



Department of Energy

Washington, DC

June 30, 2000

Docket Clerk
RCRA Information Center
U.S. Environmental Protection Agency
Crystal Gateway I, First Floor
1235 Jefferson Davis Highway
Arlington, Virginia 22202

Docket Number F-2000-CURA-FFFFF

Dear Sir or Madam:

Re: *Handbook of Groundwater Policies for RCRA Corrective Action, EPA530-D-00-001, April 2000 Draft*

On April 20, 2000, the Environmental Protection Agency (EPA) released for comment a draft guidance document, *Handbook of Groundwater Policies for RCRA Corrective Action*, EPA 530-D-00-001. The Department of Energy (DOE) appreciates the opportunity to comment on this Handbook. More than 60 DOE sites continue to undergo remediation under EPA or State corrective action authorities or similar remediation programs. Nearly all of these sites require groundwater remedial actions. At many other DOE sites, maintenance of corrective action remedies will be occurring for many years where groundwater remains contaminated with hazardous and radioactive constituents.

DOE particularly appreciates the effort that EPA spent in compiling many of its related groundwater policies into one document. This comprehensive guidance is particularly important because EPA has chosen not to finalize national regulations to implement corrective action, and because EPA has announced several reform initiatives in recent months that greatly impact implementation of DOE corrective action projects (e.g., environmental indicators). Throughout the last few years, DOE has been concerned about how the latest thinking on important corrective action topics will be made available consistently to regulators and the regulated communities. DOE encourages EPA to continue this effort and issue its other announced guidance documents as soon as possible for comment.

In general, DOE supports most of EPA's positions in the Handbook, particularly those that reinforce the flexibility available to regulators and regulated parties in implementing remediation of groundwater as part of RCRA corrective action projects. Very important to DOE is EPA's emphasis on the flexibility that EPA and States have in making groundwater use designations, and EPA's continued recognition that monitored natural attenuation and technical impracticability strategies are, in many cases, essential remedial elements in addressing the complex remediation scenarios found at DOE facilities.

In our comments, there are several areas, however, where we seek clarification of EPA's intent, request additional guidance, or suggest additional topics that EPA should include in a revised version of this Handbook. Major areas of DOE comments are:

- EPA could provide further guidance on the available options that sites have used to comply with the environmental indicators (EIs). There also remain some important unresolved jurisdictional issues, including what constituents are appropriately part of EI determinations and how these determinations interact with remediation projects being done under other authorities (e.g., CERCLA).
- EPA should make available as much information as possible on how environmental indicator determinations are being made, so that DOE project managers have examples of what leads to a "yes" (i.e., EIs met) determination. Without more guidance on critical questions in the EI process (e.g., groundwater/surface water interactions, cross-media transfers from groundwater plumes to indoor air exposures), these determinations could become unnecessarily complex and costly.
- DOE appreciates the flexibility afforded in the Handbook for making groundwater use determinations. DOE has some concern, however, that there is no specific guidance offered for integrating groundwater assessments into these determinations, or providing more standard criteria that can be used by project managers to make consistent groundwater use designations.
- For a number of DOE facilities, flexibility in the application of the Point of Compliance (POC) guidance may be more appropriate. There are, for example, instances where multiple POCs may be more useful than a single "throughout-the-plume" POC.

DOE comments are organized into two sections:

General Comments - This section describes overarching positions and reactions to the guidance information discussed in the Handbook.

Detailed Comments - This section provides specific comments, organized by the section of the Handbook to which they apply, as EPA requested in its FR notice.

If you have any questions or need further clarification of our comments, please contact Jerry Coalgate or my staff at 202-586-6075 or jerry.coalgate@eh.doe.gov.

Sincerely,



Thomas T. Traceski
Director, RCRA/CERCLA Division
Office of Environmental Policy and Guidance

Enclosure

cc: G.Tomassoni, EPA, Office of Solid Waste (5303W)
R.Hall, EPA, Office of Solid Waste (5303W)



**UNITED STATES
DEPARTMENT OF ENERGY**

Comments on

**Handbook of Groundwater Policies for RCRA Corrective Action
Docket # F-2000-CURA-FFFFF [Draft April 20, 2000]**

June 30, 2000

**UNITED STATES
DEPARTMENT OF ENERGY**

**Comments on
Handbook of Groundwater Policies for RCRA Corrective Action
Draft
April 20, 2000**

I. General Comments

1. DOE generally finds the Handbook to be very informative and useful. It is very helpful to have all the relevant policy and guidance related to this complex subject in one place, as well as EPA providing its national Headquarters philosophy about how these policies should be implemented by EPA Regions and States. This approach is particularly important and useful in light of EPA deciding not to finalize RCRA corrective action regulations originally proposed in 55 *FR* 30798, July 27, 1990.
2. DOE found the idea of hyperlinks and direct access to documents and policy memoranda very helpful. Throughout our Detailed Comments, we have noted several places in the document where additional links would be helpful. We have also noted a few limitations of this approach and several of the links that did not seem to provide access to the requested document.
3. We applaud EPA's use of the plain language approach to discuss the main elements of its groundwater policies. In general, the approach was very readable and easy to understand. In several places throughout our comments, we have pointed out alternative words or sentence structures to clarify the meaning of a point better.
4. DOE has pointed out a number of places in the document where graphics could be very helpful to clarify the meaning of a section. For example, in illustrating such concepts as point of compliance, a simple graphic would help support EPA's intention to make these concepts as understandable as possible to a broad audience.
5. Given the obvious importance and relative new focus by EPA on environmental indicators as a critical aspect of the short-term protectiveness goals, DOE believes EPA needs to issue more guidance and information related to approaches facilities can use to meet these elements of a groundwater corrective action. Twenty DOE facilities are currently listed on EPA's baseline list and, therefore, are likely to have EI determinations made. As EPA outlines in the Handbook, the only guidance that exists currently on this topic for facilities is the February 5, 1999, guidance and EI forms that contain the EI questions. Moreover, the Handbook provides no additional examples, graphics, or case examples that would be helpful to a project manager who is faced with being part of environmental indicator determinations at their facility.

DOE encourages EPA to make available as soon as possible examples of completed forms from EI determinations that EPA has signed off on at sites throughout the country. Completed forms would help to illustrate the expectations that EPA has for the amount of analytical data that are necessary and the types of controls that EPA considers acceptable to make an EI determination. DOE is particularly interested in seeing examples of EI determinations that EPA has made at other Federal facilities where land use is under security or access controls, and the groundwater is not currently a source of drinking water for nearby populations. In addition, DOE is interested in viewing how EPA is assessing the controls needed for other common challenges that DOE faces – contamination in deep aquifers or complex geologies, aquifers contaminated with plumes of non-aqueous phase liquids (NAPLs), and aquifers that have interactions with surface water bodies.

6. DOE agrees with the three short-term protectiveness goals that EPA indicates remain important to focus groundwater investigations and cleanup projects. To quote the current Handbook, “[s]hort-term goals associated with the groundwater include preventing, minimizing, or eliminating 1) current or near-term unacceptable exposures to humans or ecologic receptors from contaminated groundwater; 2) sources of groundwater contamination; and 3) the spread of contaminated groundwater above levels of concern.” (P. 11).

However, EPA translates achieving these goals into meeting the two environmental indicators as the only measures on which facilities should focus in the short term. When these environmental indicators become the only measure of whether a facility has achieved short-term protectiveness, DOE notes that it faces some unique challenges that EPA should recognize. These challenges include:

- Clarifying the reach of environmental indicators at DOE sites. This includes determining whether the indicators are correctly applied to portions of the site regulated by programs other than RCRA corrective action (e.g., CERCLA, radioactive waste management programs); and whether all constituents, including those not regulated under RCRA, are properly evaluated under the environmental indicator questions. To date, no national guidance or decisions exist about these issues, leaving significant ambiguity about whether the environmental indicators are always the appropriate measures to focus on as part of a program to address groundwater contamination in the short term.
- Recognizing that DOE has already agreed to enforceable milestones at many of its facilities. These milestones may not always be able to be reprioritized and changed to reflect the timeframe in which EPA is evaluating compliance with environmental indicators.

Therefore, DOE encourages EPA to focus more of this section on the continued relevance of the initial three short term protectiveness goals, and acknowledge that at some facilities,

substantial risk reduction and environmental protection can be accomplished without necessarily meeting the environmental indicators.

7. DOE applauds EPA's message of flexibility that is embodied in three particular areas of the document: (1) groundwater use determinations, (2) availability and use of monitored natural attenuation, and (3) continued availability of technical impracticability determinations. However, DOE requests some expanded guidance in several areas:
 - DOE suggests a more in-depth discussion of groundwater quality assessments, as an integral part of corrective action applied to groundwater. The assessments would be preliminary to and an integral part of a corrective action applied to groundwater. Existing EPA documentation makes only vague reference on how and to what objectives assessment measurements (e.g., migration and concentrations of waste) are to be applied. A more precise definition of the decisions to be applied would allow a more efficient assessment and improve the corrective action decisions.
 - DOE also suggests that, to the extent possible, EPA provide additional detail on the terminology used in the groundwater use determination process. For example, DOE seeks more explanation on the meaning of "reasonably expected use" and "resource value (e.g., priority)" and what, if any, criteria exists to make these determinations.
 - If procedures or guidance exists for verifying the validity of groundwater use in developing groundwater cleanup objectives, DOE suggests that the verification process or criteria be further explained.
8. DOE agrees that the use of interim actions (or early actions at CERCLA sites) should be considered when it is necessary to stabilize RCRA site conditions. The Department suggests that EPA consider mentioning that it has also referred to these as "interim measures" [e.g., EPA, 1994. *RCRA Corrective Action Plan*, Chapter II; OSWER Dir. 9902.3-2A, Office of Waste Programs Enforcement, Washington, D.C.]. EPA should reference the approaches on how interim actions can help support final actions that EPA included in the 1996 CERCLA report, "Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground water at CERCLA Sites" [EPA 540-R-96-023].
9. There are two comments regarding the Point of Compliance section of this document:
 - DOE believes that there are instances where EPA's "throughout-the-plume/unit boundary" point of compliance may not foster the most effective remediation decisions. There are situations where multiple Points of Compliance may be more effective. For example, in cases where radioactive contamination of ground water remains at large Federal facilities, the contaminated areas may remain under the

control of the Government for some time. It seems appropriate to DOE that a POC close to the unit boundary would be established to monitor the area under long term Federal management, and a second POC could be established at the facility boundary or some appropriate intermediate location.

- DOE suggests that EPA further discuss how groundwater use designations can and do influence the establishment of POCs. In many large DOE facilities, groundwater within the facility boundary may never be established as a residential drinking water source; however, some locations situated farther down-gradient from the source could be subject to compliance with drinking water standards. In these cases, these differing use designations of the same groundwater source would influence the POC locations.

10. Some additional topics that DOE would like EPA to address are:

- Groundwater cleanup levels relationship to background levels. DOE noted that noticeably absent from the cleanup levels discussion (page 18) is the relationship to and use of background levels. Although DOE recognizes that EPA has explained and reiterated its position of the “remove and decontaminate” standard and the use of protective, risk-based cleanup levels [see EPA memorandum dated March 16, 1988 (Subject : Risk-Based Clean Closure) and 61 *FR* 19449; May 1, 1996], the Department has encountered instances that cleanup to background levels was expected. DOE suggests that EPA briefly restate its position regarding the role of background levels during groundwater cleanup
- Technical Impracticability and Closure. As part of the TI discussion, it would be useful for EPA to delineate TI practices for units that are or will be closing. Specifically, the extent that a TI decision needs to be re-evaluated during the post-closure care period; and the responsibilities of the facility if/when the technology becomes available either before or after the 30 year post-closure care period.

II. Detailed Comments

OVERALL COMMENTS

1. The handbook was very user-friendly, had good links, and the gray boxes were very useful. It is particularly useful to have each chapter address critical elements of the remediation process for contaminated ground water. This is the best mechanism to assemble and facilitate the distribution of valuable information. The idea of minimal narrative to describe and provide electronic access to the actual reference, instead of paraphrasing is a great improvement over the way handbooks and guidance are generally developed. This will also allow continuous updates for references, etc.
2. There are a number of places in the document where the use of graphics (e.g., flowchart or other graphic representation) would be helpful to illustrate the sequence and relationships of various elements of the corrective actions. For example, in the discussion of point of compliance, it might make the discussion more clear if a visual were present illustrating the points raised in the discussion.
3. It might be useful to include a section of additional references at the end which lists EPA headquarters and regional guidance documents addressed in this the policy compendium. For example, it would be informative to provide technical references on specific topics. These could include important and useful/relevant books, articles, EPA and other government guidance/technical documents. An example which could be included is "Use of Institutional Controls In the RCRA Corrective Action Program", Region 5, Waste, Pesticides, and Toxics Division, March 2000. There are also a number of guidance materials developed by the Department of Energy which may be of interest and value to potential users of this Handbook. If EPA has a concern regarding endorsement of these documents, it would be a simple matter to add a disclaimer type statement indicating that these other guidance materials are available for the reader's use but EPA does not necessarily endorse them. Some DOE guidance documents which might be of interest are:

Environmental Restoration Waste Management Guide, Office of Environmental Policy and Guidance (EH-413), June 2000

Environmental Response Design and Implementation Guidance, DOE/EH-413-9915, December 1999

Use of Alternate Concentration Limits (ACLs) to Determine Cleanup or Regulatory Levels Under RCRA and CERCLA, DOE/EH-413-9912, December 1999

Technical Impracticability Decisions for Ground Water at CERCLA Response Action and RCRA Corrective Action Sites, DOE/EH-413/9814, August 1998

Development of Remediation Goals under CERCLA, DOE/EH-413/9711, August 1997

RCRA Facility Stabilization Initiative, EH-231-076/0295, February 1995

These documents may be downloaded from the EH-41 website on the World Wide Web at [\[http://tis.eh.doe.gov/oepa/\]](http://tis.eh.doe.gov/oepa/) under "Policy and Guidance.

4. The use of hyperlinks embedded within the handbook is an innovative and useful approach for the majority of the quick references. However, several obstacles became obvious while using this method for some of the other references. First, when viewing the document on-line, accessing most links does not then return the reader to the place in the Handbook that the link was first accessed. Rather, you are returned to the first page of the Handbook document. Also, several of the links, most noticeably the link to <http://yosemite.epa.gov/osw/rcra.nsf/>, were unavailable during several weeks of the review.

If this Handbook is intended for use by all of the "stakeholders," EPA must understand that not all interested individuals will have access to the network on a routine basis because of location, budgetary constraints related to network access, and computer equipment, etc. Our intent is not to discourage the use of the electronic media for accessing referenced documents; however, EPA should be sensitive to the fact that many stakeholders still do not have access to the expertise or the financial resources to conduct such detailed searches for the applicable referenced documents. Finally, the following guidance documents listed in the reference section were not available online.

- EPA, 2000. Applicability of RCRA Section 3020 to In-Situ Treatment of Ground Water. Memorandum from Elizabeth Cotsworth, Director, Office of Solid Waste to RCRA Senior Policy Advisors;
- EPA, 1989a. OSWER Directive 9234.1-06, "Applicability of Land Disposal Restrictions to RCRA and CERCLA Groundwater Treatment ReInjection Superfund Management Review: Recommendation No. 26," (November 27);
- EPA, 1989b. National Priorities List for Uncontrolled Hazardous Waste Sites - Final Rule Covering Sites Subject to the Subtitle C Corrective Action Authorities of the Resource Conservation and Recovery Act (commonly referred to as the RCRA Deferral Policy). (Available in Section V, which appears on 54 FR 41004-41006 (October 4), had to be found using more advanced internet search engines.);
- EPA, 1988. OSWER Directive 9283.1-2, "Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites," (December 1);
- EPA, 1987. Alternate Concentration Limit Guidance (EPA/530-SW-87017);
- EPA, 1986. Guidelines for Ground-water Classification under the EPA Ground-Water Protection Strategy."

5. EPA uses the terms “contaminant,” “contaminated media,” and “contamination” throughout this publication. Although it may be difficult to separate (from a cleanup standpoint) radionuclides from any associated RCRA-regulated contaminants (i.e., hazardous constituents), as a general matter, the Department has concerns that users within the regulator community (i.e., EPA Regional and authorized state personnel) may extend the scope of these terms (and of this RCRA-based guidance) to include radionuclides and the radioactive portion of mixed waste.

DOE requests that EPA clarify the scope of “contaminant” and, more specifically, distinguish between contaminants subject to RCRA authorities, including corrective action, and other hazardous substances; specifically radionuclides and the radioactive portion of mixed waste. EPA should consider inserting the following language, which is excerpted from Footnote 1 of an EPA form titled Current Human Exposures Under Control Environmental Indicator (EI) RCRIS code (CA725), into Appendix 2 - Glossary of the Handbook [see also General Comment #2 and Specific Comment (RE: App. 2)]:

“Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range) or, relative to ground water, in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

COMMENTS BY SECTION

Overview Section

How do these policies apply to States authorized to implement the RCRA Corrective Action Program?

6. Page 2, 1st paragraph, Line 1: ***As of the most recent update of this Handbook, EPA has authorized 33 States and territories to implement facility-wide corrective action through their State hazardous waste programs in lieu of EPA.***

It might be useful to include a list of the authorized States as an appendix to this document or provide a link to where these data are available.

7. Page 2, 1st paragraph, line 5: ***EPA’s authorization of a State corrective action program is based on an evaluation that the State is capable of implementing corrective action equivalently to EPA, and in a manner consistent with applicable federal statutes, regulations, and guidance.***

The use of “equivalently” to EPA may be a bit vague as to the intended meaning. “Equivalent” could mean the State program has the same elements (i.e., closure, corrective action,

permitting, etc.), as the federal program, but it does not necessarily mean that the regulatory requirements are the same in terms of stringency. It is our understanding that a State program must be as stringent as, or more stringent than, federal (EPA) programs regulations. Therefore, the meaning of this sentence would be clearer to the reader if the sentence was rephrased to read: A...that the State is capable of implementing corrective action requirements as stringent, or more stringent than the federal program”.

What topics does this Handbook discuss?

8. Page 3, 1st paragraph, lines 1 – 5: ***EPA selected the topics in this Handbook because they are very often the subject of questions and some confusion. The topics in this Handbook apply to facilities undergoing facility-wide corrective action under the Hazardous and Solid Waste Amendments to RCRA.***

Notably absent from the document is a discussion of RCRA groundwater quality assessments. The assessments would be preliminary to and an integral part of a corrective action applied to groundwater. An assessment is required when a facility impacts groundwater to determine the rate and extent of dangerous waste or dangerous waste constituent migration in the groundwater and to determine their concentrations in the groundwater. These are relatively open-ended objectives. The “RCRA Ground-Water Monitoring Technical Enforcement Guidance Document” (1986) goes into detail on the conduct of a groundwater quality assessment, but makes only a vague reference on how and to what objectives these measurements/observations are to be applied. This ambiguity can lead to a costly and relatively unproductive effort. A more precise definition or explanation of the decisions to be made by an assessment in this Handbook would allow development of a more efficient and productive assessment of the contaminant migration that would support the corrective-action measures.

9. The document could benefit from a discussion on management of Investigation Derived Waste, specifically clarifying the contained-in policy.
10. Guidance should be presented on addressing groundwater contamination under extreme conditions, such as in arid climates, when groundwater is located at excessive depths, and when contamination is limited to remote locations.

Where do the policies in this Handbook come from?

11. Page 4, 1st paragraph, line 13: ***In an October 7, 1999 Federal Register Notice, EPA announced its withdrawal of most of the provisions of the corrective action provisions.***

Grammatically, the date should be written ...October 7, 1999, Federal... It would be useful to provide a link to the subject notice.

12. Page 4, 3rd paragraph, line 1: *In a June 1, 1999 memorandum (<http://www.npr.gov/library/direct/memos/memoeng.html>), President Clinton directed federal agencies to write all new documents in plain language.*

The “title” of the memorandum (“Plain Language in Government Writing”) should be provided

13. Page 4, 4th paragraph, line 1: *Another source of perceived change stems from the maturing of the RCRA Corrective Action terminology...media cleanup objectives.*

The introduction of all the terms in this paragraph may be confusing to some readers. It might be useful to have a graphic that describes them and shows the relationships between them.

Are the policies for RCRA Corrective action contained in this Handbook consistent with the Superfund cleanup program?

14. Page 5, 1st paragraph, line 1: *The basic approaches described in this Handbook for groundwater cleanup and the remedial goals it promotes are the same as those under Superfund.*

This sentence is confusing and needs to be reworded. It would be useful to identify what these goals are at this point. Specifically, what is the subject of “it promotes” refers to? Is it the Handbook or the basic approaches?

15. Page 5, 1st paragraph, line 2: *The basic approaches described in this Handbook for groundwater cleanup and the remedial goals it promotes are the same as those under Superfund.*

It would be useful to identify what these goals are at this point.

16. Page 5, 1st paragraph, line 3: *Much of the Handbook is derived from guidances developed jointly by EPA’s cleanup programs (e.g., Use of Monitored Natural Attenuation at Superfund, RCRA and Underground Storage Tank Sites).*

It would be useful to provide the number of the monitored natural attenuation guidance as well as a link to it on the EPA website. For example, “The final Monitored Natural Attenuation Directive (OSWER Directive 9200.4-17P) is available on the World Wide Web via the EPA Homepage at [<http://www.epa.gov/swerust1/directiv/d9200417>].”

Overview Section – Editorial Comments

17. Page 1, footnote #1, line 2: *The Subtitle C program governs the management of hazardous waste (for more information see see RCRA Orientation manual”*

There is redundant word in , "see see RCRA Orientation Manual"

18. Page 5, line 3: *Are the policies for the RCRA Corrective action contained in this Handbook consistent with the Superfund cleanup program?*

“Corrective action” in this question should be “Corrective Action”.

19. Page 5, 1st paragraph, line 3: *Much of the Handbook is derived from guidiances developed jointly by EPA’s cleanup programs (e.g., Use of Monitored Natural Attenuation at Superfund, RCRA and Underground Storage Tank Sites).*

The word “guidances” is misspelled.

Groundwater Use Designations

What is a groundwater use designation?

20. Page 7, 1st paragraph, line 1: *A groundwater use designation is a determination of reasonably expected use, resource value (e.g., priority), and/or vulnerability of groundwater in a particular area.*

DOE requests that EPA describe the existing policy or approach used for determining when the use of groundwater can be “reasonably expected” and whether this determination is based on the foreseeable future or an indefinite period of time.

The term “reasonably expected use” is a subjective term. It would be useful if the subject document explained what this generally means. Are there criteria that are used to identify what a “reasonably expected use” is? If so, they should be identified. If these are regulatory requirements, a regulatory citation should be provided to the source.

21. Page 7, 1st paragraph, line 2: *A groundwater use designation is a determination of reasonably expected use, resource value (e.g., priority), and/or vulnerability of groundwater in a particular area.*

The agency should explain what “resource value (e.g., priority)” means. Does Apriority” mean that a groundwater resource of highest value as a source of drinking water would be of the highest “priority”?

22. Page 7, Text Box: *Factors for Groundwater Use Designations*

We recommend that a citation for the source of the factors be provided.

How can groundwater use designations enhance flexibility for RCRA cleanups?

23. Page 8, 2nd paragraph, line 1: ***Regardless of the groundwater use designation, facilities should comply with all State and Federal laws for preventing new releases of contamination, and do their part to minimize hazardous waste generation.***

DOE agrees that preventing new releases and minimizing hazardous waste generation should be integral components of a ground water protection strategy. DOE suggests EPA consider expanding on the relationship between preventing new releases/minimizing hazardous waste generation and how use designations can enhance flexibility. If EPA elects to expand this discussion, it should consider inserting language on anti-degradation policies and how these policies protect groundwater as “waters of the state.”

How does EPA’s policy on groundwater use affect States which consider all of their groundwater to be a potential drinking water supply?

24. Page 9, 1st set of bullets. ***EPA outlines several factors or criteria which it believes States can use to distinguish among potential drinking waters on a facility-specific basis.***

DOE suggests that EPA consider inserting the following additional factors or criteria into their existing list:

- likelihood of impacting sensitive areas (wetlands) or environmental receptors;
- proximity to existing public water supply;
- hydrogeological constraints (e.g., aquifers with transmissivity less than 50 ft.²/day; complex fracturing in bedrock); and
- the presence of elevated concentrations of naturally occurring contaminants.

Who makes groundwater use designations?

25. Page 10, 1st paragraph, line 2: ***EPA prefers that such alternative state groundwater use designations comprehensive, be state-wide, be based on use, value and vulnerability, and would lead to achieving EPA’s short-term protectiveness goals and final remediation goals.***

Suggested editorial comment: Revise the sentence as follows: “EPA prefers that such alternative state groundwater use designations be comprehensive; state-wide; based on use, value and vulnerability; and lead to achieving EPA’s short-term protectiveness goals and final remediation goals.”

26. Page 9, footnote 3, line 5: ***In 1997, EPA’s Office of Solid Waste and Emergency Response issued a directive encouraging EPA’s remediation programs to defer to State determinations of current and future use when based on an EPA-endorsed CSGWPP that has provisions for facility-specific decisions.***

We recommend that the title/subject of the directive be given and, if it available on-line, a link to the directive be provided.

What are EPA’s guidelines for making groundwater use designations?

27. Page 10, 2nd paragraph. ***In discussing its guidelines for making groundwater use designations, EPA references a guidance titled “Guidelines for Groundwater Classification under the EPA Ground-Water Protection Strategy” (EPA, 1986) and goes on to describe the three classes of groundwater that represent a hierarchy of groundwater resource values to society (i.e., Class I, Class II, and Class III).***

DOE is also aware, however, of EPA's July 1991 policy, which is outlined in Protecting the Nation’s Ground Water: EPA’s Strategy for the 1990's (EPA 21Z-1020). This guidance bases the approach on two classes (i.e., either the ground water is a current or potential future source of drinking water or it is not). The July 1991 EPA ground water policy states that remediation will generally attempt to achieve a total lifetime cancer risk level in the range of 10^{-4} to 10^{-6} and exposure to non-carcinogens below appropriate RfDs. This policy further clarifies that more stringent measures may be selected based on site-specific factors (e.g., cumulative effect of multiple contaminants, exposure from other pathways). Less stringent measures may be authorized based on factors such as technological practicability, adverse environmental impacts of remediation measures, cost, and low likelihood of use.

DOE suggests that EPA clarify the relationship between the two classification schemes and, moreover, distinguish which takes precedence at RCRA ground water corrective action sites, while recognizing individual state’s roles.

Short-Term Protectiveness Goals Section

What are EPA’s short-term protectiveness goals for groundwater?

28. Page 11, 1st paragraph, line 2: ***Short term goals associated with groundwater include preventing, minimizing, or eliminating (1) current or near-term unacceptable exposures to humans or ecological receptors from contaminated groundwater; (2) sources of groundwater contamination; and (3) the spread of contaminated groundwater above levels of concern.***

It is unclear as to the time frame “near-future” is referring to. What is the difference in “short-term” and “near-future”, or their relationship to each other, in the context of this paragraph? It would be useful if the Agency could indicate what period represents “near-future” (i.e., 10 years?, 20?).

29. Page 11, Footnote #1: ***Levels of concern are generally concentrations of each contaminant in groundwater appropriate for the protection of the groundwater resource and its maximum beneficial use.***

In order to be consistent with EPA's guidance provided on Environmental Indicators, DOE suggests that the footnote be revised as follows: "Levels of concern are generally concentrations of each contaminant subject to RCRA corrective action authority in groundwater appropriate for the protection of the groundwater resource and its maximum beneficial use."

How do facilities achieve these goals?

30. Page 11, 1st paragraph, line 1-4: ***Facilities should, as appropriate, use interim actions, sometimes referred to as stabilization actions, to achieve these goals while pursuing final remedies.***

DOE agrees that the use of interim actions (or early actions at CERCLA sites) should be considered when it is necessary to stabilize RCRA site conditions. The Department suggests that EPA consider mentioning that the Agency has also referred to these as "interim measures" [e.g., EPA, 1994. RCRA Corrective Action Plan, Chapter II; OSWER Dir. 9902.3-2A, Office of Waste Programs Enforcement, Washington, D.C.]. Also, EPA should consider inserting ", often as part of a phased approach, while long-term remedies are pursued." at the end of the paragraph following "facility." This phrase conveys that interim actions may occur individually or as part of a larger corrective action.

Rationale for Short-Term Protectiveness Goals

31. Page 11, Text Box, line 1: ***The highest priority of the RCRA Corrective Action Program is to make sure people are not being exposed to risky levels of contaminants.***

We suggest the use of "risky levels" might be confusing to the reader. Perhaps it would be better to phrase this sentence as something like: "The highest priority of the RCRA Corrective Action Program is to make sure that people are not being exposed to contaminant concentration levels that pose a significant risk to their health."

How does EPA know when facilities achieve these goals?

32. Page 11, 1st paragraph: *EPA tracks the implementation of stabilization activities at facilities in a computer database known as RCRIS (RCRA Information System). EPA also developed two facility-wide indicators to track short-term goals on a national basis. While EPA continues to track stabilization activities on a unit or area-specific basis, EPA believes that facility-wide measures are important to convey an overall sense of environmental conditions at a RCRA facility. The two Environmental Indicators are called “Current Human Exposures Under Control” and “Migration of Contaminated Groundwater Under Control.”*

For continuity of thought, we suggest revising this paragraph to something like: “The EPA tracks the implementation of stabilization activities at facilities in a computer database known as RCRIS (RCRA Information System). The EPA also developed two facility-wide indicators to track short-term goals on a national basis. The two Environmental Indicators are called “Current Human Exposures Under Control” and “Migration of Contaminated Groundwater Under Control.” While EPA continues to track stabilization activities on a unit or area-specific basis, the Agency considers facility-wide measures to be important for conveying an overall sense of environmental conditions at a RCRA facility.”

33. Page, 11, 2nd paragraph.

DOE recommends that EPA issue more guidance and information related to approaches facilities can use to meet the EI objectives for groundwater corrective action. As EPA outlined in the Handbook, the only guidance that exists currently on this topic for facilities is the February 5, 1999 guidance and EI forms that contain the EI questions. Moreover, the Handbook provides no additional examples, graphics, or case examples that would be helpful to a project manager who is faced with being part of environmental indicator determinations at their facility. DOE encourages EPA to make available as soon as possible examples of completed forms from EI determinations, that EPA has signed off on at sites throughout the country, to illustrate the expectations that EPA has for the amount of analytical data that are necessary and the types of controls that EPA considers acceptable. DOE is particularly interested in seeing examples of EI determinations that EPA has made at other Federal facilities where land use is under security or access controls and the groundwater is not currently a source of drinking water for nearby populations. In addition, DOE is interested in viewing how EPA is assessing the controls needed for other common challenges that DOE faces – contamination in deep aquifers or complex geologies, aquifers contaminated with plumes of non-aqueous phase liquids (NAPLs), and aquifers that have interactions with surface water bodies.

34. Page 11, 2nd paragraph, line 6: *You can see the progress toward achieving these goals at <http://www.epa.gov/oswfiles/rcraweb/webreporting/caindicators.htm>.*

It might be useful to note that the EI guidance is available on the web and provide a link to it.

How does a facility achieve an Environmental Indicator?

35. Page 12, 1st paragraph. ***EPA briefly describes the demonstrations that must be made to achieve each of the environmental indicators; however, it does not reference the Internet-based guidance EPA Headquarters has prepared and distributed to its RCRA Senior Policy Managers to facilitate their determinations.***

EPA's Interim-Final guidance furnishes a useful framework for persons seeking to make an EI demonstration and, moreover, offers more explicit guidance regarding the minimum level of documentation that will be required to ensure that the determinations will be verifiable. However, DOE suggests that EPA reference the Interim-Final Guidance for RCRA Corrective Action Environmental Indicators and insert a "hyperlink" (http://www.epa.gov/epaoswer/osw/ei_guida.pdf) to the most recent version available to the regulated community.

36. Page 12, 1st paragraph, line 1: ***For Current Human Exposures Under Control, facilities should be able to demonstrate that there are no current unacceptable human exposures to contamination from the facility.***

This sentence is not complete in defining the phrase "Current Human Exposures Under Control." In order to be consistent with the definition and explanation provided in EPA's "Documentation of Environmental Indicator Determination" forms dated 2/5/99, DOE suggests that this sentence be revised as follows: "For 'Current Human Exposures Under Control,' a facility should be able to demonstrate that there are no current unacceptable human exposures to contamination (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the facility (i.e., site-wide))."

37. Page 12, 1st paragraph, line 6: ***These two indicators reflect facility-wide conditions for contamination that RCRA Corrective Action can address.***

The sentence above seems to indicate that the indicators are only applicable to RCRA corrective action. We are requesting EPA clarify the applicability of the indicators to CERCLA cleanups at RCRA facilities.

38. Page 12, 1st paragraph, line 2-6: ***For "Migration of Contaminated Groundwater Under Control," a facility should be able to demonstrate that groundwater contamination above levels of concern is not moving beyond the furthest three-dimensional extent to which a contaminant or contaminants occurring in groundwater have migrated.***

This sentence is not complete in defining the phrase “Migration of Contaminated Groundwater Under Control.” In order to be consistent with the definition and explanation provided in EPA’s “Documentation of Environmental Indicator Determination” forms dated 2/5/99, DOE suggests that this sentence be revised as follows: “For ‘Migration of Contaminated Groundwater Under Control,’ a facility should be able to demonstrate that the migration of ‘contaminated’ groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original ‘area of contaminated groundwater’ (for all groundwater “contamination” subject to RCRA corrective action at or from the facility (i.e., site-wide).” Following this sentence, the word “stabilized” should be defined. In addition, DOE suggests that if this comment is accepted, the phrase “area of contaminated groundwater” and the word “stabilized” should be included and defined in the Glossary on page 44.

Who determines when a facility achieves an Environmental Indicator goal?

39. Page 12, 1st paragraph, line 2: ***However, facilities or their consultants may assist EPA in the evaluation by proving information on current environmental conditions.***

This sentence may be confusing to the reader. It makes it sound like the facility may or may not play a role in making an EI determination (i.e., by whether or not it provides data on environmental conditions). Because the EI determination would be made based on information supplied, as well as actions taken by the facility, DOE recommends that EPA acknowledge the facility would usually be involved in the determination. Therefore, we suggest changing to:

“The EPA or authorized State determines when a facility achieves an Environmental Indicator goal. The determination will be based, in nearly all cases, on information supplied, in part by the facility to the regulatory agency.”

Does a facility need to perform additional investigation or cleanup, once the facility achieves the environmental indicators?

40. Page 12, paragraph 1, lines 1-7: ***Achieving the Environmental Indicators is an important interim milestone and does not relieve a facility from meeting investigation objectives or from achieving EPA’s final remediation goals. The facility will often need to conduct further investigation to support evaluation and selection of final remedies. Furthermore, the facility may need to conduct remedial actions that might be outside the scope of the two Environmental Indicators to achieve other short-term (e.g., source control) and final remediation goals for groundwater (e.g., restoring contaminated groundwater).***

This may be confusing and misleading to the readers. It is unclear as to what is meant by “...may need to conduct remedial actions that might be outside of the scope of these two Environmental Indicators to achieve other short-term (e.g., source control) and final remediation goals...” It is our position that the implementation of source control measures is

undertaken as part of an effort to control human exposures and plume migration. As such, shouldn't source control be within the scope of the subject environmental indicators?

The subject paragraph also raises a question regarding when a facility is no longer subject to environmental indicator determinations. If remediation of the facility results in waste left in place, will the facility have to continue to meet the environmental indicator requirements during the post-closure care period?

How do I consider groundwater use in evaluating the "Migration of Contaminated Groundwater Under Control"?

41. Page 12, Paragraph 1, line 4: ***The level of concern will define the boundary of a contaminant plume which should not be expanding to meet this indicator***".

We suggest revising this sentence to read something like: "The level of concern will define the boundary of the contaminant plume, which should not be expanding if the environmental indicator requirement is to be satisfied".

42. Page 12, Paragraph 1 (continued on page 13), lines 7-17: ***EPA determines level of concern on a facility-specific basis, but these would commonly be the groundwater clean-up levels developed to be consistent with the groundwater use designation and considering other current routes of exposure from contaminated groundwater. However, a regulator may choose to define the boundary using more conservative levels of concern, because conservative screening levels may be more readily available. For example, early in the investigation, the regulator may choose to use drinking water standards to define the level of concern, because sufficient information is not yet available to develop appropriate facility-specific concentrations. Generally drinking water standards will be acceptable to define the boundary of a plume when evaluating this Environmental Indicator unless more stringent levels are needed based on other actual exposures to contaminated groundwater.***

We suggest revising to:

The EPA determines the level of concern on a facility-specific basis. The level of concern will commonly be the groundwater clean-up levels, which are developed to be consistent with the groundwater designation. In addition to the groundwater use designation, the presence of other routes of exposure to contaminated groundwater will affect the establishment of level of concern. However, in some cases, a regulator may choose to define the boundary of the plume using more conservative levels of concern, because conservative screening levels may be more readily available. Furthermore, early in an investigation, the regulator may choose to use drinking water standards [i.e., maximum contaminant levels (MCLs)] to define the level of concern because sufficient information is not yet available to develop appropriate facility-specific contaminant concentrations. Generally, drinking water standards will be acceptable for defining the boundary of a plume

when making a contaminated plume migration controlled determination. In cases where there may be exposures occurring outside the boundary of the facility, more stringent contaminant levels may be required.

43. Page 13, 2nd paragraph (continued from page 12): *According to EPA’s guidance on Environmental Indicators, the Migration of Contaminated Groundwater Under Control Environmental Indicator could be achieved even when the plume is off-site. This position is consistent with the previously stated short-term goal of preventing further migration of contaminated groundwater. However, remediation of the off-site plume will often be a high priority for regulators because facilities typically have less ability to control exposures outside the boundary of the facility.*

We suggest revising to:

According to EPA’s guidance on Environmental Indicators, the Migration of Contaminated Groundwater Under Control Environmental Indicator should be achieved even when the plume is off-site. This position is consistent with the previously stated short-term goal of preventing further migration of contaminated groundwater. However, remediation of the off-site plume will often be a high priority for regulators because facilities typically have less ability to control exposures outside the boundary of the facility.

Short-Term Protectiveness Goals Section – Editorial Comments

44. Page 12, 1st paragraph, line 1: *EPA or the State determines when a facility achieves an Environmental Indicator goal.*

We suggest revising to “The EPA or authorized State determines...”

45. Page 13, 4th paragraph, line 1: *Yes. A facility can achieve this indicator once the regulator determines that the current discharge of contaminated groundwater into the surface water does not cause unacceptable impacts to surface water, sediments, or eco-systems.*

Ecosystems should be one word - ecosystems.

Final Remediation Goals Section

What Are EPA’s final remediation goals for groundwater?

46. Page 14, 1st paragraph, 3rd bullet: *(3) Remediate the sources of releases so as to eliminate or reduce further releases of hazardous wastes or hazardous constituents that may pose a threat to human health and the environment.*

DOE recommends that this statement should read “Control and/or remediate the sources...”

47. Page 14, 1st paragraph and numbered items. *EPA describes three expectations where restoration of groundwater to appropriate cleanup levels is not practicable, including prevent further migration, prevent exposure, and evaluate further risk reduction measures.*

DOE suggests EPA insert “from an engineering perspective” following the word “practicable.” Also, EPA should consider inserting “hyperlink” to the guidance’s “Technical Impracticability” topical discussion.

48. Page 14, Footnote 1. *In explaining the general goals for cleanup and screening tools for potential final remedies, EPA outlines three remedy “threshold criteria” and provides a footnote that reference the “1996 ANPR” that lists four criteria.*

DOE suggests EPA insert the following phrase after “1996 ANPR” – “. . . (61 FR 19449; May 1, 1996) and the initial Subpart S proposal (55 FR 30823; July 27, 1990) . . . ”

Groundwater Cleanup Objectives

What Are groundwater cleanup objectives?

49. Page 16, 1st paragraph, line 3: *EPA recommends that you use clear and concise groundwater cleanup objectives to help focus evaluation, selection, and implementation of remedies aimed at meeting this expectation.*

DOE suggests revising to: “EPA recommends that clear and concise cleanup objectives be established in order to help focus evaluation”...

50. Page 16, Text Box, line 3: *Rationale for Groundwater Cleanup Objectives.*

It is unclear as to how the “performance measures” (i.e., “protected” or “restored”) noted in the text box would be related, if at all, to the EI indicators which are also a form of a performance measure. If there is, a relationship between the two measures, it should be clearly spelled out. It might be useful to include an example of a measure that could serve as a performance measure in this case.

Who specifies groundwater cleanup objectives?

51. Page 16, 1st paragraph, line 1: *Facilities should recommend groundwater cleanup objectives, including all three components. Regulators should consider a facility’s recommendation when developing groundwater cleanup objectives to be included in a final remedial decision.*

This discussion seems terse and may need to be expanded upon since this phase is one of the most critical elements of the remedial process. The Department strongly feels that the establishment of cleanup objectives should involve the regulators, the regulated entity, and other interested stakeholders. For clarity, we suggest this section be expanded to note that the establishment of cleanup objectives is based on information supplied by the facility, EPA/authorized State regulatory and policy requirements, and stakeholder input.

What is the role of groundwater use in developing facility-specific groundwater cleanup objectives?

52. Page 17, 1st paragraph: ***First you should verify that the groundwater use designation is valid. For example, even if the State designation defines the aquifer as a non-drinking water resource, regulators and facilities should verify that no one is drinking the groundwater and that no other unacceptable exposure to contaminants from groundwater is occurring.***

In this paragraph, two references are made to performing verifications of specific actions (i.e., determination of the validity of a groundwater use designation, and a determination that there is no unacceptable exposures to groundwater contaminants). As used here, the exact meaning of “verify” is unclear. In both cases noted, there is the potential for different levels of verification. These could range from reviewing records to conducting field investigations of varying scope and complexity. The Department suggests that EPA identify the kinds of minimal level of information required to determine the validity of the actions noted.

53. Page 17, 2nd paragraph, line 2: ***The facility-specific cleanup objectives should at least be consistent with the groundwater use designation, but should also consider all known or reasonably expected groundwater uses and potential exposures through cross-media transfer, such as volatilization into buildings and hydraulic connections to surface waters and other aquifers.***

Based on the policy discussion appearing on page 7 (“What is a groundwater use designation?”), EPA considers protective groundwater use designation systems to be those that: (1) are based on an overall goal which is no less protective than EPA’s groundwater protection goal; (2) are applied consistently to all groundwaters of a state; (3) consider the key factors listed in the adjacent box; and (4) are developed with thorough public participation. Although the adjacent box (“Factors for Groundwater Use Designations”) includes “connections to surface waters and associated ecological receptors,” it does not explicitly include “potential exposures through cross-media transfer, such as volatilization into buildings.” DOE requests EPA clarify whether “potential exposures through cross-media transfers” generally should be one of the factors for groundwater use designations. DOE also requests EPA identify potential exposures through cross-media transfers. Finally, DOE requests that EPA describe the facility owner/operator role during the groundwater use designation, if any, and whether it expects facility owners/operators to recommend for regulator consideration a preferred use designation based on their analyses of the site-specific conditions, factors, assumptions, uncertainties, and technical limitations.

Groundwater Cleanup Objectives – Editorial Comments

54. Page 17, 3rd paragraph, line 3: *For example, other uses of and exposures to groundwater could include: industrial uses, cooling water, car washes, livestock watering, land irrigation.*

DOE suggests revising to something like: “For example, other uses of, and exposures to, groundwater could include: industrial uses, cooling water, car washes, livestock watering, and land irrigation.”

55. Page 17, 4th paragraph, line 3: *Within the range of reasonably expected uses, the maximum beneficial groundwater use is the one which that warrants the most stringent groundwater cleanup levels.*

Revise sentence as follows: “Within the range of reasonably expected uses, the maximum beneficial groundwater use is the one that warrants the most stringent groundwater cleanup levels.”

Groundwater Cleanup Levels

How should groundwater cleanup levels be developed?

56. Page 18, 2nd paragraph. *EPA clarifies that groundwater cleanup levels should typically be developed (1) by using existing cleanup standards, or (2) based an estimate of actual or potential risk.*

DOE must point out that noticeably absent from this cleanup levels discussion is the relationship to/use of background levels. Although DOE recognizes that EPA has explained

and reiterated its position of the “remove and decontaminate” standard and the use of protective, risk-based cleanup levels [see EPA memorandum dated March 16, 1988 (Subject : Risk-Based Clean Closure) and 61 FR 19449; May 1, 1996], the Department has encountered instances that cleanup to background levels was expected. DOE suggests that EPA briefly restate its position regarding the role of background levels during groundwater cleanup.

Rationale for Groundwater Cleanup Levels

57. Page 18, Text Box, line 1: ***Groundwater cleanup levels provide clear numerical targets. These targets are important to measure both progress and completion of a groundwater cleanup.***

DOE would like EPA to clarify the timeframes within a remediation project when targets are established and when these targets become enforceable standards as part of a permit or an order. For example, in its 1990 Subpart S preamble (55 FR 30822, July 27, 1990), EPA introduced the concept of “preliminary ‘target’ cleanup levels,” indicating that these would serve as “preliminary estimates of media cleanup standards to be established in the remedy selection process.” DOE’s experience is that particularly in complex remediation projects, target levels are important to set early in the action to focus data collection and technology evaluation, but in many cases, actual implementation of remedies (e.g., interim or phases responses) is necessary before final media cleanup objectives can be established. Does EPA still endorse the use of “target” cleanup levels and how do these relate to final media cleanup objectives?

What is the role of groundwater use in setting cleanup levels?

58. Page 19, 1st paragraph, line 6: ***For constituents for which no MCLs have been promulgated, regulators may rely on other established drinking water standards or risk assessment incorporating standard residential exposure assumptions (for example, ingestion of 2 liters per day, exposure frequency of 350 days/year, etc.) to estimate contaminant dose, derive risk estimates, and determine groundwater cleanup levels.***

It isn’t necessarily clear from the text, but it is assumed the example would use an exposure period of 70 years.

59. Page 19, 1st paragraph. In answering this question, EPA refers to tailoring cleanup actions to groundwater use categories. Although DOE agrees that this is the right approach, EPA should provide additional guidance on how to do this. States are reluctant to develop such standards, often relying on EPA. DOE recommends that EPA further describe how tailoring cleanup actions to groundwater use categories should be done, using a real-life example.

What is the cleanup level if the groundwater use is designated as non-drinking water?

60. Page 20, 1st paragraph, lines 5-14: ***To estimate dose, you should evaluate all current and potential exposure routes of exposure within each pathway, such as inhalation, dermal contact, and inadvertent ingestion. EPA does not currently have standard exposure assumptions for most non-residential uses of groundwater. Facilities in consultation with the regulators, generally should quantify facility-specific exposure assumptions for all expected pathways by collecting facility-specific or other relevant data to develop an appropriate numerical value for these exposures. These exposure values along with toxicity values for each contaminant are then used to calculate contaminant-specific concentrations (groundwater cleanup levels) to achieve protective risk levels (e.g., an excess upper bound lifetime cancer risk of 1×10^{-4} to 1×10^{-6} or a hazard index of one).***

DOE suggests it might be useful to provide a simple example with accompanying graphic showing exposure pathways, etc., in order to make the above more meaningful to the reader who isn't particularly familiar with risk assessments, etc. It would also be useful to provide definitions for the technical terms (i.e., dermal, hazard index, excess upper bound lifetime cancer risk, etc.). Most of the users of the Handbook may be sufficiently expert in the various subjects addressed within the handbook. However, there may be individual who are not as well versed that would benefit from the extra information.

Are there any situations where the levels described above might not be appropriate?

61. Page 20, 1st paragraph, line 1 – 2: ***For example, groundwater cleanup levels that are higher or lower than the levels described above, might be appropriate . . .***

This sub-section question refers to “levels described above.” It is not clear what levels are referred to in this question. Are the levels without standards or the levels with standards? Both are discussed in the section immediately preceding this question. DOE suggests that the question be reworded.

62. Page 20, 3rd paragraph, line 1 – 2. ***For example, groundwater cleanup levels that are higher or lower than the levels described above, might be appropriate . . .***

DOE suggests that there are additional situations “where the levels described above might not be appropriate.” For example, based on engineering feasibility and reliability, it may not be practicable or feasible to fully restore ground water to the desired cleanup levels. Specifically, conditions such as hydrogeological constraints (e.g., highly fractured bedrock) and/or contaminant-related factors (e.g., presence of DNAPLs) may trigger the need to consider ground water cleanup as technically impracticable from an engineering perspective. Also, in cases where there is no threat of exposures to releases from solid waste management units (SWMUs), provided source control or other measures are instituted to prevent further degradation of the environment, the regulators may elect not to require cleanup of a release to cleanup levels (55 FR 30828; July 27, 1990).

If the focus of the discussion should be on the two circumstances described, DOE suggests it rephrase the question as follows: “***What are some of the situations where the levels described above might not be appropriate?***” If the answer should include some broader circumstances (because additional situations are bound to exist) DOE suggests rewording the introductory paragraph to read:

“For example, groundwater cleanup levels that are higher or lower than the levels described above, might be appropriate in the following circumstances, provided such cleanup levels or alternate remedial strategies protect human health and the environment.”

In addition, add an additional bullet introducing the technical impracticability discussion from page 31. Additional circumstances could also be added as EPA deems appropriate.

Do alternate concentration limits apply to setting groundwater cleanup levels for facility-wide corrective action?

63. Page 21, 1st paragraph, lines 5-14: ***These units are subject to groundwater monitoring and corrective action requirements contained in 40 CFR 264 Part 264, Subpart F. ACLs, which are established in 40 CFR 264.94(b), allow for groundwater protection standards developed on risk rather than background, and allow decision makers to consider natural attenuation processes in remediating groundwater contamination from RCRA regulated units, where appropriate. Both of these concepts (i.e., risk-based standards and natural attenuation approaches) are available for facility-wide corrective action as explained in other policies discussed in this Handbook. If you have a regulated unit and want to use ACLs, you should read the Alternate Concentration Limit guidance, July 1987, and call the overseeing regulator.***

As written, the text seems to read as if getting ACLs granted is simply a matter of reading the guidance and calling the regulatory agency. This is misleading. Therefore, we suggest:

“These units are subject to groundwater monitoring and corrective action requirements contained in 40 CFR 264 Part 264, Subpart F. Alternate concentration limits, which are established based on consideration of the factors given in 40 CFR 264.94(b), allow for groundwater protection standards developed based on consideration of risk rather than background concentrations, and allow decision makers to consider natural attenuation processes in remediating groundwater contamination from RCRA regulated units, where appropriate. If you are planning to perform groundwater cleanup at a regulated unit and are considering the use of ACLs, detailed information on ACLs and their application can be found in the ACL guidance document (EPA number and date). Before proceeding with an ACL request, you should discuss your specific situation with the appropriate State and/or EPA Regional regulator.”

What are my cleanup levels for groundwater if I am clean closing a RCRA regulated unit?

64. Page 21, 1st paragraph, line 5: ***In 1998, EPA issued a memorandum broadening the interpretation of acceptable levels of residual constituents.***

A citation to the referenced memorandum should be provided and a link given if possible.

65. Page 21, 1st paragraph, lines 9-14: ***When the groundwater protection standards are based on a groundwater use designation other than groundwater drinking water standards, EPA or the State should be confident that the exposure assumed remains valid (e.g., periodic evaluations of actual use, zoning and/or easements to third parties) since no further regulatory control will be required under Subtitle C. For more information on risk-based closure, you should read the Risk-Based Clean Closure Memorandum and call your overseeing regulator.***

We are unclear as to the meaning of “...since no further regulatory control will be required under Subtitle C.” Is this referring to an event such as the termination of a permit or the end of the post-closure care period?

We also suggest providing a link to the “risk-based clean closure” memorandum if it is available on the on EPA website.

Groundwater Cleanup Objectives – Editorial Comments

66. Page 19, 1st paragraph, lines 1-3: ***For a non drinking water groundwater use designation, the cleanup level might not be based on drinking water, but should be protective of other uses and exposures that could occur under its designation.***

“...non drinking water” should be “non-drinking water”.

67. Page 19, 2nd paragraph, 1st line. ***EPA states that in addition to protecting human health and the environment, groundwater cleanup levels should protect unacceptable cross-media transfer and”***

DOE suggests EPA replace “protect” with “prevent.”

68. Page 19, Footnote #4, line 3: ***However, where information is available to identify the critical toxic effect for non-carcinogens, only hazard quotients with associated with similar critical effects (target organs) are combined.***

Revise sentence as follows: “However, where information is available to identify the critical toxic effect for non-carcinogens, only hazard quotients associated with similar critical effects (i.e., target organs) are combined.”

69. Page 20, 4th paragraph, numbered list:

(1) Higher cleanup levels may be appropriate, for a given facility, when groundwater is also contaminated by hazardous constituents that are naturally occurring, or have originated from a source not associated with the subject facility, and those hazardous constituents are present in concentrations such that remediation of the release would not provide significant reduction in risks to actual or potential receptors.

(2) Lower groundwater cleanup levels may be necessary because of unacceptable risks to human receptors from combined effects of hazardous wastes or hazardous constituents, or to protect potential receptors exposed through cross media transfer, or to protect ecological receptors.

Item (1) should be broken into 2 items that read:

“(1) Higher cleanup levels may be appropriate, for a given facility, when groundwater is also contaminated by hazardous constituents that are naturally occurring, or have originated from a source not associated with the facility”. Split out the second half of the sentence in item (1) beginning with , “and those hazardous constituents....”.

Item (2) when then read “Those hazardous constituents are present in concentrations such that remediation of the release would not provide significant reduction in risks to actual or potential receptors. Item (2) would then become (3).

Point of Compliance Section

What is the groundwater point of compliance for RCRA Corrective Action?

70. Page 23, 1st paragraph, lines 1: *The point of compliance for groundwater, in the context of RCRA corrective action, represents where the facility should meet groundwater cleanup levels within a contaminated aquifer at the conclusion of a final remedy (i.e., the facility has achieved its final remediation goals).*

We suggest revising to something like: “The point of compliance for groundwater, in the context of RCRA corrective action, represents the location where the facility should meet groundwater cleanup levels within a contaminated aquifer...goals).”

We also suggest, for the purposes of discussing the location of the point of compliance, that a graphic be included in the document illustrating the relationship of the point of compliance to the waste management unit (i.e., source), and contaminated plume under the scenarios discussed in paragraph one.

71. Page 23, 1st paragraph. *EPA describes, in the context of RCRA corrective action, two points at which facilities should generally meet groundwater cleanup levels. These include (1) throughout the area where groundwater is contaminated above the cleanup level(s), or, (2) when waste is left in place, throughout the plume beyond the boundary of the waste management area encompassing the original source(s) of groundwater contamination.*

In addition to the circumstances currently outlined, under 40 CFR Part 264, Subpart F regulators will establish a different point of compliance. Specifically, under 40 CFR 264.95, the point of compliance is “a vertical surface located at the hydraulically downgradient limit of the waste management area that extends down into the uppermost aquifer underlying the regulated units.” For corrective actions under Subpart F, owners/operators must conduct a corrective action program to remove or treat in place any hazardous constituents that exceed the established concentration limits in groundwater: (1) between the point of compliance and the downgradient property boundary; and (2) beyond the facility boundary.

DOE suggests EPA consider incorporating a brief description of the 40 CFR Part 264, Subpart F point of compliance; some of the significant Subpart F corrective action provisions [e.g., terminate Subpart F corrective action when the designated ground water protection standard has not been exceeded for a period of three consecutive years (40 CFR 264.100)]; and clarify the relationship between the facility-wide corrective action and Subpart F point of compliance, especially relative to the Post-Closure Rule and its influence on the point of compliance when a regulated unit is situated among one or more leaking solid waste management units (or areas of concern).

72. Page 23, 1st paragraph. EPA's rationale and policy for point of compliance should acknowledge the fact that, for some areas, use of groundwater for drinking water under a residential scenario would not be feasible or even permissible (e.g., where long-lived radionuclides are present in groundwater systems). For some locations at large facilities however, there may be locations situated farther down-gradient from the source that could be subject to compliance with drinking water standards. Therefore, in some instances the use of multiple points of compliance with different remediation goals may be more practical than establishing a single "throughout-the-plume/unit boundary" point of compliance (e.g., establishing a point of compliance based on throughout-the-plume/unit boundary followed by a point of compliance based on demonstrating technical impracticability for portion(s) of the contaminant plume).

For example, at large Federal reservations (DOD, OE, etc.) where contamination, particularly long-lived radionuclides, is left behind one could reasonably establish two points of compliance. In such circumstances, the contaminated areas may remain under the control of the U.S. Government in perpetuity. The first POC could be established within close proximity of the unit(s), to monitor the contaminated area remaining under institutional control. At this POC, non-drinking water standards would be considered when setting remediation goals. A second POC could be established at the reservation boundary, where drinking water

standards might be used as the remediation goal. Although EPA states that groundwater vulnerability, use, and likely exposures should not be considered as factors in establishing the POC, we suggest that there are situations (as above) where designated groundwater use should be considered a major factor in establishing points of compliance and in setting remediation goals.

What is the point of compliance when a facility has more than one source of groundwater contamination?

73. Page 23, 4th paragraph, line 1: ***In describing its policy for establishing the point of compliance at facilities with more than one source of groundwater contamination, EPA distinguishes between the point of compliance for areas that are “in close proximity to each other” and sources that “are not close [to] each other.”***

DOE requests that EPA provide any factors that might be used to discriminate between the two. Also, DOE requests EPA clarify the relationship of this policy to the 40 CFR Part 264, Subpart F point of compliance, which does not distinguish between proximity of regulated units (i.e., “If the facility contains more than one regulated unit, the waste management area is described by an imaginary line circumscribing the several regulated units.” [40 CFR 264.95(b)(2)]).

Point of Compliance Section – Editorial Comments

74. Page 23, 1st paragraph, line 3: ***...or when waste is left in place, throughout the plume beyond the boundary of the waste management area encompassing the original source(s) of contamination.***

Revise the sentence as follows: “If the sources are not close to each other, the point of compliance should be established throughout the plume beyond the boundaries of the individual areas where waste is left in place as part of a final remedy.”

75. Page 24, 1st paragraph, line 2-3: ***The “throughout-the-plume/unit boundary “point of compliance for groundwater would generally apply even in the context of a technical impracticability (TI) determination (see discussion in this Handbook on Technical Impracticability).***

We suggest revising “See discussion in this Handbook on Technical Impracticability” to “see discussion on Technical Impracticability in this Handbook”.

76. Page 24, Footnote #1, line 8: ***EPA, however, remains interesting in comments on this issue.***

Revise the sentence as follows: “EPA, however, remains interested in comments on this issue.”

Remediation Time Frame Section

What is the remediation time frame?

77. Page 25, 1st paragraph. EPA outlines several factors that, along with facility-specific conditions, may influence the remediation time frame. DOE suggests EPA consider referencing Figure 1 of its guidance titled Presumptive Response Strategy and Ex-Situ Treatment Technologies or Contaminated Ground Water at CERCLA Sites (EPA/540-R-96-023), which presents a number of site/contaminant characteristics that can influence the remediation time frame. Furthermore, DOE requests that EPA consider inserting the following additional factors: desirability of utilizing emerging technologies (e.g., mixed waste treatment) not yet widely available but which offer significant advantages over currently available technologies:

- level of technical expertise required and available to implement a particular remedial technology;
- amount and complexity of construction which must precede actual cleanup;
- proximity to population; and
- management strategies and the use of a phased approach to address highest priorities first.

Additionally, DOE requests that EPA reiterate its preference for establishing aggressive yet realistic remediation time frames, and that there are cases where a less aggressive time frame is appropriate. For example, instances where groundwater cleanup standards can be achieved using natural monitored attenuation and human and environmental exposures prior to attainment are highly unlikely may be good candidates for establishing longer remediation time frames.

78. Page 25, 1st paragraph, lines 1-6: ***The Remediation time frame for groundwater is the facility-specific schedule for a groundwater remedy. It includes the time frame to construct the remedy and an estimate of the time frame to achieve groundwater cleanup levels at the point of the compliance. EPA believes that remediation time frame should be reasonable base-facility specific conditions and consider the following factors were appropriate:***

We suggest revising to “The remediation time frame for a groundwater remedy includes the time to construct the remedy and includes an estimate of the time required to achieve groundwater cleanup levels at the point of compliance. The remediation time frame should be reasonable based on facility-specific conditions and consideration of the following factors where appropriate:”

The meaning of “...remediation time frame should be reasonable...” is subjective and G therefore unclear. We suggest that EPA provide guidelines defining what they mean by a “reasonable time frame.”

Source Control Section

What are the sources of contamination?

79. Page 26, 1st paragraph: *EPA defines sources as contaminated material that acts as a reservoir for the continued migration of contamination to surrounding environmental media (i.e., soil, groundwater, surface water, sediment, or air) or provides a direct threat to a receptor. Sources are not always stationary, but can migrate from a location such as a landfill or surface impoundment, where the contaminant was originally released. For example, dense non-aqueous phase liquids (DNAPLs) may be present as a mobile phase that continues to migrate deeper into the subsurface, migrate along a subsurface feature, or accumulate in a subsurface feature, such as a depression in a low permeable layer of clay.*

A graphic illustrating the various kinds of “sources” would be very useful here. Furthermore, for those not familiar with DNAPLs and their physical and geochemical behavior, the discussion of DNAPLs in the example may be confusing because it is not noted how or when this material can be a source. The text indicates that it is a “mobile” phase. Does this mean that it originated at the source is or is a source. Of course, it can be both. It could have migrated out of drums in a landfill (the original source?) and is also a “source” for constituents migrating from the DNAPL phase into the groundwater.

80. Page 26, 2nd paragraph. *EPA defines “sources” as contaminated material that acts as a reservoir for the continued migration of contamination to surrounding environmental media (i.e. soil, groundwater, surface water, sediment, or air), or provides a direct threat to a receptor.*

This definition of “sources” appears very similar to the CERCLA definition of “source material” as clarified in EPA’s principal threats directive (OSWER 9380.3-06FS).” In fact, EPA cites “source materials” as an equivalent term (to sources) on the next page (page 27). DOE agrees with and appreciates EPA’s effort to replace “source material” with the term “source” and thereby, remove the ambiguity and any confusion associated with the Atomic Energy Act (AEA) definition of “source material”.

Source Control Section – Editorial Comments

81. Page 27, 2nd paragraph, line 2: *In some situations, it may be appropriate to contain rather than treat even principal threat wates due to difficulties in treating the wastes.*

The word “wates” should be “wastes”.

Monitored Natural Attenuation Section

Is monitored natural attenuation acceptable when contaminated groundwater is off-site?

82. Page 29, 1st paragraph, line 11: ***For example, if a plume is already off-site, regulators might accept a monitored natural attenuation remedy if no one is currently exposed to the contaminated groundwater and it meets EPA’s short-term protectiveness goals.***

We suggest revising to something like: “...natural attenuation remedy if no one is currently exposed to the contaminated groundwater, there is not threat to the environment, and it meets EPA’s short-term protectiveness goals.”

How long should a facility monitor a Monitored Natural Attenuation Remedy?

83. Page 30, 1st paragraph, line 3: ***EPA specifically added the term “monitored” to the name of this remedial alternative to emphasize the importance of long-term monitoring. EPA’s Policy Directive States “Performance monitoring should continue until remedial objectives have been achieve...”***

We suggest revising to something like: “The EPA specifically added the term “monitored” to the name of this remedial alternative to emphasize the importance of long-term monitoring. EPA’s Policy Directive (EPA, 1999e) states “Performance monitoring should continue until remedial objectives have been achieved...”

As noted previously, terms such as “long term, “short-term”, etc., are subjective in nature. It would be useful for the user to have guidelines as to what EPA’s considers “long” or “short term”.

How does groundwater use influence a monitored natural attenuation remedy?

84. Page 30, 1st paragraph, line 4: ***Current use and the groundwater use designation are important to consider when evaluating a monitored natural attenuation remedy. Stakeholders should be aware of the current uses of groundwater in the vicinity of the facility and be confident that the contaminated groundwater does not represent an unacceptable threat to those users.***

We suggest revising to something like: “Current use and the groundwater use designation are important to consider when evaluating a monitored natural attenuation remedy. Stakeholders should be aware of the current uses of groundwater in the vicinity of the facility and be confident that the contaminated groundwater does not represent an unacceptable threat to those users and the environment.”

Monitored Natural Attenuation Section – Editorial Comments

85. Page 29, 2nd paragraph, line 3: ***In addition, EPA looks more favorably on those MNP proposals that would where:***

Revise the sentence as follows: “In addition, EPA looks more favorably on those MNA proposals when:”

Technical Impracticability Section

What does technical impracticability mean?

86. Page 31, 1st paragraph, lines 1-2: ***Technical impracticability (TI) refers to a situation where achieving groundwater cleanup objectives is not possible from an engineering perspective.***

We suggest revising to note there is an EPA guidance document addressing TI determinations:

“Technical impracticability (TI) refers to a situation where achieving groundwater cleanup objectives is not possible from an engineering perspective (EPA, 1993)”.

How does a technical impracticability determination affect the point of compliance?

87. Page 33, 1st paragraph, line 12-14: ***It is important to remember that even if a remedy achieves groundwater cleanup levels outside the TI zone, a facility’s corrective action obligations for implementing, maintaining, and monitoring the contaminant within the TI zone should continue(1) as long as these obligations are necessary to protect human health and the environment, or (2) until such time the cleanup within the TI zone becomes technically practicable and the cleanup levels are achieved throughout the entire plume (i.e., even within the formerly identified TI zone).***

It is unclear as to the meaning of this discussion with respect to facilities/units that are, or will be closing. For example, if a facility is closed and monitored and “contained” during a post-closure care period, does this discussion mean that at any point in the future, even beyond 30 years, if the technology to address the contamination becomes available, the facility will have to cleanup up the contamination within the TI zone?

Technical Impracticability Section – Editorial Comments

88. Page 32, 1st paragraph, line 1: ***EPA’s guidance (EPA, 1993) on technical impracticability suggests the following:”***

We suggest revising to something like: “The EPA’s guidance (EPA, 1993) on technical impracticability suggests the following factors be addressed in a demonstration:”

89. Page 33, 1st paragraph, line 7: *The facility in this context would not generally responsible for achieving groundwater cleanup levels within the TI zone as long as the regulator agrees that the TI determination remains valid.*

We suggest revising to: “The facility would not generally responsible for achieving groundwater cleanup levels within the TI zone as long as the regulator agrees that the TI determination remains valid.”

90. Page 34, 1st paragraph, line 2: *For example, the facility might want try a new technology that has the ability to achieve the cleanup objectives rather than indefinitely paying for operating and maintenance costs associated with the alternative remedial strategy.*

Revise the sentence as follows: “For example, the facility might want to try a new technology that has the ability to achieve the cleanup objectives rather than indefinitely paying for operating and maintenance costs associated with the alternative remedial strategy.”

Injection of Contaminated Groundwater Section

Can I inject groundwater that is contaminated with hazardous wastes back in the subsurface as part of corrective action?

91. Page 35, 2nd paragraph: *EPA describes the statutory exemption that allows owners/operators conducting corrective action to reinject contaminated groundwater.*

DOE suggests EPA reiterate its position that RCRA 3020(b) is more specific than the RCRA 3004(k) prohibition on “land disposal” of hazardous wastes and, therefore, treated groundwater need not meet the otherwise applicable land disposal restrictions (LDR) treatment standards before being reinjected into the aquifer from which it was withdrawn.

Performance Monitoring Section

What should the performance monitoring accomplish?

92. Page 37, 1st paragraph, bullet 7: *Demonstrate the effectiveness of institutional controls that were put in place to protect potential receptors; and*

We suggest that the guidance define and briefly discuss what “institutional controls” are and how they can be used. We also suggest the Handbook reference EPA Headquarters, Region 5 and 10 guidance documents on institutional controls [i.e., Use of Institutional Controls in the RCRA Corrective Action Program, Region 5, March 2000, Region 10 Final Policy On the Use of Institutional Controls at Federal Facilities, etc.].

What should a performance monitoring program include?

93. Page 37, 1st paragraph, lines 1-3: *The performance monitoring program should specify the location, frequency, and type and quality of samples, techniques and measurements. It should also specify the methods (e.g., statistical analysis) that will be used to evaluate the data and support decision making.*

It is also unclear as to the relationship between the above and the requirements of 40 CFR Part 264, Subpart F which applies to regulated units and which specifies requirements for the constituents to be monitored and concentration limits [264.93, and 94, respectively]], establishment of compliance points [264.95], detection and compliance monitoring [264.98, 99, etc.] and corrective action [264.100].

How often should facilities monitor?

94. Page 37, 1st paragraph, lines 1-2: *The frequency of monitoring should be adequate to detect, in a timely manner, the potential changes in facility conditions listed above.*

The discussion is inadequate with respect to what is meant by “frequency of monitoring should be adequate to detect in a timely matter the potential changes in facility conditions”. If there are minimum criteria that must be satisfied in order for a monitoring system to be considered “adequate”, EPA should identify these. It is also unclear as to the meaning of “in a timely manner”. Again, if there are minimal criteria for defining what a “timely matter” means, these should be given.

It is also unclear as to the relationship between the above and the requirements of 40 CFR Part 264, Subpart F which applies to regulated units. For example, under Subpart F, Sections 264.98 and 264.99 address detection and compliance monitoring, respectively. Under 264.98(d) and 264.99(f), the Regional Administrator will specify the frequency of sample collection/analysis.

The text of the Handbook seems to imply that the establishment of the frequency of monitoring for regulated units are unrelated to the Subpart F requirements.

How long should performance monitoring continue?

95. Page 38, 1st paragraph, lines 1-2: *Facilities should generally continue performance monitoring for a specified period after the facility achieves final remediation goals.*

We suggest revising to something like: Facilities should generally continue performance monitoring for a specified period, established by the regulatory agency, after the facility achieves the final remedial goals.

Performance Monitoring Section – Editorial Comments

96. Page 37, 2nd paragraph, bullet 2: *Detect changes in environmental conditions (e.g. hydrogeologic, geochemical, microbiological, or other changes) that may reduce the efficacy of the remedy.*

In order to keep with the intent that this Handbook be written in “plain language,” DOE suggests that the word “efficacy” be replaced with “effectiveness.”

Completing Groundwater Remedies Section

When does EPA consider groundwater remediation to be complete?

97. Page 39, 1st paragraph: *EPA considers corrective action for groundwater to be complete when all releases to groundwater of hazardous waste and hazardous constituents, including releases from solid waste management units, have been remediated*

EPA should discuss whether this question should be considered for each SWMU, or for the entire facility.

Appendix 1 - How is the RCRA Corrective Action Program Implemented?

98. Page 43, paragraph 2, lines 1-2: *At present, there are 33 states and territories authorized by EPA to carry out the corrective action. EPA or states...*

At present, there are 33 states and territories authorized by EPA to carry out the corrective action. The EPA or states...

99. Page 43, paragraph 3, lines 3-4: *“...include: 3004(u)&(v), 3005(c)(3), 3008(h), 3013, and 7003. EPA’s regulatory authority for corrective action at permitted facilities is found at 40 CFR Part 264 Subpart F. EPA provided additional...”*

We suggest revising to something like: “Section 3004(u)&(v), 3005(c)(3), 3008(h), 3013, and 7003. EPA’s regulatory authority for corrective action at permitted facilities is found at 40 CFR Part 264 Subpart F. The EPA provided additional...”

It might also be useful to provide the titles of the regulatory citations given above.

100. Page 43. *Section on RCRA Corrective Action Implemented.*

DOE suggests including the Federal Facility Agreement (FFA) document and process for conducting corrective actions.

Appendix 2 C Glossary

101. DOE recommends that a definition of remediation waste be included.
102. There is an inconsistency in the use of underlying for the individual items defined (i.e., the first five terms are not underlined, the following are underlined).
103. Perhaps a definition of “remediation” and “remediation waste” should be added for completeness.
104. We recommend that EPA define the terms "guidance" and "policy" and clarify the Agency's intent when using each of the terms. It has come to our attention that there are "facilities" and "individuals" (as defined by EPA in the Handbook) who confuse the intent of the terms guidance and policy with regulation. That is to say, if EPA releases a guidance document, these stakeholders interpret the guidance to be equivalent to the requirements promulgated in environmental regulations. It is suggested that a clarification be added, for example; "This Handbook should be reviewed when implementing groundwater remediation actions. The Handbook provides additional information and acceptable methods for meeting the requirements. Other methods may be used but must ensure an adequate level of rigor commensurate with the groundwater remediation goals."
105. The phrases “media cleanup objectives” and “media cleanup standards” are referred to on page 4 of the Handbook but not included in the Glossary. DOE suggests that these phrases be included in the Glossary with an explanation on how they relate to the other phrases “groundwater cleanup levels” and “groundwater cleanup objectives.”
106. EPA should include the following terms/phrases in the glossary:
- “Appendix VIII constituents”
 - “contaminant” or “contamination” or “contaminated”
 - “hazardous constituents”;

Although EPA has clarified these terms/phrases before and thus, they may be well-recognized, the Department strongly suggests EPA consider inserting the definitions for these terms as follows:

Appendix IX constituents - Appendix IX constituents means those constituents appearing in 40 CFR Part 264, Appendix IX and are a subset of hazardous constituents particularly suitable for groundwater analyses, but include additional constituents not found on Appendix VIII that are commonly addressed in groundwater analyses as part of CERCLA (Superfund) cleanups.

contaminant - “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to

RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range) or, relative to ground water, in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

hazardous constituents - Hazardous constituents means those constituents appearing in 40 CFR Part 261, Appendix VIII (55 *FR* 30809; July 27, 1990), including constituents that were contained within nonhazardous solid wastes (61 *FR* 19443; May 1, 1996), but not including radionuclides or the radioactive component of mixed waste.