
- HQ Environmental Protection Agency

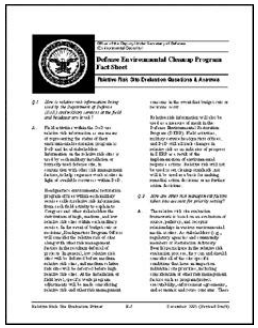
INTRODUCTION

Work Group Products

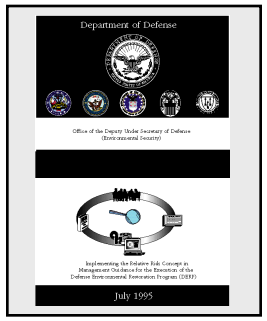
- **Produced the *DoD Relative Risk Site Evaluation Primer***



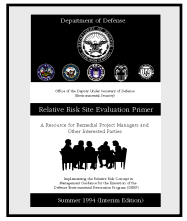
- **Developed *DoD Question and Answer Fact Sheet* and response to EPA comments**



- **Produced a draft *Interservice Relative Risk Site Evaluation Peer Review Report***



What is Relative Risk Evaluation?



Definition **The grouping of sites in the Defense Environmental Restoration Program into High, Medium, and Low categories based on an evaluation of site information using three factors: the contaminant hazard, the migration pathway, and the receptors**

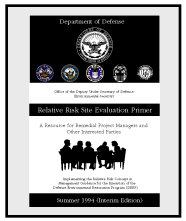
It is

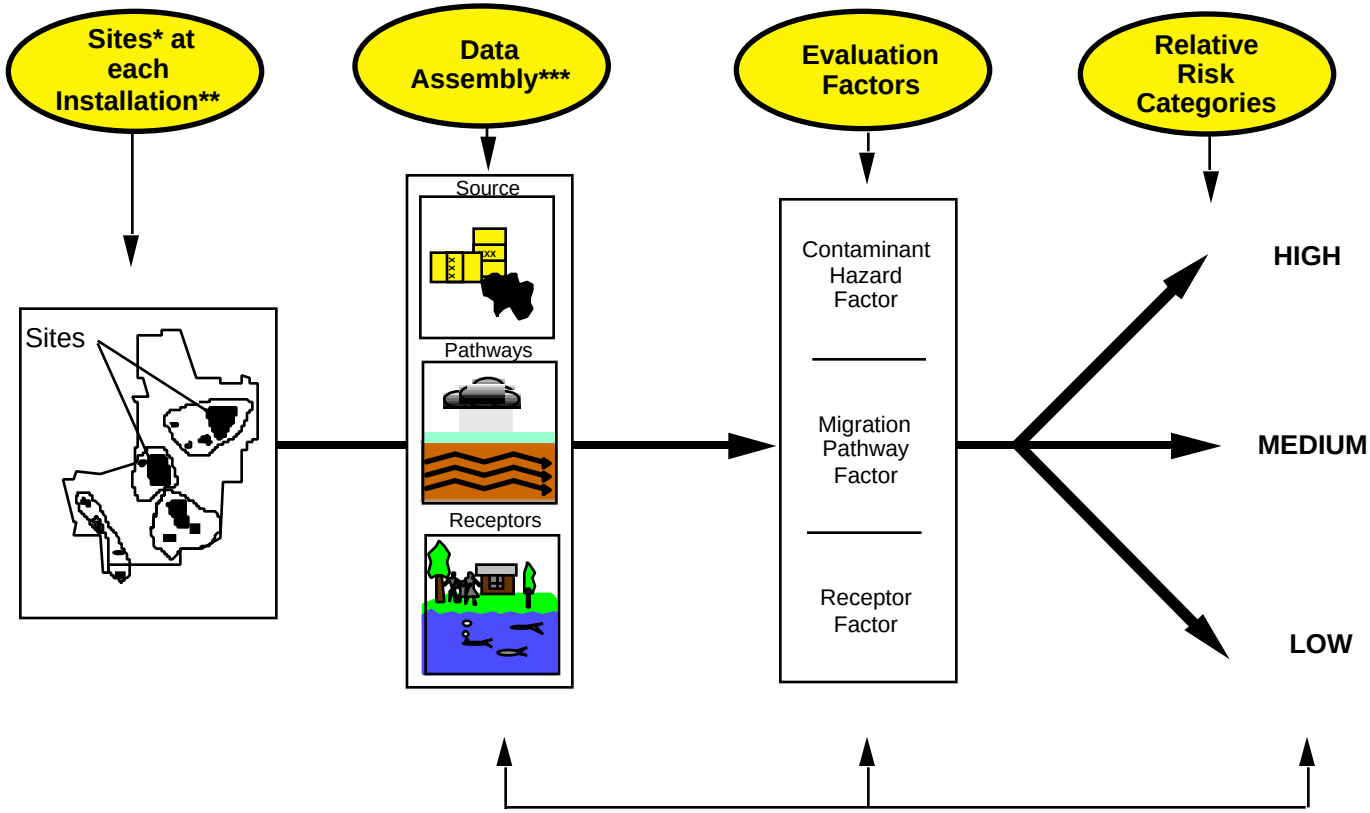
- **A common methodology for evaluating the relative risk posed by a site**
- **A screening tool**
- **An evolutionary instrument**
- **A framework for dialogue with stakeholders**

It isn't

- **A way to avoid our legal agreements**
- **A means of reducing our financial obligations**
- **An abdication of our cleanup responsibilities**
- **An absolute assessment of risk**
- **A substitute for a health assessment**
- **A remedy selection tool**

Relative Risk Site Evaluation Concept Summary





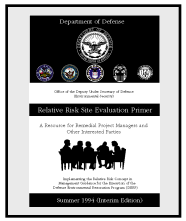
*Sites for current DoD installations equate with "Projects" in the Formerly Utilized Defense Sites (FUDS) Program

**Installations equate with "properties" in the FUDS Program

***Data assembled by environmental medium

Regulator and Public Stakeholder Involvement in Technical Evaluations

Site Evaluation Framework is a Method for Placing Sites into Relative Risk Categories



It evaluates source, pathway, and receptor relationships in:

Groundwater (human endpoint)

Surface water (human and ecological endpoints)

Sediment (human and ecological endpoints)

Surface soils (human endpoint)

Based on:

Contaminant Hazard Factor (CHF)

How high are contaminant concentrations relative to standards?

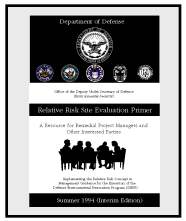
Migration Pathway Factor (MPF)

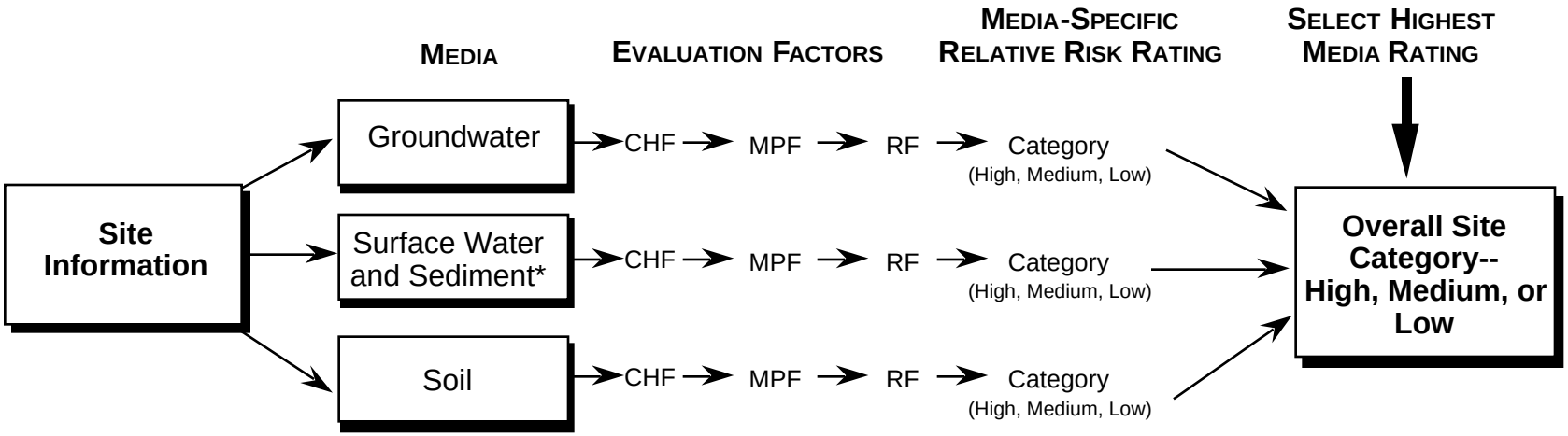
Is the contamination moving or likely to move?

Receptor Factor (RF)

Are there humans or sensitive environments affected or potentially affected by the contamination?

Structure of Relative Risk Evaluation Framework

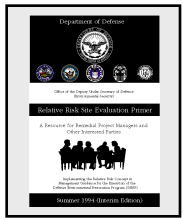




CHF = Contaminant Hazard Factor
MPF = Migration Pathway Factor
RF = Receptor Factor

*Includes human and ecological endpoints

Relative Risk Site Evaluation Matrix



CHF = SIGNIFICANT

MPF \ RF	Identified	Potential	Limited
Evident	H	H	M
Potential	H	H	M
Confined	M	M	L

CHF = MODERATE

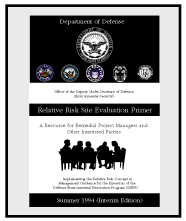
MPF \ RF	Identified	Potential	Limited
Evident	H	H	M
Potential	H	M	L
Confined	L	L	L

CHF = MINIMAL

MPF \ RF	Identified	Potential	Limited
Evident	H	M	L
Potential	M	L	L
Confined	L	L	L

CHF	=	Contaminant Hazard Factor
MPF	=	Migration Pathway Factor
RF	=	Receptor Factor
H	=	High
M	=	Medium
L	=	Low

How is Relative Risk Evaluated?



Documentation

The *Relative Risk Site Evaluation Primer* is the primary source for direction

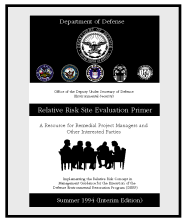
The *Relative Risk Evaluation Worksheet* in the Primer is used to record pertinent information on each site that is evaluated

Instructions in the *Primer* show how to fill out the *Relative Risk Evaluation Worksheet*

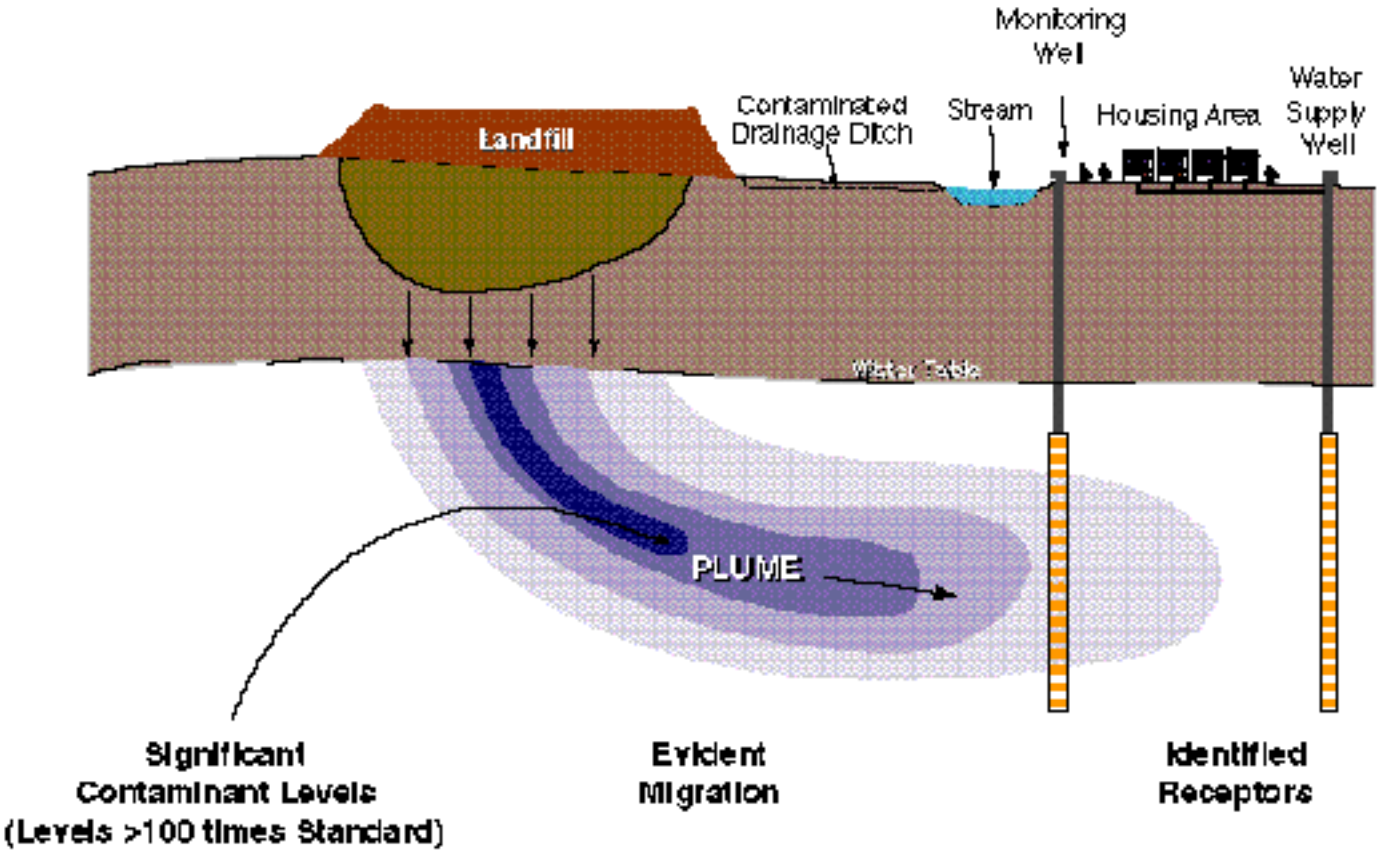
A stand-alone/executable computer program has been developed for conducting relative risk evaluations consistent with the *Primer*

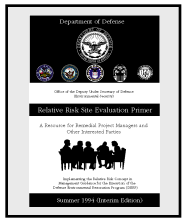
Regulatory agency and public stakeholder input is obtained on site evaluations, where possible

Relative Risk Evaluation Example



High Relative Risk (Human) – Groundwater/Surface Water





Benefits

Benefits

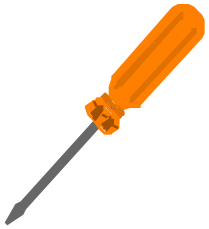
The framework provides a common approach among DoD components for categorizing sites by relative risk

The most urgent sites are identified so that resources can be focused on higher relative risk projects first

The rating serves as a basis for dialogue with stakeholders on sequencing work at installations

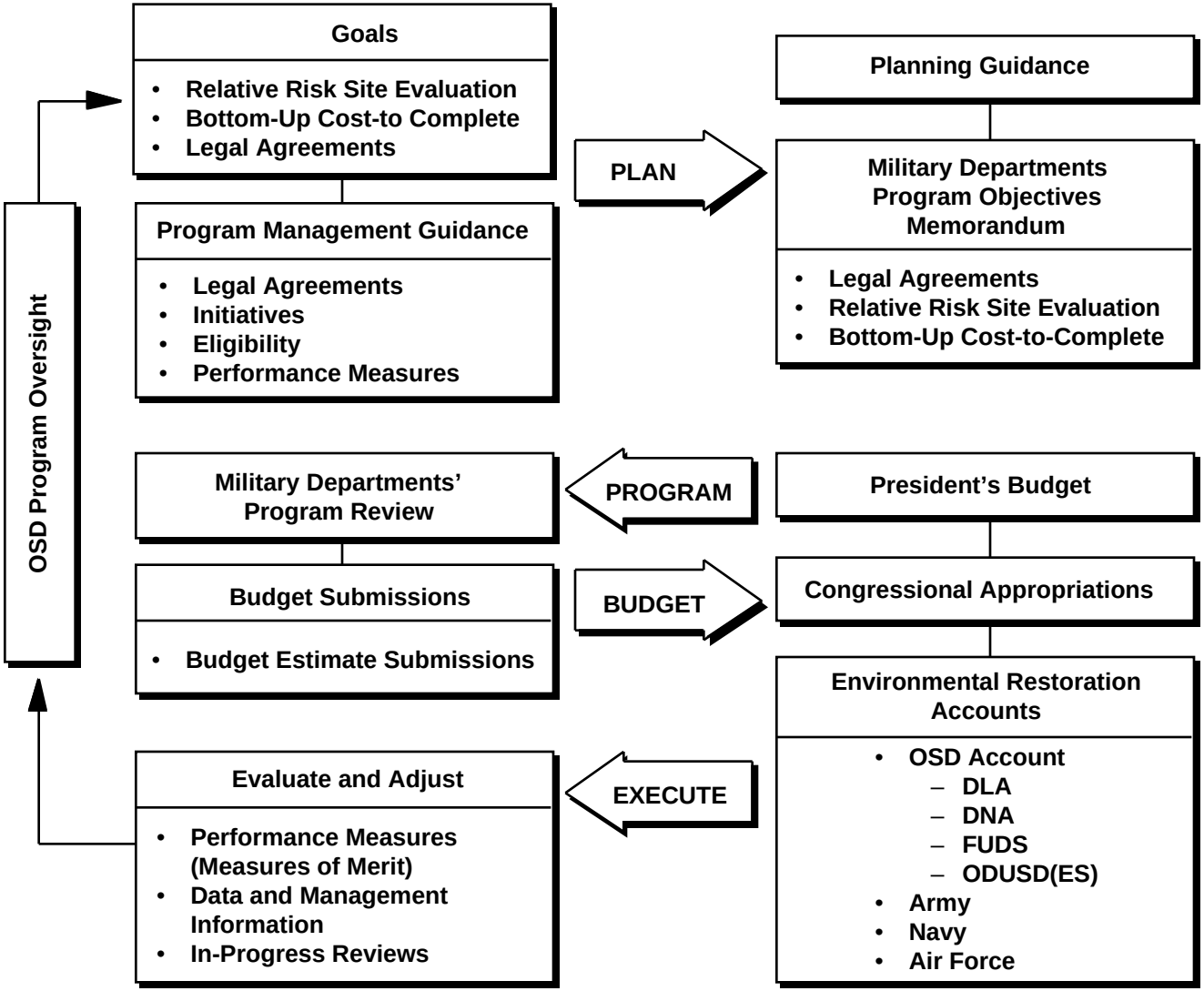
Periodic ratings serve as an indicator of progress in reducing relative risk

Use of Relative Risk Information

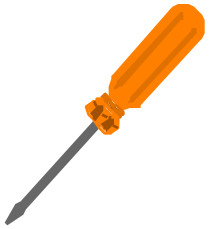


- A factor in sequencing environmental restoration work (known requirements)
  - Framework for discussions with stakeholders
  - One factor in priority setting
- A program-level management tool
  - Used to identify the distribution of sites in each of three relative risk categories for military departments within DoD
  - Used as a measure of merit (MOM) at the HQ level to measure and report progress toward achievement of cleanup goals

DERP Planning, Programming, Budgeting, and Execution



Requirements from Defense Planning Guidance



- Complete relative risk evaluations at every Defense Environmental Restoration Account (DERA) and Base Realignment and Closure (BRAC) site
- Implement actions to reduce relative risk at sites in DERA and BRAC programs, or have remedial systems in place where necessary for these sites, within specified time frames and within the context of legal agreements

Measures of Merit

- Relative risk reduction
  - High
  - Medium
  - Low
  - Not evaluated
  - Not required
- Progress at sites
  - Analysis
  - Cleanup
  - Response complete/NFA
- Milestones accomplished
  - Work underway
  - Actions taken
  - Remedy in place
  - Response complete/NFA

Relative Risk Implementation at DoD Level

- Communication on a variety of levels
  - Presentations to EPA staff and management
  - Presentations to states at DSMOA conferences
  - Placement of Primer on world wide web at http://www.dtic.dla.mil/envirodod/envdocs.html
- Training
  - Service-specific training
  - DoD training
- Performance
  - Initial evaluations September 1994 - July 1995
  - Accelerated data collection to meet the constraints for building the FY 96 program

Relative Risk Implementation at DoD Level (Concluded)

- **Data management**
  - **Data managed by services**
  - **Automated relative risk site evaluation worksheet**
  - **DoD has assembled an integrated database for peer review purposes and incorporated relative risk information into its program management database**

Overview of the Draft Peer Review Report

- ***Requirement*—Established by Relative Risk Work Group on 1 February 1995**
- ***Scope*—Active and former defense properties**
- ***Primary Objective*—To document work group efforts to develop the Relative Risk Site Evaluation Framework (i.e., Primer) and provide an internal DoD review of each Component's relative risk data and implementation procedures**

Selected Findings and Recommendations

- Offer and provide relative risk training to environmental project managers and other stakeholders in the program using similar training materials
- Increase community input in relative risk evaluations through Restoration Advisory Boards and other means
- Establish a common relative risk data reporting structure to ensure consistency in service data submissions to DoD
- Improve the quality of data reported for the contaminant hazard factor by requiring quality assurance/quality control checks of relative risk data when it is computerized
- Add military-unique compounds to the list of contaminants that can be evaluated and identify concentration standards for these compounds

Contaminant Hazard Factor (CHF)

- **Comparison of maximum project contaminant concentrations in each medium to Relative Risk concentration comparison values**

$$\text{CHF} = \sum \frac{[\text{maximum concentration of A}]}{\text{Comparison Value for A}}$$

- **Three tiers**
  - **Significant = CHF > 100**
  - **Moderate = CHF of 2 - 100**
  - **Minimal = CHF < 2**

Standards for CHF Calculation

- **Human health**
  - **Carcinogens = concentration that presents a 1 in 10,000 risk of increased cancer incidence**
  - **Non-carcinogens = the reference dose (equivalent to Hazard Quotient of 1)**
- **Ecological**
  - **Ambient Water Quality Criteria (AWQC) or EPA Lowest Observed Effects Levels in the absence of AWQC**
  - **Sediment screening criteria from National Oceanic and Atmospheric Administration (NOAA) and Ontario Ministry of Environment and Energy**

Appendix B-1: Comparison Values (For Human Endpoints)

- Apply to water and soil media
- Used in conjunction with potential or actual human exposures
- Derived from EPA Region IX Preliminary Remediation Goals (PRGs) with exception of military materials and radionuclides
- Military Materials standards are taken from Army and Oak Ridge National Lab Studies
- Radionuclide standards (“benchmarks”) are taken from EPA’s Superfund Chemical Data Matrix (SCDM) maintained as part of the Hazard Ranking System