

### Highlight 3-5: Nine Criteria for Remedial Alternatives Evaluation

#### THRESHOLD CRITERIA

1 Overall Protection of Human Health and the Environment

- How the Alternative Provides Human Health and Environmental Protection

2 Compliance with ARARs (Or justification of a Waiver)

- Compliance with Chemical-Specific ARARs
- Compliance with Location-Specific ARARs
- Compliance with Action-Specific ARARs
- Compliance with Other Criteria, Advisories, and Guidance

#### PRIMARY BALANCING CRITERIA

3 Long-Term Effectiveness and Permanence

- Magnitude of Residual Risk
- Adequacy and Reliability of Controls

4 Reduction of Toxicity, Mobility, or Volume Through Treatment

- Treatment Process Used and Materials Treated
- Amount of Hazardous Materials Destroyed or Treated
- Degree of Expected Reductions in Toxicity, Mobility, or Volume
- Degree to Which Treatment is Irreversible
- Type and Quantity of Residuals Remaining After Treatment

5 Short-Term Effectiveness

- Protection of Community During Remedial Actions
- Protection of Workers During Remedial Actions
- Environmental Impacts
- Time Until Remedial Action Objectives are Achieved

6 Implementability

- Ability to Construct and Operate the Technology
- Reliability of the Technology
- Ease of Undertaking Additional Remedial Actions, if Necessary
- Ability to Monitor Effectiveness of Remedy
- Ability to Obtain Approvals from Other Agencies
- Coordination with Other Agencies
- Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity
- Availability of Necessary Equipment and Specialists
- Availability of Prospective Technologies

7 Cost

- Estimated Capital Costs
- Estimated Annual Operation and Maintenance Costs
- Estimated Present Worth Costs

#### MODIFYING CRITERIA<sup>1</sup>

8 State Acceptance

- Features of the Alternative the State Supports
- Features of the Alternative About Which the State has Reservations
- Elements of the Alternative the State Strongly Opposes

9 Community Acceptance

- Features of the Alternative the Community Supports
- Features of the Alternative About Which the Community has Reservations
- Elements of the Alternative the Community Strongly Opposes

<sup>1</sup>These criteria are fully assessed following comment on the RIFS Report and the Proposed Plan, and are fully addressed in the ROD.

### Highlight 3-6: Tips For Preparing Nine Criteria Analysis

#### Overall Protection of Human Health and the Environment

In every FS, a "no action" alternative is developed as a baseline for comparative analysis purposes. In cases where the no action alternative is found not to meet this criterion, it can be ruled out for further consideration and, therefore, need not be discussed further in the nine criteria analysis.

#### Compliance with ARARs

For an alternative to pass into the detailed analysis stage of the RI/FS and thus become eligible for selection, it must comply with its ARARs or a waiver should be identified and the justification provided for invoking it. An alternative that cannot comply with ARARs, or for which a waiver cannot be justified, should be eliminated from consideration for further discussion as a potential alternative in the Proposed Plan or ROD.

#### Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence of an alternative should be viewed along a continuum (*i.e.*, an alternative can offer a greater or lesser degree of long-term effectiveness and permanence). Alternatives that are more effective in the long-term are more permanent.

#### Reduction of Toxicity, Mobility, or Volume Through Treatment

Each characteristic (*i.e.*, toxicity reduction through treatment, mobility reduction through treatment, and volume reduction through treatment) should be analyzed independently and collectively to determine how effectively treatment is being employed by the remedial alternative. In addition, other elements should be considered such as the risks posed by residuals. A containment remedy does not reduce the toxicity, mobility, or volume of contaminants through treatment.

#### Short-Term Effectiveness

Short-term effectiveness considers the amount of time until the remedy effectively protects human health and the environment at the site. It also includes an evaluation of the adverse effects the remedy may pose to the community, workers, and the environment during implementation. Possible adverse effects should be evaluated in advance to determine mitigative steps to adequately minimize the impact on the community, workers, or environment and to minimize any risks that would remain at the site. Institutional controls and other active measures (*e.g.*, interim remedies and removal actions) can often mitigate short-term effects and, therefore, should be considered when analyzing the remedial alternative.

#### Implementability

This criterion considers the ease of implementing the remedy in terms of construction and operation, and the availability of services and materials required to implement the alternative. Technical considerations also include the reliability of the technology, the effect on future remedial action options, and monitoring at the site. It is important to consider and include variables such as the site's topography, location, and available space. Implementability is significant when evaluating treatment technologies that are dependent on resources such as facilities, equipment, professionals or experts, and especially technologies that have not been proven effective. In addition, administrative feasibility, which includes activities that need to be coordinated with other offices and agencies (*e.g.*, obtaining permits for off-site activities or rights-of-way for construction), should be addressed when analyzing this criterion.

#### Cost

The costs of remedies always should be qualified as estimates with an expected accuracy of +50% to -30%

#### State/Support Agency Acceptance

Where there are major support agency comments, they must be summarized under this criterion (see NCP §300.430(f)(2)). The lead agency's response to those comments also should be summarized here.

#### Community Acceptance

Because information available on the community acceptance criterion may be limited before the public comment period for the Proposed Plan and the RI/FS Report, the Proposed Plan should indicate that this factor will be fully evaluated in the ROD. However, the Proposed Plan should also provide a preliminary summary of communities' views, with special emphasis from those in the community directly impacted or affected. Proposed Plans should not speculate on community acceptance of the alternatives.