UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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MEMORANDUM

SUBJECT: Superfund Reforms: Updating Remedy Decisions

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Purpose

The purpose of this Superfund Reform is to encourage appropriate changes to remedies selected in existing Superfund Records of Decision (RODs). These updates are intended to bring past decisions into line with the current state of knowledge with respect to remediation science and technology, and by doing so, improve the cost effectiveness of site remediation while ensuring reliable short and long term protection of human health and the environment. Remedy changes will

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be completed in accordance with existing regulations and guidance, which call for a memorandum to the file, an Explanation of Significant Differences, or a ROD amendment, as appropriate for the significance of the change. Cleanup levels are not expected to change absent a showing that remediation levels are unattainable.

Background

At the inception of the Superfund program in 1980, few technologies existed for the characterization and cleanup of hazardous waste sites, and relatively little was known regarding the nature of subsurface contamination. Since that time, numerous technical advances have been made which greatly improve our ability to characterize and remediate hazardous waste sites. In addition, analysis of EPA and State program experience has led to a greater understanding of the difficulties involved in remediating certain types of contamination problems.

The Agency recognizes that some remedy decisions made at Superfund sites in the past should be modified to bring those decisions up to date with the current state of the science. The best example of how knowledge and expectations have evolved in the Superfund program is the case of contaminated ground water. At the outset of the program, it was anticipated that ground water contamination would migrate in a relatively simple and predictable manner, and that remediation using pumping wells coupled with above-ground treatment would be straightforward and rapid. Today, we realize that many of the contaminants present in ground water at Superfund sites were derived from "dense, nonaqueous phase liquids" (DNAPLs) such as trichloroethylene (TCE). Such contaminants behave in a manner that was not widely understood by the technical community until the late 1980s. The migration, fate, and cleanup of DNAPL contamination in ground water is still the subject of considerable research.

The Superfund program has evolved in response to scientific advancement and remediation experience. For example, the 1993 "Guidance for the Evaluation of the Technical Impracticability of Ground water Restoration" followed the completion of an EPA study of the efficacy of "pump and treat" cleanups at Superfund and other contamination sites. This guidance recognizes that numerous challenges may be faced cleaning up contaminated ground water, and provides advice on how to demonstrate that required cleanup levels should be waived in favor of a protective, but less-stringent cleanup approach. The need for flexibility in the implementation of ground water remedies will be discussed in detail in the forthcoming EPA guidance "Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites," which should be available in late 1996.

Modification of a ROD is not a new concept in the Superfund. However, the need to modify RODs to keep up to date with new technologies has grown as the complexity of Superfund cleanups has become more apparent and national concern regarding the costs of such cleanups has increased.

Objective

This reform effort encourages the Regions to take a close look at, and modify as appropriate, past remedy decisions where those decisions are substantially out of date with the current state of knowledge in remediation science and technology, and thus are not as effective from a technical or cost perspective as they could be.

This initiative does not signal any changes in Agency policies regarding site cleanup, including policies based on the Superfund statute regarding remedy selection, treatment of principal threats, preference for permanence, establishment of cleanup levels, waivers of such cleanup levels, or the degree to which remedies must protect human health and the environment. It is instead an effort to promote the use of the best science and most appropriate technologies at Superfund sites.

Implementation

EPA is prepared to review and update existing RODs where appropriate. Eligibility for this reform effort is open to Fund, other federal agency-lead, and potentially responsible party (PRP)-lead sites. Candidate sites for remedy updates may be identified by EPA or other interested parties.

Modification of RODs generally is appropriate where significant new information has become available (i.e., the information was not available at the time the ROD was signed) that substantially supports the need to alter the remedy. This approach is in keeping with the general expectation that updates will be based on program experience and new scientific information.

Types of Remedy Updates Anticipated

We expect that the primary focus of these updates will be ground water sites, as the science of ground water remediation has changed dramatically since the inception of the Superfund program. Nonetheless, remedy updates may be appropriate at other types of sites as well. We expect that remedy updates will consist of three principal types:

1. Changes in the remediation technology employed, where a different technology would result in a more cost effective cleanup;
2. Modification of the remediation objectives due to physical limitations posed by site conditions or the nature of the contamination; and
3. Modification of the monitoring program to reduce sampling, analysis, and reporting requirements, where appropriate.

These types of updates are discussed below in greater detail, particularly as they relate to ground water remedies:

1. **Changes in the Remediation Technology:** Sites where new information indicates that another remediation technology would perform significantly better than the selected remedy for equivalent cost, or perform as well as the selected remedy for significantly lower cost, would be good candidates for a remedy update. Note that there should be sufficient information available to determine that such a technology or approach will perform as expected, given the conditions at the site. Given the potential risks of technology failure and its consequent cost, only proven technologies, or innovative technologies with well-understood performance capabilities, should be considered for remedy updates.

2. **Remediation Objectives Reconsidered**: This category includes sites where information gathered during remedial design or remedial action indicates that achieving the selected cleanup levels (e.g., Maximum Contaminant Levels) is not technically practicable from an engineering perspective. An example of such a site would be one where DNAPLs have been directly identified or reliably inferred from newly-acquired evidence, and where presence of the DNAPL will critically limit the ability to achieve cleanup levels. This scenario also might include cases where the physical attributes of the site (e.g., very complex hydrology) will prevent the selected remedy from attaining the required cleanup levels in a reasonable time frame.

Another type of site that might be considered for an update under this general category is a site where an existing ground water remediation system has reduced contaminant levels, but contaminant recovery efficiency is so low that a concentration "plateau" has effectively been reached. EPA expects that reasonable efforts will have been made to refine any existing remediation systems, so that the loss of contaminant recovery efficiency can be attributed with relative confidence to physical limitations of the site, and not to inadequacy of remediation system design or its operation. A determination regarding contaminant recovery efficiency may be made over **portions** of sites, targeting for review and update only those areas of the site where remediation has become demonstrably inefficient. For further information on defining concentration "plateaus," see "Statistical Methods for Evaluating Cleanup Standards: Volume II, Ground Water" (EPA Publication 230-R-92-014, 1992).

Where such a determination is made (i.e., that further active remediation with a given technology is no longer practicable), alternative remedy options include: 1) use of a different remediation technology or approach to enhance recovery rates; 2) use of natural attenuation to complete the cleanup, but over a somewhat longer time frame; and 3) recognition that complete cleanup is not technically practicable using either of the first two options, and that modification of the cleanup levels may be required (e.g., ARAR waiver or alternate concentration limits). For further information on waivers of cleanup levels, see "Guidance for Evaluating the Technical Impracticability of Ground Water Restoration," OSWER Publication No. 9234.2-25 (September 1993).

Use of natural attenuation to complete ground water cleanup may be appropriate where site characterization and remedy performance data indicate that required cleanup levels will be attained within a reasonable time frame through biodegradation, dispersion, dilution, adsorption, or other natural processes. The "reasonableness" of the time frame to achieve cleanup must be determined on

a site-specific basis, considering such factors as use and value of the resource; the urgency of the need for the resource; the availability of other water supplies in the area; and the ability to prevent human exposures and impacts to environmental receptors. State and local input on these decisions therefore will be critical.

3. **Reduced Monitoring Data Needs:** Sites where the ground water monitoring program could be streamlined without compromising the effectiveness or protectiveness of the remedy also may be considered for review. For example, sites undergoing long-term remedial actions such as pump and treat may, after a period of time, require less intensive monitoring than originally called for in the ROD or other work plan document. Such a determination may be made after the remediation system has been operational and functional for a period of time sufficient to determine whether: 1) the remediation system is achieving the degree of contaminant plume control sought; and 2) there have been no short-term fluctuations in contaminant concentrations or other phenomena that would justify the continuation of frequent sampling.

Where these conditions are met, it may be appropriate to consider streamlining the ground water monitoring program. Such streamlining might, for example, reduce sampling frequency from quarterly to semiannually or annually with no significant change in data quality or monitoring effectiveness. Similarly, the number of parameters tested for in each sample also may be reduced in certain cases. In other cases, specific monitoring wells may be eliminated from the program entirely. For example, wells formerly located in the contaminated plume which now comply with cleanup levels, or wells that are sufficiently close to other monitoring points that their omission from the sampling program would not adversely impact overall data quality may be eliminated from the monitoring program.

Factors to consider when contemplating changes to the monitoring program include proximity to downgradient receptors (e.g., supply wells), the relative speed with which ground water flows in the affected aquifer, and whether large seasonal changes occur in the hydrologic system. And, as virtually all ground water sites have some type of monitoring program, regional review and modification of monitoring programs should focus on those sites where such changes will produce significant cost savings. Changes to a ground water monitoring program often will not constitute a significant change to the implementation of the remedy. Where this is the case, such changes may be documented through a memorandum to the post decision document file or through modification of the specific document(s) governing the monitoring plan, as appropriate.

These examples of updates, while not exhaustive, are meant to be representative of the types of sites where it may be appropriate to modify the remedy. **In cases where a change in remedial technology or approach is proposed, remedy updates should be based on site-specific information gathered or developed after the ROD was signed.**

Remedy Update Process

Each Region should set up a process for reviewing requests for remedy updates submitted by EPA staff or other parties. The process may consist of three phases: 1) identification and prioritization of RODs for review; 2) technical review (to determine whether changes to the remedy are warranted); and 3) implementation of the remedy update (changes documented in the post-ROD file, an Explanation of Significant Differences, or a ROD Amendment; or where the remedy selected ROD is not altered, by revision of a work plan or other relevant document).

Prioritization. EPA will consider and evaluate potential remedy updates for Fund, other federal agency, and responsible party-lead sites. Requests for review of candidate RODs may be sent to the Waste Management Division Director or the Remedial Project Manager assigned to the site. To ensure that the Region's rationale for prioritizing remedy reviews is clear and equitable, all such requests should be carefully tracked. During the prioritization phase, the Region shall assess the type of modification that may be called for, the resources needed to conduct the review and update, and the potential cost savings. Review and consideration of potential remedy updates should not, however, result in any delays in the completion of work products or other remediation activities required by the existing ROD and enforcement instruments (UAOs/CDs). Work stoppage is not permitted except as authorized in the enforcement instrument for PRP-lead sites.

Review and modification of RODs can be resource intensive. We therefore encourage the Regions to establish priorities for ROD reviews and updates that balance the demands of this reform effort with available Regional resources and the need to meet other program targets.[1] It is recommended that in setting priorities among updates, the Regions should evaluate the potential cost savings of the update. Furthermore, when factoring cost savings into priority-setting for reviews, Regions should consider both the **gross cost savings** estimated for the update (favoring large sites with potentially large cost savings), as well as the **proportion of total remedy cost** which the savings would represent (fostering update opportunities for smaller sites with large proportionate reductions in cost).

Estimation of the amount of cost savings expected for the proposed remedy change should include consideration of the resources required to review and update the remedy decision, as well as the resources required to implement the change in the remedy itself. As Superfund decisions have evolved with program experience, we anticipate that older RODs may be the more likely candidates

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[1]This reform encourages the Regions to review requests to update RODs as appropriate to accommodate changes in science and technology within the limits of available resources. It does not expand or alter the conditions under which review would be required. NCP §300.825(c) requires EPA to consider comments submitted after the public comment period for a ROD where "the comments contain significant information not contained elsewhere in the administrative record file which could not have been submitted during the public comment period and which substantially support the need to significantly alter the response action."

for updating than more recent RODs. However, another factor that can affect remedy update cost savings is the stage of a remedy's construction. The costs of implementing a change in remedial technology may be much lower, for example, if the change is made during design as opposed to during or after construction. When estimating cost savings associated with a potential remedy update, the Region therefore should consider whether a given remedy is still in the design phase, or whether construction is underway or already completed. In addition, the impact of any delays to the cleanup schedule should be considered. Additionally, the Regions should consider the administrative costs of modifying a remedy, which may include preparation of an ESD or ROD amendment, responding to the concerns of parties affected by the remedy change, and modifying or renegotiating UAOs or consent decrees.

Technical Review. During the review phase, Regions will review the technical information supporting the need to alter the response action. This should include detailed site-specific information related to how the selected remedy has performed or can be expected to perform. This information may be augmented by non-site-specific information such as published reports regarding the efficacy of a particular remediation method under conditions similar to those found at the site, or other widely-accepted technical information that was not available at the time the ROD was signed. The Agency expects that PRPs and federal agencies requesting remedy reviews will take responsibility for collecting and assembling relevant information in a manner that supports an efficient review process. EPA will assume this responsibility for Fund-lead sites.

Implementation. Sites that are selected for update would then pass on to the third phase, implementation. Note that this reform initiative does not in any way change the manner in which remedies are modified, as specified in the March 8, 1990 National Contingency Plan (NCP). Where modifications to a ROD would represent a significant, but not fundamental, change from the selected remedy, EPA (or the lead agency) is required to publish an **Explanation of Significant Difference (ESD)**, as outlined in NCP §300.435(c)(2)(i). Where a ROD modification would result in a fundamental difference from the selected remedy, a **ROD Amendment** should be proposed, as discussed in NCP §300.435(c)(2)(ii). **Minor, or non-significant,** changes to a remedy must be recorded and explained in the post decision document file. Remedy changes that do not alter the remedy selected in the ROD (e.g., some ground water monitoring program changes) may be documented by revision of the work plan or other relevant document.

Community preferences are particularly important regarding any proposed changes to the remedy. Regions must ensure that communities are involved in the remedy update process and should provide an opportunity for public comment whenever the change will result in a ROD amendment. Public notice of modification of a ROD will be carried out in accordance with the NCP and existing guidance. Where an ESD is used, EPA (or the lead agency) generally provides a summary of the ESD in a local newspaper, and makes the ESD and supporting information available to the public in the Administrative Record and in the site's information repository (NCP §300.825(a)(2)). We also encourage the Regions or the lead agency to solicit public comment on ESDs where appropriate. Public involvement for ROD amendments is carried out in the same manner as for a ROD, including requirements for public comment, response to comments, and update of the

Administrative Record (refer to OSWER Directive 9355.3-02). For minor, or non-significant changes, the public may access documentation of the changes in the post decision document file in the Administrative Record. If the lead agency chooses, it also may publish an optional Fact Sheet describing the minor changes to the ROD.

Further guidance on what may constitute a minor, significant, or fundamental change to a ROD can be found in the Preamble to the above sections of the NCP, and in OSWER guidance documents "Interim Final Guidance on Preparing Superfund Decision Documents" (Directive 9355.3-02, October 1989) and "Guide to Addressing Pre-ROD and Post-ROD Changes," (Publication No. 9355.3-02FS-4, April 1991).

State, Native American Tribe, or Supporting Agency Role

States play a role in the modification of remedy decisions. Both CERCLA §121(f) and the Model CERCLA Consent Decree (which forms the basis for most consent decrees) provide that the States be given the opportunity to review and comment on specified steps in remedy selection. Further, the Model Consent Decree requires that the State be given a reasonable opportunity to review and comment on any proposed modifications. Agreements between EPA and a State, including contracts, may require modification following a change to a remedy. Further information regarding the role of States and supporting agencies in the remedy modification process can be found in the "Interim Final Guidance on Preparing Superfund Decision Documents," OSWER Directive 9335.3-02 (October 1989).

Native American Tribes are afforded substantially the same treatment as States with respect to certain provisions of CERCLA (see CERCLA §126; NCP § 300.5). A tribe that is federally-recognized, has a governing body that is currently performing governmental functions regarding environmental protection, and has jurisdiction over a Superfund site can be treated substantially the same as states under CERCLA §104 (see NCP §300.515). For more information, please contact Dave Evans (Director; State, Tribal, and Site Identification Center), at (703)-603-8885.

Modifications of RD/RA Consent Decrees

When a modified remedy is to be (or is being) implemented by PRPs pursuant to a Remedial Design/Remedial Action (RD/RA) consent decree, modification of the consent decree may be necessary. Most remedy updates will require modification of the Statement of Work (SOW) which provides detail regarding implementation of the ROD. Most consent decrees follow the Model Consent Decree which provides that any material modification to the Statement of Work for the remedy requires the written approval of the United States, the settling PRPs, and the court which entered the decree. Where remedy updates adopted pursuant to this administrative reform proposal result in cost savings to the settling defendants, it is not anticipated that the Regions will have difficulty obtaining the cooperation (and assistance) of PRPs in preparing the documents required to obtain court approval of the modified consent decree.

Where the modified remedy requires a nonmaterial change in the SOW, the Model Consent Decree language provides that the modification can be made upon written agreement between EPA (after providing the State a reasonable opportunity to review and comment on the modification) and the settling defendants. If the remedy update does not require a change to the SOW, the Model Consent Decree modification provision does not require approval of the settling parties. The Department of Justice should be consulted as soon as the Region believes that modification of the consent decree would be required to accommodate a remedy change.

Headquarters Consultation

Current policies regarding consultation with Headquarters on certain remedy selection issues apply to this initiative. Current consultation policies are found in the memorandum entitled, "Twenty Fifth Remedy Delegation Report - FY 1994," signed by Richard J. Guimond, October 8, 1993. However, in the future the Regions should refer to any relevant Headquarters memoranda updating these consultation guidelines.

Conclusion

In closing, let me state that the success of this Superfund Reform will be contingent in part on how well the results of these reviews and updates are communicated among Regional and Headquarters offices. Progress reports, including the number and type of remedies reviewed, and the number and nature of the remedies updated, will be prepared periodically by my staff with your involvement. Copies of these reports will be provided to you so that you may be aware of national trends in this reform effort. We expect to hold periodic conference calls to coordinate the national implementation of this Superfund reform and to obtain results on the progress in reviewing and updating RODs.

If you have any questions or wish to discuss these matters further, please contact Peter Feldman ((703) 603-8768) or Bruce Means ((703) 603-8815) of the Office of Emergency and Remedial Response, Karen Harrison of the Office of Enforcement and Compliance Assurance ((202) 564-5121), or Brian Grant of the Office of General Counsel ((202) 260-6512).

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