7.0 DOCUMENTING POST-ROD CHANGES: MINOR CHANGES, EXPLANATIONS OF SIGNIFICANT DIFFERENCES, AND ROD AMENDMENTS[1]

7.1 EVALUATING POST-RECORD OF DECISION INFORMATION

After a ROD is signed, new information may be received or generated that could affect the implementation of the remedy selected in the ROD, or could prompt the reassessment of that remedy.[1] The information could be identified at any time during, immediately prior to, or after the implementation of the remedy. Where information is submitted by a PRP, the public, or the support agency after a ROD is signed, the lead agency must consider and respond to this information and place such comments and responses in the Administrative Record file when *all* of the following criteria are met (per NCP §300.825(c)):

- Comments contain significant information;
- The new information is not contained elsewhere in the Administrative Record file;
- The new information could not have been submitted during the public comment period; and
- The new information substantially supports the need to significantly alter the response action.

The lead agency also may evaluate whether a remedy change is warranted on its own merits, even where the requirements of NCP §300.825(c) are not triggered.[2]

7.2 TYPES OF POST-RECORD OF DECISION CHANGES

The lead agency's categorization of a post-ROD change to the Selected Remedy is a site-specific determination and must consider the following as set out in NCP §300.435(c)(2).

- *Scope.* Does the change alter the scope of the remedy (*e.g.*, type of treatment or containment technology, the physical area of the response, remediation goals to be achieved, type and volume of wastes to be addressed)?
- *Performance.* Would the change alter the performance (*e.g.*, treatment levels to be attained, long-term reliability of the remedy)?
- *Cost.* Are there significant changes in costs from estimates in the ROD, taking into account the recognized uncertainties associated with the hazardous waste engineering process selected? (Feasibility Study cost estimates are expected to provide an accuracy of +50 percent to -30 percent.)

Based on this evaluation, and depending on the extent or scope of modification being considered, the lead agency must make a determination as to the type of change involved (*i.e.*, nonsignificant or minor, significant, or fundamental change). Remedy changes should fall along a continuum from minor to fundamental. Similarly, an aggregate of nonsignificant or significant changes could result in a fundamental change.

Post-ROD changes fit into one of the three following categories:

- *Nonsignificant or Minor Changes* usually arise during design and construction, when modifications are made to the functional specifications of the remedy to address issues such as performance optimization, new technical informa-

[1] It is EPA's policy to encourage appropriate remedy changes in response to advances in remediation science and technology (*Superfund Reforms: Updating Remedy Decisions,* (EPA 540-F-96-026, September 1996).

[2] Responding to post-ROD comments submitted by PRPs, the public, or the support agency may only require a general overview of the comments and a simple EPA response if no change to the remedy is involved or the change is minor (see *Answers to Comments Submitted After the Superfund ROD Is Signed*, EPA memorandum, October 11, 1995, http://es.epa.gov/oeca/osre/951011. html). However, a formal public comment period may be conducted depending upon whether the change is significant or fundamental (for definitions of these types of changes see Section 7.2).

tion, support agency/community concerns and/or cost minimization (*e.g.*, value engineering process). Such changes may affect things such as the type or cost of materials, equipment, facilities, services, and supplies used to implement the remedy. The change will not have a significant impact on the scope, performance or cost of the remedy.

- *Significant Changes* generally involve a change to a component of a remedy that does not fundamentally alter the overall cleanup approach.

- *Fundamental Changes* involve an appreciable change or changes in the scope, performance, and/or cost or may be a number of significant changes that together have the effect of a fundamentalchange. An example of a fundamental change is one that results in a reconsideration of the overall waste management approach selected in the original ROD.

Highlight 7-1 provides examples of post-ROD changes. (See also NCP preamble, 55 *FR* 8772 for more information.) Please note that the examples presented in Highlight 7-1 are not meant to present strict thresholds for changes in cost, volume, or time.

7.3 DOCUMENTING POST-RECORD OF DECISION CHANGES

The type of documentation required for a post-ROD change depends on the nature of the change. Changes that significantly or fundamentally affect the remedy selected in the ROD will require more explanation and/or opportunity for public comment than those that do not. Each type of post-ROD change is associated with one of three documentation procedures: (1) a memo or note to the post-ROD file for an insignificant or minor change; (2) an explanation of significant differences (ESD) for a significant change, and (3) a ROD amendment for a fundamental change. Sample outlines for ESDs and ROD Amendments are provided in Highlight 7-2.

7.3.1 Documenting Non-Significant (or Minor) Post-ROD Changes: Memo to the Site File

Any non-significant or minor changes should be recorded in the post-ROD site file (*e.g.*, the RD/RA case file). If the lead agency chooses, non-significant changes can also be documented for the public in a Remedial Design Fact Sheet. Although not legally required, a written statement describing the change is generally recommended (See "*Answers to Comments Submitted After the Superfund ROD is Signed*," EPA memorandum, October 11, 1995, http://es.epa.gov/oeca/osre/951011. html).

7.3.2 Documenting Significant Post-ROD Changes: Explanation of Significant Differences

When documenting significant changes made to a remedy, the lead agency must comply with CERCLA §117(c) and NCP §§300.435(c)(2)(i) and 300.825(a)(2). An ESD must describe to the public the nature of the significant changes, summarize the information that led to making the changes, and affirm that the revised remedy complies with the NCP and the statutory requirements of CERCLA.

To describe the nature of the significant changes, it is suggested that a side-by-side comparison of the original and proposed remedy components be used to clearly display the significant differences.

The ESD should provide additional information on changes that have resulted in the remedy as a result of the change (*e.g.*, changes in the cleanup cost estimate or remediation time frame). Generally, a new nine-criteria analysis is not required; however, the ESD should include a statement that the ROD remains protective and continues to meet ARARs (NCP §§300.430(f)(1)(ii)(B)(1) and (2)).[3] It is also generally appropriate to prepare an ESD document when the lead agency decides to exercise a contingency remedy that was previously described in the ROD (see Section 8.3).

While the ESD is being prepared and made available to the public, the lead agency may proceed with the pre-design, design, construction, or operation activities associated with the remedy. The lead agency

[3] An ESD does not generally reopen consideration of ARARs for the remedy since an ESD does not fundamentally change the remedy. However, if an ESD results in the addition of any new components to the remedy, any ARARs that apply to the change that the ESD describes must be discussed and met or waived. For example, if any ARARs apply to an ESD change which adds stabilization of residuals to a thermal treatment remedy, they must be discussed in the ESD and met or waived.

Highlight 7-1: Examples of Post-Record of Decision Changes

(NOTE: Examples are not meant to present strict thresholds for changes in cost, volume, or time.)

Minor Changes

- **Small Increase in Volume:** Remedial design testing shows that the volume of soil requiring treatment is 75,000 cubic yards rather than the 60,000 estimated in the ROD, but the estimated cost of the overall remedy will only increase by a small percentage.

- **Disposal Location:** During remedial design, it is discovered that it is not feasible to construct the on-site landfill (which is part of the Selected Remedy) in the location specified in the ROD. However, another similar location at the site is suitable for a landfill, and this location is chosen.

- **Ground-Water Monitoring:** The Selected Remedy calls for long-term pump and treat of contaminated ground water with monitoring on a quarterly basis. After a period of time, a determination is made that no significant change in data quality or monitoring effectiveness will occur if monitoring contaminant levels in the ground water is less frequent. Ground-water monitoring is changed to semi-annual sampling.

Significant Changes

- **Large Increase in Volume/ Cost Increase:** Sampling during the remedial design phase indicates the need to significantly increase the volume of contaminated waste material to be incinerated in order to meet selected cleanup levels, thereby substantially increasing the estimated cost of the remedy.

- **Disposal Location:** The lead agency determines that it is not feasible to construct an on-site landfill for treated waste in accordance with the remedy selected in the ROD. The treated wastes must be sent to an off-site landfill. Although the overall management approach for the treated waste (landfill disposal) will remain the same, the costs and implementation time will increase significantly.

- **Contingency Remedy:** As part of an active ground-water pump and treat system, contaminant concentrations decrease to an asymptotic level which is close to attainment of the cleanup level. Investigation shows that adding additional wells to pump and treat ground water will not improve the performance of the remedy in attaining the cleanup level. The ROD included contingency language that the pump and treat remedy would continue operating until contaminant levels were reduced by at least 90%. At such time, monitored natural attenuation would be relied upon to attain the cleanup levels specified in the ROD (if performance monitoring data indicated that this would be an effective method of achieving the final cleanup levels). A decision is made to implement the contingency, thus changing the remedy from pump and treat to monitored natural attenuation. This represents a significant change in achieving the cleanup levels at the site.

- **New ARAR Promulgated (Impacts on Cleanup Levels and Other Parameters):** The lead agency determines that the attainment of a newly promulgated requirement is necessary, based on new scientific evidence, because the existing ARAR is no longer protective. Although this new requirement will significantly change the remedy (*i.e.*, cleanup level, timing, volume, or cost), it will not fundamentally alter the remedy specified in the ROD (*i.e.*, the selected technology will not change) and it will not impact the level of protection (*i.e.*, risk reduction) that the remedy will provide.

- **Land Use:** During remedial design, the local zoning board decides to change the current land use from residential to commercial. Although this new requirement will significantly change features of the remedy (*i.e.*, determination of principal or low level threats, reasonable risk scenarios, appropriate cleanup levels), it will not fundamentally alter the remedy specified in the ROD (*e.g.*, the selected technology will not change).

- **Secondary Technology:** The lead agency decides to use a biological treatment method instead of air stripping (which was specified in the ROD) for ex-situ treatment of extracted ground water. The basic pump and treat approach remains unaltered and the cleanup level specified in the ROD will be met by the alternate technology; the change is significant, but not fundamental. [See *Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites* (EPA 540-R-96-023, October 1996).]

Highlight 7-1: Examples of Post-Record of Decision Changes (continued)

- **Institutional Controls:** During a five-year review, the lead agency reviews institutional control measures implemented at the site and determines that additional measures, that differ significantly from what was described in the ROD, are necessary to be protective (*e.g.*, need for an easement to replace a deed notice).

- **Change in ARARs:** At a five-year review, it is determined that a cleanup level is not consistent with an updated State cleanup standard, and thus is not protective and needs to be modified. This change will not cause a fundamental change in the volume of waste to be remediated.

Fundamental Changes

- **Change Primary Treatment Method:** The in-situ soil washing remedy selected in the ROD proves to be infeasible to implement after testing during remedial design. A decision is made to fundamentally change the remedy to excavate and thermally treat the waste.

- **Change Primary Treatment Method with Cost Increase:** Additional information obtained during remedial design testing demonstrates that the Selected Remedy for ground water, monitored natural attenuation, will not meet cleanup levels, as had been originally predicted in the RI/FS. The lead agency decides to fundamentally change the remedy from monitored natural attenuation to pump and treat. The estimated cost of the cleanup increases significantly.

- **Change Primary Treatment Method with Cost Decrease:** Pump and treat is the Selected Remedy for ground water. Prior to construction of a pump and treat system, interested parties collect and present ground-water information to the lead agency showing that contaminant concentrations are decreasing due to natural processes (*e.g.*, biodegradation, dilution, adsorption, dispersion). Modeling indicates that monitored natural attenuation will achieve cleanup levels in a time frame comparable to pump and treat at substantially less cost.

- **Change from Containment to Treatment with Cost Increase:** At a five-year review for a small industrial site, tests indicate that the containment remedy will not be protective and now a more active response approach (*e.g.*, treatment) is necessary. A new remedy must be selected that will meet protectiveness requirements, resulting in unanticipated costs for the site.

- **Technical Impracticability Waiver:** While implementing an active pump and treat remedy, the presence of DNAPL is discovered. A determination is made to invoke a Technical Impracticability Waiver of the ARAR because treatment of the DNAPL zone is impracticable from an engineering perspective. Rather than treat the source material (DNAPL) a decision is made to implement a containment approach (*e.g.*, slurry wall) for the DNAPL zone. Pump and treat will continue outside the containment zone. As a result, the scope, performance, and cost of the original remedy is fundamentally changed.

- **Community Preference:** The original remedy selected in the ROD was on-site incineration of contaminated soils with estimated costs of $50 million. The community opposes the building of an incinerator and requests that an alternate remedy be selected. New information received after the ROD was signed demonstrates that thermal desorption can meet the cleanup goals in a reasonable time frame for less cost with no loss in protection. This change is based on the community's preference for an alternative to the original Selected Remedy.

- **Volume Decrease Changes Primary Treatment Method:** The Selected Remedy called for treatment by lead recovery and recycling of lead contaminated materials. Additional investigation in design showed the volume of waste to be smaller than originally presumed. The decrease in volume made recycling uneconomical. The amended remedy calls for treatment and containment such that waste is stabilized and consolidated in a lined and capped on-site containment facility. The scope of the new remedy is more efficient, is cost-effective, and is supported by the State and the community.

should consult with the support agency, as appropriate, before issuing an ESD (NCP §300.435(c)(2)). Although not specifically required by CERCLA §121(f) and NCP §300.435(c)(2)(i), it is also recommended that the lead agency provide the support agency the opportunity to comment, and summarize the support agency's comments in the ESD. The lead agency also must publish a notice of availability and a brief description of the ESD in a major local newspaper of general circulation (as required by NCP §300.435(c)(2)(i)(B)). The ESD must be made available to the public by placing it in the Administrative Record file and information repository (NCP §§300.435(c)(2)(i)(A) and 300.825(a)(2)). A formal public comment periodis *not* required when issuing an ESD.

In some cases, an additional public comment period or public meeting may be held voluntarily on a planned ESD (NCP §300.825(b)). This may be useful where there is considerable public or PRP interest in the matter. The Office of Emergency and Remedial Response (OERR) recommends issuing the ESD in a fact sheet format as outlined in Highlight 7-2. The Regional Administrator (or their designee) must sign an ESD. In such cases it may be appropriate to delay implementation of the remedy relating to the ESD to allow a consideration of possible concerns.

7.3.3 Documenting Fundamental Post-ROD Changes: ROD Amendment

When a fundamental change is made to the basic features of the remedy selected in a ROD with respect to scope, performance, or cost, the lead agency is required to develop and document the change consistent with the ROD process (NCP §§300.435(c)(2)(ii)(A) through (H)). This entails the issuance of a revised Proposed Plan that highlights the proposed changes. An amended ROD that documents the change follows the Proposed Plan. The portion of the ROD being amended is evaluated using the nine criteria, focusing on those central to the rationale for the Selected Remedy.

In general, the introductory sections of the ROD do not need to be readdressed in the ROD Amendment but may be referenced from the previous ROD. The focus of the amendment should be to document the rationale for the amendment and provide assurances that the proposed remedy satisfies the statutory requirements. This is accomplished through an evaluation, utilizing the nine criteria, of the portion of the remedy being changed.

To describe the nature of the changes, it is suggested that a side-by-side comparison of the original and proposed remedy components be used to clearly display the differences.

The information included in a ROD Amendment is a function of the type of change made and the rationale for that change. If the amended ROD addresses the entire response action for the site or a series of operable units (*e.g.*, soil, surface water, ground water), only the portion of the remedy that is being changed (*e.g.*,ground water) requires an amendment. For the portion of the ROD being amended, a new nine-criteria analysis, including a new ARARs analysis, will be necessary (see NCP §300.430(f)(1)(ii)(B)(2)). Portions of the analysis in the original ROD can be cross-referenced, where appropriate. RD/RA activities being conducted on other portions of the site or at operable units not proposed for changes may continue during the amendment process.

When fundamental changes are proposed to the ROD, the lead agency must conduct the public participation and documentation procedures specified in NCP §§300.435(c)(2)(ii) and 300.825(a)(2). This would include issuing a revised Proposed Plan that highlights the proposed changes. The format should follow that of the Proposed Plan described in Chapter 3. The final decision to amend is not made until after consideration of public comment (NCP §300.435(c)(2)(ii)).

If a fundamental change is made after a consent decree has been entered at an enforcement-lead site, the decree may need to be modified to conform to the amended ROD, and perhaps involve the Department of Justice or the Court. RPMs should check with their Regional Counsel on how this may be accomplished.

ROD Amendments, like RODs, must be signed by the Regional Administrator (or their designee). A recommended outline and checklist can be found in Highlight 7-2.

7.4 HEADQUARTERS REVIEW AND FILING OF DECISION CHANGES

Draft ESDs and ROD Amendments (including revised Proposed Plans) should be submitted to EPA Headquarters for review and comment pursuant to *Focus Areas for Headquarters OERR Support for Regional Decision Making* (OSWER 9200.1-17, May 22, 1996). In the event that the remedy change meets the criteria for review by the National Remedy Review Board, the appropriate consultation procedures should be followed. For more information on the National Remedy Review Board, see http://www.epa. gov/superfund/programs/nrrb/index.htm. See also Appendix C, *Consolidated Guide to ConsultationProcedures for Superfund Response Decisions* (EPA 540-F-97-009, May 1997).

A copy of a signed final ESD or ROD Amendment should be submitted within 30 days of signature to the following Headquarters office:

ROD Clearinghouse
Superfund Document Center
U.S. EPA Mail Code 5202G
401 M Street, SW
Washington, DC 20460

Please refer to Appendix D for guidance on submitting decision documents to EPA Headquarters.

Highlight 7-2: Sample Outline and Checklist for ESDs and ROD Amendments

Component	Explanation of Significant Differences	ROD Amendment
Introduction to the Site and Statement of Purpose	• Site name and location. • Identification of lead and support agencies. • Citation of CERCLA §117(c) and NCP §300.435(c)(2)(I). • Include date of ROD signature. • Summary of circumstances that led to the need for an ESD. • Statement that ESD will become part of Administrative Record file (NCP 300.825(a)(2)). • Address of location where the file is available and hours of availability.	• Site name and location. • Identification of lead and support agencies • Citation of CERCLA §117 and NCP §300.435(c)(2)(ii). • Include date of original ROD signature. • Summary of circumstances that led to the need for a ROD Amendment. • Statement that ROD Amendment will become part of Administrative Record file (NCP 300.825(a)(2)). • Address of location where the file is available and hours of availability.
Site History, Contamination, and Selected Remedy	• Brief summary of contamination problems and site history. • Present the Selected Remedy, as originally described in the ROD.	• Brief summary of contamination problems and site history. • Present the Selected Remedy, as originally described in the ROD.
Basis for the Document	• Summarize information that prompted and supports significant differences from the Selected Remedy, including the results of the treatability studies or other information developed or provided during the remedial design process. • Reference any information in the Administrative Record file that supports the need for the change.	• Summarize the information that prompted and supports fundamentally changing the remedy selected in the ROD, including the results of treatability studies or other information developed or provided during the remedial design process that supports the amendment. • Reference any information in the Administrative Record file that supports the need for the amendment.

Description of Significant Differences or New Alternatives	• Describe the significant differences between the remedy as presented in the ROD and the action now proposed, highlighting scope, performance, and cost.
	• Describe any changes in Expected Outcomes that will result from the ESD (e.g., change in time to achieve cleanup objectives).
		• Describe original Selected Remedy and new proposed remedy in the same manner as in a standard ROD, highlighting the following:
		  • Treatment components.
		  • Containment or storage components.
		  • Institutional Control components.
		  • Key ARARs.
		• Explain how the change will affect the Remedial Action Objectives for the site.
		• Describe any changes in Expected Outcomes that will result from the ROD Amendment (e.g., change in land use, change in cleanup levels).

Evaluation of Alternatives	Not Applicable to ESDs.	• Use the nine criteria to compare the original and the new proposed remedies.
Support Agency Comments	• Include a summary of support agency comments on the ESD.	• Include a summary of support agency comments on the ROD Amendment.
Statutory Determinations	• State that the modified remedy satisfies CERCLA §121.	• State that the modified remedy satisfies CERCLA §121.
Public Participation Compliance	• Document that the public participation requirements set out in NCP §300.435(c)(2)(i) have been met.	• Document that the public participation requirements set out in NCP §300.435(c)(2)(ii) have been met.

8.0 DOCUMENTING NO ACTION, INTERIM ACTION, AND CONTINGENCY REMEDY DECISIONS

This chapter discusses the essential components of RODs that are prepared to document three specific types of remedial action decisions: no action, interim action, and contingency remedies. In preparing one of these three types of RODs, RPMs should modify the recommended format of the "standard ROD" for final response actions (see Highlight 8-1 and the checklist at the end of Chapter 6) as indicated in this chapter. In the examples provided here, for each type of ROD, sections of the standard ROD that should be eliminated have been crossed out (*e.g.*, ~~Statutory Determinations~~), and remaining sections should be modified according to the directions provided. All other sections should be prepared as in a standard ROD (see Chapter 6 for complete descriptions).

Highlight 8-1: Recommended Outline for Standard Recordof Decision*

PART 1: DECLARATION
- Site Name and Location
- Statement of Basis and Purpose
- Assessment of Site
- Description of Selected Remedy
- Statutory Determinations
- ROD Data Certification Checklist
- Authorizing Signatures

PART 2: DECISION SUMMARY
- Site Name, Location, and Brief Description
- Site History and Enforcement Activities
- Community Participation
- Scope and Role of Operable Unit or Response Action
- Site Characteristics
- Current and Potential Future Site and Resource Uses
- Summary of Site Risks
- Remedial Action Objectives
- Description of Alternatives
- Comparative Analysis of Alternatives
- Principal Threat Waste
- Selected Remedy
- Statutory Determinations
- Documentation of Significant Changes

PART 3: RESPONSIVENESS SUMMARY
- Stakeholder Comments and Lead Agency Responses
- Technical and Legal Issues

* See Chapter 6 for an expanded outline/ checklist.

8.1 DOCUMENTING NO ACTION DECISIONS

The lead agency may determine that no action (*i.e.*, no treatment, engineering controls, or institutional controls[1]) is warranted under the following general sets of circumstances:

- When the site or a specific problem or area of the site (*i.e.*, an operable unit) poses no current or potential threat to human health or the environment;
- When CERCLA does not provide the authority to take remedial action; or
- When a previous response(s) has eliminated the need for further remedial response.

Examples of potential situations where no action decisions may be appropriate are provided in Highlight 8-2. Highlights 8-4, 8-5, and 8-6 outline ROD formats for situations where a no action ROD may be warranted.

[1] An alternative may include monitoring only and still be considered "no action." However, monitored natural attenuation is not a "no action" decision. See Appendix B for a detailed discussion of this distinction and for monitored natural attention documentation recommendations.

Highlight 8-2: Examples of Situations Where No Action Decisions May Be Appropriate

Example 1:
- Where the baseline risk assessment concludes that current or potential future site conditions pose no unacceptable risks to human health or to the environment (section 8.1.1).

Example 2:
- Where a release involves only a pure petroleum product that is exempt from the definitions of hazardous substances, pollutants, and contaminants under CERCLA §101 (section 8.1.2).

Example 3:
- Where a previous removal or remedial action eliminates existing and potential risks to human health and the environment so that no further action is necessary (section 8.1.3).

8.2 DOCUMENTING INTERIM ACTION DECISIONS

During scoping, or at other points in the RI/FS, the lead agency may determine that an interim remedial action is appropriate.[2] An interim action is limited in scope and only addresses areas/media that also will be addressed by a final site/operable unit ROD. Reasons for taking an interim action could include the need to:

- Take quick action to protect human health and the environment from an imminent threat in the short term, while a final remedial solution is being developed; or

- Institute temporary measures to stabilize the site or operable unit and/or prevent further migration of contaminants or further environmental degradation.

Interim actions either are implemented for separate operable units or may be a component of a final ROD for other portions of the site. In either case, an interim action must be followed by a final ROD, which must satisfy all of the following:

- Provide long-term protection of human health and the environment;

- Comply with ARARs;

- Fully address the principal threats posed by the site or operable unit; and

- Address the statutory preference for treatment that reduces the toxicity, mobility, or volume of wastes.

The basic format presented in this section will be the same for all interim actions. However, the detailed information required within each section of the ROD may vary, depending on whether the action addresses ground water or source materials.

8.2.1 Interim Actions Versus Early Actions

Interim remedial actions should not be confused with "early remedial actions." "Early" in this case is simply a description of when the action is taken in the Superfund process.[3] Thus, an early action is one that is taken before the RI/FS for the site or operable unit has been completed. Hence, early actions may be either interim or final. An example of an early interim action would be to provide a temporary alternative water supply and seal wells that are pumping from a contaminated aquifer, whereas an early final action might involve the complete removal of drums and a limited amount of surrounding contaminated soil that, without early attention, could result in contamination to currently uncontaminated areas. More detailed examples of early interim and early final actions are described in Highlight 8-3.

When an interim action is taken early in the process to mitigate immediate threats, it is likely that no formal RI/FS Report will be available yet. Although preparation of an RI/FS Report is not required for an interim action, there must be documentation that supports the rationale for the action to fulfill the NCP's Administrative Record requirements. The ROD serves this pur-

[2] A removal action also may be appropriate to address immediate risks at an NPL site. See *Interim Guidance on Addressing Immediate Threats at NPL Sites* (OSWER 9200.2-03, January 1990).

[3] For more EPA guidance on early actions, see *Early Action and Long-Term Action Under the Superfund Accelerated Cleanup Model (SACM)* (OSWER 9203.1-05I, Vol. 1, No. 2, September 1992).

Highlight 8-3: Examples of Possible Interim and Early Actions

Interim Actions

- Installing and operating extraction wells in an aquifer to restrict migration of a contaminated ground-water plume with the intention of later installing additional wells (or taking other action) to address the contamination in a final action.
- Providing a temporary alternate source of drinking water with the intention of later, in a subsequent action, remediating the source of contamination and/or the aquifer.
- Constructing a temporary cap to control or reduce exposures until subsequent action is taken.
- Relocating contaminated material from one area of a site (*e.g.*, residential yards) to another area of the site for temporary storage until a decision on how best to manage site wastes is made.

Early Actions

- **Early interim action.** Any of the interim actions discussed above, if taken before the completion of the RI/FS for site or OU, would constitute an early action.
- **Early final action.** Before the RI/FS is completed, drums are removed from the site along with surrounding contaminated soil that, without early attention, could result in contamination of currently uncontaminated areas. [This action, although taken early, is final because the removed drums and soil were taken off-site for final disposal.]

pose. A summary of site data collected during field investigations should be sufficient to document a problem in need of response. In addition, a short analysis of remedial alternatives considered, those rejected, and the basis for the evaluation (as is done in a focused FS) should be summarized to support the selected action.

8.2.2 Interim Action Record of Decision Format[4]

The interim action ROD should be tailored to the limited scope and purpose of the interim action. The format for an interim action ROD is outlined in Highlight 8-7.

8.3 DOCUMENTING CONTINGENCY REMEDY DECISIONS

The lead agency, in consultation with the support agency, may decide to incorporate a contingency remedy in the ROD. A contingency ROD may be appropriate when there is significant uncertainty about the ability of remedial options to achieve cleanup levels (*e.g.*, cleanup of an aquifer to MCLs or non-zero MCLGs). For example, a contingency ROD may be appropriate when the performance of a treatment technology (or a demonstrated technology being used on a waste for which performance data are not available) appears to be the most promising option, but additional testing will be needed during remedial design to verify the technology's performance capabilities; in this case, a more "proven approach" could be identified as a contingency remedy.[5] The ROD should specify under what circumstances the contingency remedy would be implemented. Be as specific as possible with the criteria that the lead agency will use to decide to implement the contingency option as opposed to the selected remedy (*e.g.*, failure to achieve desired performance levels). The process by which the contingency will be invoked should be discussed as well. Generally, an ESD will be required to invoke a contingency. However, if the con-

[4] In some cases, RODs will include both interim actions and a final action; such RODs should clearly specify which components of the action are interim and which are final. For any final action components, the ROD should include the information and documentation required for the "standard ROD" (see Chapter 6). For example, where a ROD includes a final source control measure and a temporary alternate water supply, the ROD must provide the documentation required in the "standard format" for the final source control action, as well as addressing in the streamlined manner above, the rationale and justification for the interim water supply action. In this example, it would be necessary to address the contaminated ground water in a final action ROD at a later time.

[5] The use of contingency remedies should be considered carefully. Treatability studies and/or field investigations necessary to evaluate a technology's applicability to the site should be completed during the RI/FS. More detailed testing necessary to establish design parameters and performance requirements may be performed during remedial design.

tingency remedy or the criteria for its selection are not well-documented in the ROD, a ROD amendment may be required to invoke this cleanup option at a later point in time.

The recommended format for contingency remedy RODs is outlined in Highlight 8-8.

Highlight 8-4: Documenting a No Action Decision: Action Not Necessary for Protection

Part 1: The Declaration

- **Site Name and Location**
- **Statement of Basis and Purpose**
- ~~**Assessment of Site**~~
- **Description of Selected Remedy:** The lead agency should state that no CERCLA action is necessary for the site or operable unit, although it may authorize monitoring to verify that no unacceptable exposures to potential hazards posed by the site or operable unit occur in the future.
- **Statutory Determinations:** None of the CERCLA §121 statutory determinations are necessary in this section since no remedy is being selected. Instead, the lead agency should state briefly that no remedial action is necessary to ensure protection of human health and the environment.
- ~~**ROD Data Certification Checklist**~~
- **Authorizing Signatures**

Part 2: Decision Summary

- **Site Name, Location, and Description**
- **Site History and Enforcement Activities**
- **Community Participation**
- **Scope and Role of Operable Unit or Response Action**
- **Site Characteristics**
- **Current and Potential Future Site and Resource Uses:** This section establishes the foundation for the site risks section, which provides the primary basis for the no action decision. Current and potential future land and ground-water resource uses should be clearly explained and documented. Site use characteristics shape the formation of realistic exposure scenarios for the baseline risk assessment.
- **Site Risks:** This section provides the primary basis for the no action decision. The discussion should support the determination that no remedial action is necessary to ensure protection of human health and the environment. The lead agency should explain the basis for its conclusion that unacceptable exposures to hazardous substances will not occur. (In most cases, this will be based on the baseline risk assessment conducted during the RI.) This information should correlate with the Current and Potential Future Site Resource Uses. In limited cases where alternatives were developed in the FS, the lead agency should reference the RI/FS Report. Generally, an FS is not necessary for a no action decision.
- ~~**Remedial Action Objectives**~~ Development of this and the four subsequent sections is unnecessary when the baseline risk assessment shows no unacceptable risks at the site.
- ~~**Description of Alternatives**~~
- ~~**Comparative Analysis of Alternatives**~~
- ~~**Principal Threat Waste**~~
- ~~**Selected Remedy**~~
- ~~**Statutory Determinations**~~
- **Documentation of Significant Changes**

Part 3: Responsiveness Summary

- **Stakeholder Issues and Lead Agency Responses**
- **Technical and Legal Issues**

Highlight 8-5: Documenting a No Action Decision: No CERCLA Authority to Take Action

Part 1: The Declaration

- **Site Name and Location**
- **Statement of Basis and Purpose**
- ~~**Assessment of the Site**~~
- **Description of Selected Remedy:** The lead agency should state that no CERCLA remedial action can be taken for the site or operable unit, although it may authorize monitoring to verify that no releases that can be addressed under CERCLA occur in the future.
- **Statutory Determinations:** No §121 statutory determinations are necessary in this section since no remedy is being selected. This section should explain that EPA does not have authority under CERCLA §§104 or 106 to address the problem(s) posed by the site or operable unit. Explain if the problem has been referred to other authorities.
- ~~**ROD Data Certification Checklist**~~
- **Authorizing Signatures**

Part 2: Decision Summary

- **Site Name, Location, and Description**
- **Site History and Enforcement Activities**
- **Community Participation**
- **Scope and Role of Operable Unit or Response Action**
- **Site Characteristics (if necessary)**
- **Current and Potential Future Site and Resource Uses (if necessary)**
- ~~**Site Risks**~~
- ~~**Remedial Action Objectives**~~
- ~~**Description of Alternatives**~~
- ~~**Comparative Analysis of Alternatives**~~
- ~~**Principal Threat Waste**~~
- ~~**Selected Remedy**~~
- **Statutory Authority Finding:** The concluding statement of the absence of CERCLA authority to address the problem should be the same as in the Declaration.
- **Documentation of Significant Changes**

Part 3: Responsiveness Summary

- **Stakeholder Issues and EPA Responses**
- **Technical and Legal Issues**

Highlight 8-6: Documenting a No Action Decision: No Further Action Necessary

Part 1: The Declaration

- **Site Name and Location**
- **Statement of Basis and Purpose**
- ~~**Assessment of Site**~~
- **Description of Selected Remedy:** The lead agency should state that no CERCLA remedial action is necessary for the site or operable unit, although it may authorize monitoring to verify that no unacceptable exposures to risks posed by the site or operable unit occur in the future.
- ~~**ROD Data Certification Checklist**~~
- **Statutory Determinations:** This Declaration should state that it has been determined that no remedial action is necessary at the site or operable unit. The Declaration should explain that previous response(s) at the site or operable unit eliminated the need to conduct further remedial action. This section should also note whether a five-year review is required based on the earlier response action(s). "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action" (NCP §300.430(f)(4)(ii)).
- **Authorizing Signatures**

Part 2: Decision Summary

- **Site Name, Location, and Description**
- **Site History and Enforcement Activities:** Information related to site history provides perspective, especially where previous removal(s) have occurred. This information is useful if the No Action ROD is a closeout ROD.
- **Community Participation**
- **Scope and Role of Operable Unit or Response Action**
- **Site Characteristics**
- **Current and Potential Future Site and Resource Uses:** This section establishes the foundation for the site risks section, which provides the primary basis for the no action decision. Current and potential future land and ground-water resource uses should be clearly explained and documented. Site use characteristics shape the formation of realistic exposure scenarios for the baseline risk assessment.
- **Site Risks:** This section provides the primary basis for the no action decision. The discussion should support the determination that no remedial action is necessary to ensure protection of human health and the environment. The lead agency should explain the basis for its conclusion that unacceptable exposures to hazardous substances will not occur. (In most cases, this will be based on the baseline risk assessment conducted during the RI.) Any previous responses that were conducted at the site or operable unit that served to eliminate the need for additional remedial action should be summarized in this discussion. In limited cases where alternatives were developed in the FS, the lead agency should reference the RI/FS Report.
- ~~**Remedial Action Objectives**~~
- ~~**Description of Alternatives**~~
- ~~**Comparative Analysis of Alternatives**~~
- ~~**Principal Threat Waste**~~
- ~~**Selected Remedy**~~
- ~~**Statutory Determinations**~~
- **Documentation of Significant Changes**

Part 3: Responsiveness Summary

- **Stakeholder Issues and Lead Agency Responses**
- **Technical and Legal Issues**

Highlight 8-7: Documenting an Interim Action Decision

Part 1: The Declaration

- **Site Name and Location**
- **Statement of Basis and Purpose**
- **Assessment of the Site**
- **Description of the Selected Remedy**
- **Statutory Determinations:** *The declaration statement should generally read as follows*: This interim action is protective of human health and the environment in the short term and is intended to provide adequate protection until a final ROD is signed; complies with (or waives) those federal and state requirements that are applicable or relevant and appropriate for this limited-scope action; and is cost-effective. This action is an interim solution only, and is not intended to utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable for this [*site/operable unit*]. [*NOTE: Where treatment is utilized, replace the previous sentence with the following: "Although this interim action is not intended to address fully the statutory mandate for permanence and treatment to the maximum extent practicable, this interim action does utilize treatment and thus supports that statutory mandate."*] Because this action does not constitute the final remedy for the [*site/operable unit*], the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element [*NOTE: Include if treatment is being used: "although partially addressed in this remedy,"*] will be addressed by the final response action. Subsequent actions planned to address fully the threats posed by conditions at this [*site/operable unit*]. Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within five years after commencement of the remedial action. Because this is an interim action ROD, review of this site and remedy will be ongoing as EPA continues to develop remedial alternatives for the [*site/operable unit*].
- **ROD Data Certification Checklist**
- **Authorizing Signatures**

Part 2: Decision Summary

- **Site Name, Location, and Description**
- **Site History and Enforcement Activities**
- **Community Participation**
- **Scope and Role of Operable Unit:** This section provides the rationale for taking the limited action. To the extent that information is available, the section should detail how the response action fits into the overall site strategy. This section should state that the interim action will neither be inconsistent with, nor preclude, implementation of the final remedy.
- **Site Characteristics:** This section should focus on the description of those site or operable unit to be addressed by the interim remedy.
- **Current and Potential Future Site and Resource Uses**
- **Site Risks:** This section should focus risks addressed by the interim action and should provide the rationale for the limited scope of the action. The rationale can be supported by facts that indicate that temporary action is necessary to stabilize the site or a portion of the site, prevent further environmental degradation, or achieve significant risk reduction quickly while a final remedial solution is being developed. Qualitative risk information may be presented if quantitative risk information is not yet available. The more specific findings of the baseline risk assessment, and the ultimate clean-up objectives (*i.e.*, acceptable exposure levels) for the site or unit, should be included in the subsequent final action ROD for the operable unit.
- **Remedial Action Objectives**
- **Description of Alternatives:** This section should describe the limited alternatives (including the no action alternative) that were considered for the interim action (generally three or fewer). Only those requirements that are applicable or relevant and appropriate requirements (ARARs) to the limited-scope interim action should be incorporated into the description of alternatives.
- **Comparative Analysis of Alternatives:** The comparative analysis should be presented in light of the limited scope of the action. Evaluation criteria not relevant to evaluation of interim actions need not be addressed in detail. Rather, their irrelevance to the decision should be noted briefly.

Highlight 8-7 (cont.): Documenting an Interim Action Decision

- **Principal Threat Waste**
- **Selected Remedy**
- **Statutory Determinations:** The interim action should protect human health and the environment from the exposure pathway or threat it is addressing and the waste material being managed at least in the short term (until a final ROD is implemented). The ARARs discussion should focus only on those ARARs specific to the interim action (*e.g.*, residuals management during implementation). An interim action waiver may be appropriate where a requirement that is an ARAR cannot be met as part of the interim remedy, but will be attained (unless use of one of the five waivers is justified) by the final site remedy (CERCLA §121(d)(4)(A) and NCP §300.430(f) (1)(ii)(C)(1)). The discussion under "utilization of permanent solutions and treatment to the maximum extent practicable" should indicate that the interim action is not designed or expected to be final, but that the selected remedy represents the best balance of trade-offs among alternatives with respect to pertinent criteria, given the limited scope of the action. The discussion under the preference for treatment section should note that the preference will be addressed in the final decision document for the site or final operable unit, although treatment components "that support the preference" should be noted.
- **Documentation of Significant Changes**

Part 3: Responsiveness Summary

- **Stakeholder Issues and Lead Agency Responses**
- **Technical and Legal Issues**

Highlight 8-8: Documenting a Contingency Remedy Decision

Part 1: The Declaration

- **Site Name and Location**
- **Statement of Basis and Purpose**
- **Assessment of the Site**
- **Description of the Selected Remedy:** Both the selected remedy and the contingency remedy should be described in bullet form.
- **Statutory Determinations:** The Declaration should be modified to indicate that both the selected remedy and the contingency remedy will satisfy the statutory requirements.
- **ROD Data Certification Checklist**
- **Authorizing Signatures**

Part 2: Decision Summary

- **Site Name, Location, and Description**
- **Site History and Enforcement Activities**
- **Community Participation**
- **Scope and Role of Operable Unit or Response Action**
- **Site Characteristics**
- **Current and Potential Future Site and Resource Uses**
- **Site Risks**
- **Remedial Action Objectives:** This is a crucial section for RODs that contain selected remedies with contingency provisions. A very explicit statement of the RAOs should be included. Other remedy performance expectations and criteria should be included as well.
- **Description of Alternatives:** This section should identify any uncertainties about the use of the technologies being considered and the extent additional testing is needed. The selected remedy and the contingency remedy must be fully described.
- **Comparative Analysis of Alternatives:** The selected remedy, the contingency remedy, and other alternatives considered should be evaluated fully against the nine criteria; the uncertainties should be noted, as well as the expectations for performance. Community (and support agency) acceptance of an innovative technology should be discussed.
- **Principal Threat Waste**
- **Selected Remedy:** The selected and contingency remedies should be identified. Additional testing/investigations to occur as part of remedial design to further evaluate the selected remedy should be discussed. The criteria that will be used to decide to implement the contingency remedy and the vehicle for invoking the contingency (*i.e.*, ESD) should be identified.
- **Statutory Determinations:** The statutory determination discussion should document that both remedies fulfill CERCLA §121.
- **Documentation of Significant Changes**

Part 3: Responsiveness Summary

- **Stakeholder Issues and Lead Agency Responses**
- **Technical and Legal Issues**

9.0 DOCUMENTING SPECIFIC REMEDY SELECTION SITUATIONS

9.1 INTRODUCTION

The purpose of this chapter is to provide suggested language and recommendations for documenting the following remedy selection cases:

- Presumptive remedy decisions.
- Response actions for lead (Pb) in soil.
- Response actions for ground water.
- Response actions involving the use of a technical impracticability waiver.

For each of the special cases listed above, this chapter provides general background information; details the sections of the remedy selection decision documents which may require modification; describes the information that should be included in the sections identified; provides sample language; and identifies sources of additional information. This chapter does not repeat the information presented in Chapters 3 and 6. It details how the recommended outline and checklist presented in those chapters should be modified to address the situations named above.

9.2 DOCUMENTING PRESUMPTIVE REMEDY DECISIONS

EPA developed the presumptive remedy initiative to expedite remedy selection at sites with similar characteristics (*e.g.*, municipal landfills) or contaminants (*e.g.*, volatile organic compounds (VOCs)). The selection of presumptive remedies is based on historical patterns of remedy selection and current scientific and engineering information. To date, EPA has issued presumptive remedies for VOCs in soil, municipal landfills, and woodtreater sites. In addition, EPA issued a presumptive response strategy for contaminated ground water at CERCLA sites and will soon be finalizing a presumptive remedy for sites with metals in soils.

9.2.1 Modifications to Remedy Selection Decision Documents

The presumptive remedy selection approach is consistent with the standard RI/FS and remedy selection process and requires the same basic remedy selection documentation requirements, with some modifications as described below. Certain sections of remedy selection decision documents should be modified to explain the context and rationale for a remedy selection decision based on a presumptive remedy. The recommended documentation approach is described below.

Community Participation Section

Additional community outreach will usually be appropriate when implementing a presumptive remedy approach to ensure that the community understands the rationale and basis of the streamlining of remedial alternatives analysis. Any additional community outreach efforts should be documented in this section.

Scope and Role of Operable Unit or Response Action Section

This section should describe the role of the presumptive remedy in the response action for this operable unit (*e.g.*, the soils are contaminated with VOCs or the site was formerly a wood treatment facility). A brief description of the lead agency's basis for the use of the presumptive remedy should be provided in this section (*i.e.*, the site matches the type of site for which the presumptive approach was designed to address). Information on why and how the presumptive remedy process streamlines the RI/FS process should be summarized as well. Highlight 9-1 provides sample language for this section.

Site Characteristics Section

If streamlining mechanisms associated with a presumptive remedy were used, describe how the site characterization was affected. For example, in the case of a municipal landfill, describe how the presumptive remedy of containment eliminated the need to characterize the contents of the landfill, and that site characterization focused on ground-water contamination.

Highlight 9-1: Sample Language for Describing a Presumptive Remedy Approach

Soil vapor extraction (SVE) is considered by EPA to be a highly effective way to cleanup volatile organic compounds (VOCs) in soils in many cases. SVE has been identified as a presumptive remedy by EPA for VOCs in soil because it repeatedly has been shown to be effective at treating similar wastes at other CERCLA sites. Presumptive remedies were developed by EPA to streamline the selection of cleanup methods for certain categories of sites by narrowing the consideration of cleanup methods to treatment technologies or remediation approaches that have a proven track record in the Superfund program. EPA has determined that it is appropriate to apply the presumptive remedy for VOCs in soil at this Operable Unit based on the soil and contaminant characteristics found at the site and guidance provided in the directive, *Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soils* (EPA 540-F-93-048). Further information on the selection of presumptive remedies for VOC soil contamination is presented in *User's Guide to the VOCs in Soils Presumptive Remedy* (EPA 540-F-96-008).

Site Risks Section

A streamlined site risk analysis is possible for some categories of presumptive remedy sites. For example, in the case of municipal landfills, the risk evaluation may be streamlined if ground-water contamination at the site is sufficient to provide the basis for remedial action. If a streamlined risk evaluation is performed, a brief description of the process should be provided in this section. This description should identify the exposure pathways evaluated and their associated risk. An explanation should be provided for pathways not quantitatively evaluated (*e.g.*, a direct contact threat was not evaluated due to the nature of the cap that is being constructed at the site).

Description of Alternatives Section

In addition to the descriptions of alternatives that are generally found in this section, a brief explanation of how the alternatives were selected within the context of the presumptive remedy should be provided. This is particularly important for the presumptive remedies that identify a "suite" of acceptable remediation technologies or approaches with a preferred technology identified (*i.e.*, VOCs in soil, woodtreater sites, and metals in soils). If the preferred technology is judged appropriate based on the circumstances of the specific site in question, an explanation that the preferred technology and the no action alternatives were the only alternatives considered should be provided. If the preferred technology was eliminated from consideration during the RI/FS, an explanation of the factors influencing that decision should be provided, along with any site-specific factors affecting consideration of the remaining presumptive remedies for that category. In some cases, it also may be appropriate to attach a technical appendix that provides more information about the presumptive remedy selected.

9.2.2 Special Considerations for the Administrative Record File

In order to meet NCP requirements, it is recommended that the Administrative Record file for a presumptive remedy site generally include the following: (1) relevant OSWER generic presumptive remedy documents (listed below); (2) a "bridging" memorandum or other documentation which shows that the presumptive remedy is appropriate to apply to the site in question; and (3) a notice in the Administrative Record file and in the Administrative Record file index regarding the availability of the data upon which the presumptive remedy is based. For additional information about Administrative Record file requirements specific to the presumptive remedy process, see *Presumptive Remedies and NCP Compliance*, a memorandum from James E. Costello, Chairperson CERCLA Administrative Records Workgroup, ORC Region VI, and George B. Wyeth, Office of General Counsel, dated June 14, 1995 contained in *Implementing Presumptive Remedies: A Notebook of Guidance and Resource Materials* (EPA 540-R-97-029, October 1997).

9.2.3 Additional Guidance

The following presumptive remedy directives have been issued to date, and are available through the Superfund homepage, http://www.epa.gov/superfund/oerr/techres/index.htm. All of these documents are also contained in *Implementing Presumptive Rem-*

edies: A Notebook of Guidance and Resource Materials (EPA 540-R-97-029, October 1997).

- *Presumptive Remedies: Policy and Procedures* (EPA 540-F-93-047, September 1993).
- *Presumptive Remedies and NCP Compliance* (Memorandum from James E. Costello, Chairperson CERCLA Administrative Records Workgroup, ORC Region VI, and George B. Wyeth, Office of General Counsel, dated June 14, 1995).
- *Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soils* (EPA 540-F-93-048, September 1993).
- *Presumptive Remedy for CERCLA Municipal Landfill Sites* (EPA 540-F-93-035, September 1993).
- *Presumptive Remedies for Soils, Sediments, and Sludges at Wood Treater Sites* (EPA 540-R-95-128, December 1995).
- *Presumptive Response Strategy and Ex-situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites* (EPA 540-R-96-023, October 1996).
- *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills* (EPA 540-F-96-020, December 1996).
- *User's Guide to the VOCs in Soils Presumptive Remedy* (EPA 540-F-96-008, July 1996).
- *Presumptive Remedy: Supplemental Bulletin Multi-Phase Extraction (MPE) Technology for VOCs in Soil and Ground Water* (EPA 540-F-97-004, April 1997).
- *Presumptive Remedy for Sites with Metals in Soils* (Forthcoming).

9.3 DOCUMENTING RESPONSE ACTIONS THAT ADDRESS LEAD (Pb) IN SOIL

Sites with lead (Pb) contamination require special documentation because a unique risk assessment methodology is employed to evaluate potential threats to human health at such sites. As a result, the *Summary of Site Risks*, *Selected Remedy*, and *Remedial Action Objectives* sections should address the issues that are unique to sites contaminated with Pb.

9.3.1 Modifications to Remedy Selection Decision Documents

Site Risks Section and Selected Remedy Section (Expected Outcomes)

The *Summary of Site Risks* and *Selected Remedy* sections should document the use of Pb models and the site-specific assumptions that were made to determine remediation goals (*e.g.*, cleanup levels) for Pb in soil. Any studies of blood lead levels (PbBs) performed by the Agency for Toxic Substances and Disease Registry (ATSDR), as well as any additional EPA technical reviews should also be summarized. The information in the following discussion is intended to complement the suggested content for these sections, as described in Sections 6.3.7 and 6.3.12.

Important issues to document in these sections will depend on which methodology was used to assess Pb risks at the site. Three scenarios are described below:

Scenario 1: IEUBK Model for Children[1] Used to Determine Cleanup Levels for Lead in Soil

If the IEUBK Model was used, the *Summary of Site Risks* section should explain the following information:

[1] The Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead (Pb) in Children predicts PbB levels for children (age six months to seven years) exposed to Pb in their environment. The IEUBK model takes into account site-specific concentrations of Pb in various media in evaluating children's exposure to Pb contamination. Common site-specific inputs include Pb concentrations in soil, dust, air, water, and paint. In the absence of site-specific data, the model utilizes default values stored in the model. These values represent typical background concentrations in the United States. The IEUBK model employs the user-specified and default Pb values in a series of complex equations to estimate the potential concentration of Pb in the blood of a hypothetical child or population of children.

- Range of Pb concentrations detected for medium-specific inputs (*e.g.*, concentrations in soil, air, and water).

- Exposure pathway (*e.g.*, ingestion of soil, paint) associated with the exceedance of acceptable blood lead concentration.

- Summary of site-specific studies conducted (*e.g.*, PbB, relative bioavailability (RBA)).

- Output of the model (*e.g.*, percentage of children with PbBs in excess of 10 micrograms per deciliter (μg/dL)).

- References to the portions of the RI/FS or risk assessment that detail use of the model.

The *Selected Remedy* section should contain a complete discussion of expected outcomes, including a discussion of the selected cleanup levels for the remedial action. In the Proposed Plan, this discussion should contain preliminary remediation goals (PRGs) for site soils and other media that address Pb risk. In the ROD, this discussion should contain the final cleanup levels and the rationale for any modifications from the PRGs.

The following source provides additional information on the IEUBK model: *Guidance Manual for the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children* (EPA 540-R-93-089, February 1994).

Scenario 2: Interim Adult Methodology[2] Used to Determine Cleanup Levels for Lead in Soil

If the Interim Adult methodology was used, the *Summary of Site Risks* section should explain the following information:

- Range of Pb concentrations detected for medium-specific inputs (*e.g*, Pb concentrations in soil, air, and water).

- Exposure scenario (*e.g.*, commercial or industrial).

- References to the portions of the RI/FS or risk assessment that detail use of the methodology.

The *Selected Remedy* section should contain a complete discussion of expected outcomes, including a discussion of the selected cleanup levels for the remedial action. In the Proposed Plan, this discussion should contain preliminary remediation goals (PRGs) for site soils and other media that address Pb risk. In the ROD, this discussion should contain the final cleanup levels and the rationale for any modifications from the PRGs.

Scenario 3: Neither of the above methodologies used to develop soil cleanup levels

If neither of the above methods was used, the *Selected Remedy* section should explain the following:

- The basis and rationale for the final cleanup levels for lead in soils.

- Why neither of the above tools was used to determine these levels.

Highlight 9-2 provides sample language for these discussions.

Remedial Action Objectives Section

The *Remedial Action Objectives* section should also address the unique circumstances posed by a site contaminated with Pb. The *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities* (EPA 540-F-94-043, July 1994) provides the following guidance for how the remedial action objectives should be described for site contaminated with Pb: "EPA will generally take a response action if circumstances indicate that there is a greater than 5% probability that the blood lead levels of a child (age 6 to 84 months) may exceed 10 micrograms per deciliter. In accordance with this policy, one of the remedial action objectives at this site is that there will be no more than a 5% chance of a child's blood lead value exceeding 10 micrograms per deciliter."

[2] The Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil guidance utilizes a methodology for assessing risks associated with non-residential adult exposures to Pb in soil. This approach primarily focuses on estimating fetal PbB concentrations in pregnant women exposed to Pb-contaminated soils. This approach also provides tools that can be used to evaluate the risk of elevated PbB concentrations among exposed adults.

Highlight 9-2: Sample Language for Evaluation of Human Health Risks at Sites with Lead (Pb) Contamination

The Integrated Exposure Uptake Biokinetic (IEUBK) model for lead (Pb) in children was used to evaluate the risks posed to young children as a result of the lead (Pb) contamination at this site. Because Pb does not have a nationally approved reference dose (RfD), slope factor, or other accepted toxicological factor which can be used to assess risk, standard risk assessment methods cannot be used to evaluate the health risks associated with Pb contamination. The IEUBK model was run using site-specific data to predict a Pb soil level that will be protective of children and other residents. Site-specific soil and ground-water Pb concentrations, as detailed in the summary tables for the Chemicals of Concern (COCs) in this ROD, were used in place of model default values. The IEUBK Model predicted that exposure to site soils would result in children's blood lead (PbB) levels that range from 7.8 to 12.5 µg/dL. Assuming a geometric standard deviation of 1.6, this range of values results in a distribution of PbB levels where approximately 15% of children aged 6 months to 7 years have blood lead (PbB) levels in excess of the level of concern recommended by the Centers for Disease Control and Prevention (10 µg/dL). A PbB study was not conducted at this site because the site is primarily industrial and has localized Pb contamination that has not impacted nearby residential areas. In addition, residents were not supportive of a community PbB study. To protect future residents in the local area, the IEUBK model was used to calculate a preliminary remediation goal (PRG) for Pb in soil of 540 ppm.

9.3.2 Additional Guidance

EPA's Technical Review Workgroup for Lead Home Page provides information regarding lead risk assessment and the use of the IEUBK model and Interim Adult methodology (http://www.epa.gov/superfund/programs/lead/index.htm), including the following documents:

- *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities* (EPA 540-F-94-043, July 1994).
- *Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities* (EPA 540-F-98-030, August 27, 1998).
- *Guidance Manual for the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children* (OSWER Directive 9285.7-15-1, February 1994).
- Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996.

9.4 DOCUMENTING GROUND-WATER REMEDY DECISIONS

This section presents the suggested documentation approach when selected remedies address contaminated ground water. Ground-water remedy decisions often involve complex site conditions or remedy components that require additional explanation. Appendix B contains sample language for documenting specific ground-water remediation scenarios (*e.g.*, phased approach, NAPLs, monitored natural attenuation), and should be used in conjunction with this chapter when writing a remedy selection decision document.

9.4.1 Modifications to the Remedy Selection Decision Documents

Site Characteristics Section

In documenting ground-water remedy decisions it is important that the *Site Characteristics* section reflect specific information unique to a ground-water site. In particular, this section should include the following information:

- Nature and extent of ground-water contamination including source(s) of contamination, COCs, estimated extent and volume of contaminated plume and the potential for migration of the contaminant plume.
- Geology and hydrogeology of the site and surroundings (in addition to the topography and geography), including the following:

- Aquifer(s) affected or threatened by site contamination, types of geologic materials, approximate depths, whether aquifer is confined or unconfined.

- Ground-water flow directions within each aquifer and between aquifers and ground-water discharge locations (*e.g.*, surface waters, wetlands, other aquifers).

- Interconnection between surface contamination (*e.g.*, soils) and ground-water contamination.

- Confirmed or suspected presence and location of NAPLs.

- If ground-water models were used to define the fate and transport of COCs, identify the model used and major model assumptions.

Current and Potential Future Site and Resource Uses Section

This section of the ROD (and the relevant discussion in the Proposed Plan) should explain the current ground-water uses and document the basis for future ground-water use assumptions. If the State has a Comprehensive State Ground Water Protection Plan (CSGWPP), its impact on future use assumptions also needs to be addressed (see *The Role of CSGWPPs in EPA Remediation Programs* (EPA 540-F-95-084, April 4, 1997)). If a potential future use of the ground water is as a drinking water source, the approximate time frame of this potential future use should be estimated and reported in this section as it may have an impact on the remediation time frames evaluated in subsequent sections (*e.g.*, use as a drinking water source not anticipated within the next 20 years).

Remedial Action Objectives Section

When addressing ground-water contamination, the *Remedial Action Objectives* section of the Proposed Plan and ROD needs to clearly present the intended results of the remedial action. A range of Remedial Action Objectives (RAOs) may be applicable to ground-water remedy decisions. Some of these objectives may be achievable in a relatively short time frame (*e.g.*, exposure control, plume containment), while other objectives may require a much longer time frame (*e.g.*, plume restoration). For this reason, ground-water decision documents must present clear and precise documentation of the RAOs. The information presented in this section should be of sufficient detail to allow for a comprehensive analysis of remedial alternatives.

Ground-water remedies should be expressed in terms of the following overall objectives, clearly indicating which objectives are to be achieved over which portion of the plume, whether they are interim or final, and in what time frames these objectives are expected to be achieved:

1. Prevent exposure to contaminated ground water, above acceptable risk levels.

2. Prevent or minimize further migration of the contaminant plume (source control).

3. Prevent or minimize further migration of contaminants from source materials to ground water (source control).

4. Return ground water to its expected beneficial uses wherever practicable (aquifer restoration).

Description of Alternatives Section

This section should highlight the following information for ground-water response decisions:

- *Ground-Water Extraction and Treatment Components*. Describe the following as appropriate:

  - Ground-water extraction method.

  - Location for discharging treated ground water.

  - Technologies for treating extracted ground water. Discuss whether presumptive treatment technologies or innovative technologies are being used for this purpose.

  - Additional treatment and/or management for treatment residuals.

  - Other methods/technologies that will be used for aquifer remediation (*e.g.*, air

sparging, in-situ bioremediation, monitored natural attenuation) and indicate whether any are innovative technologies.

- *Ground-water or Source Containment (e.g., NAPL) Components*. Describe the following as appropriate:
  - Containment method (*e.g.*, subsurface barriers, hydraulic control).
  - Area of source material or ground-water plume to be contained (both areal extent and vertical extent).
  - Basis for establishing containment area (*e.g.*, known or suspected extent of NAPLs, extent of plume above MCLs).
  - Geologic stratum that will serve as a bottom for the containment system. If none, explain how containment system will be effective.
- *Ground-Water Components that Incorporate Monitored Natural Attenuation*. Describe the following as appropriate:
  - Portions of the plume that will be addressed using a monitored natural attenuation approach.
  - Explain why monitored natural attenuation is expected to attain cleanup levels (or other remedial action objectives) in a time frame that is reasonable when compared to the cleanup time frames of the other alternatives and when compared to the time frame of the anticipated resource use.
  - Institutional controls that will restrict the use of ground water until cleanup levels are attained.

Selected Remedy Section

This section should expand on the level of detail provided in the previous discussion, especially with regard to the following:

- Presentation of a detailed (*e.g.*, 1-2 page) cost estimate for the selected remedy.
- Phased implementation stages of the remedy that will be used to optimize the remedy for site conditions and increase cost-effectiveness.
- Remedy refinements that may be needed during the life of the remedy (*e.g.*, adjusting the number of extraction wells, adjusting the pumping rate, pulsed pumping of some wells).
- If applicable, the contingency actions that will be implemented in the event that remedy does not perform as expected (especially important for remedies such as natural attenuation).
- Brief discussion of the monitoring program necessary to ensure remedy effectiveness as well as the entity responsible for maintaining the monitoring program (especially important for remedies with long durations such as natural attenuation).
- Provisions for ground-water monitoring once the system is shut off to ensure cleanup levels are maintained.
- Identification and description of institutional controls to be implemented.

9.4.2 Additional Guidance

Additional guidance can be found in Appendix B of this document and in the following:

- *Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites* (EPA 540-R-96-023, October 1996).
- *Considerations in Ground-Water Remediation of Superfund Sites and RCRA Facilities* (OSWER 9283.1-06, May 1992).
- *Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration* (EPA 540-R-93-080, October 1993).

9.5 DOCUMENTING TECHNICAL IMPRACTICABILITY (TI) WAIVERS

Since Technical Impracticability (TI) waivers are only used when site-specific cleanups cannot meet regulatory requirements, their use requires special documentation in Proposed Plans, RODs, ROD Amendments, and ESDs. This section describes how a technical impracticability (TI) waiver of an Applicable or Relevant and Appropriate Requirement (ARAR) should be documented in these decision documents.

Technical impracticability is the basis for one of the six statutory and regulatory ARAR waivers provided for in CERCLA §121(d)(4)(C) and NCP §300.430(f)(1)(ii)(C)(3). A technical impracticability waiver may be used when compliance with an ARAR is technically impracticable; that is, compliance is not feasible from an engineering standpoint or because of excessive costs, particularly in relation to performance.[3] TI waivers most often are used for ARARs that are used to establish cleanup performance standards or levels such as Maximum Achievable Control Technology (MACT) under the Clean Air Act or Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act, or State requirements that are more stringent than MCLs.

A decision to propose or invoke a TI waiver can be made at any time during the remedial process, but must be included in a remedy selection decision document. Information supporting the TI decision can be included in the RI/FS, a separate TI evaluation report, or in a separate section or technical appendix of the decision document itself. When a TI waiver is invoked, an alternative remediation strategy must be developed that ensures protection of human health and the environment. Both the TI waiver decision and the alternative remedial strategy must be documented in an appropriate decision document. A TI waiver decision can be made prior to implementation of the groundwater remedy, if sufficient information is available to support such a decision; or after implementation of the ground-water remedy when remedy performance data demonstrate that a TI waiver is justified.

[3] Cost is relevant to the technical impracticability waiver because engineering feasibility is ultimately limited by cost. EPA's policy is that cost can be considered in evaluating technical impracticability, although it "should generally play a subordinate role" and should not be a major factor unless compliance would be "inordinately costly" (55 *FR* at 8748, March 8, 1990).

Remedial Project Managers should contact the appropriate Regional Coordinator at EPA Headquarters to determine the review procedure for invoking a technical impracticability waiver. As summarized below, certain issues should be addressed in a Proposed Plan, ROD, ROD Amendment, or ESD when a TI waiver is invoked. More specific documentation recommendations are provided in Highlight 9-4.

9.5.1 Discussion of a TI Waiver in a Proposed Plan

If sufficient site characterization and other supporting information is available as a result of the RI/FS, a decision to invoke a TI waiver can be made in a subsequent decision document. In such a case, the Proposed Plan should explain that the lead Agency plans to invoke a TI waiver in the subsequent ROD or ROD amendment and describe the site conditions that make compliance with the ARAR technically impracticable. The Proposed Plan provides the foundation for invoking the TI waiver in the ROD. CERCLA and the NCP specify that the Proposed Plan must provide an explanation of any proposed ARAR waiver to allow the public an opportunity to comment on the waiver (NCP §300.430(f)(2)(iv)). EPA must respond to any significant Federal agency, State or public comments concerning the use of ARAR waivers. (Requirements for State and community involvement are provided in NCP §§300.430 and 300.500 - 300.515.) More detailed explanation supporting the TI waiver determination should be included in the subsequent ROD or ROD amendment.

9.5.2 Discussion of a TI Waiver in a ROD or ROD Amendment

A Technical Impracticability Waiver should be presented in a ROD only if it has been preceded by a public announcement of the waiver in a Proposed Plan. In the case of a ROD amendment, public comment on the appropriateness of a TI waiver should also be solicited. The most important sections of the ROD for documenting a TI waiver are as follows:

- Site Characterization.
- Remedial Action Objectives.
- Selected Remedy.
- Statutory Determinations.

A decision to modify the remedy selected in a previously signed ROD by invoking a TI waiver may constitute a fundamental change, and thus warrant a ROD amendment and requisite public comment procedures. When a fundamental change is proposed for a ROD, the lead agency must adhere to the public participation and documentation procedures specified in the NCP which include issuance of a proposed amendment to the ROD for public comment (NCP §300.435(c)(2)(ii)).

A ROD or ROD Amendment supporting a TI waiver should document the following:

- Site conditions that justify the TI waiver. This will generally be a summary of information contained in the TI evaluation report, or similar technical document.
- Explanation of how the TI waiver is reflected in the Remedial Action Objectives and how it modifies the objectives.
- How human health and the environment will be protected by an alternate remedial strategy.
- Specific changes in the remedy that will result from the TI waiver.
- Specific ARARs that are waived due to TI and whether the requirements are applicable or relevant and appropriate.

9.5.3 Discussion of a TI Waiver in an Explanation of Significant Differences

In some instances an ESD may be used to invoke a TI waiver. For instance, an ESD can be used in cases where the revised remedy is generally consistent with the contingency remedy discussed in the original ROD and that ROD satisfied the following conditions:

1. Contained detailed discussions of the potential need for a future TI waiver;
2. Identified a contingency remedy (*e.g.*, alternate remedial strategy) to be used in the event a TI waiver was determined to be appropriate for the site (such an alternate remedial strategy must have been discussed in the nine criteria analysis in the original ROD); and
3. Specific conditions were identified that would be used as the basis for implementing the contingency remedy (*i.e.*, triggers).

If an ESD is determined to be sufficient, public notice and opportunity for comment should also be provided (although not required by the NCP, public comment is highly recommended when invoking a TI waiver). For more information on an ESD or ROD Amendment, see Chapter 7 of this document.

9.5.4 Additional Guidance

Highlight 9-3 provides tips for documenting the use of TI waivers. The following documents provide more detailed guidance for evaluation of Technical Impracticability and use of Technical Impracticability waivers:

- *Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration* (EPA 540-R-93-080, October 1993).
- *Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites, Final Guidance* (EPA 540-R-96-023, October 1996).

Highlight 9-3: Tips for Documenting Use of a Technical Impracticability Waiver

- Often a decision to modify the remedy selected in a previous ROD by invoking a TI waiver will constitute a fundamental change in the remedy and will require a ROD amendment.
- The most important parts of the ROD for documenting a TI waiver are the site characterization, remediation objectives, selected remedy description, and statutory determinations sections.
- Where the TI waiver applies to several alternatives, and the waived ARAR(s) and justification are identical, this information can be described once and referenced in the text for other alternatives.
- The ROD should state which ARAR(s) are being waived and whether the requirement is applicable, or relevant and appropriate.
- The decision to invoke a TI waiver can occur at any time during implementation of a remedial action, regardless of whether the decision document contains contingency language.

Highlight 9-4: Technical Impracticability Waiver Information for Proposed Plans and RODs

This table shows the additional information that should be included in a Proposed Plan or ROD when a TI waiver is proposed or invoked.

Section	Proposed Plan	ROD
	DECLARATION	
Description of Selected Remedy	Not Applicable	☐ Identify the TI waiver as a component of the remedy and provide a brief justification for the waiver.
Statutory Determinations	Not Applicable	☐ Use the following standard language: *"The Selected Remedy is protective of human health and the environment, complies with or meets the requirements for a waiver of Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, is cost effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable."*
	DECISION SUMMARY	
Site Background (Proposed Plan)/ Site Characteristics (ROD) *Site Characteristics is presented as a separate section in the ROD, however it is included as a component of the Site Background in the Proposed Plan.*	Describe site characteristics that show there are constraints on attaining ARAR(s). (The TI waiver does not need to be mentioned in this section; however, the foundation for proposing the waiver later in the decision document should be provided.) Site characteristics include the following: ☐ The nature and extent of contamination. ☐ Key site conditions shown in the Site Conceptual Model that limit restoration of media and attainment of ARAR (*e.g.*, geologic or hydraulic conditions, contaminant fate and transport, contaminant sources). ☐ Briefly describe remedy performance data if appropriate, under the Site Background section in the Proposed Plan, (*e.g.*, studies show no technology is effective in removing contaminant X from the media under certain conditions found at the site).	Describe site characteristics that show there are constraints on attaining ARAR(s). (The TI waiver does not need to be mentioned in this section, however, the foundation for proposing the waiver later in the decision document should be provided.) Site characteristics include the following: ☐ The nature and extent of contamination. ☐ Key site conditions shown in the Site Conceptual Model that limit restoration of media and attainment of ARAR (*e.g.*, geologic or hydraulic conditions, contaminant fate and transport, contaminant sources). The ROD should provide more information on this topic than the Proposed Plan, such as specific site characterization studies and diagrams showing the extent of contamination. ☐ Describe remedy performance data pertinent to invoking the TI waiver, if available. This information could be included at the conclusion of the Site Characteristics section.
Remedial Action Objectives	☐ Describe how the Remedial Action Objectives, such as those related to attaining ARARs and cleanup levels for the site, were modified by the TI waiver (*e.g.*, the TI waiver may have been factored into the cleanup goals by assuming ARARs would not be met in part of the ground-water plume).	☐ Describe how the Remedial Action Objectives, such as those related to attaining ARARs and cleanup levels for the site, were modified by the TI waiver (*e.g.*, the TI waiver may have been factored into the cleanup levels by assuming ARARs would not be met in part of the ground-water plume).
Summary of Alternatives (Proposed Plan)/ Description of Alternatives (ROD)	☐ For each alternative where a TI waiver is proposed or invoked, identify the ARAR(s) being waived.	☐ For each alternative where a TI waiver is proposed or invoked, generally describe the ARAR(s) being waived (*e.g.*, Federal and State drinking water standards).

Section	Proposed Plan	ROD
Evaluation of Alternatives (Proposed Plan)/ Comparative Analysis of Alternatives (ROD)	Threshold criteria: □ Overall protection of human health and the environment. - Briefly address how alternatives with a TI ARAR waiver component will be protective (this criterion draws on ARARs, among other factors, to assess protectiveness). □ Compliance with ARARs (or justify a waiver). - Identify the specific ARARs under each alternative for which a waiver is proposed or invoked. - Provide a brief justification for the TI waiver, and explain that more detailed justification is provided in the preferred alternative section of the Proposed Plan. Balancing criteria: □ Describe, where appropriate, how the TI waiver will impact the performance of each balancing criterion (*e.g.*, will there be less reduction in toxicity, mobility or volume because of the waiver?) Modifying Criteria: □ Describe both the State and the community positions on the TI waiver. (The State's position is especially important when State ARARs are waived. This information may not be available for Proposed Plans.)	Threshold criteria: □ Overall protection of human health and the environment. - Briefly address how alternatives with a TI ARAR waiver component will be protective (this criterion draws on ARARs, among other factors, to assess protectiveness). □ Compliance with ARARs (or justify a waiver). - Identify the specific ARARs under each alternative for which a waiver is proposed or invoked. - Provide a brief justification for the TI waiver, and explain that more detailed justification is provided in the *Selected Remedy* section of the ROD. Balancing criteria: □ Describe, where appropriate, how the TI waiver will impact the performance of each balancing criterion (*e.g.*, will there be less reduction in toxicity, mobility or volume because of the waiver?) Modifying Criteria: □ Describe both the State and the community positions on the TI waiver. (The State's position is especially important when State ARARs are waived.)
Preferred Alternative (Proposed Plan)/ Selected Remedy (ROD)	□ State that a TI ARAR waiver is a component of the remedy but that other components of the remedy will provide protection from site contamination (*i.e.*, the alternative remedial strategy). □ In the expected outcomes section, explain the impact the TI waiver will have on land and water uses and on risk reduction.	Describe the TI waiver in a separate sub-section under the Selected Remedy description. Include the following information: □ Generally describe the ARARs for which a TI waiver will be invoked. □ Summary of the most important data, analysis, studies, and remedy performance information that provide the foundation for the waiver (reference Technical Impracticability Evaluation or other relevant documents in the Administrative Record file as a source of additional information). □ Describe components of the remedy that constitute the alternate remedial strategy. Even though some ARARs are waived, the remedy must protect human health and the environment. For example, the alternative strategy should prevent further contamination migration and prevent exposure to the contaminated ground water. Describe remedy components used to achieve these objectives. □ In the expected outcomes section, explain the impact the TI Waiver will have on land and water uses and on risk reduction.

Section	Proposed Plan	ROD
Statutory Determinations	Not Applicable	A remedy is required to comply with ARARs, and if it does not, a waiver must be justified: □ Cite each ARAR for which a TI waiver will be invoked. Identify whether it is an applicable requirement or a requirement that is relevant and appropriate. □ Reference the statutory and regulatory authority for a TI waiver (CERCLA §121 (d)(4)(C) and NCP §300.430(f)(1)(ii)(C)(3)). □ Summarize the principal reasons that justify the waiver (be specific). □ Cite ARARs that are expected to be attained by the remedy A remedy must satisfy the preference for treatment, and if it does not, justification for not meeting this preference must be provided: □ Describe any impact the TI waiver will have on complying with the statutory requirement to reduce toxicity, mobility or volume through treatment.