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**Environmental
Protection Agency**

40 CFR Parts 264, 265, 270, and 271
Corrective Action for Solid Waste
Management Units at Hazardous Waste
Management Facilities; Proposed Rule

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 264, 265, 270, and 271

[FRL-3403-8; EPA/OSW-FR-90-012]

RIN 2050-AB42

Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency is today proposing requirements under the Resource Conservation and Recovery Act (RCRA) for corrective action for solid waste management units (SWMUs) at facilities seeking a permit under section 3005(c) of RCRA. This proposal will establish procedures and technical requirements for implementing corrective action under section 3004(u) of RCRA.

Today's proposal would create a new subpart S in the RCRA part 264 regulations to define requirements for conducting remedial investigations, evaluating potential remedies, and selecting and implementing remedies at RCRA facilities. It also proposes to amend the RCRA part 270 permit requirements, make conforming changes to part 264 and 265 facility closure information requirements, and establish standards for States to become authorized to administer corrective action requirements.

DATES: Written comments on this proposed rule should be submitted on or before September 25, 1990.

Public hearings on this proposed rulemaking are scheduled as follows:

- October 9, 1990 in San Francisco.

CA.

- October 12, 1990 in Washington.

DC.

ADDRESSES: The public hearings will be held at the following locations:

- October 9, 1990 at the Hyatt Regency San Francisco in Embarcadero Center, 5 Embarcadero Center, San Francisco, CA 94111 (415-788-1234); and
- October 12, 1990 at the Omni-Shoreham Hotel, 2500 Calvert Street NW., Washington, DC 20008 (202-234-0700).

Those individuals who wish to present oral testimony at either of the public hearings must request an opportunity to be heard. Requests must be made in writing to Thea McManus, Hearings Clerk, Office of Program Management (OS-305), U.S. Environmental Protection Agency, 401 M

Street SW., Washington, DC 20460. The request should reference the RCRA Corrective Action Proposed Rule, Regulatory Docket No. F-90-CASP-FFFFF. Unless otherwise requested in writing, individuals will be scheduled 10-minute time segments to present oral testimony. Time segments will be allotted based on the order in which the written requests are received. Written requests must be received by the end of the written comment period.

Written comments on today's proposal should be addressed to the docket clerk at the following address: U.S. Environmental Protection Agency, RCRA Docket (OS-305), 401 M Street SW., Washington, DC 20460. One original and two copies should be sent and identified by regulatory docket reference number F-90-CASP-FFFFF. The docket is open from 9 a.m. to 4 p.m., Monday through Friday, excluding Federal holidays. Docket materials may be reviewed by appointment by calling (202) 475-9327. Copies of docket materials may be made at no cost, with a maximum of 100 pages of material from any one regulatory docket. Additional copies are \$0.15 per page.

FOR FURTHER INFORMATION CONTACT: General questions about the regulatory requirements under RCRA should be directed to the RCRA/Superfund Hotline, Office of Solid Waste, U.S. Environmental Protection Agency, Washington, DC 20460, (800) 424-9346 (toll-free) or (202) 382-3000 (local). For the hearing impaired, the number is (800) 553-7672 (toll-free), or (202) 475-9852 (local).

Specific questions about the issues discussed in this proposed rule should be directed to David M. Fagan, Office of Solid Waste (OS-341), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, (202) 382-4740.

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1. Authority

These regulations are issued under the authority of sections 1003, 1006, 2002(a), 3004(u), 3004(v), 3005(c), and 3007 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. 6924 (a), (u), and (v), and 6925(c).

II. Background

Prior to passage of the Hazardous and Solid Waste Amendments of 1984 (HSWA), statutory authorities and promulgated regulations for compelling corrective action at facilities regulated under subtitle C of the Resource Conservation and Recovery Act (RCRA) were limited to the following: (1) Section 7003 of RCRA, which provides EPA enforcement authority to take action where solid or hazardous waste may present an imminent and substantial endangerment to human health or the environment; (2) section 3013 of RCRA, which provides authority for requiring investigations where the presence of hazardous waste or releases of hazardous waste may present a substantial hazard to human health or the environment; and (3) 40 CFR part 264, subpart F, which provides a regulatory program to address releases

of hazardous wastes and hazardous constituents to ground water from "regulated units." ("Regulated units" are defined in 40 CFR 264.90 as surface impoundments, waste piles, land treatment units, and landfills which received hazardous waste after July 26, 1982.) Section 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), provides a broad authority, similar to RCRA section 7003, to take abatement actions to remediate any actual or potential imminent and substantial endangerment caused by actual or threatened releases of hazardous substances.

The 1984 HSWA amendments substantially expanded corrective action authorities for both permitted RCRA facilities and facilities operating under interim status. Section 3004(u) of HSWA requires that any permit issued under section 3005(c) of RCRA to a treatment, storage, or disposal facility after November 8, 1984, address corrective action for releases of hazardous wastes or hazardous constituents from any solid waste management unit (SWMU) at the facility. These permits will contain schedules of compliance where corrective action activities cannot be completed prior to permit issuance. In addition, facility owners or operators must demonstrate assurances of financial responsibility for completing the required corrective actions. Section 3004(v) authorizes EPA to require corrective action beyond the facility boundary where appropriate. Section 3008(h) provides EPA with authority to issue administrative orders or bring court action to require corrective action or other measures, as appropriate, when there is or has been a release of hazardous waste or hazardous constituents from a RCRA facility operating under interim status.

III. Purpose of Today's Rule

The purpose of today's rule is to establish a comprehensive regulatory framework for implementing the Agency's corrective action program under RCRA. This rule defines both the procedural and substantive requirements associated with sections 3004(u) and 3004(v). While the new corrective action authorities became effective on their date of enactment (November 8, 1984), today's proposed rule is intended to establish a comprehensive regulatory framework for these statutory authorities. The proposal should serve to promote national consistency in implementing this important component of the RCRA

program, and will establish standards to which States seeking authorization for section 3004(u) corrective action must demonstrate equivalence. In addition, this rulemaking provides a procedural vehicle for the regulated community and other interested parties to comment on the Agency's regulatory intentions for this program.

The following sections of this preamble provide a detailed explanation of the background and specifics of today's proposed rulemaking. Section IV discusses implementation of the corrective action program to date. Section V provides an overview of the regulatory program proposed today and the management philosophy which led to this proposal. Section VI provides a section-by-section analysis of the proposed rule. Section VII examines the relationship of today's rule to other environmental programs. Section VIII discusses public involvement in the corrective action program, while section IX provides information on State authorization for the new program.

IV. EPA's Implementation of the Corrective Action Program To Date

Since 1982, the RCRA program has been implementing the subpart F corrective action requirements for releases to ground water from regulated units through permits. Since November 1984, the HSWA corrective action requirements, which were effective immediately, have been implemented on a case-by-case basis in individual facility permits or section 3008(h) corrective action orders. To implement the HSWA corrective action program to date, EPA has issued several regulations and guidance documents. This section describes those rules and guidance documents, the current status of corrective action activities in the permitting and enforcement programs, and the availability of technical guidance documents pertaining to corrective action.

A. Pre-HSWA RCRA Corrective Action

EPA's base permit regulations, promulgated under pre-HSWA authority, establish a program for monitoring and remediating releases to ground water from regulated hazardous waste management units (40 CFR part 264, subpart F, discussed below), and reporting of releases from permitted units (under 40 CFR part 270). These regulations were established in 1982 under the general statutory authority in section 3004(a) of RCRA.

Under current subpart F regulations, the corrective action requirement (§ 264.100) is the third step of a three-phase program for detecting,

characterizing, and responding to releases to the uppermost aquifer from regulated units. The first phase, called detection monitoring, requires facility owners or operators to monitor ground water at the downgradient edge of the waste management boundary for indicator parameters or constituents that indicate the likelihood of a release. If a release is detected, the owner/operator tests for all appendix IX (of 40 CFR part 264) constituents, and a ground-water protection standard (GWPS) is established for every appendix IX constituent detected above background levels. Under the second, or compliance monitoring phase of the program (which is triggered when the release is confirmed), the owner/operator is required to perform additional investigations to characterize the nature and extent of contamination. In the third and final stage—corrective action—the owner/operator is required to remove or treat in place all contaminants present in concentrations above the ground-water protection standard beyond the compliance point.

The ground-water protection standards established under subpart F are set at either the background levels, maximum contaminant levels (MCLs) for 14 specific constituents, or alternate concentration limits (ACLs). MCLs are contaminant concentration levels which represent the maximum permissible level in drinking water supplies as promulgated by the EPA under the Safe Drinking Water Act. ACLs are contaminant concentration levels determined by the Agency to be protective of human health and the environment based on site-specific circumstances. Proposed revisions to the existing subpart F regulations to create a program consistent with today's proposal for subpart S are expected to be published shortly in the *Federal Register*. A discussion of the relationship between this proposal and the proposed amendments to subpart F is included in section VII.C of this preamble.

B. July 15, 1985, Codification Rule (50 FR 28702)

On July 15, 1985, EPA promulgated regulations that codified the statutory language of the new section 3004(u) corrective action authority of HSWA (see 50 FR 28702, 40 CFR 264.90(a)(2) and 264.101). In particular, the July 1985 Codification Rule amended 40 CFR part 264, subpart F by adding new § 264.101, which essentially reiterated the statutory language of section 3004(u).

In addition, the preamble to the July 1985 Codification Rule defined the Agency's jurisdiction under the new

authorities by interpreting a number of key terms in the statutory language. Specifically, the preamble discussed EPA's interpretations of the terms "facility," "solid waste management unit," and "release," in relation to the new corrective action authorities. (EPA is proposing to codify these definitions, with some modifications, in today's rule.) The preamble also provided the Agency's interpretation of the authority conferred on it through section 3008(h), the interim status corrective action authority. A detailed discussion of the Agency's interpretation of the section 3008(h) authority was provided in a December 16, 1985, guidance memorandum entitled "Interpretation of section 3008(h) of the Solid Waste Disposal Act." A copy of that memorandum may be found in the docket established for this rulemaking.

C. December 1, 1987, Codification Rule (52 FR 45788)

On December 1, 1987, EPA issued a companion to the July 1985 Codification Rule that further modified the part 264 and part 270 hazardous waste management regulations to implement the new statutory provisions of HSWA (see 52 FR 45788). This Second Codification Rule addressed issues arising from the new amendments rather than codifying requirements imposed directly by the statute. Three elements of that rule relate to the new HSWA corrective action requirements: Permit application requirements for solid waste management units (SWMUs), corrective action beyond the facility boundary, and corrective action for injection wells with permits-by-rule.

The Second Codification Rule amended the existing part B permit application requirements of § 270.14 by adding a new provision (§ 270.14(d)) that requires certain information pertaining to solid waste management units at the facility applying for a RCRA permit. The new provision requires descriptive information on all solid waste management units at the facility, and all available information pertaining to any past or current releases from these units. The provision also requires facility owner/operators to perform sampling and analysis as required by EPA to assist in determining whether or not releases have occurred from solid waste management units at the facility.

The Second Codification Rule also amended §§ 264.100 and 264.101 of the RCRA part 264 regulations to codify section 3004(v) of RCRA. This statutory provision requires facility owner/operators to address corrective action for releases that have migrated beyon...

the facility boundary, unless the owner or operator demonstrates to EPA that, despite his or her best efforts, s/he was unable to obtain the necessary permission to undertake the required actions (see §§ 264.100(e) and 264.101(c)). This new provision applies to releases from all solid waste management units, including releases to the uppermost aquifer from regulated units. Moreover, section 3004(v) makes it clear that the provision applies to certain interim status units (section 3004(v)(2)), as well as units at permitted facilities (section 3004(v)(1)). Where access to off-site property is denied, EPA may require that certain measures be taken on site to mitigate the off-site contamination (e.g., source control measures). As will be discussed later, EPA is today proposing changes to these regulatory provisions.

The Second Codification Rule also included new provisions governing the implementation of corrective action requirements through RCRA permits-by-rule for Class I hazardous waste injection wells (see §§ 270.60(b)(3), 144.1(h), 144.31(g)). Under 40 CFR 270.60, the corrective action requirements of § 264.101 must be addressed in order to obtain a permit-by-rule for a hazardous waste injection well. Since today's proposal will replace § 264.101, these facilities will be required to comply with today's proposed subpart S regulations in the same manner as other facilities which receive permits under section 3005(c) of RCRA.

The Second Codification Rule also clarified that a Class I hazardous waste injection well with a UIC permit issued after November 8, 1984, does not have a RCRA permit-by-rule until the corrective action requirements are imposed at the entire facility. Further, the Second Codification Rule clarified that a Class I injection well that received a UIC permit retains interim status under RCRA until corrective action requirements (if necessary) are imposed through a RCRA rider permit.

D. Proposed Rule, Financial Assurance for Corrective Action (51 FR 37854)

On October 24, 1986, EPA proposed new amendments to the financial responsibility standards applicable to owners and operators of hazardous waste treatment, storage, and disposal facilities (hereinafter referred to as FACA—see 51 FR 37854). This proposed rule provided a regulatory framework for implementing the statutory requirement of section 3004(u) (codified in §§ 264.101 and 264.90(a)(2)) for demonstrating financial assurance for the costs of corrective actions.

The 1986 FACA proposal set out a detailed set of procedures implementing the section 3004(u) financial assurance requirements. These procedures addressed: (1) The timing of financial assurance demonstrations; (2) cost-estimating procedures, including the periodic adjustment of cost estimates, for determining the amounts of required financial assurance; and (3) permissible financial assurance mechanisms, including their required wording and allowable combinations of mechanisms. EPA is today proposing specific language which will clarify when financial assurance for corrective action must be demonstrated and when adjustments to the coverage levels will be required. With respect to all other procedural aspects associated with the FACA requirements (e.g., the set of acceptable mechanisms or use of a mechanism for multiple financial responsibilities), EPA intends to use the FACA proposal as general guidelines for examining, on a case-by-case basis, the adequacy of the financial assurances. Financial assurance for corrective action is discussed more fully in section VII.C.5 of this preamble.

E. National RCRA Corrective Action Strategy (51 FR 37608) and the RCRA Corrective Action Outyear Strategy (Fall, 1989)

In October 1986, EPA issued a draft "National RCRA Corrective Action Strategy" to inform the Regions, States, regulated community, and the public of the Agency's overall plans for implementing the HSWA corrective action authorities. The Strategy provided an overview of the HSWA corrective action authorities and the universe of RCRA facilities subject to these authorities, and described the basic process for identifying, investigating, and remediating releases at RCRA facilities. It also discussed the Agency's plans for establishing priorities for corrective action, the relationship between permitting and enforcement authorities, factors influencing the management of corrective action, and the relationship between EPA and the States in implementing this program.

The Agency received a number of comments on the draft strategy, many of which are reflected in the content of today's proposed rule. Today's proposal, which addresses in detail most of the elements of the draft strategy, effectively finalizes the strategy.

Although some portions of the draft strategy, such as the Agency's plans for prioritizing RCRA facilities for corrective action, are not fully addressed in today's proposal, they are

the subjects of recommendations contained in the RCRA Corrective Action Outyear Strategy (CAOS), published in the Fall of 1989. These recommendations outline a management approach for the corrective action program that is realistic and workable in light of the many challenges that EPA and the States will face in implementing this program over the next several years. While some of the CAOS recommendations can be directly implemented, others will be addressed in detail in forthcoming guidance.

F. Implementation of the HSWA Corrective Action Program

To implement the corrective action program to date, EPA has developed a general process to assure that actions taken are commensurate with the problem presented. In this process, each stage serves as a screen, sending forward to the next step those facilities or units at a facility which the Agency has found to be a potential problem, and eliminating from further consideration units and facilities where the Agency has discovered no current environmental problem. The Agency intends to provide sufficient flexibility in this process to facilitate timely abatement of environmental problems.

RCRA facilities are generally brought into the corrective action process at the time the Agency is considering a permit application for the facility, or when a release justifying action under section 3008(h) is identified. The process begins with an Agency-conducted RCRA Facility Assessment (RFA), which is analogous to the Superfund Preliminary Assessment/Site Investigation (PA/SI). The RFA includes: (1) A desk top review of available information on the site; (2) a visual site inspection to confirm available information on solid waste management units at the site and to note any visual evidence of releases; and (3) in some cases, a sampling visit, to confirm or disprove suspected releases. If, after completion of the RFA it appears likely that a release exists, the Agency typically develops a schedule of compliance, to be included in a facility's RCRA permit, for further studies and actions the permittee must undertake to fulfill the responsibilities imposed by section 3004(u). Alternatively, the Agency might issue an order pursuant to section 3008(h) to compel corrective action.

The second stage of the corrective action process is the RCRA Facility Investigation (RFI). The RFI is undertaken when a potentially significant release has been identified in the RFA; its purpose is to characterize

the nature and extent of contamination at the facility, and it is analogous to the Remedial Investigation (RI) process of the Superfund program. Typically, the RFI will be focused on specific concerns identified in the RFA and will be staged to avoid unnecessary analysis. When the Agency determines, on the basis of data generated during the RFI or other information, that cleanup is likely to be necessary, the owner/operator will be required to conduct a Corrective Measure Study (CMS) to identify a solution for the problem at the site. Once the Agency selects the remedy for the facility, the Agency will either issue a followup section 3008(h) order (in the case of an interim status facility), or modify the permit, and the remedy will be implemented by the owner/operator with Agency oversight.

In certain situations, the Agency may require an "interim measure" at the facility without waiting for the final results of the RFI or the CMS. Interim measures are actions required to address situations which pose a threat to human health or the environment or to prevent further environmental degradation or contaminant migration pending final decisions on required remedial activities. Superfund generally uses the removal authority provided under section 104 of CERCLA to accomplish this same objective where expedited response and/or emergency actions are needed.

Currently, implementation of the corrective action program is being undertaken by EPA, with assistance from State agencies. Six States have been authorized to date to implement the HSWA corrective action program.

The general corrective action process described above is carried forward in today's proposal. However, today's proposal will describe the requirements in greater detail, and will provide the public an opportunity to comment on this approach.

More detailed information about each of the phases of the corrective action program as implemented to date can be found in the guidance documents referenced below. Additional guidance will be developed in the future.

1. *RCRA Facility Assessment Guidance* (Final, October, 1988). This document can be obtained through the National Technical Information Services (NTIS), 5285 Port Royal Rd., Springfield, VA—(703) 487-4650, Document Number PB87-107789.

2. *RCRA Facility Investigation Guidance* (Interim Final, May, 1989). For further information, contact: Jon Perry—(202) 382-4663.

3. *Corrective Action Plan* (Interim Final, May, 1988). For further information, contact: (202) 382-4460.

4. *Interim Measures Guidance* (Interim Final, May, 1988). For further information, contact: Tracy Back—(202) 382-3122.

V. Approach to Corrective Action in Today's Rule

Together with the National Contingency Plan (NCP), which EPA recently promulgated (March 8, 1990, 55 FR 8686), today's proposal defines EPA's overall approach to the cleanup of environmental contamination resulting from the mismanagement of hazardous and solid waste. Today's proposal will establish a regulatory framework for corrective action under section 3004(u) of RCRA and will provide guidelines for corrective action orders imposed through administrative orders under section 3008(h) of RCRA. Substantive provisions of the rule, when promulgated, generally will be applicable to response actions under CERCLA involving releases of hazardous waste (including hazardous constituents). These provisions may also be "relevant and appropriate" to other CERCLA response actions.

This section of the preamble briefly summarizes EPA's basic approach to RCRA corrective action, the fundamental cleanup goals of the program, and the major elements of today's rule.

A. Priorities and Management Philosophy for RCRA Corrective Action

Approximately 5,700 facilities are currently in the RCRA subtitle C universe, and therefore are potentially subject to corrective action requirements. These facilities are likely, together, to have as many as 80,000 SWMUs. Many of these facilities, EPA believes, will require some level of remedial investigation and corrective action to address past or current releases.

The level of investigation and subsequent corrective action will vary significantly across facilities. This regulation would ensure that variation can be accommodated by recognizing that the necessary scope of investigations and studies may be different depending upon the situation presented. It is the Agency's intention that State and Regional personnel have the ability to require investigations sufficient to fully characterize the facility and assess necessary actions. In many cases the problem will pose less risk or be less complex than a major Superfund site listed on the National Priorities List. Therefore, the Agency

expects that, for the most part, RCRA cleanups will be less complex and less expensive than those under CERCLA, and less detailed study will be required before remedial action begins. In some cases, however, the Agency also recognizes that the situation could be comparable to that of a major CERCLA site. In such cases, the Agency will require more detailed analysis and more rigorous oversight. There will also be cases where immediate action is required, while at many other sites, current exposure will be limited and action can be safely deferred. Not only will the nature of cleanup required vary widely, but so too will the characteristics of the facility owner/operators. Some facilities will be sites controlled by financially viable owner/operators, while others will be weak financially; some will be under active long-term management, but at others the owner/operator will be seeking to leave the site; some will be simple facilities with one or two storage tanks, yet others will be major complexes, such as large Federal facilities, with thousands of solid waste management units.

Because of the wide variety of sites likely to be subject to corrective action, EPA believes that a flexible approach, based on site-specific analyses, is necessary. No two cleanups will follow exactly the same course, and therefore the program has to allow significant latitude to the decision maker in structuring the process, selecting the remedy, and setting cleanup standards appropriate to the specifics of the situation. At the same time, a series of basic operating principles guide EPA's corrective action program under RCRA. These principles, which are reflected in today's proposal, are described briefly below.

In managing the corrective action program, the Agency will place its highest priority on action at the most environmentally significant facilities and on the most significant problems at specific facilities. EPA is committed to directing its corrective action resources first to the most environmentally significant problems. The level of threat posed by each of the 5,700 facilities now subject to corrective action varies widely—some are a major concern and require prompt attention; others will require eventual cleanup but do not currently pose a threat; still others have no significant releases and will not require corrective action at all. At some of these facilities, EPA will automatically address corrective action because of its permitting priorities. Under HSWA, statutory deadlines were established for issuance of RCRA

permits to the various types of treatment, storage, and disposal facilities. Each of these permits must, to the extent necessary, require a schedule of compliance for corrective action. However, a substantial universe of facilities that will not receive permits must also be addressed for corrective action. EPA, through its Environmental Priorities Initiative, will review and set priorities for action among these facilities, to ensure that it addresses the most significant first.

It will also be important for EPA to set priorities and focus its efforts within facilities undergoing corrective action through the permitting process. Facilities receiving permits will present the full range of remedial problems; EPA and authorized States must carefully manage their resources at these facilities to ensure that the program effectively focuses on the most pressing problems. The Agency's first priority will be to require interim measures to address sites posing an immediate threat to human health and the environment, and to pursue engineering remedies to control or eliminate further migration of environmental releases. In addition, the Agency will expect prompt remediation of all significant off-site contamination, regardless of whether human or environmental exposure to the contamination is currently occurring. On the other hand, sites where current exposure is low and releases have been effectively controlled will be a lower priority. This is particularly likely to be the case where a site is controlled by a financially viable owner/operator who can ensure that releases are adequately contained and exposure eliminated and who will be capable of undertaking eventual cleanup.

The Agency may rely on "conditional" remedies where prompt remedial action can reduce risk to levels acceptable for current uses, or where final cleanup is impracticable. As a general principle, EPA believes that cleanups must achieve a level appropriate for all actual and reasonably expected uses (The question of cleanup goals is discussed more fully in the next section of this preamble.) RCRA sites subject to corrective action, however, will typically be facilities seeking permits to manage hazardous waste, rather than sites that are widely open to the public and subject to a broad range of uses. As long as the permit is in place and the facility is under the management of the owner/operator, exposure to contaminated media within the facility boundary, such as contaminated soils, would be significantly less than it would be in an

area of unrestricted access, where future uses might include residential or agricultural development. In such controlled use situations, EPA believes that it will often be reasonable to require prompt cleanup to levels consistent with current use, but to defer final cleanup as long as the owner/operator remains under a RCRA permit.

In other cases, it may be readily apparent that cleanup of a site to levels appropriate for unrestricted use will be impracticable. RCRA will have to address a number of intractable problems, such as the cleanup of large, complex sites like municipal landfills, or ground-water cleanup where the bedrock is heavily fractured. In these cases as well, it may be appropriate to rely on "conditional" remedies that control risk during the life of the permit, and rely on institutional controls to prevent future exposure.

EPA expects that these conditional remedies will play a significant role in the implementation of RCRA corrective action, and will enable the Agency and the regulated community to focus their resources most effectively on the most pressing problems. Further discussion of "conditional" remedies is contained in section VI.F.8 of this preamble.

The Agency intends to remove regulatory disincentives to independent action by facility owner/operators and will encourage voluntary cleanups. EPA recognizes that it is important to allow willing and responsible owner/operators to begin corrective action promptly without unnecessary procedural delays. In many cases, the Agency believes that owner/operators will wish to take source control measures, begin ground-water pumping, or take other measures to reduce or eliminate a problem. EPA encourages these activities, and in many cases may find it appropriate to incorporate owner/operator initiated corrective action into permits as interim measures. In addition, the Agency has taken steps to simplify RCRA permit modification procedures for corrective action in its final rule on RCRA permit modifications (53 FR 37912, September 28, 1988). The issue of voluntary corrective action is discussed more fully in section VI.A of this preamble.

Facility investigations and other analyses will be streamlined to focus on plausible concerns and likely remedies, and to expedite cleanup decisions. While remedial investigations must be thorough enough to identify any serious problems, EPA recognizes that its own resources and those of the regulated industry are finite, and therefore that these investigations must be focused on

plausible concerns and conducted in a step-wise fashion, with early screens to determine whether further investigation is necessary. Similarly, although it will be necessary in some cases—particularly at facilities with large and complex cleanup problems—for the owner/operator to analyze a wide range of cleanup alternatives, at most RCRA facilities a more limited analysis will be appropriate. For example, when the appropriate remedy is self-evident (e.g., drum removal and treatment to best demonstrated available technology (BDAT)), it may be unnecessary to evaluate alternatives that would not be adopted. Similarly, where an owner/operator proposes a remedy that is effective and protective, it may be appropriate to approve the remedy and avoid continued studies that would serve only to delay cleanup. In either case, the permit would establish performance standards in the form of cleanup levels. If the remedy failed to achieve these standards, it would have to be modified accordingly. Section VI.H.5 of the preamble discusses in further detail the issue of the technical impracticability of achieving a remedial requirement given a specified remedy.

In managing the corrective action program, the Agency will emphasize early actions and expeditious remedy decisions. One of the Agency's overriding goals in managing the corrective action program will be to expedite cleanup results by requiring sensible early actions to control environmental problems on an interim basis, and using flexible and pragmatic approaches in making final remedy decisions. EPA believes that in many cases it will be possible to identify early in the corrective action process actions which can and should be taken to control exposure to contamination, or to stop further environmental degradation from occurring. Such interim measures may be relatively straightforward, such as erecting a fence or removing small numbers of drums, or may involve more elaborate measures such as installing a pump and treat system to prevent further migration of a ground-water contaminant plume. In another example, where it is obvious that the eventual remedy will require excavation and treatment or removal of contaminated "hotspots," such action should be initiated as an interim measure, rather than deferring it until after final remedy selection.

Final remedy decisions must be based on careful judgments and sound technical information. However, today's proposed rule provides for considerable flexibility in structuring studies and

selecting remedies. It is EPA's intention to use that flexibility to streamline the remedy development/decision process whenever feasible. Corrective Measure Studies should focus on plausible remedial options, and should be scaled to fit the complexity of the remedial situation. Obvious remedial solutions should not be impeded by unnecessary studies. Voluntary cleanup initiatives by owner/operators that are consistent with EPA's cleanup goals will be encouraged as a means of expediting the remedial process.

B. Cleanup Goals for Corrective Action

EPA's goal in RCRA corrective action is, to the extent practicable, to eliminate significant releases from solid waste management units that pose threats to human health and the environment, and to clean up contaminated media to a level consistent with reasonably expected, as well as current, uses. The timing for reaching this goal will depend on a variety of factors, such as the complexity of the action, the immediacy of the threat, the facility's priority for corrective action, and the financial viability of the owner/operator. However, the final goal of cleanup would remain the same.

It should be recognized that EPA's emphasis in today's rule on minimizing further releases means that corrective action will frequently require source removal, source control, and waste treatment. In this respect, today's rule reflects a shift in emphasis from current RCRA corrective action requirements for ground-water releases from regulated units. These requirements currently focus on cleanup of the ground water, but not on control of the source. However, EPA believes that it will frequently be impossible to control releases and ensure the long-term effectiveness of remedies without significant source control. For example, a response action that focuses entirely on remediation of the contaminated medium may meet acceptable cleanup standards in the short term, but continued leaking could lead to unacceptable releases in the future as the source continues to leak. Therefore, today's rule explicitly provides EPA authority to require source control.

One of the more controversial issues related to corrective action is the cleanup goals for contaminated media, or "how clean is clean." EPA has not attempted in this rule or elsewhere to establish specific cleanup levels for different hazardous constituents in each medium. Instead, EPA believes that different cleanup levels will be appropriate in different situations, and that the levels are best established as

part of the remedy selection process. Generally, however, the cleanup must achieve protective levels for future as well as current uses. This is the approach taken in today's proposal.

To be "protective" of human health, EPA believes that cleanup levels for carcinogens must be equal to or below an upperbound excess lifetime cancer risk level of 1 in 10,000 (1×10^{-5}). As proposed today, cleanup levels would be selected within the upper bound 1×10^{-6} to 1×10^{-4} risk range during the selection of remedy process; however, remedies at the more protective end of the range would ordinarily be preferred. For non-carcinogens, cleanup levels would be set at a level at which adverse effects would not be expected to occur. The application of this approach to specific media is described below.

Ground water. Potentially drinkable ground water would be cleaned up to levels safe for drinking throughout the contaminated plume, regardless of whether the water was in fact being consumed. Where maximum contaminant levels (MCLs) established under the Safe Drinking Water Act are available for specific contaminants, these limits generally will be used; otherwise, the levels would be set within the protective range. Alternative levels protective of the environment and safe for other uses could be established for ground water that is not an actual or reasonably expected source of drinking water.

Soil. Contaminated soil would be remediated to levels consistent with plausible future patterns of use. For example, where access to an area would be unrestricted, cleanup would generally be required to levels appropriate for residential development. At industrial sites or sites dedicated to long-term hazardous waste management, cleanup to less stringent levels might be appropriate, although institutional controls could be necessary to ensure that the use pattern did not change.

Surface water. Releases to surface water should be remediated to levels consistent with potential uses. For example, where surface water is designated for drinking water or is a potential drinking water source, cleanup to drinkable levels would be required. In the case of surface water, environmental effects are likely to be particularly important, because levels protective for humans may often be insufficient for protection of aquatic organisms.

Air. Like soil, air releases from solid waste management units would be of concern where they posed a threat to humans or the environment under plausible current or future use patterns.

Typically, corrective action involving air concerns would involve source control to minimize further releases.

C. Major Elements of Today's Proposal

The principles described above will shape EPA's general approach to corrective action, and they serve as operating assumptions behind today's notice. Today's proposal will establish the basic framework for the corrective action program, both for EPA and authorized States. More specifically, it codifies the procedures for identifying problems and selecting remedies at RCRA facilities; the standards for cleanup, including the establishment of cleanup levels; and the standards for managing cleanups and the wastes generated by cleanups. The major elements of the proposal are summarized below.

Permitting procedures and permit schedules of compliance. Today's proposal, which implements section 3004(u), addresses corrective action at facilities seeking RCRA permits. Corrective action requirements will be imposed on these facilities directly through the permitting process and will be incorporated into permits through schedules of compliance. Typically, before a permit is issued, EPA or an authorized State would conduct an RFA at the facility to determine whether a potential problem existed. Where a likely release was found, the permit would contain a schedule of compliance, as specified in proposed § 264.510, requiring a remedial investigation focusing on the specifics of the likely release. This schedule of compliance would be a part of the permit, and would be successively modified, as necessary, as studies and corrective actions at the facility proceeded.

Trigger or "action levels." Where contamination is identified during the facility investigation, EPA or an authorized State will have to make a decision on whether further analysis, including analysis of potential remedies, is appropriate, or whether the contamination is at an insignificant level. For this reason, the rule incorporates the concept of "action levels"—levels that, if found in the environment, will typically trigger a Corrective Measure Study. Under today's proposal, action levels would be established in the initial permit, or, in some cases, through a permit modification after a release has been identified.

Section 264.521 of the proposal establishes the general principles by which action levels would be established for each medium. To provide

guidance for RCRA permit writers, industry, and the public, today's proposal includes in Appendix A of this preamble values that the Agency believes may be appropriate as action levels for a number of hazardous constituents in different environmental media. These levels would be incorporated individually into permits through the permitting process.

If environmental levels were found to be below the action levels, no further action would ordinarily be required. However, even if an action level has been exceeded, the proposal in § 264.514 would allow the owner/operator to demonstrate that no action was necessary. For example, if ground water were not a potential source of drinking water because of high levels of natural contamination, an owner/operator might successfully argue that cleanup was unnecessary. In this way, action levels would constitute rebuttable presumptions. This issue is discussed in more detail in section VI.E.2 of this preamble.

Corrective Measure Study and remedy selection. Typically, if an action level has been exceeded, the facility owner/operator would be required under the proposal to conduct a Corrective Measure Study (CMS). The purpose of the CMS is to identify and evaluate potential remedies. EPA anticipates that, in a few cases, owner/operators of larger sites with complex environmental problems may need to evaluate several alternative remedial approaches in determining the most appropriate remedy for the facility. For most RCRA facilities, however, it will be possible to abbreviate the analysis, and frequently it may be appropriate for the owner/operator to propose a single alternative, which EPA would approve or disapprove. The proposed regulation in § 264.522 gives the Agency the necessary flexibility to vary the scope of the Corrective Measure Study, depending on the specifics of the situation.

EPA would approve or select the remedy under the standards and criteria proposed in § 264.525. Proposed § 264.525(a) would require the remedy to be protective of human health and the environment, to achieve media cleanup standards, to minimize further releases, and to comply with subtitle C and other waste management standards. In selecting the remedy, the Agency would be required to consider a wide range of factors, such as the remedy's short- and long-term effectiveness and its practicability. These factors are generally comparable to the factors considered by the Agency in selecting

Superfund remedies under § 300.430 of the NCP. (See 55 FR 8666, March 8, 1990.)

Remedies selected under § 264.525 would require formal permit modifications, with opportunity for public comment and rights of appeal. After public comment, the proposed permit schedule of compliance would be amended, (if necessary) and approved, to require that the owner/operator develop a specific remedial design and, after approval of the design, carry out the remedy.

Cleanup levels. The Agency's goal is that remedies clean up to levels determined to be protective of human health and the environment. EPA's general cleanup goals are described in section B above and in section VI.F.5 of this preamble. Specific levels for each facility, consistent with these goals, would be established during the remedy selection process and would be incorporated into the permit and made available for public comment.

Where protective levels could not be attained, or where wastes were left on site in disposal units, long-term management would be required through the permit.

Standards for management of corrective action waste. Proposed §§ 264.550-264.552 would establish standards for conducting corrective action and handling wastes generated during corrective action. If corrective action waste meets the RCRA regulatory definition of hazardous it would have to be handled under the proposal as hazardous waste. With some limited exceptions, new units built to treat, store, or dispose of this waste on-site would have to comply with 40 CFR part 264 performance standards for hazardous waste units. Similarly, hazardous waste shipped off site would have to be sent to RCRA subtitle C facilities.

The rule would also establish more flexible standards for temporary treatment and storage units developed during the course of corrective action.

Completion of remedy. Proposed § 264.530 would establish requirements for remedy completion. Similar to RCRA closures, an independent engineer or other qualified professional would have to certify completion of the remedy, and, in addition, public notice and comment would be required before the Agency made a final decision on whether the remedy had been completed.

In some cases, it might become clear in the course of a remedy that it was not technically practicable to reach the cleanup levels specified in the permit. In this case, proposed § 264.531 would

allow termination of the remedial action and waiver of the cleanup standard. However, if environmental contamination remained at unprotective levels, long-term institutional or other controls would be required to prevent human and environmental exposure.

These requirements and alternatives that the Agency considered are discussed in more detail in the following sections.

VI. Section-by-Section Analysis

A. Purpose/Applicability (Section 264.500)

1. **Conforming Changes to Previous Codification of § 3004(u) and General Discussion.** In today's proposal, EPA is establishing a new subpart S to 40 CFR part 264. This section of the proposed rule sets forth the general applicability of the proposed subpart S regulations. The procedures and technical requirements of subpart S apply to any facility seeking a permit under section 3005(c) of RCRA.

The language of § 264.500(a) through § 264.500(d) reiterates the statutory language of section 3004(u) and section 3004(v). Proposed §§ 264.500 (b), (c), and (d) have already taken effect as a final rule following public notice and comment, and are codified at 40 CFR 264.101 (on July 15, 1985, 50 FR 28702; and December 1, 1987, 52 FR 45788). It is not the Agency's intention to reopen for public comment the substance of these pre-existing provisions. The Agency seeks comment only on the minor language changes reflected in § 264.500 (e.g., compare the first sentence of § 264.101(b) with the first sentence of § 264.500(c)), and its proposal to move these provisions from § 264.101 to § 264.500.

Proposed § 264.500(a) clarifies that subpart S applies to corrective action for all SWMUs, including regulated units (defined in § 264.90(a)(2) as any landfill, surface impoundment, waste pile, or land treatment unit that received hazardous waste after July 26, 1982). Corrective action for releases to ground water from regulated units is currently governed by § 264.100. Subpart S will apply to the investigation of releases to ground water from other SWMUs. Releases to other media (air, soil and surface waters) from both regulated units and other SWMUs will also be governed by subpart S.

The Agency intends to modify the § 264.100 standards to be consistent with the applicable sections of subpart S. Thus, regulated units and other SWMUs would be subject to the same standards for identifying and

implementing necessary remedial action. However, regulated units will continue to be subject to slightly different standards for identifying and confirming unacceptable releases to ground water. EPA believes that this distinction between regulated units and the larger universe of SWMUs is justified by the slightly different function of investigating procedures in the context of regulated units; the purpose of the ground-water detection and compliance monitoring programs in subpart F is primarily preventive, rather than essentially responsive like the subpart S program.

The statutory language of section 3004(u), repeated in §§ 264.500 (b) and (c), allows EPA to issue a RCRA permit with a schedule of compliance for investigating and correcting releases, rather than delay issuance of the permit until cleanup has been completed. This will allow more prompt permitting both of interim status facilities, bringing them under the more stringent 40 CFR part 264 standards sooner, and of new facilities, allowing more rapid expansion of treatment, storage, and disposal capacity.

Schedules of compliance, which are enforceable components of the permit, will thus be the primary vehicle by which EPA will specify the procedural and technical requirements that owner/operators must follow to achieve compliance with their subpart S responsibilities. EPA is proposing specific procedural requirements for corrective action schedules of compliance, including requirements associated with modifications to the schedules, in today's rule as amendments to the existing 40 CFR part 270 permit regulations.

As specified in proposed § 264.500(b), subpart S regulations will apply to all facilities seeking permits under subtitle C of RCRA (with the exception of the specific permits identified in proposed § 264.500(f)). Permits subject to subpart S include post-closure permits, as well as permits issued to operating hazardous waste management facilities. Further discussion of the applicability of post-closure permit requirements and their relationship to section 3004(u) corrective action is discussed in the preamble to the Second Codification Rule (December 1, 1987, 52 FR 45788).

2. Exceptions to Applicability. Today's proposed § 264.500(f) lists four types of RCRA "permits" to which the subpart S regulations would not apply. Each is discussed below.

a. Permits for Land Treatment Demonstrations. Current RCRA regulations for hazardous waste land treatment units (see § 270.63(a) and

§ 264.272) provide for a two-phased permit process in certain circumstances. A "permit" can be issued to a facility with permit conditions which cover only the activities needed to demonstrate that the hazardous waste constituents can be completely degraded, transformed, or immobilized in the treatment zone. Such a permit does not address the full RCRA standards (e.g., financial assurance, general facility standards) that apply to land treatment facilities. In the absence of permit conditions addressing full RCRA facility standards, this first-phase demonstration permit is not considered a full RCRA permit issued under the authority of section 3005. Once the demonstration is successfully completed and the actual operating permit (i.e., second part of the two-phased permit) for the land treatment unit is issued, the subpart S corrective action requirements will apply.

b. Emergency Permits. Section 270.61 of the RCRA regulations provides for issuance of emergency permits, not to exceed 90 days in duration, where immediate actions that involve treatment, storage, or disposal of hazardous waste are necessary to protect human health and the environment. The emergency permit provision was included in the RCRA regulations as a way to provide a mechanism for responses by an owner/operator in true emergency situations which could not be delayed until a full RCRA permit could be issued. In some cases, emergency permits can be issued orally when followed by a written permit within a specified time frame. EPA does not believe it is appropriate to apply subpart S requirements to emergency permits, since such a requirement would render this permit mechanism unworkable for the quick-response situations it was designed to address. If a facility is required to continue to operate under a RCRA permit beyond the allowable time limit for emergency permits, a full operating permit would be required and the facility would be subject to subpart S requirements.

c. Permits-by-Rule for Ocean Disposal Barges or Vessels. Ocean disposal barges and vessels are regulated primarily under the Marine Protection, Research and Sanctuaries Act (MPRSA). The applicable RCRA regulations (40 CFR 270.60(a)) provide that operation of vessels accepting hazardous waste for ocean dumping are deemed to have a RCRA permit if they have obtained and comply with an ocean dumping permit issued under the MPRSA, and comply with certain RCRA administrative requirements. The RCRA permit-by-rule

functions primarily to ensure that certain administrative requirements of the RCRA system—in particular, waste manifest requirements—apply to owner/operators of such vessels. Furthermore, as of November 1988, the Ocean Dumping Ban Act has in effect banned the ocean dumping of industrial waste. While corrective action requirements under subpart S do apply to underground injection control (UIC) facilities and publicly-owned treatment works (POTWs) with National Pollutant Discharge Elimination System (NPDES) permits subject to RCRA permits-by-rule under 40 CFR 270.60, such requirements are necessary to ensure that corrective action requirements apply to releases from all solid waste management units at these facilities not regulated under other laws. MPRSA permits, however, cover all portions of ocean-dumping vessels. (Any onshore storage or treatment facility that may be associated with the ocean disposal operation is required to obtain a separate RCRA permit.) Thus there are no unregulated units within an ocean dumping barge "facility." Furthermore, unauthorized releases from such vessels are subject to regulation under the MPRSA. EPA does not believe it is appropriate to apply subpart S to these vessels because the substantive requirements of section 3004(u) of RCRA are already effectively satisfied by MPRSA requirements.

d. Research, Development and Demonstration Permits. EPA does not believe that RCRA requires the application of section 3004(u) requirements to facilities seeking a research and development demonstration permit under section 3005(g) of RCRA. The conference report on section 3004(u) expressly states that the provision is intended to apply to facilities seeking a permit under section 3005(c) of RCRA. Accordingly, facilities seeking a permit under section 3005(g) would not automatically be encompassed by section 3004(u). Moreover, the reading of section 3004(u) suggested by the conference report is supported by the statutory language of section 3005(g). Section 3005(g)(1) provides that the Regional Administrator shall include such terms and conditions in research and development demonstration permits as s/he deems necessary to protect human health and the environment, including provisions related to monitoring, financial responsibility and remedial action. Section 3005(g)(1) further provides that these provisions may be established case-specifically in each permit without the establishment of

separate regulations. Accordingly, the plain language of section 3005(g)(1), and the legislative history of section 3004(u) both suggest that research and development demonstration permits can be subject to case-specific remedial conditions in the permit as determined to be necessary, and need not be subject to the general corrective action regulations developed under section 3004(u).

3. Voluntary Corrective Action.

Today's proposal for corrective action under the authority of RCRA section 3004(u) applies to RCRA facilities which are seeking permits under RCRA subtitle C. Certain facilities where RCRA hazardous wastes are present, and where corrective action may be needed, are not required to obtain subtitle C permits, and, therefore, are not subject to today's rule. For example, facilities which generate hazardous wastes and accumulate and store the wastes on site for less than 90 days prior to shipment to another facility are not subject to permits or to today's proposed rule.

In a number of cases, owner/operators not subject to a RCRA permit have expressed an interest in proceeding with corrective action in an attempt either to reduce their liability or to preclude subsequent Agency or State actions. Some activities conducted during voluntary corrective action may require a permit if hazardous waste is involved (e.g., excavated waste is placed into a disposal unit or stored on site for more than 90 days).

Current regulations, however, provide significant flexibility for non-permitted facilities to undertake corrective action without a RCRA permit. For example, 40 CFR 262.34 allows generators to accumulate hazardous waste on site in tanks or containers for up to 90 days without a permit or interim status, as long as certain conditions—most importantly compliance with tank and container standards of 40 CFR part 265—are met. In addition, this authority allows generators to treat hazardous waste in tanks during the accumulation period. Under RCRA regulations, a facility owner/operator conducting voluntary corrective action involving hazardous waste could often be considered a generator. One approach to achieving cleanup without triggering the need to obtain a subtitle C permit would be to store or treat such generated wastes in tanks within the accumulation period, so long as the wastes remained on site for less than 90 days, and other conditions of § 262.34 were met.

In addition, voluntary corrective action could take place under a consent decree issued under section 7003 of RCRA. This authority allows EPA (or an

authorized State with comparable authority) to require remedial action in the case of an imminent and substantial threat to human health or the environment, "notwithstanding any other provisions of this Act." Thus, under this authority, EPA could order a facility to take corrective action, while at the same time waiving permit requirements. Any facility interested in taking corrective action under this authority should consult with the appropriate Region or authorized State to explore the possibility of a section 7003 consent order.

The concept of "voluntary" corrective action may also apply to owner/operators who have been issued permits with corrective action schedules of compliance. Some facilities, such as those with small or low-risk contamination problems, will be of relatively low priority for expending the substantial resources required to oversee investigations and studies and make remedy decisions. For those facilities, EPA's oversight attention could be deferred for several years while the program focuses on high priority facilities with major environmental problems. However, owner/operators of lower priority facilities may wish, for various reasons, to expeditiously initiate cleanup actions, rather than wait for EPA to begin actively pursuing corrective action for the facility. EPA strongly encourages owner/operator cleanup initiatives at permitted facilities, and intends to facilitate such actions by minimizing any administrative obstacles which may impede cleanup.

Owner/operators may take a wide range of remedial-type activities at RCRA permitted facilities without triggering the need for formal approval by the Agency or modification of the permit. Such activities include, for example, treatment, storage, or disposal of any non-hazardous solid wastes; excavation of hazardous wastes for disposal off site; less-than-90-day storage or treatment of hazardous wastes in tanks; and treatment of contaminated ground water in an exempt wastewater treatment unit. However, some activities which may be necessary to achieve corrective action goals at the facility would require a permit modification. Such activities might include creation of a new hazardous waste land disposal unit, consolidation and/or movement of hazardous wastes between SWMUs at the facility, or construction (or movement on site) of a new hazardous waste incinerator to manage corrective action wastes.

The Agency intends to pursue an approach to this type of "voluntary" corrective action which will provide sufficient Agency oversight over cleanup activities to prevent possible adverse effects of cleanup actions without creating disincentives to owner/operators who wish to take a proactive position vis-a-vis their corrective action responsibilities. This approach would encourage the owner/operator to notify EPA and the State of any remedial-type activities being undertaken at the facility, even though the activities are not subject to formal Agency approval. For proposed cleanup activities that are subject to permit modification requirements, the owner/operator would be required to submit a request for a Class I, II or III permit modification, or a request for temporary authorization for the activities. (See the final permit modification regulations at 53 FR 37912, September 28, 1988.) In the request for a permit modification (or temporary authorization), the owner/operator would be expected to include: (1) A description of the remediation initiative, including details of the unit or activity that is subject to permit requirements; and (2) an explanation of how the proposed action is consistent with overall corrective action objectives and requirements outlined in today's proposed regulation. EPA expects that the corrective action regulations proposed today will offer owner/operators clear guidance in fashioning acceptable remedies and making such showings of consistency.

EPA's review of the application would focus on the units or actions subject to the permit modification requirements; it would not, however, focus on whether the proposed cleanup action as a whole satisfies the subpart S requirements. Rather, EPA will screen the cleanup proposal to ensure that it would not pose unacceptable risks to human health and the environment (e.g., by producing undesirable cross-media impacts) or interfere with attainment of the final remedy at the site (e.g., by creating a new unit over an area of soil contamination which may later need to be treated or removed to health-based levels). Following this review, the Agency would approve or disallow the application.

Where a permit modification is approved under these circumstances, the modification will make clear that the voluntary activities initiated for corrective action purposes may not be the final remedy, and that those activities, when completed, will not necessarily absolve the owner/operator from further cleanup responsibilities at a

later date. This will also hold for cleanup actions reviewed by the Agency that are not subject to permit modifications. It is not possible for the Agency to delegate to owner/operators the ultimate responsibility for ensuring that remedial activities fully satisfy RCRA's statutory requirement for protection of human health and the environment.

The Agency solicits comments on the approach to voluntary corrective action described above.

B. Definitions (Section 264.501)

EPA is today proposing to define five key terms which apply specifically to this subpart.

1. *Facility*. In the July 15, 1985, Codification Rule, EPA interpreted the term "facility" in the context of section 3004(u) to mean all contiguous property under the control of the owner/operator of a facility seeking a permit under subtitle C. This interpretation was upheld in a decision of the U.S. District Court of Appeals (*United Technologies Corporation vs. U.S. EPA*, 821 F.2d, 714 (DC Cir. 1987)). Thus, by proposing this interpretation as the definition of facility in today's rule, EPA is not modifying its basic interpretation as previously elaborated for the purpose of implementing section 3004(u). There are, however, several aspects of this definition which merit further clarification.

The definition of facility in today's proposal at § 264.501 is not intended to alter or subsume the existing—and narrower—definition of "facility" that is given in 40 CFR 260.10. That definition describes the facility as " . . . all contiguous land and structures . . . used for treating, storing or disposing of hazardous waste . . ." EPA intends to retain this definition for the purposes of implementing RCRA subtitle C requirements, with the exception of subpart S corrective action (including those provisions governing corrective action for regulated units). At the same time, however, the Agency is reviewing its uses of the term "facility" in other parts of the subtitle C regulations to ensure consistent usage.

Today's proposed definition refers to "contiguous property" under the control of the owner/operator. Several questions have been raised as to the Agency's interpretation of "contiguous property" in the context of defining the areal limits of the facility. Clearly, property that is owned by the owner/operator that is located apart from the facility (*i.e.*, is separated by land owned by others) is not part of the "facility." EPA does intend, however, to consider property that is separated only by a

public right-of-way (such as a roadway or a power transmission right-of-way) to be contiguous property. The term "contiguous property" also has significant additional meaning when applied to a facility where the owner is a different entity from the operator. For example, if a 100-acre parcel of land were owned by a company that leases five acres of it to another company that, in turn, engages in hazardous waste management on the five acres leased, the "facility" for the purposes of corrective action would be the entire 100-acre parcel. Likewise, if (in the same example) the operator also owned 20 acres of land located contiguous to the 100-acre parcel, but not contiguous to the five-acre parcel, the facility would be the combined 120 acres. EPA invites comment on these interpretations of contiguous property.

In some cases, adjacent properties may be separately owned by two different subsidiaries of a parent company, where only one of the subsidiaries' operations involves management of hazardous wastes. In such cases, EPA intends to consider the ownership to be held by the parent corporation. Thus, in the example provided, the facility would include both properties.

EPA acknowledges that, in some situations, "ownership" of property can involve a complex legal determination. EPA solicits comment and information on the interpretation offered in general, and specifically on the issue of how ownership or "control" of property should be determined in the context of subsidiary-parent companies.

2. *Release*. Today's proposal includes the definition of "release" articulated in the preamble to the July 15, 1985, Codification Rule. This definition essentially repeats the CERCLA definition of release. Today's proposed definition also includes language from SARA which extended the concept of "release" to include abandoned or discarded barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents.

Although this definition of release is quite broad, section 3004(u) is limited to addressing releases from solid waste management units. Thus, there may be releases at a facility that are not associated with solid waste management units, and that are therefore not subject to corrective action under this authority. (See discussion below which defines solid waste management unit.)

Many facilities have releases from solid waste management units that are issued permits under other environmental laws. For example, stack

emissions from a solid waste refuse incinerator at a RCRA facility are likely to be authorized under a State-issued air permit. Another example would be NPDES (National Pollutant Discharge Elimination System, under the Clean Water Act), or State-equivalent, permits for discharges to surface water from an industrial wastewater treatment system. EPA does not intend to utilize the section 3004(u) corrective action authority to supersede or routinely reevaluate such permitted releases. However, in the course of investigating RCRA facilities for corrective action purposes, EPA may find situations where permitted releases from SWMUs have created threats to human health and the environment. In such a case, EPA would refer the information to the relevant permitting authority or program office for action. If the permitting authority is unable to compel corrective action for the release, EPA will take necessary action under section 3004(u) (for facilities with RCRA permits) or section 3008(h) (for interim status facilities), as appropriate, and to the extent not inconsistent with certain applicable laws (see section 1006(a) of RCRA).

3. *Solid Waste Management Unit (SWMU)*. Today's rule proposes the following definition of solid waste management unit:

Any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

This definition is also derived from the Agency interpretation discussed in the July 15, 1985, Codification Rule. A discernible unit in this context includes the types of units typically identified with the RCRA regulatory program, including landfills, surface impoundments, land treatment units, waste piles, tanks, container storage areas incinerators, injection wells, wastewater treatment units, waste recycling units, and other physical, chemical or biological treatment units.

The proposed definition also includes as a type of solid waste management unit those areas of a facility at which solid wastes have been released in a routine and systematic manner. One example of such a unit would be a wood preservative "kickback drippage" area, where pressure treated wood is stored in a manner which allows preservative fluids routinely to drip onto the soil, eventually creating an area of highly contaminated soils. Another example might be a loading/unloading area at a

facility, where coupling and decoupling operations, or other practices result in a relatively small but steady amount of spillage or drippage, that, over time, results in highly contaminated soils. Similarly, if an outdoor area of a facility were used for solvent washing of large parts, with amounts of solvent continually dripping onto the soils, that area could also be considered a solid waste management unit.

For clarification purposes it may also be useful to identify certain types of releases that the Agency does not propose to consider solid waste management units using the "routine and systematic" criterion. A one-time spill of hazardous wastes (such as from a vehicle travelling across the facility) would not be considered a solid waste management unit. If the spill were not cleaned up, however, such a spill would be illegal disposal, and therefore subject to enforcement action under section 3008(a) or section 7003 of RCRA. Similarly, leakage from a chemical product storage tank would generally not constitute a solid waste management unit; such "passive" leakage would not constitute a routine and systematic release since it is not the result of a systematic human activity. Likewise, releases from production processes, and contamination resulting from such releases, will generally not be considered solid waste management units, unless the Agency finds that the releases have been routine and systematic in nature. (Such releases could, however, be addressed as illegal disposal under section 3008(a) or section 7003.) EPA solicits comment on these interpretations, and on the overall definition of solid waste management unit.

EPA recognizes that these interpretations have the effect of precluding section 3004(u) from addressing some environmental problems at RCRA facilities. However, EPA intends to exercise its authority, as necessary, under the RCRA "omnibus" provision (section 3005(c)(2)), or other authorities provided in RCRA (e.g., section 3008(a) and section 7003) or CERCLA (e.g., CERCLA section 104 or section 106), or States, under State authorities, to correct such problems and to protect human health and the environment.

The RCRA program has identified certain specific units and waste management practices at facilities about which questions have been raised concerning applicability of the definition of a solid waste management unit. One such question relates to military firing ranges and impact areas. Such areas are

often potentially hazardous, due to the presence of unexploded ordnance. EPA has decided that such areas should not be considered solid waste management units. There is a strong argument that unexploded ordnance fired during target practice is not discarded material which falls within the regulatory definition of "solid waste." Ordnance that does not explode, as well as fragments of exploded ordnance, would be expected to land on the ground. Hence, the "ordinary use" of ordnance includes placement on land. Moreover, it is possible that the user has not abandoned or discarded the ordnance, but rather intends to reuse or recycle them at some time in the future. In addition, a U.S. District Court decision (*Barcello vs. Brown*, 478 F. Supp. 646, 668-669 (D. Puerto Rico 1979)), has suggested that materials resulting from uniquely military activities engaged in by no other parties fall outside the definition of solid waste, and thus would not be subject to section 3004(u) corrective action.

Another issue which raises questions regarding the definition of "solid waste management unit" relates to industrial process collection sewers. Process collection sewers are typically designed and operated as a system of piping into which wastes are introduced, and which usually discharge into a wastewater treatment system. The Agency believes that there are sound reasons for considering process collection sewers to be solid waste management units. Such sewers typically handle large volumes of waste on a more or less continuous basis, and are an integral component of many facilities' overall waste management system. Program experience has further indicated that many of these systems, especially those at older facilities, have significant leakage, and can be a principal source of soil and ground-water contamination at the facility. Although process collection sewers are physically somewhat unique in the context of the types of units which have traditionally been regulated under RCRA, EPA believes that including them as solid waste management units for purposes of corrective action is well within the discretion provided under the statute for EPA to determine what "units" should be subject to RCRA standards.

EPA recognizes that there may be technical problems associated with investigating releases from process collection sewers, and with correcting leakage. Information and comment are specifically solicited on EPA's tentative decision to treat process collection sewers as solid waste management

units, and on technical approaches and limitations to investigating and correcting releases from such systems.

For essentially the same reasons as described above for process sewers, EPA also proposes to include open (or closed) ditches that are used to convey solid wastes as solid waste management units; comment is also solicited on this interpretation.

4. Hazardous Waste and Hazardous Constituents. Section 3004(u) requires corrective action for releases of "hazardous wastes or constituents." The Agency believes that use of the term "hazardous waste" denotes "hazardous waste" as defined in section 1004(5) of RCRA. Accordingly, today's proposed rule repeats the statutory definition of "hazardous waste" found in that section. The term "hazardous waste" is distinguished from the phrase "hazardous waste listed and identified," which is used elsewhere in the statute to denote that subset of hazardous wastes specifically listed and identified by the Agency pursuant to section 3001 of RCRA. Thus, the remedial authority under section 3004(u) is not limited to releases of wastes specifically listed in 40 CFR part 261 or identified pursuant to the characteristic tests found in that section. Rather, it extends potentially to any substance meeting the statutory definition. However, EPA believes that use of the phrase "hazardous wastes or constituents" (emphasis added) indicates that Congress was particularly concerned that the Agency use the section 3004(u) authority to address a specific subset of this broad category, that is, hazardous constituents.

The term "hazardous constituent" used in section 3004(u) means those constituents found in appendix VIII to 40 CFR part 261. See H. Rep. No. 98-198, 98th Cong., 1st Sess. 60-61, May 17, 1983. In addition, the Agency proposes to include within the definition those constituents identified in appendix IX to 40 CFR part 264. Appendix IX generally constitutes a subset of appendix VIII constituents particularly suitable for ground-water analyses. However, it also includes additional constituents not found on appendix VIII, but commonly addressed in ground-water analysis conducted as a part of Superfund cleanups.

It is EPA's intention that investigations of releases under subpart S focus on the subset of hazardous waste (including hazardous constituents) that is likely to have been released at a particular site, based on the available information. Only where very little is known of waste characteristics, and where there is a

potential for a wide spectrum of wastes to have been released, would the owner/operator be required to perform extensive or routine analysis for a broader spectrum of wastes.

5. *Corrective Action Management Unit (CAMU)*. The definition of CAMU is provided in section VI.J 3.b of today's preamble. This section also provides a thorough discussion of the CAMU concept and of how the Agency intends to define CAMUs in the context of implementing remedies.

C. Remedial Investigations (Sections 264.510-264.513)

1. *General*. The RCRA Facility Investigation (RFI) is the second phase of the RCRA corrective action process, and will typically be preceded by a RCRA Facility Assessment (RFA), conducted by EPA or the State prior to issuance of the permit or section 3008(h) order. The RFA is the first step in the RCRA corrective action process, and is analogous to the Preliminary Assessment/Site Investigation (PA/SI) stage of the Superfund program. The RFA serves as a screen, eliminating solid waste management units (SWMUs), environmental media, or entire facilities from further consideration where the Agency determines that there is no evidence of a release or likelihood of a release that poses a threat to human health and the environment. The RFA also serves to focus the scope of the follow-on remedial investigations by identifying those releases or areas that are of the most environmental concern at the facility. The RCRA RFI is comparable to the Remedial Investigation in the Superfund program. Because of the similarity of the two processes and because of their common goals, the RFI is referred to in this section and in the rule by the more generic term, remedial investigation.

As described above, EPA would require a remedial investigation under proposed § 264.510 if the RFA indicated that a release from a SWMU was likely to have occurred or to be occurring, or, in certain limited circumstances, likely to occur in the future. Requirements for the remedial investigation would be specified by the Agency in a schedule of compliance in the facility's permit. The schedule would typically identify the SWMUs and environmental media that required more detailed investigation as well as the types of investigations required; it would also typically require the owner/operator to develop a plan for conducting these investigations. The permit would also include "action levels" for specific constituents in specific media under investigation. If

subsequent investigation indicated that these action levels had been exceeded, a Corrective Measure Study could be required by the Agency.

EPA has recently issued a guidance document entitled *RCRA Facility Investigation Guidance*, which describes a menu of technical investigations that may be appropriate to conducting remedial-type investigations at RCRA facilities. EPA wishes to emphasize that the nature and scope of remedial investigations for RCRA facilities under proposed § 264.510 will be tailored to the specific conditions and circumstances at the facility. Investigations will be focused on the specific units, releases, and exposure pathways that have been identified by EPA to be of concern. In some cases, the scope of a remedial investigation could be limited to taking several soil samples of a particular area of discolored soils. Likewise, for inactive units that do not contain substantial volumes of volatile organic compounds, remedial investigations will rarely need to address air releases. In defining the nature and scope of remedial investigations at RCRA facilities, EPA will endeavor to minimize unnecessary and unproductive investigations, and to focus resources on characterizing actual environmental problems at facilities.

Today's rule, in §§ 264.511 through 264.513, proposes a regulatory framework (both procedural and substantive) for conducting remedial investigations. For more information on technical approaches to these investigations, readers should refer to the *RFI Guidance*, which has been included in the public record of this rulemaking.

EPA also anticipates that remedial investigations will typically be phased, to avoid unnecessary investigations where a concern can be quickly eliminated. Because of the importance of accurate data, and the likely need to extend or modify the analysis as data are developed, the remedial investigation will often, in addition, require a high level of interaction between the permittee and the Agency. The specific contents and scope of the investigations are described below.

2. *Scope of Remedial Investigations (§ 264.511)*. Proposed § 264.511 defines in general terms the scope of remedial investigations which may be required under § 264.510. Proposed § 264.511(a) states the general performance objective that remedial investigations characterize the nature, extent, direction, rate, movement, and concentration of releases, as required by the Agency. The scope and complexity

of remedial investigations will depend on the nature and extent of the contamination, whether the releases have migrated beyond the facility boundary, the amount of existing information on the site, the likely risk at the site, and other pertinent factors. The proposed general performance standard gives considerable flexibility to the Agency in defining the specific scope, level of detail, and data requirements for each remedial investigation. The specific investigation requirements deemed to be appropriate at a given facility will be included in the permit as part of the schedule of compliance.

Proposed §§ 264.511(a)(1)-(7) provide a menu of more specific types of information that may be required in remedial investigations: (1) Characterization of the environmental setting; (2) characterization of solid waste management units; (3) description of the humans and environmental systems which are, have been, or may potentially be exposed to the release; (4) information that will assist the Agency in assessing the risk posed to humans and environmental systems by the release; (5) extrapolations of future contaminant movement; (6) laboratory, bench-scale, or pilot-scale tests or studies to determine the feasibility or effectiveness of treatment or other technologies which may be appropriate in implementing remedies at the facility; and (7) statistical analyses to aid in the interpretation of data required in the investigation.

The *RFI Guidance* describes in detail technical approaches to characterizing the releases and environmental settings in remedial investigations. In addition, the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (September 1988) provides specific guidelines for characterizing ground-water releases. Therefore, this preamble will not describe in detail these technical procedures.

Section 264.511(a)(1)(i)-(v) describes five types of information that may be required in a characterization of the environmental setting: Hydrogeologic conditions; climatological conditions; soil characteristics; surface water characteristics including sediment quality; and air quality and meteorological conditions. This information would be required as appropriate to address the concerns identified in the RFA. Specific requirements for the facility will be included in the permit schedule of compliance.

Section 264.511(a)(2) would allow EPA to require a characterization of any SWMU from which releases may be

occurring or may have occurred. This characterization, which could include chemical and physical analyses, will be important in making decisions as to potential source control measures that may be needed. Characterization of wastes contained in SWMUs may involve generation of chemical and physical data about the wastes, their constituent breakdown, volumes, concentrations, and other relevant data. In some cases, unit characteristics such as materials of construction, age, or type and thickness of liners may be relevant to remedy decisions.

Section 264.511(a)(3) proposes that the Agency may require a full " . . . description of human and environmental systems which are or may be exposed to release(s)." The proximity and distribution of exposed populations may indicate the need for interim measures as proposed under § 264.540 of today's rule. Useful exposure information will generally be available at facilities with landfills or surface impoundments, in the form of Exposure Information Reports required under section 3019 of RCRA. The RFA report may also provide useful information on human and environmental systems which may potentially be exposed. Where information available prior to permit issuance does not adequately identify potentially exposed populations, EPA will require this information, as appropriate, to be generated as part of the remedial investigation.

The Agency is also concerned with the potential exposure of sensitive environmental species or systems to releases from SWMUs. As in the Superfund program, the Agency intends to carefully evaluate effects on sensitive environmental systems, including wetlands, estuaries, and habitats of endangered or threatened species.

Section 264.511(a)(4) would provide the Agency with the authority to require information that will assist the Regional Administrator in the assessment of risks to human health and the environment from releases from solid waste management units. Information collected under § 264.511(a)(3) also would be used in the assessment of risk. The risk assessment would integrate information on exposed human and environmental systems and information on contaminant concentrations to assess the magnitude of threats to exposed populations. The Agency may perform a risk assessment to determine whether interim measures are appropriate prior to selecting the final remedy or to evaluate whether a determination is warranted so that no further action is necessary (under proposed § 264.514).

The permittee should refer to chapter VIII of the *RFI Guidance* for information regarding the Agency's expectations for data that may be needed to conduct a risk assessment.

Section 264.511(a)(5) would provide the authority for the Agency to require a permittee to submit information that extrapolates future contaminant movement. Such information could be important in determining whether interim measures will be required to prevent further migration of contamination and what measures are likely to be effective in doing so. In addition, extrapolated contaminant movement will be important in assessing the adequacy of proposed schedules of implementation of the remedy.

Section 264.511(a)(6) would provide the Agency with the authority to require " . . . laboratory, bench-scale, or pilot-scale tests or studies to determine the feasibility or effectiveness of treatment technologies . . . that may be appropriate in implementing remedies at the facility." It is often difficult, and sometimes impossible, to predict the effectiveness of treatment technologies accurately without data from bench- or pilot-scale studies. Experience in the Superfund program has shown that bench-scale and pilot-scale studies can be useful both in developing potential remedies and in predicting the effectiveness of alternative approaches. Typically, such studies would be performed during the Corrective Measure Study (CMS) (which may be required after a contaminant concentration level specified in the permit as an "action level" is exceeded). However, in some cases such studies may need to be initiated during the remedial investigation to prevent delays in cleanups, and the Agency should have the regulatory authority to require this. For example, at SWMUs at facilities where confirmed releases have occurred over a long period of time and where wastes placed in those SWMUs were highly toxic or mobile, it should not be necessary to wait for the CMS phase of the corrective action process to begin to evaluate, on a small scale, the effectiveness of various treatment technologies in achieving protective concentration levels in the contaminated medium.

Section 264.511(a)(7) would provide the authority for the Agency to require a permittee to perform statistical analyses to aid in the interpretation of data collected through remedial investigations required under § 264.510. For example, such statistical analyses may be needed to determine whether

measured concentrations of contaminants exceed action levels.

Section 264.511(b) would authorize the Regional Administrator to specify the constituents and parameters for which samples collected during remedial investigations would be analyzed. Generally, analyses required will be limited to certain hazardous wastes or hazardous constituents listed in appendix VIII of 40 CFR part 261 or appendix IX of 40 CFR part 264 that are known or suspected to have been released from the unit. However, in some cases, where the wastes disposed in the unit are unknown to the owner/operator, or the unit is known to contain a hazardous substance(s) not included on either appendix VIII or IX, referenced above, additional analyses may be required. In the first case, it may be necessary to have an initial analysis which is designed to scan, for example, for all appendix IX constituents. Further analyses may then be limited to constituents which are found to be present in the initial sample. In addition, EPA may stipulate a requirement to analyze for substances not on either appendix VIII or IX (see preamble discussion on the definition of "hazardous waste"). Authority to specify the analyses to be performed, and for which constituents, will be important in ensuring that quality data are developed to accurately characterize releases, and to support no further action decisions that may be appropriate.

3. *Plans for Remedial Investigations (§ 264.512)*. Under today's proposed § 264.512, permittees may be required to submit a plan for conducting the remedial investigation if an investigation is determined to be necessary. The Agency considered, but is not proposing, making submittal of such plans an absolute requirement; that is, expressing it as a "shall" rather than a "may". In some cases the Region or State may have extensive knowledge of the facility prior to permit issuance, and may be able to specify, in detail, how the investigations should be conducted. In this situation, it would not be necessary to require the owner/operator to submit a workplan for approval. Likewise, in some other cases the permittee may have begun remedial investigations under an interim status corrective action order, under CERCLA, or on a voluntary basis. Where the workplan developed for investigations prior to permit issuance is determined by the Regional Administrator to be adequate, it will not be necessary to require submission and approval of the current plan—that plan would simply be