2.6 IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES (CONTINUED)

The discussion should focus on how each alternative achieves adequate protection and describe how the alternative will reduce, control. or eliminate risks at the site through the use of treatment, engineering, or institutional controls. This evaluation should identify any unacceptable short-term impacts.

Compliance with ARARs and Other Criteria, Advisories, and Guidance

Section 300.415(i) of the NCP requires that Fund-financed removal actions under CERCLA section 104 and removal actions pursuant to CERCLA section 106 attain ARARs under Federal or State environmental laws or facility siting laws, to the extent practicable considering the urgency of the situation and the scope of the removal. At certain sites, ARARs may form the basis of the removal action objectives.

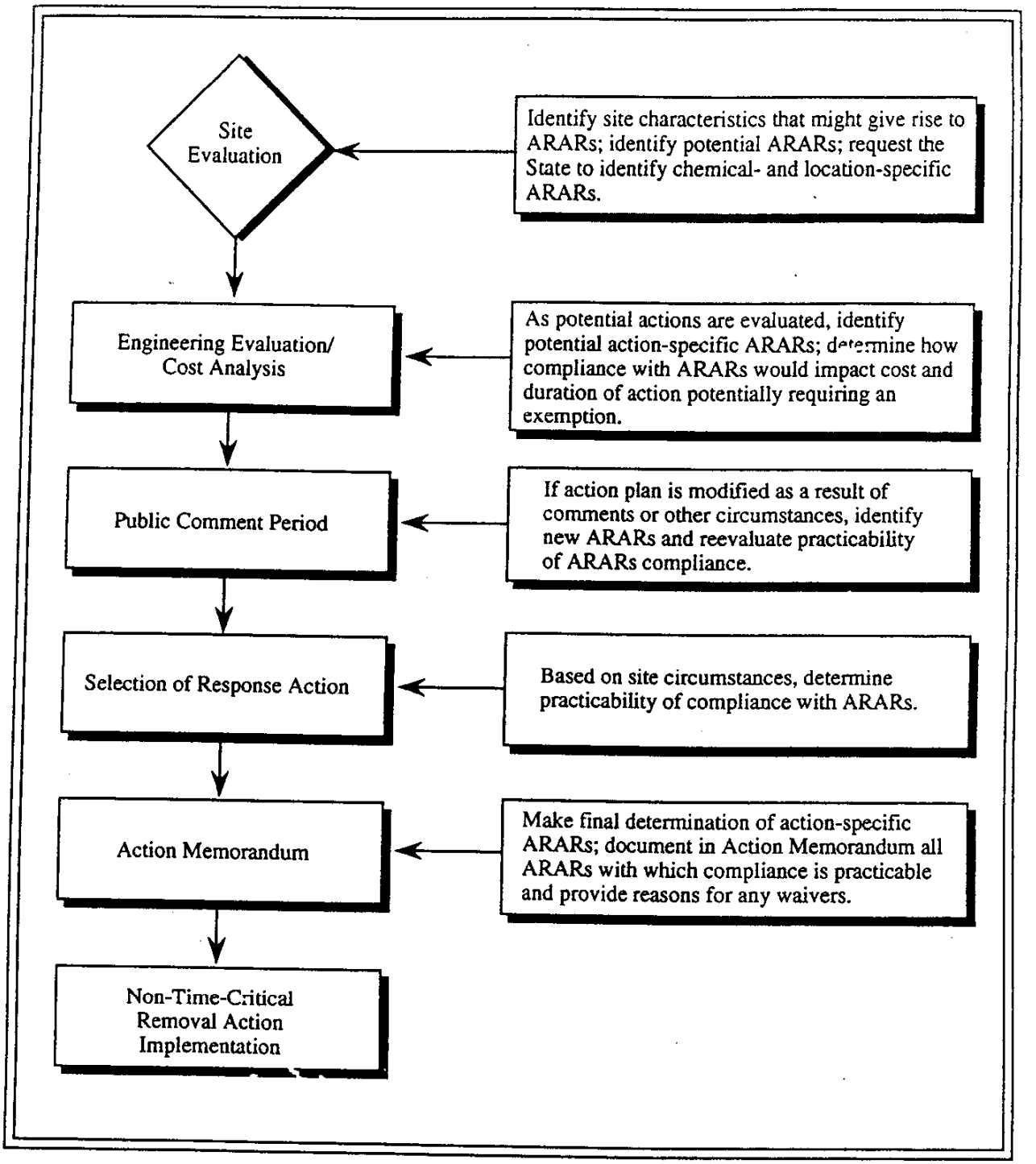
The detailed analysis should summarize which requirements are applicable or relevant and appropriate to an alternative and describe how the alternative meets those requirements. To ensure a full consideration of potential ARARs, OSCs/RPMs may choose to employ a summary table to list potential ARARs. OSCs/RPMs will then be able to quickly identify particular requirements in order to plan for compliance or eliminate requirements not of concern for a given site or alternative.

Since the evaluation of a site will produce data relatively quickly on the location of a release and on the chemical constituents of concern, chemical-specific ARARs and location-specific ARARs should be identified as promptly as possible upon request by the OSC/RPM. Therefore, only State standards that are promulgated, identified by the State in a timely manner, and more stringent than Federal requirements may be applicable or relevant and appropriate. Action-specific ARARs should be identified later in the process after qualified cleanup technologies are chosen for analysis in the EE/CA. The process for identifying and evaluating ARARs during non-time-critical removal actions is shown in Exhibit 8 on the following page.

In addition to ARARs, EPA may, as appropriate, identify other Federal or State advisories, criteria, or guidance to be considered (TBC) for a particular release. TBCs are not required by the NCP; rather, TBCs are meant to complement the use of ARARs. Because ARARs do not exist for every chemical or circumstance, TBCs may be very useful in determining what is protective of a site or how to carry out certain actions or requirements. A list of TBCs, such as the EPA Spill Cleanup Policy, Health Effects Assessments, EPA's Ground Water Protection Strategy, and advisories issued by the Fish and Wildlife Service and the National Marine Fisheries Service under the Fish and Wildlife Coordination Act, can be found in the NCP Proposed Rule Preamble, 53 FR 51449-51450 (December 21, 1988).

The EnviroText Retrieval System, a joint project of EPA, DOE, DOD, the Department of Justice, and the U.S. Army, will be a user-friendly, full-text library search system of multimedia environmental laws. On-line service as a pilot program is expected to start in Fall 1993, and should assist greatly in considering potential ARARs at any given site.

EXHIBIT 8
Identification and Evaluation of ARARs During Non-Time-Critical Removal Actions



Long-Term Effectiveness and Permanence

This evaluation assesses the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes at the site. The following components should be considered for each alternative:

- Magnitude of Risk. This criterion looks at the effectiveness of the alternative and assesses the risk from waste and residuals remaining at the conclusion of site activities. This component also evaluates whether the alternative contributes to future remedial objectives. If the non-time-critical removal action is an interim step and is expected to be followed by remedial action, this factor could be reduced in scope or deleted, if appropriate. If the non-time-critical action is the last action anticipated for a site or release, then the magnitude of risk should be fully evaluated for the action.

- Adequacy and Reliability of Controls. A completed removal action may require PRSC, those response activities necessary to sustain the integrity of a Fund-financed removal action following its conclusion (see Chapter 1). After the removal is completed, PRSC costs may be paid by the PRP, State or local government, or the remedial program.

Reduction of Toxicity, Mobility, or Volume Through Treatment

EPA's policy of preference for treatment (i.e., for technologies that will permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as their principal element) requires evaluation based upon the following subfactors for a particular alternative:

- The treatment process(es) employed and the material(s) it will treat
- The amount of the hazardous materials to be destroyed or treated
- The degree of reduction expected in toxicity, mobility, or volume
- The degree to which the treatment will be irreversible
- The type and quantity of residuals that will remain after treatment
- Whether the alternative will satisfy the preference for treatment.

The ability of the treatment technology to reduce the principal threats posed by the release, including the extent to which the toxicity, mobility, or volume of the contaminants are reduced (either alone or in combination) may be subject to time and applicability restraints, and may be beyond the scope of an interim removal action when remedial action is indicated.

Short-Term Effectiveness

The short-term effectiveness criterion addresses the effects of the alternative during implementation before the removal objectives have been met. Alternatives should also be evaluated with respect to their effects on human health and the environment following implementation. The following factors should be addressed as appropriate for each alternative:

- Protection of the Community. This factor addresses any risk to the affected community that results from implementation of the proposed action, whether from

air quality impacts, fugitive dusts, transportation of hazardous materials, or other sources.

- Protection of the Workers. This factor assesses any threats to site workers and the effectiveness and reliability of protective measures that would be taken.

- Environmental Impacts. This factor evaluates the potential adverse environmental impacts from the implementation of each alternative. The factor also assesses the reliability of mitigation measures in preventing or reducing the potential impacts.

- Time Until Response Objectives Are Achieved. This factor estimates the time needed to achieve protection for the site itself or for individual elements or threats associated with the site.

Implementability

The implementability criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation. The following factors should be considered under this criterion.

Technical Feasibility

The EE/CA must assess the ability of the technology to implement the remedy. Technical difficulties were initially identified during development of alternatives and should be addressed again in detail for the alternative as a whole. Each alternative should be evaluated for implementation factors such as assembling, staffing, and operating the alternative within the time frames in the removal schedule.

The reliability of the technology is also of concern, as technical problems associated with implementation may delay the schedule. Each alternative should be evaluated for technology maturity, prior use under similar conditions for similar wastes, and possible difficulty in operation once it is constructed. Operational difficulties could include the frequency or complexity of equipment maintenance or controls, the need for raw materials, or the need for a large technical staff. Potential impacts on the local community during construction operations should also be evaluated.

The EE/CA should consider environmental conditions not only with respect to the operation phase of the alternative, but also to the set-up and construction phase. Certain technologies may be difficult to construct or operate in remote locations. Climate or terrain may severely impact or eliminate specific alternatives from consideration. For example, an alternative that uses an oil/water separator or sedimentation tank may be unusable at freezing temperatures. Temperature and time of year may directly impact a technology's ability to reach a specific site. For example, a rainy season may make roads to the site inaccessible. Not only will local terrain affect the ability to locate an alternative, but it may also affect performance. For example, a site located in a valley may be susceptible to inversions or limited air currents, therefore making incineration unacceptable.

Potential future remedial actions should also be discussed. Remedial action or a non-time-critical removal action that completely cleans up an NPL site may trigger the five-year review

requirements of CERCLA section 121(c). This evaluation should also consider the operation of PRSC measures or operation and maintenance (O & M). This discussion should depict how difficult it would be for EPA to implement these future remedial actions. This is particularly applicable to an interim action where additional action is expected.

If the site will be receiving long-term remedial treatment, the EE/CA must determine if each alternative contributes to the efficient performance of any anticipated remedial activities. CERCLA section 104(a)(2) states that a removal action should, to the extent practicable, contribute to the efficient performance of any long-term remedial action with respect to the release or threatened release concerned. Removal actions that do contribute may be eligible for an exemption from the $2 million/12-month statutory limit on removal actions. OSWER Publication 9360.0-12A, "Final Guidance on Implementation of the 'Consistency' Exemption to the Statutory Limits on Removal Actions" (June 12, 1989), PB90-274465/CCE, states that removal actions should be designed to avoid wasteful, repetitive, short-term actions that do not contribute to the efficient, cost-effective performance of a long-term remedial action.

In some cases, it may not be easy to demonstrate removal action consistency with future remedial action. Remedial actions often cannot be anticipated when an EE/CA is being developed for a non-time-critical removal action. It may be difficult to show with reasonable certainty that a removal option would be consistent with a future remedial action. Section 104(a)(2) of CERCLA provides for discretion in using the practicability standard. Accordingly, OSCs/RPMs should avail themselves of this discretion when developing and evaluating removal action alternatives that would provide for partial cleanups of sites.

The ability to monitor the effectiveness of the alternative may also be considered in the EE/CA. These monitoring considerations would generally not be evaluated for Fund-lead non-time-critical removal actions where remedial work was planned.

Administrative Feasibility

The administrative feasibility factor evaluates those activities needed to coordinate with other offices and agencies. The administrative feasibility of each alternative should be evaluated, including the need for off-site permits, adherence to applicable nonenvironmental laws, and concerns of other regulatory agencies. Factors that should be considered include, but are not limited to, the following:

- Statutory Limits. Each alternative should be evaluated for its compliance with the statutory limits on removal actions. If an alternative requires a statutory exemption from the $2 million or 12-month limit, the EE/CA should evaluate whether the site qualifies. If the time or money needed to implement the alternative will exceed the statutory limit for removal actions, an exemption request, which is part of the Action Memorandum, should be submitted to Headquarters for review as soon as possible. Headquarters approval is only required for non-NPL consistency waivers and for emergency waivers (money, not time).

- Permits and Waivers. The EE/CA should evaluate whether each alternative will require off-site permits (e.g., building permits). Other factors that may affect the administrative feasibility include the need for easements, right-of-way agreements, or zoning variances.

2.6 IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES (CONTINUED)

Availability of Services and Materials

The EE/CA must determine if off-site treatment, storage, and disposal capacity, equipment, personnel, services and materials, and other resources necessary to implement an alternative will be available in time to maintain the removal schedule. Availability of funds to meet PRSC requirements is also a factor. Several important availability factors are:

- Personnel and Technology. Using the removal action schedule as a guide, the EE/CA should determine whether a specific alternative will be available from the manufacturer. Other technologies may require a large number of skilled laborers or specialists (e.g., welders, pipe fitters, chemical engineers) that may not be readily available if the site is remote, thus impacting the ability to assemble the removal action alternative.

- Off-Site Treatment, Storage, and Disposal. If off-site removal and treatment of the waste is being considered, the EE/CA should address the adequacy of off-site capacity. If the site is in a remote location, this type of service may not be available or may be extremely costly because of transportation expenses. OSCs/RPMs should review OSWER Publication 9834.11, "Revised Procedures for Implementing Off-Site Response Actions" (November 13, 1987), PB91-139282/CCE, before evaluating this option. The OSC/RPM and Regional off-site contact should discuss whether there are treatment facilities in compliance with the off-site policy that can accept the type of CERCLA waste at the site. [A final rule addressing this issue is expected in 1993.]

- Services and Materials. This factor involves considering such services as laboratory testing capacity and turnaround for chemical analyses, adequate supplies and equipment for on-site activities, or installation of extra utilities (e.g., power lines, sewer connections).

- Prospective Technologies. This factor assesses whether specific technologies are generally available for the site. Promising technologies sometimes require further development before they can be applied at full-scale. The EE/CA should indicate when a technology would be available for full-scale use. Also, if time allows, the OSC/RPM may be able to develop specifications to allow competitive bidding for a treatment contract. This would be of particular use in developing innovative technologies.

State (Support Agency) Acceptance

The State (or support agency in the case of State-lead sites) may have technical and administrative concerns. Since States may review the alternatives, their concerns should be considered in determining the recommended alternative in the EE/CA and in the final selection of the alternative in the Action Memorandum.

Community Acceptance

As with State acceptance, community acceptance of an alternative will be considered when making a recommendation in the EE/CA and in the final selection of the alternative in the Action Memorandum.

Cost

Each removal action alternative should be evaluated to determine its projected costs. The evaluation should compare each alternative's capital and PRSC costs. The present worth of alternatives that will last longer than 12 months should be calculated. In certain cases, OSCs/RPMs may conduct a sensitivity analysis of the present worth calculations.

To compare the cost of each alternative, the direct and indirect capital costs and the PRSC costs of each alternative should be projected. OSWER Publication 9360.0-02C, "Removal Cost Management System: Version 3.2" (May 1990), EPA/540/P-90/003, PB90-272601, provides guidance on performing cost projections and daily cost tracking. The following items are considered capital costs and PRSC costs:

- Direct capital costs
  - Construction costs
  - Equipment and material costs
  - Land and site acquisition costs
  - Buildings and services costs
  - Relocation expenses
  - Transport and disposal costs
  - Analytical costs
  - Contingency allowances
  - Treatment and operating costs
- Indirect capital costs
  - Engineering and design expenses
  - Legal fees and license or permit costs
  - Start-up and shakedown costs
- Annual PRSC costs
  - Operational costs
  - Maintenance costs
  - Auxiliary materials and energy
  - Disposal of residuals
  - Monitoring costs
  - Support costs.

Many sources of cost information exist, including the ERCS contract price list, vendor estimates, and estimates for similar projects. For items not currently on the ERCS list and for projects where outside bids are being considered, cost estimates more than 12 months old should be updated using an appropriate economic index, such as the Engineering News Record Construction Cost Index for construction costs, the Marshall and Stevens Index for treatment facility costs, the American City and County Municipal Cost Index for manpower costs, and the

Producer Price Index for Finished Goods, published by the U.S. Department of Labor in the Monthly Labor Review. All these information sources can be found in Regional and/or public libraries.

After identifying and estimating the costs, OSCs/RPMs should calculate the present worth for removal action alternatives that will last longer than 12 months. Present worth analysis evaluates expenditures that occur over different time periods by discounting all future costs, usually PRSC costs, to a common base year, usually the present year. Present worth analysis produces a single figure representing the amount of money that, if invested in the base year and dispersed as needed, would cover all costs associated with the alternative. This analysis is particularly important when comparing technologies with different operating lifetimes. The final present worth figure and the assumptions used in calculating that figure should be included in the EE/CA. The detailed computations should be attached as an appendix to the EE/CA.

For alternatives that include only PRSC after 1 year from the start of the removal action, the total cost of the option over the full life of the project should be calculated. In comparing alternatives, however, OSCs/RPMs should use the cost of the option to EPA for 1 year, provided that all PRSC costs will be assumed by another party after 1 year. OSWER Publication 9355.3-20 "Revisions to OMB Circular A-94 on Guidelines and Discount Rates for Benefit Cost Analysis" (June 25, 1993) provides information on discount rates for present worth calculations.

In addition, OSCs/RPMs should determine whether a sensitivity analysis is warranted. A sensitivity analysis assesses the effect that variations in specific assumptions associated with design, implementation, operation, discount rate, and effective life of an alternative can have on the present worth. The sensitivity of such costs to uncertainties can be observed by varying the cost assumptions and noting their effect on the present worth. A sensitivity analysis might be appropriate when uncertainties exist about the amount of waste present, how quickly a technology can perform, or the future price of cleanup services.

For More Information:

1. CERCLA:
   §104(a), Removal Action
   §121, Cleanup Standards
   §311(b), Alternative or Innovative Treatment Technology Research and Demonstration Programs
2. NCP §300.415(i), ARARs Attainment
3. Office of Policy Analysis (OPA) Publication, "Guidelines for Performing Regulatory Impact Analysis" (December 1983).
4. ORD Publication EPA/600/M-91/049, "Alternative Treatment Technology Information Center–ATTIC Brochure" (August 1991).
5. OSWER Publication 9234.1-01, "CERCLA Compliance with Other Laws Manual, Part 1 (Interim Final)" (August 1988), EPA/540/G-89/006, PB90-272535.
6. OSWER Publication 9234.1-02, "CERCLA Compliance with Other Laws Manual, Part 2: Clean Air Act and Other Environmental Statutes and State Requirements" (August 1989), EPA/540/G-89/009, PB90-148461.

7. OSWER Publications 9355.0-46FS and 9355.0-46, "Technology Selection Guide for Wood Treater Sites" (May 1993), PB93-963505, also previously cited as OSWER Publication 9360.0-46FS and 9360.0-46.
8. OSWER Publication 9355.3-01, "Guidance For Conducting Remedial Investigations and Feasibility Studies (RI/FS) Under CERCLA" (October 1988), EPA/540/G-89/004, PB89-184626.
9. OSWER Publication 9355.3-20, "Revisions to OMB Circular A-94 on Guidelines and Discount Rates for Benefit Cost Analysis" (June 25, 1993), PB93-963297.
10. OSWER Publication 9360.3-02, "Superfund Removal Procedures—Guidance on the Consideration of ARARs During Removal Actions" (August 1991), PB92-963401/CCE.
11. OSWER Publication 9360.0-02C, "Removal Cost Management System: Version 3.2" (May 1990), EPA/540/P-90/003, PB90-272691.
12. OSWER Publication 9360.0-12A, "Final Guidance on Implementation of the 'Consistency' Exemption to the Statutory Limits on Removal Actions" (June 12, 1989), PB90-274465/CCE.
13. OSWER Publication 9380.0-17, "Furthering the Use of Innovative Treatment Technologies in OSWER Programs" (August 1991), EPA/540/2-90/004, PB91-921366.
14. OSWER Publication 9380.3-03, "Inventory of Treatability Study Vendors" (March 1990), EPA/540/2-90/003a, PB91-228395.
15. OSWER Publication 9834.11, "Revised Procedures for Implementing Off-site Response Actions" (November 13, 1987), PB91-139287/CCE.*
16. OSWER Publication 9834.11a, "Off-Site Policy RFA or Equivalent Investigation Requirement at RCRA Treatment and Storage Facilities" (January 4, 1988), PB91-139295/CCE.*

* *A final rule addressing this issue is expected in 1993.*

2.7 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

Once the alternatives have been described and individually assessed against the criteria, a comparative analysis should be conducted to evaluate the relative performance of each alternative in relation to each of the criteria. This is in contrast to the preceding analysis in which each alternative was analyzed independently without consideration of other alternatives. The purpose of the comparative analysis is to identify the advantages and disadvantages of each alternative relative to one another so that key tradeoffs that would affect the remedy selection can be identified.

2.8 RECOMMENDED REMOVAL ACTION ALTERNATIVE

The EE/CA should identify the action that best satisfies the evaluation criteria based on the comparative analysis in the previous section. This description should briefly describe the evaluation process used to develop the recommended action. For both Fund-lead and PRP-lead EE/CAs, EPA should determine the recommended action. This determination may be placed in the administrative record file concurrently with the EE/CA. This section of the EE/CA may enhance public involvement efforts by describing clearly why the alternative was recommended. Because the EE/CA is open to public comment and evaluation and because EPA is required to prepare

a written response to significant comments, the recommended alternative may not always be the final alternative selected in the Action Memorandum. The Action Memorandum and the administrative record should provide enough detail to justify the final alternative selected.

Appendix A

References

OPA Publication, "Guidelines for Performing Regulatory Impact Analysis" (December 1983).

ORD Publication EPA/600/M-91/049, "Alternative Treatment Technology Information Center–ATTIC Brochure" (August 1991).

OSWER Publication 9200.2-02, "Accelerated Response at NPL Sites Guidance" (December 15, 1988), PB90-258302/CCE.

OSWER Publication 9200.2-16FS, "Quality Assurance for Superfund Environmental Data Collection Activities" (February 1993), PB93-963273.

OSWER Publication 9200.3-01H-1, "Superfund Program Implementation Manual Fiscal Year 1993" (June 1993), PB92-963276.

OSWER Publication 9200.5-402A, "Contracting and Subcontracting Guide to the Superfund Program" (May 1992), EPA/540/G-91/012, PR-923.

OSWER Publication 9203.1-02I, "Superfund Accelerated Cleanup Bulletin: Presumptive Remedies for Municipal Landfill Sites, Volume 1, Number 1" (April 1992), PB92-963367.

OSWER Publication 9203.1-03, "Guidance on Implementation of the Superfund Accelerated Cleanup Model (SACM) under CERCLA and the NCP" (July 7, 1992), PB93-963252.

OSWER Publication 9203.1-03A, "Exercising Flexibility Through the Superfund Accelerated Cleanup Model (SACM)" (October 26, 1992), PB93-963253.

OSWER Publication 9203.1-05I, Volume 1, Numbers 1-5 (December 1992)

- Volume 1, Number 1, "Status of Key SACM Program Management Issues—Interim Guidance" PB93-963262.
- Volume 1, Number 2, "Early Action and Long-Term Action Under SACM—Interim Guidance" PB93-963263.
- Volume 1, Number 3, "Enforcement Under SACM—Interim Guidance" PB93-963264.
- Volume 1, Number 4, "Assessing Sites Under SACM—Interim Guidance" PB93-963265.
- Volume 1, Number 5, "SACM Regional Decision Teams—Interim Guidance" PB93-963266.

OSWER Publication 9230.0-03C "Community Relations in Superfund: A Handbook" (January 1992), EPA/540/R-92/009, PB92-963341.

OSWER Publication 9234.1-01, "CERCLA Compliance with Other Laws Manual, Part 1 (Interim Final)" (August 1988), EPA/540/G-89/006, PB90-272535.

OSWER Publication 9234.1-02, "CERCLA Compliance with Other Laws Manual, Part 2: Clean Air Act and Other Environmental Statutes and State Requirements" (August 1989), EPA/540/G-89/009, PB90-148461.

References (Continued)

OSWER Publication 9240.0-01D, "User's Guide to the Contract Laboratory Program" (January 1991), EPA/540/P-91/002, PB91-921278.

OSWER Publication 9242.2-01B, "Emergency Response Cleanup Services (ERCS) Contracts: User's Manual" (October 1987), PB90-191966/CCE.

OSWER Publication 9242.2-02, "Site-Specific Contracting for Removals" (April 10, 1989), PB91-215053/CCE.

OSWER Publication 9242.6-01, "ARCS Work Assignment Management, Field Guide" (January 1989), PB91-214965/CCE.

OSWER Publication 9242.6-07, "Approval of Long-Term Contracting Strategy for Superfund (Superfund Management Review: Recommendations E.2)" (August 1990), PB90-273822/CCE.

OSWER Publication 9285.1-03, "Standard Operating Safety Guides" (June 1992), PB92-963414.

OSWER Publication 9285.7-01B, "Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, Part A, Interim Final" (December 1989), EPA/540/1-89/002, PB90-155581.

OSWER Publication 9285.8-02 "Health and Safety Audit Guidelines: SARA Title I, Section 126" (December 1989), EPA/540/G-89/010, PB90-204157.

OSWER Publications 9355.0-46FS and 9355.0-46, "Technology Selection Guide for Wood Treater Sites" (May 1993), PB93-963505, also previously cited as OSWER Publications 9360.0-46FS and 9360.0-46.

OSWER Publication 9355.3-01, "Guidance For Conducting Remedial Investigations and Feasibility Studies (RI/FS) Under CERCLA" (October 1988), EPA/540/G-89/004, PB89-184626.

OSWER Publication 9355.3-20, "Revisions to OMB Circular A-94 on Guidelines and Discount Rates for Benefit Cost Analysis" (June 25, 1993), PB93-963297.

OSWER Publication 9360.0-02C, "Removal Cost Management System: Version 3.2" (May 1990), EPA/540/P-90/003, PB90-272691.

OSWER Publication 9360.0-12A, "Final Guidance on Implementation of the 'Consistency' Exemption to the Statutory Limits on Removal Actions" (June 12, 1989), PB90-274465/CCE.

OSWER Publication 9360.0-12FS, "Exemptions from the Statutory Limits on Removal Actions" (November 1990), PB91-921304/CCE.

OSWER Publication 9360.0-13, "Guidance on Implementation of the 'Contribute to Remedial Performance' Provision" (April 6, 1987).

OSWER Publication 9360.0-15, "The Role of Expedited Response Actions Under SARA" (April 21, 1987), PB91-214221/CCE.

OSWER Publication 9360.0-18, "Removal Program Priorities" (March 31, 1988), PB91-205484/CCE.

OSWER Publication 9360.2-02, "Policy on Management of Post-Removal Site Control" (December 3, 1990), PB91-921326/CCE.

OSWER Publication 9360.2-04, "Authorization for Regional Administrators to Approve Consistency Exemption at NPL Sites" (February 24, 1992), PB92-963343.

OSWER Publication 9360.3-01, "Superfund Removal Procedures—Action Memorandum Guidance" (December 1990), EPA/540/P-90/004, PB90-274473.

OSWER Publication 9360.3-02, "Superfund Removal Procedures—Guidance on the Consideration of ARARs During Removal Actions" (August 1991), PB92-963401/CCE.

OSWER Publication 9360.3-05, "Superfund Removal Procedures—Public Participation Guidance for On-Scene Coordinators: Community Relations and the Administrative Record" (June 1992), PB92-963416.

OSWER Publication 9360.3-06, "Superfund Removal Procedures—Removal Enforcement Guidance for On-Scene Coordinators" (April 1992), PB92-963409.

OSWER Publication 9360.4-01, "Quality Assurance/Quality Control Guidance for Removal Activities—Sampling QA/QC Plan and Data Validation Procedures (Interim Final)" (April 1990), EPA/540/G-90/004, PB90-274481.

OSWER Publication 9360.4-02, "Compendium of ERT Soil Sampling and Surface Geophysics Procedures" (January 1991), EPA/540/P-91/006, PB91-921273.

OSWER Publication 9360.4-03, "Compendium of ERT Surface Water and Sediment Sampling Procedures" (January 1991), EPA/540/P-91/005, PB91-921274.

OSWER Publication 9360.4-05, "Compendium of ERT Air Sampling Procedures" (May 1992), PB92-963406.

OSWER Publication 9360.4-06, "Compendium of ERT Ground Water Sampling Procedures" (January 1991), EPA/540/P-91/007, PB91-921273.

OSWER Publication 9360.4-07, "Compendium of ERT Waste Sampling Procedures" (January 1991), EPA/540/P-91/008, PB91-921276.

OSWER Publication 9360.4-08, "Compendium of ERT Toxicity Testing Procedures" (January 1991), EPA/540/P-91/009, PB91-921271.

OSWER Publication 9360.4-10, "Removal Program—Representative Soil Sampling Guidance" (November 1991), PB92-963408.

References (Continued)

OSWER Publication 9360.6-08, "Technical Assistance Team (TAT) Contracts Users' Manual" (October 1991), PB92-963407.

OSWER Publication 9380.0-17, "Furthering the Use of Innovative Treatment Technologies in OSWER Programs" (August 1991), EPA/540/2-90/004, PB91-921366

OSWER Publication 9380.3-03, "Inventory of Treatability Study Vendors" (March 1990), EPA/540/2-90/003a, PB91-228395.

OSWER Publication 9832.0-1A, "Procedures for Documenting Costs for CERCLA Section 107 Actions" (January 30, 1985), PB91-138958/CCE.

OSWER Publication 9832.1, "Cost Recovery Actions Under CERCLA" (August 26, 1983), PB91-138966/CCE.

OSWER Publication 9832.11, "Guidance on Documenting Decisions Not to Task Cost Recovery Actions" (June 7, 1988) PB91-139048/CCE.

OSWER Publication 9832.13, "Superfund Cost Recovery Strategy" (July 29, 1988), PB91-139063/CCE.

OSWER Publication 9833.0-1A, "Guidance on CERCLA Section 106(a) Unilateral Administrative Orders for Remedial Designs and Remedial Actions" (March 13, 1990), PB91-139089/CCE.

OSWER Publication 9833.3A-1, "Final Guidance on Administrative Records for Selection of CERCLA Response Actions" (December 3, 1990), PB91-139121/CCE.

OSWER Publication 9834.10, "Interim Guidance on Notice Letters, Negotiations, and Information Exchange" (October 19, 1987), PB91-139253/CCE.

OSWER Publication 9834.10-1b, "Model Notice Letters" (February 7, 1989), PB91-139279/CCE.

OSWER Publication 9834.11, "Revised Procedures for Implementing Off-Site Response Actions" (November 13, 1987), PB91-139287/CCE. (A final rule addressing this issue is expected in 1993.)

OSWER Publication 9834.11a, "Off-Site Policy RFA or Equivalent Investigation Requirement at RCRA Treatment and Storage Facilities" (January 4, 1988), PB91-139295/CCE. (A final rule addressing this issue is expected in 1993.)

OSWER Publication 9836.0-1A, "Community Relations During Enforcement Activities and Development of the Administrative Record" (November 3, 1988), PB91-139519/CCE.

OSWER Publication 9837.2B, "Enforcement Project Management Handbook: FY1993 Update" (May 1993), PB93-963602.

Statutes and Regulations

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, 42 U.S.C. §§9601-9675 (1992)

Cooperative Agreements and Superfund State Contracts for Superfund Response Actions, 55 FR 23007 (June 5, 1990) (codified at 40 CFR Part 35, Subpart O)

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Appendix B

Key Words Index

Action Memorandum....4-5, 8, 14-15, 20, 31, 38, 42-43, 46

Administrative Order on Consent (AOC).... 11

Administrative record....6, 13-15, 20, 24, 26, 46

Approval Memorandum....5-6, 15-17, 19, 21-23

Applicable or relevant and appropriate requirements (ARARs)....29, 31-32, 34-38

Confidential information.... 26-27

Contracts management....9-10

Cooperative Agreement....8

Cost recovery.... 11

Environmental Response Team (ERT)....28, 32

Memorandum of Understanding (MOU)....8

Notice letter.... 10

OSC reports.... 17-18

Public involvement.... 5-6, 12-15, 43

Post-removal site control (PRSC)....5, 8, 39, 42-44

Potentially responsible parties (PRPs)....8, 10-11, 22, 26-27, 39

Preliminary assessment (PA)....4, 22

Present worth analysis.... 43-44

Previous removal actions.... 26-27

Regional Decision Teams (RDT).... 3, 7-8, 11

Remedial Investigation/Feasibility Study (RI/FS)....2, 19-20

Removal action objectives.... 4, 20, 31

Removal schedule.... 32-33

Key Words Index (Continued)

Removal scope 32

Removal site evaluation (RSE) 4

Site characterization 24-30

Site closeout 5, 11

Site description 25-26

Site inspection (SI) 4, 24

Statutory limits 6, 8, 11, 19-20, 31, 33, 41

Streamlined risk evaluation 29-30

Superfund Accelerated Cleanup Model (SACM) 2-3, 7-8, 10-11, 28

Unilateral Administrative Order (UAO) 11

Appendix C

Comparison of EE/CA to RI/FS

EE/CA Process	RI/FS Process*
1. **EE/CA Approval Memorandum** • Secure management approval and funding for EE/CA • Include finding of actual or threatened release and, if present, an imminent and substantial endangerment and general site information and costs • Document that situation meets NCP criteria and action is non-time-critical	1a. **Pre-RI/FS Scoping** • Collect existing data • Visit site/identify areas of concern • Generate statement of work 1b. **RI/FS Scoping** • Collect/analyze existing data • Determine need for/implement additional studies • Develop preliminary remedial action alternatives/objectives • Evaluate need for treatability studies • Begin preliminary identification of ARARs • Identify data needs/data quality objectives • Design data collection program • Develop work plan • Identify health and safety protocols
EE/CA	**REMEDIAL INVESTIGATION**
2. **EE/CA Executive Summary** • Identifies threat • Describes removal action objectives • Summarizes recommended action	
3. **Site Characterization** • Collect site description and background • Identify previous removal actions • Determine source, nature, and extent of contamination • Collect analytical data • Perform streamlined risk evaluation • Identify contaminant- and location-specific ARARs	2. **Site Characterization** • Investigate site physical characteristics • Define sources of contamination • Determine nature and extent of contamination • Conduct laboratory analyses • Conduct data analyses • Conduct baseline risk assessment • Identify contaminant- and location-specific ARARs • Define remedial action goals • Draft RI Report
4. **Identification of Removal Action Objectives** • Evaluate statutory limits • Determine scope of removal action • Determine schedule of removal action	

* OSWER Publication 9355.3-01, "Guidance for Conducting Remedial Investigations and Feasibility Studies (RI/FS) Under CERCLA" (October 1988), EPA/540/G-89/004, PB89-184626

EE/CA Process	RI/FS Process*
	FEASIBILITY STUDY
5. **Identification and Analysis of Removal Action Alternatives** • Identify treatment technologies (presumptive remedy and treatability studies, as appropriate) • Evaluate effectiveness – Overall protection of human health and the environment – Compliance with ARARs – Long-term effectiveness and permanence – Reduction of toxicity, mobility, or volume through treatment – Short-term effectiveness • Evaluate implementability – Technical feasibility – Administrative feasibility – Availability of services and materials – State acceptance – Community acceptance • Evaluate cost	3a. **Development of Alternatives** • Remedial action objectives • General response actions • Volumes or areas of media • Screen technology and process options • Process options identification • Technology alternatives • Action-specific ARARs 3b. **Screening of Alternatives** • Effectiveness • Implementability • Cost • Innovative technologies 3c. **Performance of Treatability Studies** • Data requirements • Bench- or pilot-scale study • Treatability test work plan • Documentation of results
	4. **Detailed Analysis of Alternatives** • Overall protection of human health and environment • Compliance w/ARARs • Long-term effectiveness and performance • Reduction of toxicity, mobility, or volume through treatment • Short-term effectiveness • Implementability • Cost • State acceptance • Community acceptance (analyze alternatives against these nine criteria)
6. **Comparative Analysis of Removal Action Alternatives** (See criteria above) Compare alternatives	5. **Comparative Analysis** (See criteria above) Compare alternatives
7. **Recommended Removal Action Alternative (summarized in Action Memorandum)** [Public comment period on EE/CA of at least 30 days]	6. **Preferred Remedial Alternative (summarized in Proposed Plan)** [Public comment period of at least 30 days]

* OSWER Publication 9355.3-01, "Guidance for Conducting Remedial Investigations and Feasibility Studies (RI/FS) Under CERCLA" (October 1988), EPA/540/G-89/004, PB89-184626

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 6 1993

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Transmittal of Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA (Publication 9360.0-32)

FROM: Henry L. Longest II, Director
Office of Emergency and Remedial Response

TO: Director, Waste Management Division
Regions I, IV, V, VII, VIII
Director, Emergency and Remedial Response Division
Region II
Director, Hazardous Waste Management Division
Regions III, VI, IX
Director, Hazardous Waste Division
Region X
Director, Environmental Services Division
Regions I, VI, VII
Superfund Branch Chiefs, Regions I-X
Regional Counsels, Regions I-X

PURPOSE

The purpose of this memorandum is to transmit new guidance on the appropriate use of non-time-critical removal authority under Superfund and the development of Engineering Evaluation/ Cost Analysis (EE/CA) reports and EE/CA Approval Memorandums. This guidance supersedes the March 30, 1988, outline from Timothy Fields, Jr. to the Superfund Branch Chiefs on the EE/CA process.

BACKGROUND

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) allows non-time-critical removal actions to be taken when there is a planning period of at least six months before on-site activities need to be initiated, and the lead agency determines that a removal action is appropriate (see 55 FR 8666, March 8, 1990). The most recent guidance on this subject was issued on March 30, 1988, when a draft outline of a EE/CA document was distributed for Regional review.

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Despite clear authority to perform non-time-critical removal actions, few have been conducted. In order to encourage increased use of this type of response, we have developed this guidance to provide the Regional offices, as well as States and potentially responsible parties (PRPs), with the necessary information to conduct effective non-time-critical removal actions.

IMPLEMENTATION

Based on comments we have received while preparing this guidance, we expect that Regional offices will vary in implementing this guidance. A range of program staff may be called upon to conduct non-time-critical removal actions in the various Regions. We expect that the readers of this document will differ in their experience and training. Therefore, the guidance contains features that will be beneficial to readers coming from all perspectives, from EPA On-Scene Coordinators and Remedial Project Managers to State agency staff to members of the public. For example, the document contains thirteen bibliographic sections that identify sources of more detailed information, and numerous exhibits and diagrams. Readers who are unfamilar with the material presented in the guidance can therefore easily come up to speed with some additional reading, while readers already familiar with the process can simply focus on the significant material presented in the text.

So that the Regions may make maximum use of the information presented here, the guidance has been written to allow as much flexibility as possible, giving Regional managers the latitude to use information from various sources, make site-specific decisions, and take initiative on resolving problems. We have established a process called streamlined risk evaluation as an intermediate form of risk assessment unique to non-time-critical removal actions. There is also a side-by-side comparison of the EE/CA and remedial investigation/feasibility study (RI/FS) processes, to point out similarities and distinctions.

The information in this publication will assist Regional offices in accelerating selected responses in accordance with the Superfund Accelerated Cleanup Model (SACM). Bound copies of the guidance will be shipped directly to the Regional offices in eight to twelve weeks for distribution to Regional staff.

If you have any questions on this guidance, please contact Deborah Y. Dietrich at 703-603-8760.

Attachment

cc: Timothy Fields, Jr.
Sally Seymour
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Stephen Luftig
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