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Part III

Environmental Protection Agency

40 CFR Parts 259, 261, 266, and 270
Standards for the Management of Cement Kiln Dust; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 259, 261, 266, and 270

[FRL–6413–5 RIN 2050–AE34]

Standards for the Management of Cement Kiln Dust

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency ("we" or EPA) is today proposing a creative, affordable, and common sense approach for the management of cement kiln dust (CKD) waste under the Resource Conservation and Recovery Act (RCRA). CKD would remain a non-hazardous waste provided the following management standards are met. First, for ground-water protection, the Agency is proposing management standards which require a landfill to be designed to control releases of toxic metals to ground water at the point of compliance. Second, to control releases of fugitive dust, the proposed management standards would require persons managing CKD waste to cover or otherwise manage the landfill, CKD handling areas, and CKD storage areas to control wind dispersal of fugitive CKD. Finally, this rule also proposes concentration limitations on various pollutants in CKD used for agricultural purposes. This rule also proposes RCRA Subtitle C regulatory standards for CKD that is not managed according to the management standards described above.

DATES: EPA will accept public comment on this proposed rule until November 18, 1999.

ADDRESSES: Commenters must send an original and two copies of their comments referencing docket number F–99–CKDP–FFFFF to: RCRA Docket Information Center, Office of Solid Waste (5305G), U.S. Environmental Protection Agency Headquarters (EPA, HQ), 401 M Street, SW., Washington, DC 20460. Hand deliveries of comments should be made to the Arlington, VA, address below.

Comments may also be submitted electronically through the Internet to: rcra-docket@epa.gov. Comments in electronic format should also be identified by the docket number F–99–CKDP–FFFFF. All electronic comments must be submitted as an ASCII file avoiding the use of special characters and any form of encryption.

Commenters should not submit electronically any confidential business information (CBI). An original and two copies of CBI must be submitted under separate cover to: RCRA CBI Document Control Officer, Office of Solid Waste (5305W), U.S. EPA, 401 M Street, SW., Washington, DC 20460.

Public comments and supporting materials are available for viewing in the RCRA Docket Information Center (RIC), located at Crystal Gateway I, First Floor, 1235 Jefferson Davis Highway, Arlington, VA. The RIC is open from 9 a.m. to 4 p.m., Monday through Friday, excluding Federal holidays. To review docket materials, it is recommended that the public make an appointment by calling 703 603–9230. The public may copy a maximum of 100 pages from any regulatory docket at no charge. Additional copies cost $0.15/page. The index and some supporting materials are available electronically. See the "Supplementary Information" section for information on accessing them.

FOR FURTHER INFORMATION CONTACT: For general information, contact the RCRA Hotline at 800 424–9346 or TDD 800 553–7672 (hearing impaired). In the Washington, DC, metropolitan area, call 703 412–9810 or TDD 703 412–3323. For more detailed information on specific aspects of this proposed rulemaking and regulatory decision, contact Bill Schoenborn, U.S. EPA (5306W), 401 M Street, SW., Washington, DC 20460, (703) 308–8483, or e-mail: schoenborn.william@epa.gov.

SUPPLEMENTARY INFORMATION: The index and the following supporting materials are available from the RCRA Information Center:

1. Report to Congress on Cement Kiln Dust (59 FR 709, January 6, 1994).
2. Regulatory Determination on Cement Kiln Dust (60 FR 7366, February 7, 1995).
3. Notice of Data Availability: Additional Data Available on Wastes Studied for the Report to Congress on Cement Kiln Dust; Request for Comments. (59 FR 47133, September 14, 1994).
4. Correction to Notice of Data Availability (59 FR 51440, October 11, 1994).

The index and some of the supporting materials are available on the Internet. Follow these instructions to access the information electronically:

WWW: *http://www.epa.gov/epaoswer/other/ckd/index.htm*
FTP: *ftp.epa.gov*
Login: anonymous
Password: Your internet address

Files are located in /pub/epaoswer.

The official record for this action will be kept in paper form. Accordingly, EPA will transfer all comments received electronically into paper form and place them in the official record, which will also include all comments submitted directly in writing. The official record is the paper record maintained at the address in **ADDRESSES** at the beginning of this document.

EPA responses to comments, whether the comments are written or electronic, will be published in a notice in the **Federal Register** or in a response to comments document placed in the official record for this proposed rulemaking. EPA will not immediately reply to commenters electronically other than to seek clarification of electronic comments that may be garbled in transmission or during conversion to paper form, as discussed above.

The contents of today's document are listed in the following outline:

I. Statutory Authority
II. Background
A. Bevill Amendment
B. Report to Congress and Notice of Data Availability
C. Regulatory Determination and Subsequent Studies
1. Summary of Agency's Determination
2. Proposed Enforceable Agreement
3. The Need for CKD Management Standards
4. New Analyses
D. Beneficial Use of Cement Kiln Dust
III. Discussion of Options to Address Risks From Mismanaged CKD
A. State-Based Approach
B. Memorandum of Understanding
C. Two-Dust Approach
D. Develop Regulations Under Authority of Subtitle D
E. Subtitle C Enforcement Without Listing CKD
F. Tailored Standards Under Subtitle C
G. States Adopt Appropriate Programs
H. Today's Approach—Exclude Properly Managed CKD From Hazardous Waste Listing
1. Develop Management Standards and Exempt Properly Managed CKD From Classification as a Hazardous Waste (Management-based Listing)
2. Alternative Management-based Listing
3. Characteristic CKD
4. Apply Tailored RCRA Subtitle C Standards to Improperly Managed CKD
IV. Proposed Management Standards
A. Protection of Ground-water Resources
1. The Need for Ground-water Protection Standards
2. Applicability
3. Location Standards
4. Performance-Based Standard for the Protection of Ground Water
5. Technology-Based Standards for the Protection of Ground Water
6. Requirements for Ground-water Monitoring
7. Corrective Action
B. Standards for Fugitive CKD Emissions
1. The Need to Limit Fugitive CKD Emissions
2. Applicability

3. Performance Standard for the Protection of Air
4. Technology-Based Standards for Fugitive Dust Control
C. Closure
D. Post-Closure Care
E. Closure/Post-Closure Planning Requirements
F. Financial Assurance
G. Implementation
1. Notification, Recordkeeping, and Reporting
2. Permitting Requirements
H. Applicability of the Boilers and Industrial Furnaces Rule
I. Exemption from the Definition of Hazardous Waste
1. Waste-Derived Clinker
2. Light-Weight Aggregate Kiln Dust
3. Use of CKD in Removal and Remediation Actions
J. Final Rule Effective Date
V. Subtitle C Backup Standards
A. Subtitle C Requirements for Hazardous CKD Waste
1. 3004(x)—Special Characteristics
2. Facility-wide Corrective Action Requirement
3. Manifest, Recordkeeping, and Reporting Requirements
B. Implementation of Part 259 and RCRA Subtitle C Backup Standards
1. Enforcement
2. Removal of a Hazardous Waste Designation
3. Alternative Approach to Structuring the Performance Standards
VI. Standards for CKD Used as a Lime Substitute
A. Summary
B. CKD Agricultural Use Risk Assessment
1. Risk Assessment Methodology
2. Human Health Criteria and Effects
3. Agricultural Use Practice Assumptions
4. Fate and Transport of Chemical Constituents in the Environment
5. Uptake of Contaminants in Plant and Animals
6. Receptor Scenarios and Exposure Pathways
7. Lead Risk Assessment
8. Ecological Risk and Phytotoxicity
9. Risk Assessment Results
C. Approach to Establishing Limiting Concentrations
1. Risk-based Approach—Proposed Limiting Concentrations for Cadmium, Lead, and Thallium
2. Risk-Based Approach—Proposed Limiting Concentration for Chlorinated Dioxins and Furans
3. Comparison to Agricultural Lime—Proposed Limiting Concentration for Arsenic
4. Peer Review of the Risk Assessment
D. Implementation of Controls for the Agricultural Use of CKD
E. Alternative Standard to Limit Chlorinated Dioxins and Furans in CKD
VII. Relationships Between this Action and Other Regulatory Programs
A. Stormwater Regulations
B. Clean Air Act
VIII. State Authority
A. Statutory Authority
B. Effect of Today's Proposed Rule
IX. Regulatory Requirements
A. Regulatory Impact Analysis Pursuant to Executive Order 12866
1. Scope and Approach for Estimating Economic Costs and Impacts
2. Summary of Cost and Impact Results
3. Benefits of the Rulemaking
B. Regulatory Flexibility Analysis
1. Identification of Small Cement Companies
2. Outreach
3. The Agency's RFA Screening Analysis
4. Agency Findings and Conclusions Regarding SBREFA Impacts
C. Environmental Justice—Applicability of Executive Order 12898
D. Protection of Children—Applicability of Executive Order 13045
E. National Technology Transfer and Advancement Act
F. Unfunded Mandates Reform Act
G. Paperwork Reduction Act
H. Executive Order 12875: Enhancing the Intergovernmental Partnership
I. Executive Order 13084: Consultation and Coordination with Indian Tribal Governments
Appendix I to the Preamble—Justification for CKD Listing
Appendix II to the Preamble—Reportable Quantities

I. Statutory Authority

Section 3001(b)(3)(C) of RCRA, as amended, required that, after completing a Report to Congress (RTC) mandated by section 8002(o) of RCRA, the EPA Administrator must determine whether Subtitle C regulation of cement kiln dust (CKD) waste is warranted. The RTC documenting EPA's study of CKD was signed by the Administrator on December 30, 1993. EPA's regulatory determination was published in the **Federal Register** on February 7, 1995 (60 FR 7366). To implement that determination, EPA is today proposing rules using its authorities under sections 2002(a), 3001(b)(3)(C) and 3004(x) of RCRA.

II. Background

On October 21, 1976, Congress enacted RCRA (Pub. L. 94–580). Section 3001 of RCRA mandated that the EPA Administrator "promulgate regulations identifying characteristics of hazardous waste, and listing particular hazardous wastes which shall be subject to the provisions of this subtitle." Section 3004 required the Administrator to promulgate standards applicable to owners and operators of hazardous waste treatment, storage, and disposal facilities.

In response to these requirements, EPA proposed regulations for managing hazardous wastes under Subtitle C of RCRA on December 18, 1978 (43 FR 58946). In this regulatory proposal, EPA proposed to defer most of the RCRA Subtitle C requirements for six categories of wastes, which it termed "special wastes," until information could be gathered and assessed and the most appropriate regulatory approach determined. The special wastes were wastes typically generated in large volumes, and, at the time were thought to possibly pose less risk to human health and the environment than wastes being regulated as hazardous wastes. EPA identified CKD waste as one of these "special wastes." [1]

A. Bevill Amendment

On October 12, 1980, Congress enacted the Solid Waste Disposal Act Amendments of 1980 (Pub. L. 96–482), which added section 3001(b)(3)(A)(iii) (now frequently referred to as the Bevill Amendment) to RCRA which, among other things, temporarily exempted "cement kiln dust waste" (along with two other categories of waste) from Subtitle C regulation, pending completion of certain studies. These amendments also added section 8002(o), which required the Administrator to study the adverse effects on human health and the environment, if any, from the disposal of "cement kiln dust waste," and submit a Report to Congress on its findings. The 1980 amendments also added section 3001(b)(3)(C), which required the Administrator to make a regulatory determination, within six months of the completion of the section 8002(o) study, whether or not to regulate CKD waste under Subtitle C of RCRA.

In response to the 1980 RCRA amendments, on November 19, 1980, EPA published an interim final amendment to its hazardous waste regulations to reflect the provisions of the Bevill Amendment (45 FR 76618), which is codified at 40 CFR 261.4(b)(8). Since that time, CKD has been exempt from Subtitle C of RCRA—that is, this material has never been regulated as a hazardous waste under Federal law.[2]

B. Report to Congress and Notice of Data Availability

To comply with the Congressional mandate and to establish the factual

[1] The other five proposed "special wastes" specifically identified in the 1978 proposed rule were mining waste; utility waste; phosphate rock mining, benefication, and processing waste; uranium waste; and oil and gas drilling muds and oil production brines.

[2] It should be noted here that under the RCRA Subtitle C Boilers and Industrial Furnaces (BIF) Rule, CKD generated by kilns that burn hazardous waste as fuel may be ineligible for Bevill Exclusion under certain conditions (see 40 CFR 266.112).

basis for EPA decision making regarding the appropriate regulatory status of CKD waste under RCRA, EPA published in December 1993 its "Report to Congress on Cement Kiln Dust" (RTC). In keeping with the statutory requirements, the report addressed the following eight study factors, as articulated at section 8002(o) of RCRA:

(1) The source and volumes of [CKD] generated per year;

(2) Present disposal practices;

(3) Potential danger, if any, to human health and the environment from the disposal of (CKD);

(4) Documented cases in which danger to human health or the environment has been proved;

(5) Alternatives to current disposal methods;

(6) The costs of such alternatives;

(7) The impact of those alternatives on the use of natural resources; and

(8) The current and potential utilization of (CKD).

The RTC also included a review of applicable State and Federal regulations, so regulatory decisions derived from the report would avoid duplication of existing requirements.

In preparing the RTC, EPA developed industry-wide and, in some cases, facility-specific data and analytical methods that reflect the complexity of the issues addressed in the RTC. Facilities that generate CKD waste vary considerably in size, location, operational aspects, and waste management techniques. Moreover, to examine in detail the broad array of study factors mandated by RCRA section 8002(o), EPA developed approaches and methods that were sufficiently sophisticated to take into account the special nature of CKD. The specific methods that EPA used to address each of the study factors are described in detail in Chapters 3 through 9 of the RTC. Additional information on the methods used and supporting data are contained in the Background Documents to the RTC available from the RIC as discussed above under the **ADDRESSES** section.

In 1992 and 1993, the Agency visited 20 cement manufacturing facilities in the U.S. and obtained samples of cement kiln dust generated by each operation.[3] The Agency conducted chemical analyses on all of the samples for a number of constituents. The analytical results were used in the development of the RTC, and they were included in the Agency's RCRA docket that supports the report. Late in the study, one final set of metals analyses were conducted on the cement kiln dust samples as managed (e.g., stored, disposed) by six of the 20 facilities sampled. The Agency obtained the raw analytical data too late for use in developing the RTC, but did include the data in the RCRA docket for public inspection and comment.[4]

After issuance of the RTC, the raw data were subjected to data validation and the analytical results were finalized. Although not used in the development of the RTC, the Agency did consider these data in the process of formulating the CKD regulatory determination. Accordingly, on September 30, 1994, EPA published a Notice of Data Availability (NODA) (see 59 FR 47133) announcing the availability of the additional analytical data. On October 11, 1994 (59 FR 51440), the Agency published a Correction Notice which identified certain errors and corrected certain portions of the new data pertinent to additional assessments of potential risk from CKD waste.[5]

C. Regulatory Determination and Subsequent Studies

1. Summary of Agency's Determination

On February 7, 1995, EPA issued the determination required by section 3001(b)(3)(C) of RCRA, finding that additional control of CKD was warranted (60 FR 7366). The Agency stated that its concerns about the potential harm to human health and the environment posed by some CKD suggest the need for some level of regulation under RCRA Subtitle C authority. The Agency also recognized that certain of these areas of concern (those related to releases to surface waters) are more appropriately controlled under other EPA-administered statutes. In order to avoid unnecessary duplication among regulatory programs, EPA stated it would rather use the other existing regulatory programs to control risks where appropriate, and develop a more creative, affordable, and common sense approach that would control the adverse effects of CKD.

The Agency decided to develop, promulgate, and implement regulations for CKD as necessary to protect human health and the environment by using a variety of statutes. For surface waters, the Agency believes that existing regulations and the planned general permit under the National Pollutant Discharge Elimination System (NPDES) permitting program provide an adequate mechanism for controlling point source discharges and for managing storm water that contains CKD. With respect to ground water, the Agency decided to use its authority under RCRA Subtitle C provided by sections 2002(a), 3001(b)(3)(C), and 3004(x) to develop a program tailored to local cement plant conditions to control specific risks. In the regulatory determination, EPA also stated that it would develop and implement additional controls under the Clean Air Act (CAA), as necessary to address concerns relating to air emissions of CKD. Subsequently, however, EPA has concluded that RCRA authorities will better serve that purpose. EPA's reasons for changing its approach are discussed in detail in Section VII. B. (Clean Air Act) below.

For most off-site beneficial uses of CKD (e.g., in waste stabilization or certain construction uses), EPA's current record indicates there are no significant risks. However, the Agency also decided to evaluate the need for additional controls for a limited number of off-site uses of CKD (such as use as a substitute for lime fertilizer on agricultural fields) in its regulatory proposal. The Agency stated that its focus would be restricted to those off-site uses for which there may be significant risks.

EPA also stated in the regulatory determination that specific RCRA Subtitle C components deserve particular scrutiny in developing a tailored approach, including the following: facility-wide corrective action under section 3004(u); land disposal restrictions requirements (LDRs) under sections 3004(c),(d),(e),(f) and (g); minimum technology standards under section 3004(o); and permit requirements under section 3005. EPA stated that most of the concerns traditionally addressed by the land disposal restrictions program, permit requirements, and the minimum technology standards would be best addressed through management standards developed specifically for CKD.

2. Proposed Enforceable Agreement

On March 22, 1995, the U.S. cement industry, through the American Portland Cement Alliance (APCA), submitted to the Agency a voluntary management program for CKD. This program was based on earlier work APCA submitted to EPA in 1993. Under this voluntary program, cement

[3] The CKD sampling trip reports can be found in the RIC under the following numbers: Phase I sampling trip reports (Nos. F-94-RCKA-S0001 to S0066); Phase II CKD sampling trip reports (Nos. F-94-RCKA-S0067 to S0073).

[4] All of the analytical data on CKD can be found in the Technical Background Document: Analysis of CKD Generation and Characteristics Data, RIC docket Nos. F-94-RC2A-S0017 to S0017.G.

[5] Additional data on CKD waste studied in the Report to Congress, including supplemental errata, is available in the RIC docket under the general identification number F-94-RC2A-FFFFF.

manufacturing facilities would manage their CKD according to industry-developed management standards, and EPA would enforce those standards through a contract rather than through regulation. The proposed agreement included provisions for compliance standards, facility waste management plans, a public participation process, enforcement, and penalties. The industry indicated that its intent was to provide the Agency with a constructive alternative to Subtitle C regulation that would not stigmatize CKD as hazardous waste.

The proposed enforceable contract represented a new approach and raised a number of legal and technical issues which EPA evaluated. The Agency also contacted various State agencies, industry groups, and public citizen groups to assess their positions on the proposal. Although EPA in the past has entered into unenforceable "voluntary" agreements with other industries, the Agency has determined that it does not have inherent contract authority to enter into enforceable agreements, although it has authority to enter into enforceable consent orders under the imminent hazard provisions of RCRA section 7003, or section 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The cement industry chose not to pursue enforceable agreements under these authorities because of concern that it would be inappropriate to characterize CKD as posing an imminent and substantial danger to human health and the environment.

3. The Need for CKD Management Standards

In the RTC, the Agency described the decision rationale used to make its regulatory determination. The Agency applied a step-wise approach that it considered to be consistent with Congressional intent that EPA consider all of the study factors listed in RCRA section 8002(o). The methodology used by EPA examined the need for CKD management standards and the economic consequences of imposing full Subtitle C requirements on the industry. (See 60 FR 7366 for a discussion of the steps EPA considered in determining the need for CKD management standards.)

a. Documented Evidence of Damage

The Agency determined that the potential exists for hazardous constituents, including metals, to migrate from CKD waste sites and that CKD has caused documented impacts (and may continue to cause impacts) at levels of concern. Information is available to indicate that ground water has been affected by CKD management units. During the development of the RTC, the Agency identified five cases of damage to ground water, 10 cases of damage to surface water and 21 cases of damage to air from CKD waste management units.[6] Two additional cases of ground water damage, two additional cases of surface water damage, and 16 additional cases of air damage were subsequently identified in the 1994 NODA and placed in the RCRA docket in a technical background document entitled Additional Documented and Potential Damages From the Management of Cement Kiln Dust (See 59 FR 47133, September 14, 1994).[7] In its Regulatory Determination, EPA stated these cases suggest that despite State regulations damages continued to occur with current (i.e., as of 1994) CKD management practices.

Typically, ground-water damages were the result of metals constituents leaching into ground water from unlined CKD landfills and waste piles. Ground-water damages were of concern to the Agency because relatively few (17% in 1991) of all CKD management units had ground-water monitoring systems, while 25 of 91 cement manufacturing facilities were reported in 1991 to be located within one mile of a public drinking water well. Additionally, ground-water damage was a major factor cited for including two CKD disposal units on the CERCLA (Superfund) National Priorities List (NPL).

Damages to air were also identified due to particulate emissions of CKD from quarries, haul roads, and CKD handling equipment. Most of these cases involved visible emissions violations (opacity) related to equipment malfunctions associated with CKD handling equipment (kilns, baghouses, and screw conveyors). In the regulatory determination, EPA characterized the air releases as persistent, with many facilities having more than one violation. Also, significant releases of airborne particulates were frequently observed first-hand by Agency staff during the course of the RTC study.[8]

b. Potential Risks to Human Health and the Environment

The Agency conducted a series of risk screening and site-specific risk modeling studies to evaluate potential risks from on-site management and off-site uses of CKD. Methodologies and results of these studies were documented in Chapter 6 of the RTC and its related technical background documents and in two subsequent EPA technical background documents entitled Human Health and Environmental Risk Assessment in Support of the Regulatory Determination on Cement Kiln Dust (August 31, 1994) and Supplemental Errata Document for the Technical Background Document for the Notice of Data Availability on Cement Kiln Dust (September 30, 1994).[9]

EPA assessed the risks of potential releases of CKD contaminants to the environment, both during the routine management of the dust at cement plants and during beneficial use of the dust at other locations. The risk assessment was intended to complement the damage case study, which provided actual instances of environmental contamination, sometimes attributable to management practices and facility settings not considered in the risk assessment. The risk assessment was also intended to cover the potential for certain more subtle or long-term risks that might not be evidenced in the damage case files.

One of the primary objectives of the risk assessment was to evaluate, as realistically as possible, the baseline risks of CKD management practices at actual sites. This was accomplished by focusing initially on a sample of case-study cement plants and off-site beneficial use scenarios that appeared to provide a reasonable representation of the universe of sites where CKD is disposed and used. For each sample site, EPA evaluated the potential for CKD contaminants to be released into the environment, migrate to possible human and ecological receptors through a number of media and pathways (e.g., ground water contamination, surface water runoff to streams or lakes, windblown dust) and result in exposures and adverse effects. This evaluation included a combination of qualitative analyses designed to document and describe major factors contributing to (or limiting) risks, and quantitative modeling designed to

[6] Based on subsequent review of the damage cases, except for two reassessments (one air damage case and one surface water damage case), the Agency believes the information received in comment does not contradict the Agency's basic conclusions regarding any of the damage cases identified in the RTC and subsequent NODA. A detailed description of these damage cases is available in Chapter 5 of the RTC.

[7] RIC Docket Nos. F-94-RC2A-S0003 to S0015.

[8] A general description of these emissions can be found in the EPA CKD sampling trip reports which are located in the support section of the RIC docket on the Report to Congress.

[9] These documents are available in the RIC docket (Nos. F-94-RCKA-FFFFF, F-94-RC2A-S0019 and -S0019.A).

estimate the magnitude of risks. The analysis conducted for the RTC was then expanded to incorporate significant new information collected after the RTC was published. This expanded analysis, which is documented in EPA's technical background document supporting the Agency's 1995 Regulatory Determination enabled EPA to characterize risk levels for each pathway at each plant for the facilities evaluated.

The Agency's analysis indicates that there are potential risks warranting concern, from both current on-site waste management practices and certain off-site beneficial uses. Based on these analyses, EPA predicted only low or negligible risk potential from on-site management of CKD via direct exposure pathways (e.g., ingestion of drinking water) . The Agency did find potential risk to human health via indirect (i.e., foodchain) exposure pathways, however. Potential risks from exposure to particulate matter were also indicated.

The Agency modeled health risks via indirect food-chain pathways (i.e., risks from ingestion of contaminated crops, livestock, or fish). These contaminants reach food products via movement of stormwater run-off and/or windblown dust from uncontrolled CKD storage or disposal areas to nearby water bodies and farm fields. EPA's foodchain pathway analysis estimated potential individual cancer risks from 1×10^{-5} (1 in 100,000) to 1×10^{-3} (1 in 1,000) for highly exposed subsistence fishers and farmers. Cancer risks of concern were due primarily to exposure to arsenic in CKD. Similar cancer risk levels due to dioxins are also possible at some additional sites. However, the Agency's data base on dioxin levels in CKD was not extensive enough to conduct a large scale study. EPA's risk modeling also estimated potential exceedances of non-cancer hazard thresholds via indirect exposure to the toxic metals cadmium, chromium, thallium and lead, which are present in CKD.

Finally, EPA's CKD analysis indicated potential human health risks due to exposure to the fine particulate matter (PM) which characterizes CKD. Based on the Agency's analysis, windblown dust (PM less than 10 microns in size) from uncontrolled CKD waste management units could exceed EPA's health-based fine particulate National Ambient Air Quality Standard (NAAQS) at plant boundaries and potentially at nearby residences. Further analysis of potential exposure to airborne PM from cement kiln dust waste management units was conducted as part of EPA's population risk assessment. This analysis also indicates that persons living around cement plants may be exposed to airborne PM concentrations in excess of the NAAQS. An overview of the population risk assessment is provided in Section II.C.4.a. of this preamble. A detailed description of that analysis is provided in the technical background document on population risk assessment.

As previously noted, the Agency predicted a negligible impact to ground water and consequently low or negligible risk to human health via ingestion of contaminated drinking water. However, a large percentage of cement plants (and CKD management units at those cement plants) are located in areas of karst terrain,[10] many of which may be underlain by bedrock with hydrological characteristics conducive to leachate transport to off-site locations with limited filtration, adsorption, and dilution. For reasons discussed in the regulatory determination, the Agency determined that its ground-water model is not suitable for modeling in karst terrain. The Agency has evidence of ground-water contamination at each facility where ground-water data were available, and thus conducted additional analyses of ground-water transport.

The Agency conducted two additional ground-water analyses to evaluate the potential for ground water transport at CKD management facilities. In the first analysis, the Agency evaluated whether the choice of ground water models significantly influenced the results. In this analysis, the Agency used EPA's Composite Model for Leachate Migration with Transformation Products (EPACMTP) with the same parameters used in the modeling to support the Report to Congress. The Agency concluded that the choice of models did not significantly influence the conclusions on ground water transport. In the second analysis, the Agency parameterized the thermodynamic isotherms to reflect the major ions likely to be present in CKD and the typical pHs found in CKD. Based on this analysis, the Agency concluded that the composition of CKD leachate may make metals more mobile. These analyses are discussed in Section II.C.4.b, Additional Ground Water Modeling.

The Agency's initial risk assessment for off-site beneficial uses of CKD indicated that most off-site uses do not pose significant risks. Direct cropland application, however, occurs at a number of locations in the country. Screening level analyses of agricultural use described in the RTC and NODA suggest that some CKD, at plausible application rates, contains sufficiently high concentrations of metals and dioxins to cause food chain risks. Based on these initial findings, EPA conducted a more detailed analysis of potential risks from use of CKD as an agricultural liming agent. A summary description of the agricultural use analysis and results of that analysis are presented in Section VI.—Standards for CKD Used as a Lime Substitute.

c. Waste Characteristics

While CKD itself does not exhibit the RCRA Subtitle C hazardous waste characteristic of corrosivity (40 CFR 261.22), EPA's data show that mixtures of CKD and water often exhibit the characteristic of corrosivity.[11] In particular, EPA data show that the pH level in run-off from precipitation that contacts CKD storage and waste piles typically exceeds 12.5 standard units, the standard for the corrosivity characteristic for hazardous wastes (40 CFR 261.22). In addition, EPA's analyses of CKD show that CKD does contain certain metals listed in Appendix VIII ("Hazardous Constituents") Part 261 of RCRA. For many of the toxic metals, the total concentrations in kiln dust were not significantly different whether the dust was generated in kilns that burn or do not burn hazardous waste. Likewise, in terms of potential constituent solubility and release, leach test results show that no significant distinction can be made between CKD generated from kilns that burn hazardous waste and those that do not burn hazardous waste.

With respect to organics, volatile and semi-volatile compounds were generally not found in CKD. However, levels of 2,3,7,8-substituted dioxin, and 2,3,7,8-substituted dibenzofuran were detected, although the concentrations were generally low. The calculated 2,3,7,8-tetrachlorinated dibenzo-p-dioxins toxicity equivalence (TEQ) values for the facilities sampled by EPA ranged from non-detected to 9 ppt.

d. Adequacy of Existing Regulations

In making its regulatory determination, EPA evaluated State and Federal regulations pertaining to CKD waste and concluded that more stringent regulation of CKD is necessary based on current regulatory schemes.[12]

[10] Karst terrains are defined in this proposal at 40 CFR 259.16(b)(1) as areas where karst landscape, with its characteristic hydrogeology and/or landforms are developed.

[11] EPA hazardous waste identification rules do not include a characteristic or definition for solid corrosives.

[12] Supporting documentation for this analysis can be found in Chapter 7 of the RTC— *Existing Regulatory Controls on CKD Management.*

The Agency also determined that current practices are inadequate to limit contaminant releases and associated risks. CKD is now managed primarily on-site in non-engineered landfills, piles, and ponds. Many piles and landfills lack liners, leachate controls, or run-on/run-off collection systems. In addition, while dust suppression measures exist at many facilities, it appears that they are generally ineffective at controlling airborne releases of CKD. The Agency believes the following factors warrant additional environmental controls for CKD: (1) the general lack of current regulations applicable to contaminant discharges to ground water for protection of human health and the environment; (2) the general lack of ground-water monitoring systems at CKD disposal units; and (3) the existence of damages to ground water and air that are persistent and continuous, and for which no requirements exist to address the risks posed via these pathways.

4. New Analyses

a. Population Risk

Subsequent to the Regulatory Determination, the Agency calculated population risks for individuals living in the vicinity of cement manufacturing plants that manage CKD onsite. The assessment included population risks from indirect, or foodchain, exposure pathways and population effects from exposure to airborne particles, but not potential population risks from beneficial use of CKD. This work builds on earlier CKD analyses focusing on the health risks to maximally exposed individuals, presented in the RTC on CKD and supporting documentation, the 1994 NODA on CKD, and a background document supporting the 1995 CKD Regulatory Determination. A detailed description of the population risk assessment is provided in the *Technical Background Document: Population Risks from Indirect Exposure Pathways, and Population Effects from Exposure to Airborne Particles from Cement Kiln Dust Waste* in the docket for this rule.

The assessment of population risks from indirect exposure estimates the number of cancer cases and the number of people living near cement plants that are potentially exposed above noncancer effect thresholds through the ingestion of vegetables, beef and milk, and fish. For this analysis, existing facility-specific individual risk estimates were combined with facility-specific data on populations potentially exposed via indirect pathways to derive facility-specific population risk estimates. As a first step, information on individual risk generated from a sample of 82 facilities was used to identify and eliminate from concern those facilities that have negligible potential for significant population risk. For remaining facilities, population risk for the vegetable ingestion pathway was calculated by combining prior estimates of individual risk with estimates of nearby farmers and backyard gardeners based on census data. For the final step, results from the 82 facilities for which facility-specific information was available were extrapolated to the total universe of 108 cement facilities. Population risk for the fish ingestion pathway was estimated using existing facility-specific individual risk estimates along with numbers of recreational fishers that could be exposed, calculated based on fish yield data from local streams. Facility-specific results were then extrapolated to the full universe of cement plants to obtain total population risk for this pathway.

The Agency estimates that exposures via indirect pathways occurring in populations within five miles of all cement plants nationwide potentially result in a total of 0.04 excess cancer cases over a 70-year period. That is, exposures would potentially lead to about 0.009 excess cancer cases in the subsistence farmer population, and about 0.03 excess cancer cases in the "homegrown" population. Cancer cases predicted for the recreational fisher population are negligible. The total population within five miles of all cement facilities nationwide is approximately 3.4 million.[13] Thus, the overall population cancer risk can be characterized as follows: a total of 0.0006 excess cancer cases per year could potentially occur within this population of 3.4 million due to indirect exposures.

For population noncancer effects, EPA predicts that, across all populations within five miles of all cement facilities nationwide, a total of about 1,040 people are potentially exposed via indirect exposure pathways to contaminant levels above the hazard index. That is, about 6 individuals from the population exposed to contamination from homegrown vegetables are exposed to contamination exceeding noncancer effects thresholds (i.e., hazard index greater than 1). About 37 individuals from the subsistence farmer population and about 1,000 individuals from the recreational fisher population are estimated to be exposed to contamination exceeding noncancer effects thresholds. The overall population noncancer effects can be characterized as follows: a total of about 1,040 people, or less than one-tenth of one percent, from among the population of 3.4 million within five miles of all cement plants nationwide is likely to be exposed via indirect exposure pathways to contamination exceeding noncancer effects thresholds.

The assessment of population effects from exposure to airborne particles estimates the number of people potentially exposed to fugitive CKD at levels above the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM). Both the existing NAAQS for coarse particles and a new NAAQS proposed for fine particles were considered. New modeling of CKD emissions and downwind dispersion was performed for selected "high risk" cement plants, substantially improving on the previous work by using advanced modeling techniques, estimating emissions from all CKD handling stages rather than just final disposal as modeled previously, and considering the effect of terrain, among other refinements. The concentrations of airborne particles were then overlaid on census block grids to estimate populations potentially exposed above the PM_{10} NAAQS. The Agency estimates that about 18 people may be exposed to airborne PM_{10} concentrations in excess of the NAAQS around the 82 facilities for which facility-specific information is available.[14] As with the indirect exposures analysis, EPA derived a more complete picture of potential population effects due to PM exposures by extrapolating from results within the known universe to determine the potential population effects for the full universe of cement facilities. In sum, EPA estimated that, across all 108 facilities, a total of between 18 and 4,118 people living within 500 meters of the facility boundary may be exposed to airborne PM concentrations in excess of the NAAQS. It is not known what percentage of the population exposed above the NAAQS is likely to develop any morbid effects because the dose-response relationship for PM exposures is not well defined.

[13] This is an estimate based on site-specific data for 61 facilities and extrapolated data for the remaining 47 facilities.

[14] The estimate of 393 people is based on an evaluation of 52 of the 82 cement facilities; based on analyses conducted previously the remaining 30 facilities were determined to have zero or negligible effects in terms of PM exposures because they do not manage CKD on-site (see methodology and results presented in *Technical Background Document on Potential Risks of Cement Kiln Dust in Support of the Cement Kiln Dust Regulatory Determination*, January 31, 1995).

b. Additional Ground-Water Modeling

Because the available damage cases indicate the potential for impacts to ground water in areas of non-karst terrain (four of the 13 damage cases are located in areas of non-karst terrain), the Agency conducted additional ground-water modeling to evaluate the potential subsurface transport of metals in non-karst terrain. The additional modeling occurred in two phases. In Phase I, the Agency tested the sensitivity of the modeling by incorporating the same assumptions used in the modeling to support the Report to Congress in EPACMTP, a ground-water model used by EPA to conduct national assessments. The intent of this exercise was to determine whether model selection significantly influenced the conclusions regarding the subsurface transport of constituents to receptor locations. In Phase II, the Agency evaluated the sensitivity of EPACMTP to assumptions regarding the speciation and adsorption of metals. In this analysis, the Agency revised the isotherms generated by MINTEQA2, a geochemical speciation model,[15] to reflect higher pHs (as found in CKD leachate), more appropriate ions in the leachate, and a lower dissolved organic carbon concentration in the leachate.

In Phase I of the additional ground-water modeling, EPA evaluated the sensitivity of its previous model selection by estimating constituent concentrations at well locations with EPA's regional ground-water model, EPACMTP. The results from this analysis were then compared with the results generated by the previous modeling, which used MMSOILS. EPACMTP combines a finite source methodology with a metal-specific procedure (using MINTEQA2) for handling geochemical interactions that affect the subsurface fate and transport of metals. A complete description of this methodology is available in *EPA Composite Model for Leachate Migration with Transformation Products: Background Document for Metals*, which has been placed in the RCRA docket in support of this proposed rule.[16] The analysis incorporated the same data and assumptions used to support the ground-water modeling for the EPA's 1993 Report to Congress.

In general, the revised modeling using EPACMTP predicted lower concentrations of metals in ground water for antimony, arsenic, chromium, cadmium, and thallium and higher concentrations for barium and beryllium. At all facilities, the risk from contaminated ground water predicted by EPACMTP was negligible. Leaching of lead was negligible in both modeling exercises (the MMSOILS model predicted that lead would reach the water table at only one modeled facility). From this analysis, the Agency concluded that the selection of ground-water models was not the most significant reason for the inability of the modeling to predict elevated metal concentrations in ground water.

In Phase II of the additional ground-water modeling, EPA evaluated the sensitivity of the ground-water modeling results to changes in assumptions regarding the speciation and adsorption of metals in CKD leachate. Specifically, EPA revised the assumptions about pH, presence of leachate organic acids, and ions present in CKD leachate to generate new partitioning coefficients (K_ds) for five metals: barium, beryllium, cadmium, chromium, and lead. The Agency then used the same modeling protocol for EPACMTP described above to evaluate the effects on ground-water fate and transport of these five metals. A more detailed description of the revisions to the MINTEQA2 isotherms and the caveats associated with these analyses are available in the technical support document *Examination of Metals Transport under Highly Alkaline Conditions*, which has been submitted to the docket in support of this proposed rule.

This additional analysis indicates that migration of the metals may be sensitive to the pH of the leachate and the buffering capacity of the unsaturated and saturated zones. Under highly alkaline conditions with little or no buffering, cadmium, chromium, lead, barium, and beryllium are predicted to be more mobile. In general, these metals displayed a greater tendency to move through the unsaturated zone and reach the ground water. For example, the analysis indicated that at four of the five modeled facilities, elevated levels of barium, beryllium, cadmium, chromium, and lead were found in the ground water within 10 meters of the disposal unit. At four of the modeled facilities, concentrations of lead exceeded EPA's action level for lead of 0.015 mg/L within 10 meters and at one facility, chromium exceeded its maximum concentration limit (MCL) of 0.1 mg/L by less than a factor of 10. In addition, modeling indicated that beryllium, cadmium, and chromium would have concentrations within a factor of 10 of their respective MCLs at four facilities, one facility, and two facilities, respectively.

c. New CKD Waste Characteristics Data

In an effort to further understand the influence of hazardous waste burning on CKD composition, EPA has undertaken analyses of two new sources of data on toxic metals in CKD. In June 1996, as part of a RCRA §3007 data request, EPA collected information on constituent concentrations in CKD from seven cement plants within Region VII that burn hazardous waste, to the extent available for each of the five years 1991 through 1995. In October 1996, new CKD constituent data from 15 cement plants that do not burn hazardous waste, collected during July and August 1996, were submitted to the Agency by the Non-Hazwaste Burner CKD Coalition (NHBCC).

The EPA Region VII data set consists of analytical results from a substantial number of CKD samples, varying by plant, by constituent, and by year from a few dozen to a few hundred per year. All of these data reflect CKD generated by the seven plants while burning hazardous waste. The NHBCC data set consists of analytical results from six to 32 CKD samples from each non-burning plant. Although both data sets have their individual nuances, the Agency believes these data sets together accurately reflect constituent values in CKD for both types of kilns, and tend to complement one another. Both data sets are available in the RCRA docket for this rule.

The NHBCC, Environmental Technology Council (ETC), and local citizen groups have asserted to EPA staff that these new data demonstrate statistically significant differences in the concentrations of total metals between CKD from kilns that burn conventional fossil fuels ("non-hazardous waste burner CKD") and CKD from kilns that burn RCRA hazardous waste ("hazardous waste burner CKD"). The NHBCC argues that these differences affect the potential risk associated with the disposal of CKD and that non-hazardous waste burner CKD exhibits only isolated elevated concentrations of toxic constituents, hence relatively low risk compared to hazardous waste burner CKD. As explained in Section III.C. below, the NHBCC believes these differences justify EPA imposing a regulatory distinction between hazardous waste burner CKD and non-

[15] U.S. EPA, 1996a. Background Document for Metals. EPA Composite Model for Leachate Migration with Transformation Products (EPACMTP). Volume 1: Methodology. U.S. EPA, Office of Solid Waste, Washington, DC 20460.

[16] U.S. EPA, 1996b. EPA Composit Model for Leachate Migration with Transformation Products (EPACMTP) Background Document. U.S. EPA, Office of Solid Waste, Washington, DC 20460.

hazardous waste burner CKD, a so-called "two-dust approach."

EPA has considered the NHBCC's assertion of statistical differences between hazardous waste burner and non-hazardous waste burner CKD, but at this point based on available data does not accept their assertion of lower risk for non-hazardous waste burner CKD relative to hazardous waste burner CKD for the following reasons. First, when hazardous waste burner and non-hazardous waste burner CKD data sets are compared, for some toxic metals the statistical distribution of concentrations in each group significantly overlap. For example, for the constituent arsenic, CKD from ten out of 15 non-hazardous waste burner plants have mean total concentrations in excess of the mean concentration of arsenic in hazardous waste burner CKD averaged from the seven hazardous waste burning plants in EPA Region VII (1995 data); and CKD from seven out of 15 non-hazardous waste burner plants have mean arsenic concentrations higher than the mean concentration reported for hazardous waste burner plants in the EPA NODA. Similarly, for chromium, CKD from four out of 15 non-hazardous waste burner plants have mean total concentrations in excess of the mean concentration for chromium in hazardous waste burner CKD averaged from the seven hazardous waste burning plants in EPA Region VII (1995 data). Because of this overlap, EPA does not believe that all non-hazardous waste burner CKD poses less potential hazard than hazardous waste burner CKD. Furthermore, a comparison of means suggests constituent concentrations for all toxic metals are within the range of data reported in the EPA NODA. EPA believes that the new information supports the Agency's previous conclusion that metals levels in CKD are not substantially different, whether generated by kilns that burn hazardous waste or kilns that do not burn hazardous waste.

Second, concentrations of the toxic constituent thallium in non-hazardous waste burner CKD are consistently higher than in hazardous waste burner CKD. The mean concentration for thallium in non-hazardous waste burner CKD from the 15 NHBCC plants (180.5 mg/kg) [17] is over three times higher than the mean concentration for 31 non-burning plants reported in the EPA NODA (52.3 mg/kg), and 47 times higher than the mean concentration in hazardous waste burner CKD from the seven EPA Region VII plants (3.8 mg/kg). The NHBCC has argued that relatively higher concentrations of thallium in non-hazardous waste burner CKD are not caused by fuels but by CKD recirculation and, therefore, non-hazardous waste burner CKD should not be regulated because this material is never disposed. The Agency believes recirculation of CKD back into the cement manufacturing process is beneficial because recirculated CKD would never be disposed. Forty-seven out of 88 non-hazardous waste burner plants, however, reported wasting CKD in 1995, so the Agency remains concerned that disposal of CKD with elevated levels of thallium could still pose a potential hazard to human health and the environment.

Third, the NHBCC data have not addressed the cases of environmental damage or PM_{10} risks that form the basis of the EPA's Regulatory Determination. The Agency finds no basis for changing the Regulatory Determination to regulate only CKD from hazardous waste burning kilns. The damage cases resulted from on-site management of CKD in non-engineered landfills, piles and ponds, at plants that largely do not or did not burn RCRA hazardous wastes. In addition, CKD, regardless of fuels burned, contains particles 10 microns in size and smaller, and could potentially pose risks to human health if released through fugitive emissions.

EPA requests additional data on hazardous waste burner and non-hazardous waste burner CKD. If new information warrants such action, the Agency would re-evaluate its current position on the appropriate levels of control for hazardous waste burner and non-hazardous waste burner CKD.

D. Beneficial Use of Cement Kiln Dust

It is likely that even with advances in recycling technologies, some CKD will need to be removed from kiln systems. Because resources are lost when CKD is permanently disposed, and because disposal practices can be burdensome, finding alternative uses for waste CKD can help facilities avoid disposal costs and generate additional revenue, while at the same time reduce the amount disposed of in landfills. Currently, CKD is used beneficially for sludge-, waste-, and soil-stabilization, land reclamation, waste remediation, acid neutralization, agricultural applications, such as a fertilizer or lime substitute, and construction applications. [18] According to responses from the 1991 Portland Cement Association (PCA) Survey and RCRA section 3007 requests, about 780,000 metric tons (860,000 tons) of CKD were used beneficially in 1990, or 5.4 percent of the gross CKD generated in 1990, and about 19 percent of the net CKD generated for that year. This total represents 9.5 percent of the 8.2 million metric tons of CKD recycled directly back into the kiln or raw feed system in 1990. Of the 780,000 metric tons, about 71 percent (670,000 metric tons) was used for waste stabilization, 12 percent (111,000 metric tons) for soil amendment, 5.6 percent (53,000 metric tons) as liming agent, nearly three percent (25,000 metric tons) as materials additives, about one percent (11,000 metric tons) as road base, and eight percent (76,000 metric tons) for other uses.

The American Society for Testing and Materials (ASTM) standards advise that use of CKD should be undertaken only after the material's characteristics have been properly evaluated with respect to the intended application. ASTM also recommends frequent performance testing until the degree of variability has been established. [19] The manner and extent of CKD adaptation for beneficial applications is in constant flux as research and development of CKD use continue to grow.

Most current off-site uses, such as for waste stabilization or land application as fill material, are either currently regulated (under RCRA for hazardous waste stabilization, or under the Clean Water Act in the case of municipal sewage sludge) or appear to present low risk due to low exposure potential. As explained in the Regulatory Determination, in light of the low exposure potential, EPA believes that these uses constitute environmentally sound recycling and beneficial use. Therefore, the Agency is not proposing management standards for these beneficial uses of CKD or to list as a hazardous waste CKD used for such practices. We are proposing that beneficially used CKD is non-hazardous waste. Thus, with the exception of CKD used for agricultural purposes, EPA solicits comments on these and other potential uses that might constitute environmentally sound recycling or beneficial use.

As explained previously, the Agency's risk assessment data on the use of CKD as a lime substitute on agricultural fields indicates that some small percentage of CKD (roughly 5%) may

[17] The highest thallium values in CKD reported from the 15 NHBCC plants are associated with cement kilns that recycle over 90% of their CKD back into the manufacturing process.

[18] Bhatty, J.I., 1995, Alternative uses of Cement Kiln Dust. Portland Cement Association Publication RP327, 18p.

[19] ASTM, 1991. Standard Guide for Commercial Use of Lime Kiln Dusts and Portland CKDs. 1990 Annual Book of American Society for Testing and Materials Standards. Volume 11.04. Method Number D5050-90. pp. 172-174.

present risk to human health and the environment and, therefore, the agricultural use of CKD warrants controls. Accordingly, in today's rule, EPA proposes to limit concentrations for arsenic, cadmium, lead, thallium and chlorinated dibenzodioxins and dibenzofurans in CKD used for agricultural purposes. If used for agricultural purposes, CKD with concentrations of these substances in excess of today's proposed limiting concentrations would be considered a listed hazardous waste.

III. Discussion of Options To Address Risks From Mismanaged CKD

Today's proposal presents several possible approaches, including the Agency's preferred approach for addressing the hazards presented by CKD. EPA invites commenters to address these approaches, so that EPA can evaluate the Agency's preferred approach not only on its own merits but also in comparison to these alternatives. If, when issuing the final regulation for CKD, EPA were to rely on a Memorandum of Understanding, regulation exclusively under Subtitle D of RCRA, the State-based approach, and the Two-Dust approach presented below, the Agency would have to revisit the Regulatory Determination.

The Agency would more favorably consider the State-based regulatory approach or MOU if: (1) there were more evidence that cement manufacturing facilities have made improvements to their CKD management practices; (2) there was greater agreement among all stakeholders regarding appropriate CKD management standards; (3) there was a strong level of support from industry, States, and other stakeholders for movement toward an MOU or State-based approach; and (4) the alternative adequately considered the interests of other parties with a stake in the Agency's CKD rulemaking. In making a final rule determination, EPA may consider some combination of the alternative approaches discussed.

A. State-Based Approach

The American Portland Cement Alliance (APCA) has submitted a proposal to EPA for a State-based approach to cement kiln dust (CKD) management. The main components of APCA's proposed approach are listed below, in chronological order:

(a) EPA Would Complete Work on CKD Management Standards. EPA would complete internal work, already begun during discussions regarding APCA's proposed enforceable agreement, which is discussed above in Section III.A.—State-Based Approach, to refine the CKD management standards for issuance as guidance as provided below.

(b) EPA Would Publish Proposed Guidance and "Backstop" Regulatory Regime For Public Comment. APCA proposes that EPA would publish a Notice of Data Availability in the **Federal Register** which would have two separate components. The first component would describe and summarize the key components of the CKD management standards, and announce the public availability of a complete copy of the CKD management standards. APCA proposes that in the Notice, the Agency would announce its willingness to withdraw its earlier Regulatory Determination if all of the States in which CKD is land disposed developed an adequate CKD management program within two years. The second component would be a "backstop" proposed rule based on a "conditional exclusion" or "contingent management" approach in which RCRA Subtitle C authority would not be triggered unless the conditions of the exclusion were violated. APCA proposes that EPA would finalize the proposal only if one or more States in which CKD is land disposed do not have an adequate CKD management program within two years. EPA would solicit public comment on all aspects of the Notice.

(c) EPA Would Publish Final Guidance In Response To Public Comment. APCA proposes that one year after publishing the initial guidance and backstop proposal, EPA would publish its "final" guidance in a subsequent **Federal Register** notice in response to public comments. In this notice, EPA would also include an explicit time line for the remaining steps in the State-based approach.

(d) EPA Would Take Final Action Regarding Inadequate State Programs. Two years after publishing the initial proposed guidance and backstop proposal, APCA proposes that EPA would publish another **Federal Register** notice announcing its assessment of the adequacy of State CKD management programs. APCA proposes that if EPA finds that such State programs are adequate, the Agency would announce withdrawal of its 1995 Regulatory Determination. Conversely, if the Agency finds one or more States with inadequate CKD programs, APCA proposes that EPA issue a final rule that will be effective in those States. These regulations would be based on a conditional exemption approach in which RCRA Subtitle C authorities would not be invoked unless terms of the exemption were violated. For those States with adequate programs, EPA would withdraw its 1995 Regulatory Determination.

The technical standards in today's proposed rule reflect completed internal work on appropriate CKD management standards and could serve as the Notice that APCA suggests in (b) above. In our view, the Part 259 standards represent proposed final management standards for CKD management, and the standards proposed today under Part 261 could form a "backstop rule." The Agency solicits comments on APCA's proposed State-based regulatory approach for CKD management and on the details of State programs affecting the management and beneficial use of CKD. Both APCA's proposed CKD management standards that were submitted to the Agency as part of the proposed enforceable agreement, and a full description of APCA's State-based approach are available in the RIC in support of this rule.[20]

B. Memorandum of Understanding

Another option considered by the Agency, in lieu of a detailed regulatory scheme, would be to enter into a memorandum of understanding (MOU) with the cement industry. As with enforceable agreements, a MOU would include specific standards for the management of CKD. This approach is not unprecedented.

In January 1994, EPA and the American Forest and Paper Association (AF&PA) negotiated a MOU regarding the implementation of land application agreements among AF&PA member pulp and paper mills and the EPA.[21] The purpose of the MOU was to develop a stewardship program for the practice of land application of pulp and paper mill sludges. Each paper mill participating in the program signed a "Land Application Agreement" which established standards and land management practices for the mill's land application of sludge. The MOU also provided for annual materials monitoring reports to be submitted to EPA, AF&PA member outreach programs, and annual AF&PA member surveys. The individual "Land Application Agreements" specify, among other things, dioxin/furan concentration limits for land applied sludge and receiving soils, application rates, waste testing requirements, and recordkeeping and reporting requirements. MOU and "Land Application Agreements" do not

[20] The cement industry's proposed management practices (version 6/1/5), see RIC docket No. F-99-CKDP-S0031.

[21] For a copy of the MOU, see RIC docket No. F-99-CKDP-S0107.

provide for enforcement, including citizen suits. Moreover, EPA, to date, has not formally assessed the success of the Agreements.

The Agency could consider a similar approach to tailored management standards and for monitoring the management of CKD. The Agency solicits comments on the advantages and disadvantages of a program utilizing either an enforceable agreement, which is discussed above in Section III.A.—State-Based Approach, or memorandum of understanding to encourage environmentally-sound CKD management practices.

C. Two-Dust Approach

In meetings with EPA staff, the Non-Hazwaste Burner CKD Coalition (NHBCC) has argued that any proposed regulatory mechanism for CKD, should distinguish between CKD from kilns that burn conventional fossil fuels (non-hazardous waste burner CKD) and CKD from kilns that burn RCRA hazardous waste, both in oversight mechanisms and in the contents of any minimum management practices. The NHBCC has argued that EPA should reimpose the Bevill exclusion for non-hazardous waste burner CKD, supplemented where necessary and justified by an appropriate voluntary program or discretionary steps by the States. According to the NHBCC, EPA should regulate hazardous waste burner CKD in the least burdensome manner consistent with any relevant risks that the dust may present.

The NHBCC has cited several points in support of a two-dust approach. First, the NHBCC has argued that less stringent treatment for non-hazardous waste burner CKD is justified on the basis of new CKD waste characteristics data which shows low risk (see Section II.C.4.c.—New Waste Characteristics Data, above). Second, the NHBCC states that unit costs of managing stockpiled CKD would increase to prohibitive levels for some member companies which are small businesses as defined by the Small Business Administration. According to the NHBCC, these small businesses do not have any additional revenue streams, unlike cement facilities that burn RCRA hazardous wastes, to offset the additional costs of CKD management. Third, the NHBCC has expressed concern that Federal regulation of CKD under RCRA Subtitle C will discourage beneficial re-use by stigmatizing CKD as a hazardous waste. The NHBCC claims that such regulation would undermine public confidence in CKD as a material suitable for reuse, discourage the development of new markets for CKD waste, and force up compliance costs by compelling facilities which currently sell CKD to stockpile it instead. EPA solicits comment on the NHBCC's proposed two-dust approach and requests additional data on hazardous waste burner and non-hazardous waste burner CKD. If new information warrants such action, the Agency would re-evaluate its current position on the appropriate levels of control for hazardous waste burner and non-hazardous waste burner CKD.

D. Develop Regulations Under Authority of Subtitle D

Another option would be to issue standards such as those described in today's Notice solely as RCRA Subtitle D requirements, relying on authority in RCRA section 4004(a). Under this approach the standards would be enforceable by the public through citizen suits. EPA would additionally encourage States to adopt standards developed under Subtitle D as enforceable standards under State law, but the Agency could not compel them to do so. Such standards would not be directly enforceable by EPA under the enforcement authorities of sections 3007 and 3008. EPA could take enforcement action under section 7003, if there is a finding of substantial endangerment. In contrast, the Agency is today proposing a regulatory structure that would provide the opportunity for Federal enforcement against major violations of the proposed standards, where warranted (see §261.4(b)(8)(ii)(A)). The Agency solicits comment on issuing today's proposed standards solely as RCRA Subtitle D requirements and views on the need for Federal enforcement of major violations of the proposed standards.

E. Subtitle C Enforcement Without Listing CKD

APCA has suggested that EPA could adequately regulate CKD not managed in accordance with today's proposed Part 259 standards using RCRA enforcement authorities without having to identify the mismanaged CKD as a RCRA hazardous waste. APCA asserts that as long as EPA specified that a violation of the Subtitle C backup standards in Part 266 constitutes a "violation of the requirements of RCRA Subtitle C," then EPA and citizens could enforce against those violations under RCRA sections 3008(a) and 7002(a) respectively. Similarly, APCA asserts that EPA could enforce against violations under RCRA section 3008(d)(3) criminal enforcement authority. APCA's approach is more specifically set forth in a letter to EPA dated August 24, 1998, and is available in the RIC docket for this rule. EPA invites comment on APCA's approach.

F. Tailored Standards Under Subtitle C

Another option available to the Agency is to regulate all CKD under authority of Subtitle C, using the tailored standards proposed today (i.e., the standards that would apply to CKD which, under today's proposal, would become hazardous waste because it is being improperly managed). Under this approach, all CKD would be listed hazardous waste and would be regulated under the tailored standards proposed today in Part 266 which incorporates the standards proposed today in Part 259.

The Agency solicits comment on the option of regulating all CKD under authority of RCRA Subtitle C and whether certain provisions could be eliminated or whether additional provisions are needed.

G. States Adopt Appropriate Programs

Alternatively, States may come forth with appropriate programs for managing CKD. Such programs would have requirements similar to those listed in Sections IV., V., and VI. of today's proposal, and include standards for addressing risks posed by fugitive CKD, standards for addressing risks to ground water, standards for agricultural use of CKD, and requirements for monitoring, reporting, and corrective action. The Agency believes there may be no need to finalize a Federal program if States with cement facilities that dispose CKD adopt appropriate programs and standards for managing CKD. The Agency solicits comment on the option presented in this paragraph of States adopting appropriate programs.

H. Today's Approach—Exclude Properly Managed CKD From Hazardous Waste Listing

1. Develop Management Standards and Exempt Properly Managed CKD From Classification as a Hazardous Waste (Management-based Listing)

Today's proposed rule would regulate CKD under RCRA to address the concerns identified in the RTC while avoiding unnecessary requirements. The approach taken is to establish management standards for CKD and make it clear that all CKD managed in accordance with those standards is not classified as a hazardous waste. CKD not managed in accordance with the standards, on the other hand, is proposed to be listed as a hazardous waste under 40 CFR 261.11.

The concept of regulating a waste if it fails to meet certain standards forms the

basis of many RCRA regulations. To provide added flexibility for implementation, EPA has previously proposed options for conditional exemptions from Subtitle C regulation for certain refining wastes,[22] and promulgated conditional exemptions for non-chemical military munitions.[23] Today's proposed rule would limit regulation of CKD under Subtitle C to that CKD which is mismanaged.

The DC Circuit Court of Appeals has expressly upheld EPA's authority under RCRA to establish a conditional exemption from Subtitle C regulation for wastes that, absent the exemption, would be hazardous (see *Military Toxics Project* v. *EPA, 146 F. 3rd. 948, D.C. Cir. 1998).* For a more detailed discussion of EPA's authority to establish a conditional exemption from Subtitle C regulation, see the discussion at 62 FR 6636–6637 of the Military Munitions Rule preamble.

Accordingly, EPA is today proposing to: (1) establish standards that define proper management of CKD waste; (2) exempt from classification as hazardous waste all CKD managed in accordance with specific standards proposed today; (3) list mismanaged CKD as a hazardous waste based on the criteria defined at 40 CFR 261.11(a)(3)(i–xi); and (4) provide tailored standards under Subtitle C for the proper management of CKD that has been mismanaged. The Agency's evaluation of mismanaged CKD against the listing criteria in §261.11(a)(3) can be found in Appendix I of this preamble, while the associated evaluation of reportable quantities for releases of CKD can be found in Appendix II of this preamble. Under the proposed approach, CKD would only become hazardous waste subject to RCRA Subtitle C regulation when persons managing the waste commit egregious or repeated violations, such as failing to install controls designed to meet the performance standards, or failing to manage CKD in units that conform to specific default technology-based standards. CKD managed in accordance with today's proposed standards would be outside the scope of Subtitle C, and would not be considered hazardous waste. The Agency believes the CKD management standards proposed today will protect the public from human health risks and prevent environmental damage resulting from current CKD disposal practices. The standards are designed to prevent contamination of ground water and potable water supplies, and prevent human health risks from inhalation of airborne CKD and ingestion via food chain pathways.

In developing the proposed management standards for cement kiln dust, EPA considered several factors. First, and primarily, the Agency believes that subjecting waste CKD to the full RCRA Subtitle C program, while protective, would be prohibitively burdensome on the cement industry, and is not a feasible regulatory option under the factors cited in RCRA section 8002(o). The full Subtitle C regulatory program would be highly prescriptive and provides little tailoring for site specific conditions. Second, the CKD management standards proposed today are based on EPA's current knowledge of the cement industry and the human health and environmental risks posed by CKD. The Agency considers these technical standards to be sufficient to control the specific risks identified while eliminating unnecessary compliance costs. EPA believes that for CKD, imposing the additional requirements of full Subtitle C would add significantly to compliance costs without a reduction in risks (see the Regulatory Determination for CKD: Potential Costs and Impacts of Subtitle C Regulation, 60 FR 7371, February 7, 1995).[24] Third, the Agency desires to encourage the common industry practice of recycling of CKD waste back into the industrial process, and promote environmentally sound off-site beneficial use of this material. Most current off-site uses, such as for waste stabilization or general construction, are either currently regulated (under RCRA for hazardous waste stabilization, or under the Clean Water Act in the case of municipal sewage sludge) or appear to present low risk due to low exposure potential. Classifying all CKD as hazardous could prevent such uses because of the expense resulting from hazardous waste management requirements.

EPA emphasizes, however, that if persons mismanage CKD waste, depending on the nature in which it is mismanaged, the non-compliant waste may become subject to Subtitle C requirements which would include enforcement action for violations of the proposed management standards (see Section V. B.—Implementation of Part 259 and RCRA Subtitle C Backup Standards). The Subtitle C requirements applicable to such CKD would to some extent be tailored as appropriate to ensure proper management of CKD. For example, the proposed Subtitle C design requirements for CKD landfills are different from those under the generally-applicable Subtitle C regulations. However, other generally-applicable RCRA requirements would apply to persons managing listed CKD as hazardous waste. In particular, persons managing listed CKD would be required to obtain permits if they treat, store or dispose of hazardous CKD, and to manifest shipments of hazardous CKD. Certain generally applicable RCRA requirements would not be applied to hazardous CKD, under the authority of section 3004(x) of RCRA. These include land disposal restrictions, minimum technology requirements, and facility-wide corrective action requirements.

2. Alternative Management-Based Listing

Another approach EPA considered would be to list as a hazardous waste only CKD that is managed according to specific practices that are known to pose significant risks to human health and the environment. For example, the management of CKD in unlined landfills, under water or in direct contact with the ground-water table, without fugitive dust controls, or when used for agricultural purposes without proper controls, is likely to pose significant risks to human health and the environment. Under this approach, CKD mismanaged in these specified ways would be listed as hazardous waste. One disadvantage to this approach is that while it may prevent those poor management practices identified by the Agency at this time, such a listing would require the Agency to anticipate and identify all possible ways that CKD could be mismanaged. The Agency requests comments on the advantages or disadvantages of this approach over the approach proposed today, including comment on additional mismanagement practices that should be identified and considered if such an approach were adopted.

3. Characteristic CKD

CKD rarely exhibits a hazardous characteristic. Under the rule proposed today, characteristic CKD would, in most cases, be regulated in the same manner as other CKD. That is, it would be exempt from the definition of

[22] See 60 FR 57747, November 20, 1995, Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Petroleum Refining process Wastes; Land Disposal Restrictions for Newly Identified Wastes; and CERCLA Hazardous Substance Designation and Reportable Quantities.

[23] See 62 FR 6621, February 12, 1997, Military Munitions Rule; Hazardous Waste Identification and Management; Explosives Emergencies; Manifest Exemption for Transport of Hazardous Waste on Right-of-Ways and Contiguous Properties; Final Rule.

[24] Supporting documentation for these cost analyses can be found in the Technical Background Document: Data and Analyses Addressing the Costs of CKD Management Alternatives, RIC Docket Nos. F–94–RC2A–S0018 and S0018.A).

"hazardous waste" so long as it is managed in accordance with the specified standards; if not so managed, as described above, it would be subject to tailored Subtitle C requirements. The sole exception to this approach would be for CKD from kilns that burn hazardous waste as fuel, which would be subject to full (not tailored) Subtitle C requirements if it fails the two-part test in the Boiler and Industrial Furnace Rule (a prime component being a comparison to hazardous characteristic criteria for metals). This approach maintains in place the rules for CKD from hazardous waste burners that exist currently under 40 CFR 266.112.

4. Apply Tailored RCRA Subtitle C Standards to Improperly Managed CKD

As described previously, CKD that has been determined to be improperly managed and no longer a non-hazardous waste would be subject to Subtitle C standards that are tailored to address the risks presented by CKD. The management standards applicable to such CKD would be promulgated under EPA's general authority for setting management requirements for hazardous waste under sections 2002(a)(1), 3002, 3003, and 3004 of RCRA.

Subtitle C requirements that apply to hazardous waste generally, and are not expressly modified in these tailored standards, would apply to CKD or facilities managing CKD. For example, if a person managing CKD waste disposes of non-exempt CKD onsite, she or he would be required to obtain a RCRA permit. However, EPA has authority under section 3004(x) of RCRA to alter certain statutory requirements that would otherwise apply to all hazardous waste facilities, for wastes previously subject to the Bevill exclusion and newly being brought under Subtitle C regulation. In particular, EPA has authority to modify requirements relating to land disposal restrictions, minimum technology for landfill design, and facility-wide corrective action. EPA would rely on this authority to exempt CKD from land disposal restrictions, minimum technology requirements, and facility-wide corrective action requirements as we are proposing today. A more detailed discussion of the reasons for this approach under section section 3004(x) can be found in Section V.A.1.–3004(x)—Special Characteristics.

IV. Proposed Management Standards

A key element of the regulatory system for CKD described above is the standards to be established for CKD management. As discussed above, as long as CKD is managed according to these standards, it would remain a non-hazardous waste. Furthermore, compliance with these standards would be required under the tailored RCRA Subtitle C requirements applicable to any CKD that is mismanaged.

Because these standards are a condition for maintaining non-hazardous status, EPA proposes to promulgate them at 40 CFR Part 259, separate from the regulations governing hazardous waste. The tailored RCRA Subtitle C regulations for hazardous CKD waste are proposed to be promulgated in 40 CFR Part 266; those regulations will incorporate the Part 259 proposed standards by reference, in addition to identifying the other Subtitle C requirements applicable to hazardous CKD.

A. Protection of Ground-Water Resources

1. The Need for Ground-Water Protection Standards

As tabulated in the background document for today's proposed rule titled Technical Background Document on Ground Water Controls at CKD Landfills, EPA has identified 13 cases of ground water damage resulting from the migration of potentially hazardous constituents, including metals, from waste CKD.[25] These damages reflect CKD management practices from 1980 to 1995 at cement facilities across the United States. While the Agency acknowledges that CKD management practices may have changed at individual cement manufacturing sites, EPA believes certain practices which have led to damages to ground and surface waters have not stopped and occur today at other cement manufacturing facilities nation-wide.

The Agency considers damage to mean that metal constituents have contaminated ground water and/or surface water above a Federal or State standard (e.g., a maximum concentration limit). Constituents of concern from CKD that have been released to ground and surface waters include arsenic, chromium, and lead, among others. When ground-water exceedances do occur, the magnitude of the exceedance is usually within two orders of magnitude of the standard. Environmental damage generally affects the area in the immediate vicinity of the waste disposal site. Environmental damage has been identified both at facilities that burn and those that do not burn RCRA hazardous wastes.

As documented in Table 2–1 of the technical background document on ground water controls, the Agency finds that many factors have contributed to causing the release of CKD constituents to ground water or the subsurface environment at these damage case sites. Factors which are noted to have contributed to the release of CKD constituents into the sub-surface environment include: (1) CKD disposal below the natural water table or ground-water infiltration into the waste unit; (2) the lack of a bottom liner or leachate collection system, or both, to control leakage from the waste unit; (3) surface run-off or erosion transporting CKD constituents to surface water bodies and/or wetlands which can serve as a source of ground-water recharge; (4) the lack of an impermeable cover to control percolation of rain water and/or surface water run-off into the waste unit; and (5) the presence of a shallow ground-water flow system with conduit flow characteristics (e.g., karst aquifer or fractured bedrock aquifer). Notably, all of the damage cases are associated with CKD waste disposal units which did not have bottom liners, leachate collection systems, or impermeable covers in place during the active disposal period.

The cement industry, because it uses limestone, has a relatively high percentage of CKD disposal sites located in potential karst areas that is unique compared to other industries the EPA regulates. The Agency estimates that 78 out of 110 plants are underlain by limestone formations in areas of potential karst terrain. Based on additional analysis performed in support of today's proposed rule which is documented in the technical background document on ground water controls, the Agency has increased the estimate of the percentage of cement plant sites located in potential karst areas from about half to 71%.

The Agency believes these limestone formations may have conduits with hydraulic characteristics that potentially allow leachate to rapidly enter ground-water aquifers directly without substantial dilution or attenuation. As documented in the technical report supporting this rule titled Cement Kiln Dust Migration Pathway, modeling results for one CKD disposal site (Facility A) did not predict breakthrough of contaminants into the ground-water table within 130 years, even under highly alkaline conditions. Ground-water and surface water

[25] Detailed writeups for each of the 13 ground-water damage cases can be found in Chapter 5 of the RTC, the Technical Background Document:Additional Documented and Potential Damages from the Management of Cement Kiln Dust (F–94–RC1A–S0003 to S0015); and the Technical Background Document. Additional Documented Damages to Ground Water From the Management of cement Kiln Dust, which has been placed in the RIC docket in support of this proposed rule.

releases, however, which are described in the technical background document for this proposed rule titled Additional Documented Damages to Ground Water From the Management of Cement Kiln Dust, occurred at the same site in 1995, within 30 years of first receipt of waste. The faster ground-water migration time can be attributed to fractures in the limestone and an upper perched water table. These factors were not accounted for in the Agency's model, which assumed laminar ground-water flow in a homogenous granular bedrock. Nor did the Agency's model account for placement of CKD in direct contact with ground water.

Nine of the 13 cases of groundwater damage identified occurred at facilities located in karst terrain. The Agency believes the identification of additional documented damage cases further supports the qualification, noted in the 1995 Regulatory Determination, that available ground-water pathway modeling techniques are not applicable in areas of karst terrain. For example, in two documented damage cases, excessive discharges of CKD-contaminated waters can be attributed to ground-water flow through fractured bedrock. In another case, CKD disposal in caverns has resulted in the discharge of contaminated ground water into a nearby surface stream. This does not necessarily mean that ground-water contamination will occur at all such cement plants; however, it should be regarded as a significant qualification to the general findings in the RTC of low or negligible risk from the ground-water pathway risk modeling results. Also, as noted in Section II.C.4.b—Additional Ground-water Modeling, the conclusions on ground water modeling should be qualified by the additional analysis conducted by the Agency. In this analysis, the Agency concluded that the typical ions in CKD and the highly alkaline nature of the leachate are likely to mobilize metals, including lead, chromium, and beryllium, at levels greater than previously predicted. In addition to ground-water contamination, contamination of surface water and/or wetlands was also identified as being a concern at twelve of these damage case sites.

At many of these sites, environmental damages are persistent and continuing. The identification by the Agency of six additional cases of damage since the 1995 Regulatory Determination indicates that damage to ground-water resources near CKD disposal sites may be more common than originally thought in 1995. EPA's latest information indicates that remedial measures have been initiated at only seven of the ground-water damage case sites, such as removal of contaminated materials, installation of an impermeable cap, and/or construction of a seep/ground-water extraction and treatment system. In two cases, ground-water contamination has been found that corroborates the surface water damage cases which were reported in the 1993 RTC and associated NODA. This suggests that, at these CKD disposal sites, releases of contaminated water are pervasive. Many of these sites have been slow to implement remedial measures to control off-site migration of contaminants.

The Agency further believes ground-water controls are warranted because of the matrix in which constituents of concern are bound. As mentioned in Section II.C.4.b. (Additional Ground-water Modeling) of this proposal, more recent modeling of the highly alkaline conditions shows that, in general, these conditions increase the likelihood that some constituents of concern, including lead, chromium, and cadmium, may be more mobile than previously demonstrated. Specifically, the Agency has noticed enhanced transport and breakthrough to the water table for these metals. These new ground-water modeling results support the findings of increased leachability of toxic metals, as observed in the damage cases. As reported in the RTC, the highly alkaline nature of CKD-water mixtures is evident in TCLP results, which commonly show a resultant pH greater than 10 standard units, even after adding acid.

Current waste management practices appear to be inadequate to limit releases of at least some metal contaminants. According to a survey by APCA of 1995 CKD waste management practices, 65% of all respondents indicated that their landfills had liners, but only one respondent (1.5%) used a synthetic liner. Over 60% of respondents considered bedrock or native clay or shale materials to be liners. In 1990, only 17% of all CKD management units nation-wide had ground-water monitoring systems. The American Portland Cement Alliance reports that in 1995, 33 out of 94 cement manufacturing facilities had "ground-water monitoring systems." EPA, however, could not verify whether the monitoring systems were capable of characterizing ground water beneath the active CKD management unit(s). EPA believes that a substantial portion of the cement industry relies on inadequate measures to control the release of contaminants to ground water, and that these practices have not changed substantially or have only marginally improved over the past several years.

Finally, as stated in the 1995 Regulatory Determination, the Agency believes there are no current Federal ground-water protection standards that are adequate to address the risks posed by CKD via the ground-water pathway. The Safe Drinking Water Act (42 U.S.C. 300 f–j) protects drinking water by setting maximum concentration limits (MCLs) for toxic contaminants, including metals. However, drinking water standards are only protective at the point of consumption. Public water supply wells, however, are protected through the wellhead protection program under the SDWA (41 U.S.C. 300h–7(e)).

2. Applicability

EPA is concerned that today's proposal might create an incentive for persons managing CKD waste to create unneeded "units" or unnecessarily large units prior to the effective date of the final rule so that such units would be deemed "existing units" and not be subject to certain requirements of today's proposed rule. To address this concern, today's proposed definition of "existing unit" specifies that expansions would have to be consistent with past operating practices, or operating practices modified to ensure good management. The Agency believes this added provision ensures that persons managing CKD waste will not create new units or unnecessarily enlarge their existing units to avoid compliance with portions of today's proposed rule, but at the same time, accounts for legitimate landfill enlargements or changes in facility operations resulting from additional waste volumes. EPA solicits comment on whether today's proposed regulatory distinction between lateral and vertical expansions would encourage owners and operators to expand existing landfills laterally prior to the effective date of the final rule to avoid meeting the requirements applicable to new units. EPA is proposing ground-water protection standards for all new and existing CKD waste landfill units, except units closed prior to the effective date of the rule. Today's proposed performance and technology-based standards would apply to new units, and any expansion of an existing CKD landfill unit, defined as any lateral expansion of the waste boundary of an existing landfill unit. Any lateral expansion would be considered a new unit and must meet the requirements applicable to new units. In contrast, any vertical expansion of an existing unit would be considered part of the existing unit and subject only to those requirements applicable to existing units. Under this

proposed definition, any new area of any existing unit that receives waste after the effective date of this rule is an expansion. All new and existing CKD landfill units (i.e., the existing landfill plus any expansion) must comply with ground-water monitoring and corrective action requirements proposed in today's rule.

With regard to surface impoundments, the Agency has found few facilities that engage in this CKD management practice. EPA solicits comment on whether wet handling of CKD in surface impoundments can be conducted in a manner that meets the performance standards contained in today's proposed rule. EPA continues to take the position that placement of CKD in a surface impoundment that is in direct contact with the ground-water table would not be protective of human health and the environment.

3. Location Standards

One set of standards for ground-water protection relates to facility location. EPA has identified locations that require special restrictions and may influence the location of landfills: sites below the natural water table, floodplains, wetlands, fault areas, seismic impact zones and unstable areas, particularly unstable areas in karst terrain. For other wastes, such as municipal solid wastes, the Agency has viewed these locations as needing special protection (see 53 *FR* 33314, August 30, 1988). Accordingly, EPA is proposing to impose location standards for CKD disposal sites to ensure protectiveness in the areas described above. With one exception which prohibits CKD disposal below the natural water table, the Agency is not proposing an absolute prohibition against siting CKD landfills at these locations; however, persons managing CKD waste would have to make a showing to the EPA Regional Administrator (or the State, in authorized States), on a case-by-case basis that their design is protective in these environments.

a. Disposal Below the Natural Water Table

Today's proposed rule includes a ban on management of CKD in new units located below the natural water table. The natural water table is defined as the natural level at which water stands in a shallow ground-water well open along its length and penetrating the surficial deposits just deeply enough to encounter standing water at the bottom. This level is uninfluenced by ground-water pumping or other engineered activities.

EPA believes that this stringent restriction is necessary to protect human health and the environment because of the potential damage caused by management of CKD at sites located below the natural water table. The Report to Congress, subsequent Regulatory Determination, and background documents to this proposed rule all describe damages to ground water and surface water resulting from management of CKD at sites (e.g., quarries) that subsequently filled with water after abandonment. As mentioned above, two of these sites were once listed on the NPL. In the Regulatory Determination, the Agency also identified surface water damages resulting from problems with run-on and run-off, but deferred to its authorities under the Clean Water Act to control surface water problems.

b. Floodplains

EPA is proposing that new and existing CKD landfill units may not be located in a 100-year floodplain unless a demonstration is made to the EPA Regional Administrator (or the State, in authorized States), that the landfill has been designed so that it does not restrict flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in the washout of solid waste so as to pose a hazard to human health and the environment. The Agency's rationale today is consistent with the similar rule regarding municipal solid waste landfill units (MSWLFs) (see 53 *FR* 33314, August 30, 1988). Specifically, floodplains may be adversely impacted by the disposal of solid waste through potential flooding damages including: (1) Rapid transport of hazardous constituents by flood water resulting in degradation of water quality downstream; (2) restriction of flood water flow, causing greater flooding upstream; and (3) reduction of the storage capacity of the floodplain, which may cause more rapid movement of flood water downstream, resulting in higher flood levels and greater flood damages downstream.

Today's proposal would require that new and existing CKD landfill units located in a 100-year floodplain be designed and operated to prevent the adverse effects described above. The intent of today's proposed rule is to require that CKD landfill units not cause significant impacts on the flow and water storage capacity of a floodplain experiencing a 100-year flood. Site-specific information should be used to evaluate whether a facility has met this standard.

Today's proposal defines the floodplain using the 100-year flood level.[26] This criterion would limit the chance for site inundation and resulting damages. The intent of this criterion is: (1) To require an assessment of any new or existing CKD disposal site or expansion of any existing site in a floodplain to determine the potential impact of the disposal site on downstream and upstream waters and land; (2) to prohibit such disposal activities if the site, as designed, may cause increased flooding during the 100-year flood; and (3) to require, if the disposal site is located in a floodplain, the use of available technologies and methods to protect against inundation by the base flood, and minimize the potential for adverse effects on water quality and on the flood-flow capacity of the floodplain.

c. Wetlands

Today's proposal provides that no new CKD landfill unit may be placed in wetlands,[27] unless the person managing CKD waste makes a specific demonstration to the EPA Regional Administrator (or the State, in authorized States), that the new unit: (1) will not result in "significant degradation" of the wetland as defined in the Clean Water Act section 404(b)(1) guidelines, published at 40 CFR Part 230; and (2) will meet other requirements derived from the section 404(b)(1) guidelines. Existing disposal units, including vertical expansions that are located in wetlands would continue to operate.

EPA believes that these restrictions are necessary to protect human health and the environment because of the special environmental significance of wetlands and the potential damage caused from siting CKD landfill units in wetlands. The 1993 Report to Congress and associated background documents describe the environmental damage that results by siting CKD landfill units adjacent to wetlands. One case study describes releases of toxic metals in excess of State standards for warmwater wildlife habitats, which potentially could damage the ecological integrity of wetlands adjacent to the CKD disposal site. Another case study describes

[26] To determine whether a CKD landfill unit is in the 100-year floodplain persons managing CKD waste should use flood insurance rate maps (FIRMS) developed by the Federal Emergency Management Agency.

[27] For purposes of this section, wetlands means those areas defined by 40 CFR 232.2(r): "* * * areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

environmental releases of toxic metals into the nearshore waters of Lake Huron, which have filled in emergent wetlands and damaged sensitive aquatic habitats. Today's proposed rule would minimize wetland degradation by new CKD landfill units and expansions by allowing siting in wetlands only in cases where protective unit design has been demonstrated.

Today's proposed rule adopts four major requirements: (1) A practical alternatives test (§ 230.10(a)); (2) the assessment of compliance with other applicable laws (§ 230.10(b)); (3) the assessment of aquatic degradation (§ 230.10(c)); and (4) the assessment of steps taken to minimize the adverse effects of discharge (§ 230.10(d)). These requirements parallel those in the guidelines for wetlands protection under section 404(b)(1) of the Clean Water Act. The guiding principle is that discharges should not be allowed unless the persons managing CKD waste can demonstrate that such discharges are unavoidable and will not cause or contribute to significant degradation of wetlands.

Accordingly, to satisfy the four requirements mentioned above, before a CKD landfill unit may be sited in a wetland the persons managing CKD waste must make the following five demonstrations to the Regional Administrator (or the State in authorized States). First, alternative sites for the proposed landfill which are located outside of wetlands must be considered. An alternative site is defined as one which does not involve wetlands. For a person managing CKD waste to site a CKD landfill in a wetland, he must clearly rebut the presumption that a practical alternative is available. Second, a demonstration must be made that siting in a wetland does not violate any of the provisions of the following applicable laws: (1) Any applicable State water quality standard; (2) any applicable toxic effluent standard under section 307 of the Clean Water Act; (3) the Endangered Species Act of 1973; and (4) the Marine Protection, Research, and Sanctuaries Act of 1972. Third, a demonstration must be made that siting the landfill in a wetland will not cause or contribute to significant degradation of wetlands. Fourth, if siting in a wetland is still considered after the first three demonstrations discussed above, then an additional demonstration must be made that appropriate and practical steps have been taken to minimize the potential for adverse effects of the landfill on wetlands. Finally, it must be shown that sufficient information is available for making reasonable determinations with respect to these demonstrations; otherwise, the person managing CKD waste cannot make the demonstrations necessary to qualify for the waiver to the ban. In today's proposed rule, EPA has not set a structure or time frame for approval by the EPA Regional Administrator (or the State in authorized States), in order to give the regulatory authority maximum flexibility in setting schedules.

Today's proposed rule addresses only RCRA requirements. Nothing in today's proposed rule affects any requirements that facilities may have to comply with under other programs, such as section 404 of the Clean Water Act which affects disposal in wetlands.

d. Fault Areas

EPA proposes today that no new CKD landfill units may be sited within 60 meters (200 feet) of a fault that has had displacement in Holocene time, unless a demonstration is made to the EPA Regional Administrator (or the State, in authorized States), that an alternative setback distance of less than 60 meters will prevent damage to the structural integrity of the CKD landfill unit, and will be protective of human health and the environment. The Holocene is the most recent epoch of the Quaternary Period, a period of geologic time that extends from the end of the Pleistocene Epoch to the present and includes approximately the last 10,000 years. Regional geologic maps of Holocene age faults are published by the U.S. Geological Survey. EPA believes that motion along faults may adversely affect the structural integrity of CKD landfill units, and that a 60-meter buffer zone is necessary to protect engineered structures from seismic damages.[28]

Earthquakes present a threat to public safety and welfare in a significant portion of the United States. Damage and loss of life in earthquakes occur as a result of surface displacement along faults and ground motion, as well as secondary effects of the shaking such as ground or soil failure. Faults also present concerns relating to failure of containment structures for CKD landfills. Today's proposed standard is designed to protect CKD landfill units from deformation (i.e., bending and warping of the earth's surface) and displacement (i.e., the relative movement of any two sides of a fault measured in any direction) of the earth's surface that occur when a fault moves.

Available information collected in support of the MSWLF rule suggests that structural damage resulting from earthquakes is most severe for structures located within 60 meters of the fault trace, and decreases with increasing distance away from the fault. However, EPA believes that for some geologic formations the 60 meter setback distance may be overprotective. Therefore, the Agency has allowed in today's proposed rule the opportunity for demonstrations to be made to the EPA Regional Administrator (or the State, in authorized States), that an alternative setback distance of less than 60 meters will prevent damage to the structural integrity of the CKD landfill unit. The Agency requests comment on both the general concept of a location restriction based on fault areas and the specific 60-meter setback requirement.

e. Seismic Impact Zones

Today's proposal would require that any new CKD landfill unit located in a seismic impact zone be designed to resist the maximum horizontal acceleration in lithified material for the site. The design features affected include all containment structures (i.e., liners, leachate collection systems, and surface water control systems). Seismic impact zones are defined as areas having a ten percent or greater probability that the maximum expected horizontal acceleration in lithified material for the site, expressed as a percentage of the Earth's gravitational pull (g), will exceed 0.10g (i.e., 98.0 centimeters per second per second) in 250 years. The term "lithified material" refers to any consolidated or coherent, relatively hard, naturally occurring aggregate composed of one or more minerals (e.g., granite, shale, marble, sandstone, limestone, etc.). This definition explicitly excludes loose, incoherent masses such as soils or regolith, and man-made materials such as fill, concrete or asphalt. EPA's rationale today is consistent with the similar rule regulating MSWLFs, and the Agency solicits comment regarding whether it is appropriate to use the same approach for CKDLFs.

EPA believes that the adverse impact of siting CKD landfill units in seismic areas justifies the need for a comprehensive standard to prevent releases from these facilities. Types of failure that may result from ground motion are: (1) Failure of structures from ground shaking; (2) failure of containment structures due to soil liquefaction, liquefaction-induced settlement and landsliding, and soil slope failure in foundations and embankments; and (3) landsliding and

[28] A fault is defined as a fracture or a zone of fractures in any material along which strata on one side has been displeased relative to strata on the other side. See United States Geological Survey, 1978, Preliminary Young Fault Maps, Miscellaneous Field Investigation (MF) 916.

collapse of surrounding structures.[29] The background document supporting this section of the rule provides examples of the potential adverse effects on CKD landfill units that may occur in seismic impact zones. The Agency believes that these failures may result in contamination of air, ground water, surface water and soil. Therefore, in order to protect human health and the environment, all containment structures must be designed to withstand the stresses created by peak ground acceleration at the site from the maximum earthquake based on regional studies and site-specific analyses.[30]

The process designing earthquake-resistant components may be divided into three steps: (1) Determining expected peak ground acceleration at the site due to a maximum quake, based on regional studies and site-specific seismic risk analysis; (2) determining site-specific seismic hazards (e.g., soil liquefaction); and (3) designing the facility to withstand peak ground accelerations. Various methods for accomplishing the above tasks appropriate to individual CKD landfill units should be selected by the person managing CKD waste, subject to regulatory agency approval.

f. Unstable Areas

EPA is also proposing that persons managing CKD waste in new and existing CKD landfill units located in unstable areas must demonstrate the structural integrity of the unit to the EPA Regional Administrator (or the State, in authorized States). This demonstration must show that engineering measures have been incorporated into the unit's design to mitigate the potential adverse structural impacts on the structural components of the unit that may result from subsidence, slope failure, or other mass movements in unstable areas. For purposes of this section, structural components include liners, leachate collection systems, and final covers.

EPA is particularly concerned with CKD landfill units located in areas of karst terrain. For purposes of this section, karst terrain means an area where karst landscape, with its characteristic hydrogeology and/or landforms is developed. In karst terrain, ground-water flow generally occurs through an open system with both diffuse and conduit flow end member components, and typically has rapid ground-water flow velocities which exceed Darcian flow velocities.[31] Composed of limestone, dolomite, gypsum and other soluble rock, karst terrain typically has well developed secondary porosity enhanced by dissolution. Landforms found in karst terrain include, but are not limited to, sinkholes, sinking streams, caves, springs and blind valleys. Karst terrains always include one or more springs for each ground-water basin, and underground streams except where ground-water flow is diffuse or the host rock has megaporosity.

The regulatory definition of karst terrain in today's proposal expands beyond the obvious landform features typically associated with mature karst topography (e.g., sinkholes and caves). Not all waste disposal sites overlying carbonate aquifers exhibit mature features of well-developed karst, but, nevertheless, may overlie karst aquifers with well developed conduit systems in which turbulent flow regimes dominate. Karst systems are commonly mantled by thick regolith, or partially covered by caprock which may exhibit a topography that is not characteristic of a traditional karst setting. If the regulatory definition of karst relies solely on apparent karst landform features, persons managing CKD waste at facilities situated in karst settings with no apparent on-site karst features could claim that their facilities are not in karst terrain and, therefore, do not overlie a karst aquifer. EPA solicits comment on today's proposed definition of karst terrain and the proposed approach for identifying karst hydrology within and around facility property.

The fundamental hydrologic difference between karst and non-karst terrain is ground-water flow velocity in excess of velocities that are typical of porous media (i.e., Darcian flow velocities). A well developed karst aquifer usually has a ground-water flow velocity orders of magnitude greater than a porous media aquifer. The most important aspect of open karst systems is that the dominant basin-wide component is rapid turbulent ground-water movement, that is non-Darcian flow, through conduits to one or more springs that can vary in magnitude based on the size of the basin and seasonable ground-water conditions. The magnitude of the springs are largely a function of the size of the ground-water basin and aquifer recharge.

Accordingly, before a CKD landfill unit can be sited in a potential karst terrain, a person managing CKD waste must first verify and certify that the facility is situated in a karst terrain based on the revised definition of karst terrain pursuant to §259.16(b)(1). Today's rule proposes that prior to construction of a CKD landfill in carbonate terrain, a karst ground-water investigation must be conducted to define the direction of ground-water flow, and points of discharge for the karst ground-water basin(s) the facility may affect. The karst ground-water investigation shall include a dye tracer study to identify springs which are hydrologically related to the karst ground-water basin potentially affected by the unit. The verification of a karst terrain may include, but not necessarily be limited to, a review of the available literature. If the literature fails to provide conclusive evidence that the facility does not overlie a karst terrain, a basin-wide field study should be implemented, even if the discharge points of the basin exist beyond the facility boundary, to identify all potential springs from which ground water passing beneath the CKD landfill unit may discharge. Certification may be obtained from an independent professional ground-water scientist, from the EPA Regional Administrator, or from the State, in authorized States.

After verification, the person managing CKD waste must locate background and intermediate sampling locations, and downgradient springs or ground-water monitoring wells for detection monitoring pursuant to §259.44(a) and §259.45(b) for assessment monitoring. The person managing CKD waste must establish a ground-water monitoring system pursuant to §259.41(a) that incorporates spring monitoring. The Agency believes that this will generally necessitate: (1) a field study to conduct an inventory of karst features and locate springs; (2) quantitative tracer studies to verify flow path, time-of-travel, and duration of the dye plume; (3) the regular monitoring of chemographs and hydrographs of springs and monitoring wells; and (4) the development of a sampling strategy based on the unique fate and transport characteristics of the toxic constituents in CKD and hydrology of the karst aquifer, that is capable of detecting releases from the CKD landfill unit.

EPA believes it is important to include quantitative dye tracer studies in any analysis of karst in order to

[29] See Livermore Associated Research Group, Inc. 1982. Seismic Location Standards. Prepared for U.S. Environmental Protection Agency, Office of Solid Waste, Washington, D.C.

[30] To determine whether a CKD landfill unit is in a seismic zone, persons managing CKD waste should look at maps depiciting the potential seismic activity across the United States that have been prepared by the United States Geological Survey (Open File Report 82-1033).

[31] Darcian flow means ground-water flow which follows Darcy's law, where the specific discharge is proportional to the hydraulic gradient. Darcian ground-water flow is typically linear and laminar, travels from 1×10^{-11} to 1×10^{2} centimeters per second, and is characteristic of ground-water flow through granular porous media.

determine the time of travel and duration of the dye plume. Such data are essential inputs to construction of a model of contaminant migration through the aquifer. The contaminant model is predicated on the dye behaving similarly to a contaminant in its dissolved phase or in suspension adsorbed to colloids. Information on the time of travel and duration of the dye plume would be compared to data from the storm hydrograph and chemograph to identify optimum sampling intervals. The Agency solicits comments on practical difficulties with dye studies and characterizing karst terrain, and whether there are other alternative approaches to ensure protection of human health and the environment.

Some areas of karst terrain may be prone to subsidence because of natural subsurface conditions. Limestone and dolomite are slightly soluble in water, and the solution process can enlarge existing fractures, joints and other voids creating sinkholes and caves. Potential caverns and karst pinnacles in the soil and bedrock may eventually lead to collapse or puncture of the landfill liner due to excessive overburden or settling. Accordingly, today's rule proposes that the ground-water investigation shall also include an inventory of karst features within and around facility property to identify areas prone to surface subsidence or mass movement.

4. Performance-Based Standard for the Protection of Ground Water

a. Overview

To provide maximum flexibility while ensuring protectiveness, EPA is proposing two types of standards relating to groundwater protection: a traditional technology standard, specifying landfill design and other technical requirements, and a more flexible performance-based standard for facilities that wish to utilize a design or technology that they believe will meet the performance standard. To ensure that it is complying with the standards, a person managing CKD waste may choose either to propose an alternative approach to the EPA Regional Administrator (or the State, in authorized States), or may implement the technology standards. EPA may approve the alternative if the Agency concludes the alternative will meet a more general performance standard described below.

With respect to ground water protection, EPA is proposing that the unit design must ensure that exceedances of a ground-water protection standard not occur at the relevant point of compliance. This standard would apply to the metal constituents listed in Appendix VIII of Part 261 (antimony, arsenic, barium, beryllium, cadmium, chromium (total), lead, mercury, selenium, silver, and thallium). For each constituent, the standard would be as follows: (1) if available, the maximum contaminant level (MCL) established under section 1412 of the Safe Drinking Water Act (see 40 CFR Part 141); (2) for constituents with concentration levels lower than background, the background level; and (3) for constituents with no MCLs, an alternative risk-based number or, (in an unauthorized State) other appropriate level established by the EPA Regional Administrator. The Agency solicits comment on the adequacy of using MCLs to define limits for metals in ground water at the point of compliance, and whether or not health-based numbers (HBNs) rather than MCLs should be used as a primary groundwater protection standard. While, EPA's Subtitle D groundwater protection standards are based on MCLs, the Agency's hazardous waste listing determinations are traditionally based on HBNs. The primary difference between MCLs and HBNs is that HBNs are derived based solely on health effects whereas several factors in addition to health effects are considered in the development of MCLs. Development of MCLs requires an evaluation of: (1) The availability and cost of analytical methods; (2) the availability and performance of technologies and other factors relative to feasibility and identifying those that are "best'; and, (3) an assessment of the costs of the application of technologies to achieve various concentrations. Therefore, MCLs may be more or less conservative than HBNs corresponding to the Agency's hazardous waste listing risk range of 10E–4 to 10E–6 for carcinogens and an HQ of 1 for non-carcinogens.

EPA is proposing today that facilities that wish to propose a design to comply with the performance standard must submit a proposed plan to implement the performance standard for approval by a regulatory agency. EPA will provide such oversight in unauthorized States. Authorized States, on the other hand, may be more stringent and are not required to adopt today's proposed performance standard approach. If a State chooses not to provide such review, compliance with the technology standards would be required (since there is no mechanism for approving an alternative approach). EPA strongly urges States to provide the option of a performance standard. Such a standard would protect human health and the environment and minimize the cost of compliance by allowing facilities to tailor ground-water controls to site-specific conditions.

b. Performance Standard and the Point of Compliance

The MCL is the maximum permissible level of a contaminant in water which is delivered to any user of a public water system, and is a standard for evaluating the potability of water. It is the traditional measure used by the Agency to protect the nation's public drinking water supplies (see 40 CFR Parts 141–143 National Drinking Water Regulations). MCLs would be measured at the point of compliance (POC), defined as the closest practical distance from the unit boundary, or at an alternative point chosen by the EPA Regional Administrator (or the State, in authorized States). The alternative POC must be on facility property and be no more than 150 meters from the unit boundary. In allowing for an alternative POC, the Agency's rationale is to allow greater flexibility for a State to set design requirements based on the site-specific factors (for example, see §257.3–4(b)(1)(i) through (vii)).

5. Technology-Based Standards for the Protection of Ground Water

EPA is proposing that design criteria similar to those for MSWLFs under the Subtitle D program (Solid Waste Disposal Facility Criteria, 56 FR 50978, October 9, 1991) be adopted with certain modifications for ground-water monitoring (see §259.40) and remediation. For facilities complying with the technology-based standards for the protection of ground water, any new CKD waste management unit or lateral expansion of an existing unit must be constructed with a composite liner and a leachate collection and removal system (LCS) that is designed and constructed to maintain less than a 30 cm depth of leachate over the liner. The composite liner must consist of two components: an upper flexible membrane liner (FML) with a minimum thickness of 30-mil, and a lower component consisting of at least two feet of compacted clay with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. In selecting this uniform design, EPA's goal was to identify one that would provide adequate protection in all locations.

The Agency believes the technology-based standards proposed in today's rule will be protective of ground-water resources. Liners will prevent leachate from seeping from the landfill and entering the aquifer. The FML must

have a minimum thickness of 30-mils and be installed in direct and uniform contact with the lower clay component to ensure adequate liner performance, including being able to withstand the stress of construction (see U.S. EPA RREL, Lining of Waste Containment and Other Impoundment Facilities EPA/600/2–88/052. September 1988). Compacted clay liners must be at least two feet thick to ensure a high probability of having a hydraulic conductivity of 1×10^{-7} cm/sec. Functionally, both the FML and lower clay component are necessary to retard the migration of contaminants into the subsoil. The FML component would provide a highly impermeable layer to maximize leachate collection and removal. The compacted clay liner would adsorb and attenuate pollutants in the event of FML liner failure.

A LCS is necessary to relieve the hydraulic pressure within the landfill which could drive leachate migration through the base of the landfill. LCS design normally consists of a permeable material placed on a sloping surface so as to allow leachate to be removed and collected. Large units may also have a pipe drainage system. Sloping the LCS towards a sump minimizes any downward flow, and reduces the amount of leachate leaving the LCS.

The Agency seeks comments on the effectiveness of various liner thicknesses and materials in preventing the migration of the hazardous constituents of CKD to groundwater. Of particular interest to the Agency is the effectiveness of use of CKD as a liner or cap material. CKD may be a suitable material for use as a liner or cap material because of its cementitious properties. Studies on CKD obtained by the Agency suggests that very low hydraulic conductivities (less than 1×10^{-7} cm/sec) are readily achievable in the laboratory, and in field trials using heavy equipment to compress CKD to high densities.[32] However, the Agency also has contravening information from one site visit and two case studies where CKD has been used as a cap material[33] which suggests that compaction control is difficult to maintain over an area that is acres in size. Nevertheless, EPA is not proposing today that CKD be banned from use as a liner or cap material. Rather, it can be used as part of a unit design if the person managing CKD waste can demonstrate that the design meets the performance standard for ground water, including establishing that the material will maintain integrity over long periods of time and, therefore, has a low potential for release of contaminants.

6. Requirements for Ground-water Monitoring

EPA is proposing that ground-water monitoring be required for all new and existing CKD management units, to detect the presence of regulated constituents in the ground water. The ground-water monitoring and corrective action requirements proposed today are based on requirements promulgated under Part 258 for MSWLFs and hazardous waste regulations under Part 264—Subpart F for Solid Waste Management Units. The ground-water monitoring system must include at a minimum one up gradient and three down gradient wells. The down gradient wells must be located not farther than 150 meters from the unit boundary at the relevant POC specified by the EPA Regional Administrator (or the State, in authorized States). The ground-water monitoring system must be capable of ascertaining the quality of background ground water that has not been affected by releases from the unit, and assessing the quality of ground water passing the relevant POC, as certified by a qualified ground-water scientist. The ground-water monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of ground-water quality at the background and down gradient wells.

For facilities located in karst terrain, EPA is also proposing that the ground-water monitoring strategy include, where necessary, springs which are the ultimate discharge points of the karst ground-water basin in which the facility is situated. In karst terrain, point-of-compliance ground-water monitoring wells may not detect a point source release from a CKD management unit based on failure of the monitoring wells to intersect the conduit through which the contaminant plume passes. While monitoring wells are appropriate, they are not fail-safe. Consequently, discharge points of the karst ground-water basin should be incorporated into the overall monitoring strategy to detect a release. In today's rule, EPA is proposing that the EPA Regional Administrator (or the State, in authorized States), in addition to specifying the relevant POC, may also specify ground-water monitoring at discharge points of the karst ground-water basin potentially affected by releases from the CKD waste management unit.

EPA is proposing two types of monitoring: detection monitoring and assessment monitoring. Under proposed § 259.44, persons managing CKD waste in a CKD waste management unit will be required to undertake a ground-water detection monitoring program, similar to that described under § 258.54 of the MSWLF rule. In a departure from the MSWLF rule, EPA is proposing to require detection monitoring only for the following parameters: pH, conductivity, total dissolved solids, potassium, chloride, sodium, and sulfate. These detection parameters are easily measured and should provide a reliable indication of inorganic releases from the CKD waste management unit to ground water. The Agency solicits comment on the adequacy of these detection parameters for monitoring releases and whether metal constituents are necessary.

If detection monitoring indicates a statistically significant increase over background for one or more of the detection parameters listed above, under proposed § 259.45, a person managing CKD waste is required to implement an assessment monitoring program, similar to that described in § 258.55 of the MSWLF rule. In another proposed departure from the MSWLF rule, today's proposed rule does not require a scan for the hazardous constituents listed under part 258, Appendix II. Instead persons managing CKD under today's proposed rule would be required to sample and analyze the ground water for only the inorganic constituents listed in Appendix VIII of Part 261 (antimony, arsenic, barium, beryllium, cadmium, chromium (total), lead, mercury, nickel, selenium, silver, and thallium).

Because this proposal requires ground-water monitoring at new and existing CKD landfill units, today's action effectively prohibits the location of such units in areas where subsurface conditions prevent monitoring of subsurface contaminant migration from the landfill unit. EPA anticipates that the Regional Administrators (or authorized States) will not issue an operating permit for CKD landfill units located in areas where subsurface monitoring is impossible. Geologic

[32] See Todres, H.A., 1992. Cement Kiln Dust: Field Compaction and Resulting Permeability. Research and Development Bulletin RD106T, Portland Cement Association, Skokie, Illinois. 47p; and, Todres, H.A., Mishulovich, A., and Ahmed, J. 1992. Cement Kiln Dust Management: Permeability. Research and Development Bulletin RD103T, Portland Cement Association, Skokie, Illinois. 9p.

[33] See Spectra Engineering, P.C., 1995. Lehigh Portland Cement Company, Alsen Dust Disposal Facility, Closure Certification Report. Prepared for Lehigh Portland Cement Company, Cementon Plant, Cementon, New York. See also letter from Thomas M. Polasek, P.E., Michigan Department of Environmental Quality, to Frank Davis, Lafarge Corporation, re: Consent Judgment Compliance, October 10, 1996.

settings that could preclude effective ground-water monitoring include areas of limestone bedrock in mature karst settings, with complex networks of conduits, fractures, and joints which impede accurate prediction of ground-water flow. The Agency considers it the responsibility of the persons managing CKD waste to prove that a landfill can be effectively monitored.

7. Corrective Action

Today's proposal establishes corrective action steps similar to § 258.56 of the MSWLF rule. Within 90 days of finding that any of the part 261 inorganic constituents (see previous section) have been detected at a statistically significant level exceeding the ground-water protection standards as defined under § 259.45(h), the persons managing CKD waste must initiate an assessment of corrective measures. Such an assessment must be completed within 90 days, or within an alternative period of time decided by the EPA Regional Administrator, in accordance with § 259.46. Today's proposal allows for swift remediation of a ground-water problem, yet provides flexibility for selecting and implementing the corrective remedy.

Under proposed § 259.47 and § 259.48, the selection of a remedy and implementation of the corrective action program must be completed in accordance with those procedures which are similar to those enumerated in 40 CFR 258.57 and 258.58 for MSWLFs. These requirements only apply to those hazardous constituents that are likely to be present in CKD as previously described. An exceedance of today's proposed ground-water protection standards would not immediately result in classification of such CKD as mismanaged. If a person managing CKD waste, however, failed to take the necessary corrective action after detecting an exceedance, CKD would be considered mismanaged and, therefore, hazardous waste. The Agency solicits comment regarding the time periods in which remedial activities must be initiated, and whether or not today's proposed minimum time periods are appropriate given the widely varying circumstances likely to be encountered at facilities requiring corrective action.

In today's rule the Agency is not proposing facility-wide corrective action standards for the management of CKD. Instead, EPA proposes to require corrective action at units which are actively managing CKD. EPA believes that the costs associated with requiring corrective action at all solid waste management units that may happen to be located at a CKD facility make it inappropriate to impose such a requirement. Where releases from such units have occurred, other state law authorities and the Federal imminent hazard authorities under section 7003 of RCRA or section 106 of CERCLA, will be adequate to address any threats to human health and the environment. (The handling of corrective action at facilities that become subject to today's proposed Subtitle C standards is discussed in Section V.B.—Implementation of part 259 and RCRA Subtitle C Backup Standards.)

B. Standards for Fugitive CKD Emissions

1. The Need to Limit Fugitive CKD Emissions

In the Agency's follow-up work leading to the September 1994 NODA (see 59 FR 47133, September 14, 1994), EPA found evidence of possible risk to human health due to the fine particulate nature of inhaled dust. Particulate matter is of health concern because fine particles such as CKD can penetrate into the sensitive regions of the respiratory tract and cause respiratory illness. Negative effects associated with exposure to particulate matter include premature death, hospital admissions from respiratory ailments, and increased respiratory symptoms such as persistent coughs, phlegm, wheezing, and physical discomfort. Long-term exposure to particulate matter may increase the rate of respiratory and cardiovascular illness and reduce life span. Although the Agency's direct inhalation exposure modeling studies described in the RTC did not indicate significant risk from inhaled chemical constituents in CKD, subsequent screening-level modeling on five case study plants indicated that windblown dust from uncontrolled CKD waste management units (uncovered and dry CKD piles) could exceed EPA's health-based PM_{10} fine particulate (10 microns or less) National Ambient Air Quality Standard (NAAQS) [34] at plant boundaries, and potentially at nearby residences.

Results from a subsequent extension of this work to a larger sample of 52 cement plants suggest that 28 of the plants could exceed NAAQS PM_{10} standards at plant boundaries, if the plants do not have effective dust control mechanisms in place. The Agency recognizes that dust from mining and quarry operations could contribute to the particulate emissions from a cement plant; however, other evidence (i.e., damage cases) indicates that fugitive CKD emissions are a substantial contributor to environmental damages in the form of air quality degradation.

Additionally, particulate emissions of fugitive dust are the major contributor of CKD to EPA's indirect foodchain pathway model. The Agency's quantitative modeling of "indirect" food chain pathways, both aquatic and agricultural, indicates potential human health effects, both cancer and non-cancer. A wide range of chemical constituents, including arsenic, cadmium, chromium, barium, thallium, lead, and dioxins, were indicated as constituents of concern at various plants. Because some CKD disposal units are located near, and in some instances immediately adjacent to, farm fields, rural residences with gardens, or surface waters containing fish, there is potential for indirect risk from the consumption of CKD-contaminated beef, vegetables and fish, as well as ingestion of CKD-contaminated water during recreational swimming.

Although quantitative risks presently can not be estimated, these initial modeling results relating to fine particulates suggest cause for concern and argue for further attention to this source of fugitive dust. Consequently, the Agency believes it is necessary to impose additional controls on fugitive emissions under authority provided by RCRA section 3004(n).

2. Applicability

EPA is proposing air protection standards to limit fugitive CKD emissions for all new and existing CKD waste landfill units, except units closed prior to the effective date of the final rule. Any expansion of an existing CKD landfill unit, defined as any lateral or vertical expansion of the waste boundary of an existing landfill unit, must meet today's proposed requirements. Under this proposed definition, any area of any existing unit that receives waste after the effective date of this rule is an expansion. EPA is also proposing that interim storage units, such as containers or buildings which contain CKD destined for recycling or sale, must comply with the air performance standards.

[34] The level of the national primary and secondary 24-hour ambient air quality standards for PM_{10} is 150 micrograms per cubic meter $\mu g/m^3$), and 65 $\mu g/m^3$ for PM_{25}, 24-hour average concentration. The standards are attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ for PM_{10}, and above 65 $\mu g/m^3$ for PM_{25}, as determined in accordance with Appendix K to 40 CFR part 50, is equal to or less than one. The level of the national primary and secondary annual standards for PM_{10} is 50 micrograms per cubic meter ($\mu g/m^3$), and 15 $\mu g/m^3$ for PM_{25}, annual arithmetic mean. The standards are attained when the expected annual arithmetic mean concentration, as determined in accordance with Appendix K to part 50, is less than or equal to 50 $\mu g/m^3$ for PM_{10} and 15 $\mu g/m^3$ for PM_{25}.

Consistent with controls proposed today for ground water, the Agency is not proposing to require fugitive dust controls for the old, inactive portions of existing CKD landfills. However, EPA solicits comment on applying air controls to the entire active unit, including any inactive area of a CKD landfill with an expansion.

These proposed standards could be met in one of two ways. First, a person managing CKD waste could obtain a determination from the EPA Regional Administrator (or from the State, in authorized States), that a management practice or design meets the performance standard, providing adequate assurance that the unit is managed to control wind dispersal of particulate matter. Second, the person managing CKD waste could design units according to technology-based standards outlined below, so as to obviate the need for such a demonstration.

3. Performance Standard for the Protection of Air

Under today's proposal, unit design must ensure that wind dispersal of particulate material (PM) is controlled. The specific performance standard for air is that the persons managing CKD must cover or otherwise manage the unit to control wind dispersal of CKD waste. This standard would apply to solid PM that becomes airborne directly or indirectly as a result of CKD handling procedures. The most common sources of PM at cement manufacturing facilities to which this standard applies includes vehicular traffic on unpaved roads or on CKD waste management units, and wind erosion from waste management units. This standard would not apply to CKD emitted from an exhaust stack.

The Agency understands that methods for controlling fugitive dust will vary depending on factors such as geographic location, climate, facility design, and CKD management method. While the technology-based standards of conditioning CKD, using covers, watering, and use of tanks, containers, or buildings for temporary storage, meets the performance standard, other techniques and technologies may be as or more effective. Therefore, today's proposal provides persons managing CKD waste, working with regulatory agencies, with substantial flexibility to determine the appropriate method to control fugitive emissions based on facility-specific conditions.

To demonstrate compliance with the performance standard for the protection of air, EPA is proposing that persons managing CKD waste in new and existing CKD landfills, temporary storage areas, and trucks provide cover or otherwise manage the CKD such that equivalent control exists to that provided by daily cover of the landfill unit. Additionally, if landfill units, roads, temporary storage areas, and trucks are managed with no visible fugitive emissions of CKD, the Agency would view that the performance standard is met. The Agency solicits comment regarding the effectiveness of various fugitive dust control methods in demonstrating compliance with the performance standard for air so that EPA can provide comprehensive guidance to persons managing CKD and to staff at regulatory agencies who would implement today's proposed rule.

4. Technology-Based Standards for Fugitive Dust Control

a. Conditioning

For facilities complying with the technology-based standards, EPA is proposing that CKD managed in landfills must be emplaced as conditioned CKD. For purposes of this section, conditioned CKD means cement kiln dust that has been compacted in the field at appropriate moisture content using moderate to heavy equipment to attain 95% of the standard Proctor maximum dry density value according to ASTM D 698 or D 1557 test methods. Such conditioning can be achieved by mixing the CKD with water on a continuous or batch basis, such as pug-milling, followed by compaction. The material should be spread in lifts of uniform thickness and compacted to the required density with appropriate equipment (e.g., a heavy sheep-foot roller). The compaction of moist CKD, coupled with the waste's natural cementitious properties, enables individual waste particles to bond together, thus greatly reducing the availability of particulate material for air dispersal, and, therefore, this standard is protective for fugitive dust from landfills. In addition, the bonding can serve to decrease the leaching of contaminants from CKD.

b. Covers

The Agency is also proposing that disposed CKD be covered with material at the end of each operating day sufficient to prevent blowing dust. EPA believes that cover material applied at the end of each operating day over the active face of the CKD landfill will prevent the entrainment of fugitive dust, and is a more effective practice for dust suppression than frequent wetting and watering.[35] The cover must be constructed of materials that have appropriate physical and chemical properties, and sufficient strength and thickness to prevent failure due to physical contact with CKD, climatic conditions, the stress of installation, and the stress of daily operation. Similarly, EPA is proposing that CKD transported in trucks on or off the facility be covered to minimize fugitive emissions of CKD. Alternative materials or actions may be approved by the EPA Regional Administrator (or the State, in authorized States), as long as the person managing CKD waste makes a demonstration that the alternative meets the performance standard.

c. Wetting

Wetting of CKD on roads is not required in today's proposed performance-based standards. EPA believes, however, that consistent wetting and watering of unpaved roads, when used in conjunction with other air control technologies, can reduce releases of fugitive emissions from facilities that manage CKD. Data from an EPA study of fugitive dust emissions from cement plants and potential control measures indicates that fugitive dust emissions from unpaved roads can be significantly reduced by increasing the moisture content of the dust. However, the wetting of roads by itself will not meet today's proposed performance standard for air.

The Agency solicits comments on the effectiveness of these and other methods for controlling fugitive emissions of CKD.

d. Temporary Storage

The Agency today is proposing that CKD destined for temporary storage prior to recycling, sale, or disposal not be placed in land-based units, but in tanks, containers, or buildings. CKD would not be considered a hazardous waste provided the storage that precedes sale or recycling provides adequate control of fugitive dust. An acceptable containment unit must be a man-made structure with a foundation constructed of non-earthen materials, have walls (which may be removable), and have a roof suitable for diverting rainwater away from the foundation. In considering these criteria for containers and buildings, EPA is placing special emphasis upon practical considerations, such as the need to transport materials in and out of the unit in a reasonable fashion. The Agency would not require that these units meet full Subtitle C

[35] Although wetting and watering is a common fugitive dust suppression practice at CKD landfills, the persistent releases of fugitive CKD reported in the RTC suggest that frequent wetting alone is not sufficient to prevent blowing dust.

requirements for storage of hazardous wastes as outlined in parts 264 and 265 subparts I and J.

C. Closure

In today's proposed rule, EPA is requiring that new and existing CKD landfill units, including expansions be closed in accordance with specified standards, and that units be monitored and maintained after closure. Closure and post-closure plans describing these activities are to be prepared to comply with a minimum set of procedural requirements. As described in the damage cases supporting this rule, improperly closed CKD landfills have the potential for contaminating the environment due to inadequate controls to contain the waste. For example, in one damage case, CKD wastes remained exposed due, in part, to failure to install a proper cap or insulate the waste from the erosive wave action of Lake Huron.

EPA proposes that all persons managing CKD waste in CKD landfill units must install a final cover designed to minimize infiltration and promote drainage from its surface while minimizing erosion. It must also be designed so that settling and subsidence are accommodated to minimize the potential for disruption of continuity and function of the final cover. The Agency believes that placement of a final cover over closed portions of a CKD landfill is necessary to minimize the infiltration of rainwater, minimize the dispersal of CKD waste through physical interaction, and minimize the need for further maintenance at the facility through the post-closure period and beyond. The infiltration layer must be a minimum of 18 inches of earthen material that has a hydraulic conductivity of less than or equal to the bottom liner system, or no greater than 1×10^{-5} cm/sec, whichever is less. The erosion layer must have a sufficient thickness to sustain native plant growth. Alternative final cover designs may be approved by the EPA Regional Administrator (or the State, in authorized States), if the cover layers achieve the same objectives as the specified design in this proposed rule.

D. Post-Closure Care

Today's proposed rule also requires that post-closure care be conducted for a period of 30 years after the closure of each CKD landfill unit. Post-closure care consists of maintaining the effectiveness of the final cover and continuing ground-water monitoring and leachate management to control the formation and release of leachate into the environment. Routine maintenance of the integrity and effectiveness of the final cover is necessary to prevent liquids from penetrating into the closed landfill and creating the potential for leachate migration.

EPA is proposing in today's rule to give the EPA Regional Administrator (or the State, in authorized States), discretion to reduce or extend the length of the post-closure period based on site-specific demonstrations. The Agency is concerned that 30 years may be excessive or insufficient to detect releases at some landfills. Therefore, the Agency wants to ensure that any potential release will be detected regardless of when it occurs.

Required activities in today's proposed rule include repairs to the final cover to correct the effects of settling, subsidence, and erosion, and preventing run-on and run-off from damaging the cover. Cover maintenance also includes periodic cap replacement, which is necessary to remediate the effects of routine deterioration. The Agency believes that these activities will minimize liquids in CKD landfills and are the minimum steps necessary to protect human health and the environment in the long term.

Today's proposal under §259.50 also requires ground-water monitoring and maintenance of the ground-water monitoring system during the post-closure care period. The fundamental purpose of monitoring during the post-closure care period is to detect ground-water contamination in a timely fashion should the CKD waste containment structure fail, and to trigger corrective action activities as soon as contamination occurs. Long-term monitoring is essential to detect releases due to catastrophic failure or design and installation errors (e.g., tearing of liners due to ground movement).

E. Closure/Post—Closure Planning Requirements

Today's proposed rule also requires preparation of closure and post-closure plans describing activities that will be undertaken to close each CKD landfill unit properly and maintain them after closure. These plans must be prepared and placed in the facility operating record no later than the effective date of this rule, or the date of initial receipt of the waste, whichever is later.

The closure and post-closure care standards also include certain procedural requirements. First, prior to closing of each landfill unit, the EPA Regional Administrator (or the State, in authorized States) must be notified and the notification must be placed in the facility operating record. Second, closure of the landfill unit must begin within 30 days after the date of final receipt of CKD waste and closure complete within 180 days of receipt of the last shipment of waste. Extensions to these deadlines may be approved for good cause by the EPA Regional Administrator (or the State, in authorized States). Third, following closure of the facility, a notation in the deed to the property must be recorded that indicates the property has been used for CKD disposal. Finally, the EPA Regional Administrator (or the State, in authorized States) must be notified and a certification must be placed in the facility operating record that verifies that closure and post-closure activities have been conducted in accordance with closure and post-closure plans. The certification must be signed by an independent registered professional engineer, or approved by the EPA Regional Administrator (or the State, in authorized States).

F. Financial Assurance

In today's proposed rule, a demonstration of financial assurance is required for the costs of conducting closure, post-closure care, and, if applicable, corrective action for known releases. The proposed financial assurance requirements are patterned after the financial assurance provisions for municipal solid waste landfill facilities (MSWLFs) under Subtitle D. (see §§258.71 to 258.75).

The purposes of financial assurance are to ensure that the owner or operator of a CKD landfill unit adequately plans for the future costs of closure, post-closure care, and corrective action for known releases, and to ensure that adequate funds will be available when needed to cover the costs if the owner or operator is unwilling or unable to do so. To demonstrate to the EPA Regional Administrator (or the State, in authorized States) that it has planned for future costs, written cost estimates must be prepared. These cost estimates would serve as the basis for determining the amount of financial assurance that must be demonstrated.

EPA is proposing that persons managing CKD waste in new and existing CKD landfill units, including expansions, be required to demonstrate financial responsibility for closure, post-closure care, and corrective action for known releases in an amount equal to the cost of a third party conducting these activities. The "third party" provision ensures that adequate funds will be available for the regulatory agency to hire a third party to conduct closure, post-closure care, and corrective action in the event that the person managing CKD waste fails to fulfill these obligations.

The cost estimates must be based on the cost of closing the CKD landfill unit at the point of the landfill's active life when the extent and manner of its operation would make closure the most expensive. Similarly, cost estimates for post-closure care must include estimates for both annual and periodic activities, and account for the most expensive costs of routine post-closure care. EPA is proposing that the cost estimates be updated annually for inflation and whenever design changes cause changes in the costs at the CKD landfill unit. Cost estimates may be reduced provided a justification for the reduction is placed in the operating record and the EPA Regional Administrator (or the State, in authorized States) is notified. The Agency solicits comment on whether cost estimates need prior approval by the EPA Administrator.

In today's proposal, any person managing CKD waste who is required to undertake a corrective action program would be required to prepare an estimate of the cost of an appropriate corrective action program (for example, by multiplying the total annual costs of remedial actions by the number of years required to complete the corrective action program).

Today's proposed rule includes a list of specific financial mechanisms that may be used to demonstrate financial responsibility, as well as criteria for judging whether other mechanisms are acceptable. The rule permits the use of a trust fund with a pay-in period, surety bond, letter of credit, insurance, State-approved mechanism, and State assumption of responsibility.

Today's proposed rule would also allow private owners or operators of cement kiln dust landfills (CKDLFs) that meet certain financial and recordkeeping and reporting requirements to use a financial test to demonstrate financial assurance for CKDLF closure, post-closure care and corrective action costs up to a calculated limit. (Costs over the limit must still be assured through a third-party mechanism such as a surety bond or trust fund, or, in authorized States, through other appropriate mechanisms the State determines to meet the performance standard proposed at § 259.64(l)). The financial test allows a company to avoid incurring the expenses associated with the existing financial assurance requirements which provide for demonstrating financial assurance through the use of third-party financial instruments, such as a trust fund, letter of credit, surety bond, or insurance policy. With the financial test, private persons managing CKD waste may demonstrate that they are capable of meeting their financial obligations at their CKDLFs through "self insurance."

In addition, today's proposed rule allows persons managing CKD waste to comply with financial responsibility requirements for CKDLFs using a guarantee provided by another private firm (the guarantor). Under such a guarantee, the guarantor promises to pay for or carry out closure, post-closure care, or corrective action activities on behalf of the person managing CKD waste in a CKDLF if the person fails to do so. Guarantees, like other third-party mechanisms, such as letters of credit or surety bonds, ensure that a third party is obligated to cover the costs of closure, post-closure care, or corrective action in the event that the person managing CKD waste goes bankrupt or fails to conduct the required activities. At the same time, a guarantee is an attractive compliance option for persons managing CKD waste because guarantees are generally less expensive than other third-party mechanisms.

Today's proposed rule releases persons managing CKD waste from financial responsibility for closure, post-closure care, or corrective action when the EPA Regional Administrator (or the State, in authorized States), is notified that a certification has been placed in the facility operating record that the specific activities (i.e., closure, post-closure care for a period, corrective action) have been completed in accordance with the appropriate plan. The certification must be signed by a professional engineer, approved by the EPA Regional Administrator (or the State, in authorized States).

EPA is also considering requiring persons managing CKD waste in CKD landfill units to demonstrate financial assurance for third party liability to compensate injured third parties. Such liability requirements are currently required under RCRA Subtitle C for hazardous waste management facilities (see 40 CFR 264.147). Financial assurance for third-party liability potentially benefits the public health by providing the incentive of lower insurance premiums resulting from improved facility design and operation.

Under § 264.147, an operating land disposal facility must have both coverage for sudden accidental releases in the amount of $1 million per occurrence and $2 million annual aggregate plus nonsudden coverage. This nonsudden accidental coverage is for an additional $3 million per occurrence and $6 million annual aggregate. Thus, were the Agency to require the same level of liability coverage for CKD landfills as for hazardous waste land disposal owners and operators, they would need at least $4 million and $8 million in total.

For municipal solid waste landfill facilities, EPA has deferred the development of third party liability requirements under part 258. EPA's decision to defer these requirements was based upon two issues. The first was that the Agency had insufficient data to set appropriate levels for third party liability coverage. Second, the Agency was concerned that owners and operators of MSWLFs would encounter difficulty in obtaining financial assurance mechanisms to fulfill this requirement. (For more information on these points please see the Appendix to the final regulation establishing the Solid Waste Disposal Criteria at 56 FR 51108.)

The Agency, however, believes that the risks from CKD landfill are closer to those for from MSWLFs than from hazardous waste treatment, storage, and disposal facilities (TSDFs). Therefore, the types of liability requirements for hazardous waste TSDFs may be inappropriate for CKD landfills. Further, the amounts of coverage that EPA should require may also differ. EPA has limited data at this time to specify the amount of liability coverage that would be appropriate for a CKD landfill unit. Another consideration is the cost of implementing such a requirement. EPA is reluctant to directly adopt the levels of coverage required for Subtitle C facilities without further analysis comparing the risks and resultant third party claims from CKD landfill units and other Subtitle C hazardous waste facilities. The Agency, therefore, requests comment on whether or not to require financial assurance for third-party liability for CKD landfill units. In particular, EPA requests information on the risks to third parties from these facilities, the amount of claims, and the availability of liability coverage to assist it in setting appropriate levels of liability coverage.

G. Implementation

Except as provided in proposed § 259.40, existing CKD management units, including vertical expansions would be required to be in compliance with the groundwater monitoring requirements proposed under § 259.40 within two years after the effective date of the final rule. New CKD management units, including lateral expansions must be in compliance with the ground-water monitoring requirements proposed under § 259.41 before CKD can be placed in the unit. Ground-water monitoring shall be conducted throughout the active life and post-

closure care period of the CKD management unit as proposed under § 259.51.

A unit design which causes an exceedance of the groundwater protection standard will be considered as being in compliance with today's proposed rule if appropriate corrective action is taken. As explained below, if a person managing CKD waste does not initiate corrective action to correct the source of contamination within 270 days (unless an alternative schedule for compliance is set by the EPA Regional Administrator under § 259.47(e)), the CKD managed in such a unit will be considered a Subtitle C waste, and subject to standards under 40 CFR part 266.

1. Notification, Recordkeeping, and Reporting

Record reviews are one of the ways EPA can ascertain whether a facility is in compliance with today's proposed standards. Accordingly, in § 259.23 of today's proposal, EPA has included a recordkeeping requirement to ensure that a historical record of CKD landfill performance is maintained. The person managing CKD waste would be required to maintain the following records: (1) Any required demonstration, certification, finding, monitoring, notification, testing, or analytical data proposed today under Subpart E of part 259; (2) required inspection records, training procedures, and regulatory agency notification procedures as proposed under § 259.20; (3) required closure and post-closure care plans and any monitoring or analytical data proposed under §§ 259.50 and 259.51; and (4) any required cost estimates and financial assurance documentation proposed under subpart G of today's proposal. The required information would be recorded as it becomes available, and maintained by the persons managing CKD waste in new and existing CKD landfill units. EPA requests comment on the timing of regulatory agency notification and whether specific time requirements (e.g., 14 days from a finding) should be specified for placement of documents in the operating record.

In today's rule, EPA is proposing that information would be retained in an operating record near the facility, or in an alternative location approved by the State (or in unauthorized States, by the EPA Regional Administrator). In addition, today's rule proposes that all information contained in the operating record must be publicly available. EPA believes that these requirements would ensure the availability of basic types of information that demonstrate compliance with the requirements of today's proposal, but requests comment on the operating record being kept near the facility or in an approved alternative location and whether limitations should be placed on this requirement (i.e., distance the record can be kept from the facility, access to the record or public availability issues with the record being off-site.).

2. Permitting Requirements

EPA is proposing to modify the requirements in 40 CFR part 270 by adding § 270.68 specific to the permitting of cement manufacturing facilities which manage CKD. Part 270 of the hazardous waste regulations contains specific requirements for permit applications, permit conditions, changes to permits, expiration and continuation of permits, interim status and special forms of permits. Facilities that choose not to follow, or fail to maintain the management standards for cement kiln dust waste proposed today in part 259 may be required to obtain a permit under rules proposed today under 40 CFR 270.68. This Subtitle C permit would provide for the operation of the facility in accordance with 40 CFR part 259, and may include such additional requirements as the EPA Regional Administrator deems necessary to protect human health and the environment, including, but not limited to requirements regarding monitoring, operation, financial responsibility, closure and remedial action. In States with an authorized RCRA program, all references to the EPA Regional Administrator should be read as referring to the State Director, or other State official responsible for implementing the State Subtitle C solid waste permit program. Today's proposed rule would also allow for Federal oversight and enforcement of requirements under Subtitle C.

The Subtitle C permit proposed today under § 270.68 is different from other part 270 permits. Generally applicable standards under 40 CFR part 270 and part 124 for permit application, issuance and modification, apply to facilities that are fully subject to the Subtitle C regulations, including requirements for facility-wide corrective action. Under today's proposal, however, CKD facilities subject to a permit to allow operation in accordance with part 259 regulations are not subject to certain regulations applicable to most Subtitle C facilities. For example, these facilities would not be subject to facility-wide corrective action and would not be required to submit information to support a facility wide corrective action program (see existing § 270.14(d)). The Agency, therefore, solicits comment on today's proposed approach, and whether the full range of requirements normally imposed under part 270 should be required for cement manufacturing facilities which manage CKD. To address portions of part 270 and 124 that would not apply for these CKD facilities, proposed § 270.68 allows the EPA Regional Administrator (or the State, in authorized States), consistent with the protection of human health and the environment, to modify or waive permit application and permit issuance requirements in parts 124 and 270, except for procedures regarding public participation.

EPA anticipates that few facilities will be required to seek permits to operate in lieu of the terms of today's proposed part 259 standards and is proposing today's standards under § 270.68 rather than detailed procedures or modifications of existing part 270 for the establishment of these permits. This approach is consistent with that taken for the Research, Development and Demonstration permits found in § 270.65. In today's rule, only those facilities that fail to comply with either the performance standards or the technology-based standards under 40 CFR part 259 will be subject to RCRA Subtitle C regulations, and thus will require permits proposed under § 270.68.

H. Applicability of the Boilers and Industrial Furnaces Rule

On February 21, 1991, the Agency promulgated a final rule for burning of hazardous waste in boilers and industrial furnaces (BIF rule) (see 56 FR 7134). The BIF rule expanded controls on hazardous waste combustion to regulate air emissions from burning hazardous waste in boilers and industrial furnaces. The rule also subjected owners and operators of these facilities to the general facility standards applicable to hazardous waste treatment, storage and disposal facilities (40 CFR part 264) and subjected hazardous waste storage units at regulated burner facilities to part 264 permit standards.

Three types of facilities that burn or co-combust hazardous waste that are affected by the BIF rule are: (1) Boilers burning primarily coal or other fossil fuels, (2) industrial furnaces processing primarily ores and minerals, and (3) cement kilns processing primarily raw materials. Because residues from these processes were covered by the Bevill exclusion until special studies were completed to determine whether they should be regulated under Subtitle C (see section 3001(b)(3)(A)(i-iii)), the BIF

rule requires owners and operators to apply a two-part test to determine whether the Bevill exclusion continues to apply. Using the test, owners and operators are required to determine on a site specific basis whether co-combustion of hazardous waste has significantly affected the character of the residue. The residue is considered to be significantly affected if both: (1) Concentrations of toxic (Appendix VIII) compounds in the waste-derived residue are significantly higher than in normal residue (i.e., without burning/processing hazardous waste); and (2) toxic compounds are present in the waste-derived residue at levels that could pose significant risks to human health. (For metals, these are set at the RCRA toxicity characteristic level defined in Appendix VII to part 266.) If the test demonstrates that the waste-derived residue is significantly affected, or the persons managing CKD waste fail to obtain data adequate to demonstrate that the residue has not been significantly affected, then the derived-from residues are subject to RCRA Subtitle C hazardous waste regulations. Such residues are deemed to be from treating hazardous waste rather than from burning fossil fuels, processing ores or minerals, or manufacturing cement (see 56 FR 7196, February 21, 1991, Section XIII for a discussion of the basis for the two-part test).

One of the effects of today's proposal is to replace the exemption of CKD from hazardous waste regulation under the Bevill exemption with specific management standards applicable to CKD. As a result, the two-part test would be meaningless since, in the absence of the Bevill exemption, all waste-derived CKD would be hazardous under the derived-from rule (see 40 CFR 261.3(c)(2)(i)), whether or not it exhibits a hazardous characteristic. However, the Agency believes subjecting waste-derived CKD that does not exhibit a hazardous characteristic to full Subtitle C requirements would create excessive burdens and be unnecessary. EPA believes that applying the regulations proposed today under §261.4(b)(8) to such waste will be protective. It should be noted that characteristically hazardous waste-derived CKD is already subject to Subtitle C regulation under 40 CFR 266.112 and is not within the scope of this rulemaking.

The Agency, therefore, still believes it is necessary for persons managing CKD waste at facilities burning hazardous waste as fuel to test whether their CKD exhibits a hazardous characteristic under 40 CFR 266.112, and when the CKD tests hazardous, to manage the CKD as a hazardous waste under full Subtitle C requirements. EPA believes that subjecting characteristically hazardous CKD from hazardous waste burning kilns to RCRA Subtitle C regulations will provide an incentive for cement kiln owners and operators to reduce metals levels in their CKD to remain eligible for the tailored standards. EPA notes that cement manufacturing facilities that burn hazardous waste and generate waste-derived CKD are subject to RCRA permitting regardless of the content of the CKD they generated, including the requirement to conduct facility-wide corrective action under 40 CFR 264.90, 264.101, and part 264, subpart S. To the extent that CKD has higher levels of toxic metals due to the combustion of hazardous wastes, facilities may need to do more to achieve today's proposed performance standards.

EPA is proposing that the two-part test for waste-derived CKD and Subtitle C requirements for characteristically hazardous residues should continue to apply to waste-derived CKD as described in the BIF rule, but with a revision. EPA is proposing elimination of part one of the two-part test, as set forth in 40 CFR 266.112(a)(1) because the Agency knows of no case where CKD has passed the second test, but failed the first. The Agency today solicits comments on the need for part one of the two-part test, and solicits information on whether there is any CKD that passed part one, but failed to pass part two, the comparison with health-based limits. Additionally, the Agency proposes that waste-derived CKD that does not test hazardous will be subject to today's proposed performance standards and management standards.

I. Exemption From the Definition of Hazardous Waste

1. Waste-Derived Clinker

As discussed in the RTC, CKD is often re-introduced into the kiln as a substitute for raw material in clinker production. In the absence of the Bevill exemption, under certain regulatory scenarios clinker produced from re-introduced CKD could be considered a hazardous waste under the derived-from rule (40 CFR 261.3(c)(2)(i)). As part of the regulations proposed today, EPA is also proposing to exclude clinker from regulation as a derived-from hazardous waste when CKD is reintroduced to the cement manufacturing process. When reintroduced, CKD does not contribute any constituents to clinker production that are not already present in the production process. Furthermore, at this time, EPA has no indication that such clinker poses unacceptable threats to human health or the environment.

2. Light-Weight Aggregate Kiln Dust

As mentioned in the Phase IV Land Disposal Restrictions Final Rule on Mining and Mineral Processing Wastes (see Land Disposal Restrictions—Final Rule to Phase IV: Clarification of Bevill Exclusion for Mining Wastes, Changes to the Definition of Solid Waste for Mineral Processing Wastes, Treatment Standards for Characteristic Mineral Processing Wastes, and Associated Issues, 63 FR 28556, May 26, 1998), EPA has decided to defer any decision on the Bevill status of air pollution control dusts and sludges generated from light-weight aggregate kilns (LWAKs) pending completion of an evaluation of issues related to CKD and light-weight aggregate dust handling and use. Light-weight aggregate pollution control dust and sludge, like CKD, are produced as the result of combustion of raw materials within a kiln. Like CKD, light-weight aggregate dust is usually not characteristically hazardous because it seldom fails the Toxicity Characteristic Leaching Procedure (TCLP). In addition, if a LWAK burns RCRA hazardous waste during light-weight aggregate production, it is subject to the BIF rule, and the aggregate and associated products could be considered hazardous wastes under the derived-from rule (40 CFR 261.3(c)(2)(i)).

The Agency is considering providing tailored standards for LWAK dust that are equivalent to those being proposed for CKD. Under that scenario, LWAK dust would not be a hazardous waste when it is reintroduced to the production process, recycled, or used for beneficial purposes other than agricultural use. With little or no LWAK dust disposed, it may be unnecessary to apply the disposal conditions for CKD to LWAK dust. The Agency, however, solicits comment on the appropriateness of applying all proposed provisions for CKD to LWAK dust. Accordingly, EPA solicits information on: (1) The chemistry of aggregate dust and sludges from LWAKs that burn and do not burn RCRA hazardous waste (both total and leachable concentrations of toxic metals); (2) potential danger to human health and the environment posed by the management of LWAK dust and sludges; and (3) the current and potential utilization of LWAK dust and sludges.

3. Use of CKD in Removal and Remediation Actions

In some situations CKD has been used safely and beneficially to absorb and stabilize hazardous wastes, oily wastes,

and sludges. When used to stabilize or solidify wet wastes, CKD reacts very much like Portland cement, especially when silica (sand) is present. This reaction serves to chemically immobilize any toxic metals present in both the CKD and the waste. Depending on the nature of the waste and how much CKD is used, the appearance of the final product can be anything from a monolithic slab to a dried sludge.

Federal On-Scene Coordinators (OSC's—see 40 CFR part 300) have used CKD on a variety of emergency response sites since the inception of the Superfund removal program. After the CKD is thoroughly mixed with waste, the mixture is usually transported to an off-site disposal facility. However, significant amounts of CKD/waste mixture may be left on site after a removal action is complete. This can occur when CKD is used to treat large amounts of low hazard sludge in open lagoons, large amounts of waste-water, or large amounts of minimally-contaminated soil.

In all cases, the OSC ensures that the immediate threat has been abated. If an OSC must leave CKD on-site after the completion of the removal action, he or she will conduct post-treatment sampling and analysis to ensure that the constituents of concern have been immobilized and the mixed material will not pose a threat to human health or the environment.

CKD is also used to solidify Sewage Treatment Plant (STP) sludge and to stabilize oily sludges and other non-hazardous wastes. Treatment of sewage sludge is currently regulated under the provisions of 40 CFR part 503. In most cases, the volumes involved are small and the CKD is thoroughly mixed with the waste to ensure effective treatment. Accordingly, EPA is proposing that nothing in today's rulemaking would prevent, restrict, or regulate the beneficial use of CKD as a stabilizer or solidifier during RCRA cleanups under sections 3004(u), 3004(v) and 3008(h), Superfund response actions that are carried out in accordance with the requirements of 40 CFR part 300—the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), or when the EPA Region or, in an authorized State, the State agency, finds that the use of CKD in remediation is protective of human health and the environment. By statute or regulation, CERCLA and RCRA cleanups must be protective of human health and the environment. Therefore, use of CKD in these situations would satisfy the protectiveness requirements of RCRA Subtitle C. Such use would fall within the general exemption for beneficial uses, but to avoid any uncertainty with regard to remedial uses, a specific exemption is also being proposed.

J. Final Rule Effective Date

EPA is today proposing that the record-keeping, closure and post-closure planning, CKD listing, agricultural application standards, and fugitive dust emission standards become effective 90 days after publication of the final rule in the **Federal Register**. The remaining criteria, including landfill design, ground-water monitoring, corrective action, and financial assurance requirements would become effective 24 months after their promulgation.

EPA is proposing to make the record-keeping, closure and post-closure planning, CKD listing, agricultural application standards, and fugitive dust emission standards effective 90 days after publication because these requirements can be implemented within this time frame and an early effective date would be more protective of human health and the environment. First, the planning and record-keeping requirements are self-implementing and, thus, lend themselves to a more immediate effective date. Second, 90 days is the standard amount of time provided by EPA to implement hazardous waste listings under RCRA Subtitle C. Third, laboratories capable of testing CKD are readily accessible, so significant additional capital would likely not be required to test CKD or implement today's proposed agricultural application standards. Moreover, EPA believes that significant additional capital is not required to fund facility changes needed to implement today's proposed fugitive dust controls, such as the compaction and daily cover requirements for CKD landfills. The Agency, however, solicits comment on whether there are technical factors which make the 90 day period for implementation of today's proposed fugitive dust emission standards difficult to comply with.

The 24 month effective date would be limited to those requirements that include interactions with or determinations by the EPA Regional Administrator (or the State, in authorized States), including landfill design, ground-water monitoring, corrective action, and financial assurance requirements. EPA believes the proposed 24 month period would provide persons managing CKD waste sufficient time to perform the studies and other actions (e.g., conduct a karst inventory, install ground-water monitoring wells, implement corrective action measures) necessary to bring their facilities into compliance.

EPA today is also distinguishing between those CKD landfill (CKDLF) units that stop receiving CKD waste prior to the date of today's proposed rule and those that stop receiving CKD waste in the window between the date of today's proposed rule and the effective date of the final rule. CKDLFs in the former category will remain outside the scope of today's proposed rule. EPA, however, is today proposing that CKDLFs in the latter category have a final cover installed according to provisions specified today under § 259.50. The Agency is proposing that the final cover must be installed within six months of the last receipt of CKD waste or the unit will be subject to all of the requirements of part 259—Management Standards for Cement Kiln Dust Waste.

EPA has decided to distinguish between the two categories of closed CKDLFs for several reasons. First, the Agency does not intend to include within the scope of today's rulemaking inactive CKDLFs that stopped receiving waste prior to the date of today's proposed rule. Second, the Agency believes that some regulatory requirements for CKDLFs that stop receiving waste between the date of today's proposed rule and the effective date of the final rule would help prevent releases of CKD waste. Today's proposed cover requirement would restrict the introduction of rainwater and surface water into the CKDLF unit, thereby limiting the production of leachate. If closed without the benefit of a cover, the CKDLFs would continue to be exposed to precipitation and wind, which could result in the increased production of leachate and fugitive dust.

V. Subtitle C Backup Standards

In developing the Subtitle C standards that would apply to CKD that is mismanaged (or "backup standards"), EPA, consistent with the CKD regulatory determination, scrutinized specific RCRA Subtitle C components to develop a tailored approach for CKD generated from non-hazardous waste burning kilns, and non-characteristically hazardous CKD from kilns that burn RCRA hazardous wastes.

A. Subtitle C Requirements for Hazardous CKD Waste

EPA is proposing that persons managing CKD that fail to comply with the performance standards or the technical standards proposed today under 40 CFR part 259 shall be subject to: (1) The provisions applicable to generators of hazardous waste (40 CFR part 262); (2) the EPA administered waste permit program proposed today in

§ 270.68; (3) RCRA Subtitle C imminent hazard Sections of Subpart A (§§ 264.4 and 265.4); (4) the following Sections of subpart B (General Facility Standards): §§ 264.11 and 265.11 (Identification number), §§ 264.12 and 265.12 (Required notices), §§ 264.14 and 265.14 (Security), §§ 264.15 and 265.15 (General inspection requirements), §§ 264.16 and 265.16 (Personnel training), and §§ 264.19 and 265.19 (Construction quality assurance program); (5) RCRA Subtitle C manifest, recordkeeping and reporting requirements (subpart E—40 CFR parts 264 and 265); and (6) all applicable provisions for the management of CKD proposed in today's rule under 40 CFR part 259. EPA believes the provisions of parts 264 and 265 that are not included in today's proposed rule (e.g., subpart W—Drip Pads) appear to be either not relevant to CKD management or are already covered by standards proposed today under part 259. These requirements operate in lieu of requirements in 40 CFR parts 263–265, and 268 except where portions of those subparts are specifically cross-referenced.

1. 3004(x)—Special Characteristics

Section 3004(x) of RCRA authorizes EPA to modify certain Subtitle C requirements "to take into account the special characteristics of such wastes, the practical difficulties associated with implementation of such requirements, and site-specific characteristics * * * so long as such modified requirements assure protection of human health and the environment." Accordingly, the Agency is today proposing to suspend land disposal restriction requirements (LDRs) under RCRA sections 3004(c), (d), (e), (f), and (g); minimum technology standards under RCRA section 3004(o); and facility-wide corrective action requirements under section 3004(u) for the following reasons. First, as long as CKD is disposed according to the technology-based standards EPA proposes today, the Agency considers such controls protective of human health and the environment. Therefore, requiring treatment in accordance with land disposal restrictions would not be necessary. Second, as explained in the background documents to today's rule, the minimum technological requirements under section 3004(o) for Subtitle C landfills (e.g., double liners; two leak detection systems) would not provide significant incremental benefits over the technology-based landfill design standards proposed in today's rule, and would add to the practical difficulties associated with implementation of such requirements. The technology-based standards proposed in today's rule for CKD landfills include a composite liner, leachate collection system, and daily cover. A second liner and leachate collection system, which are required for hazardous waste landfills under subpart N of 40 CFR part 264, are unnecessary. EPA believes the technical record supporting today's proposed standards demonstrates that today's proposed technology-based standards are sufficient to protect human health and the environment. The technology-based standards proposed today can be waived, but compliance with today's proposed performance standards means the alternative CKD landfill design is protective of human health and the environment. Third, as explained above, EPA believes that it is inappropriate to impose a requirement for facility-wide corrective action for old CKD disposal units, and that reliance on RCRA section 7003 or CERCLA sections 104 and 106 should be adequate to address any substantial threats to human health and the environment (see Section IV.A.7.—Corrective Action).

2. Facility-Wide Corrective Action Requirement

EPA invites comment on the option of requiring facility-wide corrective action at facilities that fail to maintain the terms of today's proposed rule. Under this option, these facilities would be required to address past and potential releases of hazardous waste and hazardous constituents at their facilities, including from solid waste management units not covered by today's proposed rule. Old cement kiln dust piles at CKD facilities are solid waste management units. Based on the 113 cement manufacturing facilities that were active in 1990, EPA estimates that there were 740 inactive CKD disposal piles nationwide and that approximately 90 million metric tons of CKD were stored in these piles. A complete description of this study is available from the docket in Chapter 7 of the Technical Background Document on Groundwater Controls at CKD Landfills. In addition, 11 out of 13 ground-water damage cases, which form the basis of the CKD regulatory determination and today's rulemaking, involve releases of toxic constituents from old inactive CKD disposal piles. Given the number of CKD disposal units and volume of associated CKD waste nationwide, the potential facility-wide corrective action responsibilities are substantial. Under this option, cement kilns that do not operate under the terms of today's proposed rule would fall into the universe of approximately 3500 facilities that are obligated to undergo RCRA facility-wide corrective action if necessary to protect human health and the environment. This universe presently includes approximately 18 cement manufacturing facilities that burn hazardous waste.

The 3500 facilities currently required to undergo facility-wide corrective action differ greatly in the amount and complexity of environmental contamination and site conditions. To accommodate this diversity, the corrective action program advocates flexible, site-specific approaches to corrective action. For example, although all facilities are ultimately held to final facility cleanup, EPA's current program management emphasis is on source control and protection of human and environmental receptors. If facility-wide corrective action were required, CKD facilities subject to corrective action would not necessarily be required to remove old piles. At many facilities, this type of activity would be prohibitively expensive and technically impracticable, and other remedies, such as emplacement of wind and water erosion controls, installation of ground-water removal and containment systems and supply of alternate drinking water supplies if necessary, would be more appropriate. The corrective action program can also accommodate technical and cost limitations by phasing in remedies. For more information on the flexibility inherent to the corrective action program, (see 61 FR 19432, May 1, 1996—Corrective Action for Releases From Solid Waste Management Units at Hazardous Waste Management Facilities).

EPA remains concerned about the cost implications if the flexibility provided by RCRA section 3004(x) is not fully exercised. Imposing additional LDRs or the landfill design requirements specified in RCRA section 3004(o) would create substantive compliance burdens on the regulated community. Corrective action requirements would also increase costs, although as discussed above, that program allows the use of cost-saving measures. The Agency's regulatory determination under RCRA section 3001(b)(3)(c) that additional control of CKD is warranted was based on a balancing of the factors specified under RCRA section 8002(o), including cost. That determination assumed that any regulation imposed under RCRA could be designed so as to limit the cost burden while regulating the risks of concern. While the determination under RCRA section 3004(x) is separate from that under RCRA section 3001(b)(3)(c), and is based

on somewhat different factors, EPA would likely re-evaluate the underlying regulatory determination if RCRA section 3004(x) were not interpreted to allow the degree of modification proposed today. The Agency, however, interprets RCRA to provide the degree of flexibility proposed today and views the resulting regulatory system as fully consistent with its regulatory determination. EPA seeks comment on this option in general and on the use of facility-wide corrective action authority for CKD that is mismanaged. EPA seeks comment in particular on likely cost, incurred as a result of facility-wide corrective action, taking into account the flexibility that the corrective action program allows.

3. Manifest, Recordkeeping, and Reporting Requirements

EPA is proposing in today's rule that manifest, recordkeeping, and reporting requirements established in parts 262, 264, and 265 apply to hazardous cement kiln dust that is subject to provisions proposed under part 266-subpart I. The principal purpose of the manifest system is to track hazardous waste from its point of generation, through its trip with the transporter, to final disposition off-site at a treatment, storage, and disposal facility. Part 262 also contains general requirements for facilities that manage hazardous waste on-site. Subpart E of parts 264 and 265 specifies requirements concerning the return of the manifest to the facility which generated the waste. These requirements form the information loop designed to assist the CKD waste generator, who is responsible for ensuring that hazardous CKD waste actually arrives at the intended facility for disposal.

Subpart E of parts 264 and 265 also includes requirements for recordkeeping and reporting. The purpose of these requirements is to ensure that the regulated community complies with hazardous waste regulations by providing the enforcement agency with sufficient information to monitor facility operations. Together with the manifest system, these requirements are designed to minimize the likelihood of damage case incidents resulting from improper tracking and waste disposal. In addition, the Agency believes that the various records, reports, and signatures of transporters, treaters, and disposers are necessary to allow enforcement officials to assign responsibility and, ultimately, liability in cases where problems arise.

B. Implementation of Part 259 and RCRA Subtitle C Backup Standards

Today's proposed standards for the proper management of CKD are contained in part 259 of the RCRA Subtitle D regulations. Subtitle D of RCRA establishes a framework for Federal and State cooperation in controlling nonhazardous solid wastes. As discussed above, so long as CKD is managed according to the standards of part 259, CKD would be managed in a way that is protective of human health and the environment and would not be considered hazardous waste. In proposing standards under part 259, EPA is providing minimum standards for protecting human health and the environment from the hazards of CKD. The actual planning and direct implementation of the standards under part 259, however, remain outside the RCRA Subtitle C framework, so long as a facility remains in compliance with the standards and thereby maintains compliance with today's proposed rule.

As discussed earlier, EPA is today proposing that the EPA Regional Administrator (or the State, in authorized States) be allowed to review and consider alternative CKD landfill designs and make determinations whether or not they meet today's proposed performance standards. The performance standards in today's proposed rule are structured to allow flexibility to consider numerous location specific factors in tailoring facility requirements.

Similarly, EPA is also proposing that facility plans for ground-water monitoring, corrective action, closure and post-closure care, and financial assurance be reviewed and approved by the EPA Regional Administrator (or the State, in authorized States). Because EPA does not directly regulate non-hazardous solid waste under RCRA, today's proposed rule would not create enforceable requirements for CKD management, but only conditions for avoiding Subtitle C regulation. However, EPA expects that when States adopt the part 259 standards they will likely adopt them, not only as conditions, but also as directly enforceable requirements in Subtitle D programs. In that case, the Subtitle D program would be the primary means for regulating CKD.

In authorized States, EPA anticipates that there will be a high degree of cooperation between State RCRA Subtitle D programs (which will most likely implement the part 259 standards) and State RCRA Subtitle C programs. For example, because failure to comply or take appropriate corrective action within the time frames proposed today under §§259.41, 259.44, 259.45, 259.46, and 259.47 to ensure compliance with any of the standards proposed today under part 259 would mean that the CKD is mismanaged, and considered a hazardous waste. If a State uses its RCRA Subtitle D program to conduct inspections or oversight of cement kilns, violations of the standards and/or failure to take appropriate corrective action within the specified time frames should be reported to the RCRA Subtitle C program, as well.

1. Enforcement

Although the Part 259 standards proposed today would likely be adopted as a matter of State law, Federal inspection authority would still be available for facilities regulated under those standards. Because significant violations of the standards would constitute mismanagement of CKD and would result in designation of such CKD as hazardous waste, EPA (as well as State RCRA Subtitle C programs) would have authority to inspect such facilities to determine whether they were handling hazardous waste (i.e., mismanaged CKD waste). In today's proposed regulatory structure EPA has included the list of violations that would cause CKD to be designated as hazardous waste in §261.4 (Exclusions). In this section the Agency has clarified that all CKD managed in compliance with today's proposed Part 259 standards remains a non-hazardous waste. CKD becomes a listed hazardous waste if it fails to comply with the provisions of §261.4(b)(8)(ii)(A) and (B) which are described below. Thus, if the person CKD waste is managing CKD inconsistently or in a manner that does not comply with the Part 259 standards, it would be subject to Federal enforcement under regulations proposed today in §261.4(b)(8)(ii), to compel compliance with RCRA Subtitle C requirements proposed today in Part 266. EPA solicits comment on whether it would be more appropriate to list the provisions in another section of the Code of Federal Regulations such as §261.3 (Definition of Hazardous Waste).

In general, EPA believes that facilities should not necessarily be fully subjected to RCRA Subtitle C for every violation of today's proposed management standards. Therefore, EPA distinguishes between significant violations which should cause the facility to be regulated under RCRA Subtitle C, and other violations which should not have that result if they are promptly corrected. Proposed §261.4(b)(8)(ii)(A) enumerates the "egregious" violations that would trigger RCRA Subtitle C regulation immediately which would include: (1) Failure to make any applicable demonstration requirements for new CKD landfills as specified under

§§ 259.11(a), 259.12(a), 259.13(a), 259.14(a), 259.15(a) and 259.16(a); (2) failure to manage CKD destined for sale or beneficial use in a suitable containment structure, as specified under § 259.20, within two years after the effective date of the final rule, unless granted approval by the EPA Regional Administrator (or the State, in authorized States) under § 259.20(c) to implement alternative measures for fugitive dust control; (3) failure to cover or dispose of CKD in a conditioned state by 90 days after the effective date of the final rule, as specified under § 259.22, unless granted approval by the EPA Regional Administrator (or the State, in authorized States) under § 259.22(d) to implement alternative measures for fugitive dust control; and (4) failure to install a composite landfill liner or ground-water monitoring system, as specified by §§ 259.30 and 259.41, by two years after the effective date of the final rule, unless granted approval by the EPA Regional Administrator (or the State, in authorized States) for a unit design under the provisions of § 259.30(h), or a finding is made of no potential for migration under § 259.40(b); (5) failure to undertake appropriate corrective action within the time frames specified under §§ 259.41, 259.44, 259.45, 259.46, and 259.47; and (6) failure to comply with any requirement identified in a notice received from the Regional Administrator (or State) because of repeated violations of Part 259, other than those specified in subparagraphs (1) through (5) of this paragraph.

Under proposed § 261.4(b)(8)(ii)(A)(7), EPA will also consider repeated violations of Part 259's lesser requirements as a significant violation. Under this provision, if EPA determines that a person managing CKD waste repeatedly violates one or more lesser requirements under Part 259, the Agency can send notice to that person informing him or her that the next violation of such lesser requirements will constitute a violation of § 261.4(b)(8)(ii)(A), thereby causing any managed CKD to be considered mismanaged and a hazardous waste. EPA believes this provision is warranted because it provides the appropriate incentive for facilities to comply with all of Part 259 requirements, including notice and recordkeeping requirements.

In proposed § 261.4(b)(8)(ii)(B), violations of any standards of Part 259 other than those listed in § 261.4(b)(8)(ii)(A), will only trigger Subtitle C regulation if the person managing CKD waste fails to comply with those standards within 30 days of receiving a written notice of non-compliance from the Regional Administrator (or State). This provision gives the regulatory agency an intermediate enforcement response mechanism for violations of lesser Part 259 requirements that have not risen to a level that would trigger notice under § 261.4(b)(8)(ii)(A)(7).

As an alternative to allowing 30 days after receiving a written notice, EPA solicits comments on adopting a minimum period (for example, 90 days) to correct violations as a matter of enforcement policy. Under the enforcement policy approach, EPA would generally not commit to take any enforcement action that would result in RCRA Subtitle C regulation for a period of 90 days after the date of violation, unless there were unusual or aggravating circumstances. If the violation is corrected in that period of time (or, in the case of a violation that cannot be corrected, if steps are taken to prevent recurrence), EPA would not take enforcement action.

Under the regulatory approach, if a State adopted today's proposed approach, EPA would not have jurisdiction to bring an enforcement action for a lesser violation (that is, a violation not listed in § 261.4(b)(8)(ii)(A)) until 90 days had passed from the date of violation. Under the enforcement policy approach, EPA would have jurisdiction to bring an enforcement action, but would commit not to do so. EPA's enforcement policy would not bind the State, but EPA would encourage States to adopt a similar approach. (In this respect, the two approaches are similar: if EPA adopted today's proposed approach, it could not preclude a State from adopting regulations that did not allow the 90-day window to correct lesser violations.[36]

EPA seeks comment on these two approaches as well as on the general approach of distinguishing between lesser and egregious violations. In particular, EPA asks commenters to address the issues of regulatory jurisdiction, appropriate incentives to discover and correct violations, what constitutes egregious and lesser violations (e.g., whether certain paperwork violations, such as the failure to notify the regulatory authority of a violation, should be considered egregious), and the handling of cases where violations are discovered well after they occurred. The Agency also seeks comment on the question of whether or not the proposed enforcement structure, with the two regulatory categories of egregious and lesser violations, provides an incentive for persons managing CAD waste to inform the Regional Administrator of violations. If not, the Agency seeks comment on alternative structures; for example, on whether there is a category of violations intermediate between egregious and lesser. Additionally, the Agency also seeks comment on the proposed 90 day time frame to correct lesser violations before CKD is considered mismanaged.

As with all environmental issues, citizens are encouraged to be involved. Where citizen's bring a concern to EPA's attention, the Agency will respond on a case-by-case basis. In addition, RCRA authorizes citizens to enforce requirements pursuant to section 7002(a)(1)(A): "any person. * * * to be in violation of any permit, standard, regulation, condition, requirement, prohibition, or order which has become effective pursuant to this Act". This provision allows citizens to enforce both Subtitle C and Subtitle D requirements. Therefore, citizens could commence a civil action to enforce the Subtitle C requirements applicable to CKD that is not managed in compliance with today's proposed Part 259 standards.

Where a violation occurs that can be corrected, the Agency believes a person managing CKD waste who promptly corrects the problem should not necessarily be subjected to hazardous waste requirements on a permanent basis. In some cases, the nature of the violation may be such that it only affects a distinct batch of waste. For example, if a person managing CKD waste failed to manage a particular truckload of CKD according to the transportation requirements proposed today in Part 259, that truckload would become non-exempt and would have to be managed as a hazardous waste (e.g., manifested and sent to a landfill meeting the tailored Subtitle C requirements of Part 266 for final disposal). However, if the practice did not continue, the person managing CKD waste would not have to manifest other shipments or have the facility become permitted under Subtitle C. Other types of violations could result in the CKD becoming subject to Subtitle C generally.

2. Removal of a Hazardous Waste Designation

EPA believes that in some cases it may be appropriate for CKD that has been mismanaged to be again

[36] Under either version, today's proposed rule would provide the opportunity to implement corrective action for releases to ground water. An exceedance of ground-water standards by itself would not cause be considered mismanaged; only if a person managing CKD waste failed to meet the corrective action requirements in the rule would it become subject to Subtitle C regulation.

considered non-hazardous waste. For example, if a person managed CKD waste in a landfill that released metals enough to raise levels in ground water above appropriate MCLs, but later repaired the landfill and did not have other violations of the standards, requiring a RCRA Subtitle C permit might not be warranted. For these cases, EPA today proposes a procedure in § 266.121 under which the designation as hazardous waste would be removed. Under this process, if any CKD waste becomes mismanaged (i.e., loses the exclusion under § 261.4(b)(8)) and becomes subject to § 266.120, the person managing such waste may apply to the Regional Administrator (or the State, in authorized States) for removal of the hazardous waste designation for such CKD. The application must include: (1) A statement that the CKD waste is now being managed in accordance with § 259; (2) a statement explaining the circumstances of the non-compliance; and, (3) a demonstration that the non-compliance is not likely to recur and that removal of the hazardous designation would not pose a threat to human health and the environment. The Regional Administrator may reinstate the § 261.4(b)(8) exclusion if the Regional Administrator finds that the person managing CKD waste has satisfactorily explained the circumstances of the non-compliance, has demonstrated that the non-compliance is not likely to recur and that removal of the hazardous waste designation will not pose a threat to human health or the environment. The Regional Administrator may reinstate the § 261.4(b)(8) exclusion with additional conditions if the Regional Administrator finds that such additional conditions are necessary to ensure protection of human health and the environment.

Removal of the hazardous designation is not automatic, but the Agency is today proposing that if the Regional Administrator does not take action on the application within 60 days, then the application for removal of the hazardous waste designation is deemed granted, retroactive to the date of the application. However, the Regional Administrator may terminate a removal (i.e., a reinstatement of the § 261.4(b)(8) exclusion) by default under this subsection if the Regional Administrator finds that the removal of the hazardous waste designation is not appropriate based on analysis of the factors included in the application.[37] Today's proposed approach is patterned on that adopted in the conditional exemption for military munitions, promulgated February 12, 1997 (see 62 *FR* 6637–38, February 12, 1997, Military Munitions Rule: Hazardous Waste Identification and Management; Explosives Emergencies; Manifest Exemption for Transport of Hazardous Waste on Right-of-Ways on Contiguous Properties; Final Rule). EPA solicits comment on whether this procedure should be provided for CKD, and under what circumstances (and for what violations) it should or should not be available. For example, EPA would want to assure that the procedure could not be used repeatedly by a person managing CKD waste who was making no serious effort to comply until violations were called to its attention by inspectors.

EPA notes that releases from a CKD disposal unit do not, under today's proposed rule, automatically constitute a violation of the Part 259 standards. If the unit was designed and constructed in accordance with the design requirements, but a release nevertheless occurs, the CKD remains exempt so long as it complies with the corrective action requirements in the Part 259 standards. In implementing today's proposed rule in authorized States, EPA anticipates there will be a high level of cooperation between State Subtitle D and State Subtitle C programs. Based on conversations with State environmental representatives, the Agency anticipates that State D programs will generally take the lead in assuring compliance with today's proposed standards by conducting inspections of CKD landfills and their associated facility operating records. If a violation of today's proposed standards is documented as a result of a State inspection, or a facility reports to the State that a release of contaminants to the environment has occurred, under provisions of § 259.46, today's rule would allow persons managing CKD waste 90 days to assess corrective measures. Under § 259.47, the person managing CKD waste must select a remedy within 90 days of completing the assessment, and specify a schedule for initiating and completing remedial activities. Under regulations proposed today in § 259.47(e), the State would have flexibility to set an alternative schedule for compliance.

Once a State program makes a final determination of non-compliance, (that is, after allowing a minimum of 270 days from the date of violation or notification of the State for the person managing CKD waste to begin implementation of corrective measures, the State program director makes a determination that a person managing CKD waste has mismanaged CKD), the CKD managed at such a facility would be hazardous waste, and subject to the proposed provisions of Part 266. Accordingly, responsibility for implementation and enforcement of the provisions of today's rule shifts to the hazardous waste program authority (either the EPA Regional Administrator or, in an authorized State, the State Subtitle C program). The EPA Regional Administrator (or the State, in authorized States) would review and approve Subtitle C permits under 40 CFR 270.68, assure compliance with the hazardous waste generator requirements of 40 CFR Part 262, and assure compliance with the hazardous waste manifest, recordkeeping, and reporting requirements of 40 CFR Parts 264 and 265.

3. Alternative Approach to Structuring the Performance Standards

Today's proposed standards are generally written in the form of performance standards. In complying with the performance standards, a person managing CKD waste would have to develop an approach, make a demonstration to the Regional Administrator (or the State in authorized States) that the intended approach will achieve today's proposed performance standards, and receive approval by the regulatory authority prior to implementing the approach. Representatives from the cement industry have suggested an alternative regulatory structure in which the Agency would establish a general performance standard to be achieved by the person managing CKD waste without a requirement that the approach receive prior approval by the Regional Administrator. The Agency seeks comment on the appropriateness and specifics of such an approach.

Stakeholders have expressed concerns about the industry's suggested alternative structure regarding the uncertainty of the public participation process, specifically about whether and how the affected public would be able to participate in decisions made by persons managing CKD waste regarding compliance with today's proposed performance standards. EPA believes that the public has a vital role to play in decisions that affect their health and the environment. Additionally, when appropriate, the Agency has been supportive of self-implementation because such an approach can lead to regulatory compliance within a shorter time frame than might otherwise be

[37] If a person managing CKD waste submits a petition for reinstatement that is subsequently revoked, it would be Agency policy to consider such a default reinstatement to be prospective; that is, beginning at the point the decision is made.

possible. Thus, EPA is soliciting comments on alternative regulatory structures that would allow persons managing CKD waste to implement pollution controls designed to meet the performance standards without the procedural burden of seeking approval from the regulatory authority. The Agency is interested in information on how such an alternative structure would allow persons managing CKD waste to demonstrate their design is adequate to meet today's proposed performance standards, while ensuring opportunities for the public to participate in the deliberations and decision making undertaken by the persons managing CKD. EPA believes that a process which expeditiously identifies and resolves compliance issues prior to construction is in the best interest of all parties.

The Agency is aware of one such approach. In 1995, as part of its proposed approach to establishing an enforceable agreement (see Section II.C.2—Proposed Enforceable Agreement), the cement industry submitted to EPA a draft plan for site-specific public participation. Their plan was designed to allow self-implementation of the provisions of the enforceable agreement with citizen input, but without the time-consuming process of permitting (or seeking approval by the Regional Administrator or the State). The industry's comment and appeal process included the following elements: (1) Notification of citizens when a person managing CKD has prepared a design plan and intends to submit a certification to the regulatory authority that their proposed design plan will meet a specific performance standard; (2) a 45 day comment period in which the public could submit relevant comments to the facility (for example, comments germane to the performance of the proposed design); (3) preparation by facility representatives of a document responding to the substance of all relevant comments; (4) announcement by facility representatives of the availability of the final design plan and comment response document; (5) opportunity for appeal to the appropriate regulatory authority within 30 days after the date of announcement of the final design plan; (6) arbitration by the regulatory authority affording both the commenter and facility representatives an opportunity to present their positions, and a final determination by the regulatory authority, no more than 60 days after facility representatives have filed a response to the commenter's appeal on whether the commenter has demonstrated that the proposed design plan would fail to provide for compliance with the performance standard; and (7) opportunity for judicial review of the regulatory authority's decision in federal district court.

Representatives of local citizen groups criticized this public participation process as being inadequate, both structurally and substantively. Their comments on the public participation process include the following: (1) All significant decisions regarding design, monitoring, and cleanup are left to facility owners and operators; (2) public comments and appeal rights are limited in both time and scope; (3) access to documents is limited only to the design plan and not to other important information such as data used to support the design plan, monitoring data, and inspection reports; and (4) involvement by the regulatory authority's staff is limited to a 60 day time period and consideration of comments specific to the design plan.

A second alternative regulatory structure would be similar to EPA's approach proposed in today's rule, but would establish a time frame for design approvals within which the regulatory authority must make a determination of the appropriateness of the technical approach proposed by the person managing CKD waste. A time frame of six months might be sufficient, and would add a degree of certainty to the process of prior approval. If the regulatory authority failed to take action within the specified time frame, the proposed approach for controlling CKD waste would be presumed adequate to ensure compliance with the performance standard. The Agency is seeking general comment on these two alternative regulatory structures and on other potential approaches to protecting human health and the environment while minimizing procedural burdens that could delay implementation of appropriate means of controlling risks posed by CKD.

VI. Standards for CKD Used as a Lime Substitute

A. Summary

EPA is proposing to exclude from regulation under RCRA CKD that is used as a liming agent on agricultural fields provided that such CKD meet specified levels for concentrations of certain hazardous constituents. As explained in Section II.D. (Beneficial Use of Cement Kiln Dust) in this preamble, CKD is currently being used as a substitute for agricultural liming agents. Liming materials are added to agricultural soils to maintain optimum pH for crop production and offset the effects of fertilizers that lower soil pH. EPA encourages environmentally sound beneficial use of production process waste streams, including CKD. However, the benefits associated with the recycling of CKD must be balanced against the potential hazards which the use of CKD in this manner may also present. CKD contains toxic metals and chlorinated dioxins and furans which can, at high exposure levels, present adverse human health effects. In an effort to determine whether use of CKD for pH adjustment on agricultural soil presents a potential threat to human health and the environment, the Agency conducted an assessment of the risk to individuals from the use of CKD as a liming agent. A summary of the risk analysis and results is provided below. Further description of the risk assessment is presented in the technical background document titled Risk Assessment for Cement Kiln Dust Used as an Agricultural Soil Amendment in the docket for this rule.

Based on the risk analysis, EPA calculated concentration limits that are protective of human health for hazardous constituents in CKD that is used as an liming agent on agricultural fields and home gardens. The numerical limits derived from the exposure assessment models are designed to protect human health and the environment from reasonably anticipated adverse effects. The Agency calculated risk-based protective limits for all hazardous metals and dioxins present in CKD. By comparing the risk-based concentrations derived for each constituent with data on the composition of CKD, EPA identified constituents that may be present in CKD above levels that may pose risk to human health. Those constituents are arsenic, thallium, lead, cadmium and chlorinated dioxins and furans. EPA's analysis showed that all other toxic constituents in CKD are present at concentrations that are well below protective levels. Based on these findings, EPA is today proposing to limit the concentrations of arsenic, thallium, lead, cadmium and chlorinated dioxins and furans that can be present in CKD that is used agriculturally for pH adjustment. In other words, EPA is proposing standards to limit the concentrations of arsenic, thallium, lead, cadmium, and dioxins that can be contained in CKD that is used as a substitute for agricultural lime because the Agency's risk analysis indicates that these compounds are present in CKD in

excess of levels that may pose risk to human health when CKD is applied at rates necessary to attain the desired increase in pH. The Agency is concerned that unregulated use of CKD as an agricultural liming agent may cause adverse effects on human health.

B. CKD Agricultural Use Risk Assessment

1. Risk Assessment Methodology

This section describes the methodology used to evaluate human health risk to individuals from use of CKD as an agricultural liming agent. EPA's risk analysis evaluated exposures to metals and dioxin congeners in CKD for the following receptor scenarios; farmer, fisher, home gardener, and child of farmer. The assessment includes a preliminary sensitivity analysis to identify risk-driving parameters, a deterministic analysis to estimate central tendency and high end risk, and a quantitative uncertainty analysis. Initial estimates of potential risk from agricultural use of CKD were estimated using the deterministic method, which produces point estimates of risk to individuals based upon single values for input parameters (e.g., waste stream characteristics, environmental fate and transport properties, exposure assumptions, etc). The deterministic risk estimates for this analysis were derived using a double high-end risk assessment methodology. In this method, the input parameters are varied between the central tendency (50th percentile) value and the high end (90–95th percentile) value both individually and in combination of any two independent variables to produce a series of point risk estimates. The point estimate in which all variables are set at central tendency is assumed to be the central tendency risk estimate and the highest risk estimate for any combination of double-high-end variables is assumed to be the high end estimate (approximately 95th percentile) of risk. High-end risk descriptors are plausible estimates of the individual risks for those exposed persons at the 90th percentile or greater end of the risk distribution. High-end risk is intended to depict the risks that are expected to occur in 10 percent or less of the exposed population.

The Agency also conducted a probabilistic analysis of uncertainty/variability in support of the deterministic analysis. The Agency has long acknowledged the importance of adequately characterizing variability and uncertainty in fate, transport, exposure and dose-response assessments for human health risk assessment as indicated in EPA's May 15, 1997 policy memorandum on Use of Probabilistic Techniques in Risk Assessment. The probabilistic analysis undertaken for this analysis has been conducted in accordance with the guidance set forth in the May 15, 1997 memorandum. The first step of the probabilistic analysis is a sensitivity analysis using the deterministic methodology to determine the risk-driving parameters. Results of the sensitivity analysis are provided in the technical background document for this assessment. After the risk-drivers are determined, the quantitative uncertainty/variability analysis is conducted by performing a Monte Carlo simulation by randomly varying the risk-driving parameters. A more detailed discussion of parameters that were included in the Monte Carlo analysis and selection of data distributions for each parameter is provided in the technical background document describing the risk assessment supporting this rule.

2. Human Health Criteria and Effects

The risk analysis uses chemical composition data collected and used for the 1993 Report to Congress on CKD, the 1994 NODA on CKD and background document supporting the 1995 CKD Regulatory Determination. Individual constituents of concern evaluated in the assessment included dioxins and the following metals: antimony, arsenic, barium, beryllium, cadmium, chromium, lead, nickel, mercury, selenium, silver and thallium. These constituents were evaluated based on chemical specific health based levels established and/or verified by EPA using prescribed methodologies for evaluating human effects data. The human health toxicity benchmarks used in this analysis include Agency-verified oral reference doses (RfDs) and reference concentrations (RfCs) for noncancer effects and oral cancer slope factors (CSFs) and inhalation unit risk factors (URFs) for carcinogenic effects. Agency-verified RfDs, RfCs, CSFs, and the bases for these values are presented in the EPA's Integrated Risk Information System (IRIS). The benchmarks for the dioxin and furan congeners are based on the Toxicity Equivalent Factor (TEF) for 2,3,7,8-tetrachlorodibenzo dioxin (TCDD2). The methodology for calculating TEFs for dioxin and furan congeners is presented in the 1994 EPA publication entitled Estimating Exposures to Dioxin-Like Compounds. (EPA publication number EPA/600/6–88/005Ca)

3. Agricultural Use Practice Assumptions

Agricultural use practices (i.e., application rate and frequency) used in the analysis are determined based on chemical and physical properties of soil and CKD that influence use of CKD agriculturally as well as economic considerations that affect CKD use. The quantity of liming material required per acre to raise the pH to an acceptable level is determined by several factors including desired change in pH, buffering capacity of the soil, chemical composition of the liming agent and particle size of the liming material. When these factors are considered, the rate of application is usually 2 to 5 tons per acre and the application frequency is once every 2 to 5 years for all liming agents, including CKD. EPA solicits comment on the appropriateness of using this rate and frequency of application as assumptions in its analyses.

4. Fate and Transport of Chemical Constituents in the Environment

The application of CKD as a liming agent is assumed to occur only in areas with initial soil pH of less than 6 and areas that are near active cement kilns generating large quantities of CKD. Based on these criteria, three sites, Holly Hills, South Carolina, Alpena, Michigan, and Ravena, New York were selected for modeling. Site specific meteorologic and soil properties data from these locations were used in both the deterministic and uncertainty analysis. While meteorologic conditions were evaluated in the sensitivity analysis and were not shown to be a primary risk driver, the three locations modeled represent a range of meteorologic conditions.

The Agency relied on the following models to simulate movement of pollutants into and through the environment. Speciation of metals in CKD applied agriculturally was determined through MINTEQ modeling using available site specific soil and meteorologic data identified for each geographic setting. Equations developed by Jury, *et al.*, were used in a spreadsheet calculation model to determine contaminant loss from CKD due to degradation, volatilization, leaching, and rainwater runoff of dioxins and metals. The model tracks the average annual soil concentration and the annual mass of contaminant volatilized for a period of 100 years followed by 40 years of inactive use. While the Agency assumed that CKD can be applied to a field over a period of 100 years, modeling indicates that the system will reach steady state concentrations over a period of 40 to 50 years for persistent chemicals such as

most metals and dioxins. The Universal Soil Loss Equation (USLE) as modified by EPA's Offices of Solid Waste and Research and Development was used to estimate soil erosion and overland transport of sediment from agricultural fields amended with CKD across intervening areas to nearby water bodies. Air emissions from CKD due to wind erosion were estimated using methods and equations from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area sources, Fifth Editions (commonly referred to as AP–42). Air dispersion of particulates was modeled using the EPA's Industrial Source Complex Short Term, version 3 (ISCST3).

5. Uptake of Contaminants in Plants and Animals

Plants may absorb contaminants through air-to-plant biotransfer and through soil-to-plant uptake through the roots. Air-to-plant movement of dioxins was estimated using constituent-specific biotransfer factors specifically developed for dioxin congeners by EPA's Office of Research and Development (ORD). Plant-to-soil bioconcentration factors were used to account for root uptake of constituents from the soil. The bioconcentration factors for metals were obtained from the assessment conducted for EPA's Standards for the Use or Disposal of Sewage Sludge. EPA recognizes that these biouptake factors were developed based on field studies of sewage sludge application and pertain specifically to sewage sludge. Uptake of metals is particularly sensitive to soil pH and the degree of binding to the sludge matrix. The sewage sludge values may not, therefore, be appropriate for evaluating plant uptake of metals from CKD. The Agency requests comment on whether the use of these biotransfer values is appropriate for assessing risks from agricultural use of CKD. Biotransfer factors not available from the sewage sludge assessment were obtained from the published literature. Empirical correlations were used to estimate transfer of dioxins from the soil to plant tissue using the methodology developed for dioxins by ORD. Metals, dioxin, and furan concentrations in beef and dairy fed on vegetation amended with CKD were estimated using constituent specific beef and milk biotransfer factors available in the literature.

6. Receptor Scenarios and Exposure Pathways

Receptor scenarios evaluated for this assessment include farmer, fisher, home gardener, and child of farmer. Exposure pathways evaluated for each receptor scenario are as follows. For the child of farmer, pathways evaluated include incidental ingestion of contaminated soil, ingestion of plants grown on amended soil and ingestion of products from animals raised on feed from CKD amended fields. Pathways evaluated for the farmer include those evaluated for the child of farmer and, in addition, direct inhalation of vapors and particulates during application of CKD to the field. For the home gardener, pathways include incidental ingestion of contaminated soil and ingestion of plants grown on amended soil. Exposure from ingestion of contaminated fish is evaluated for the fisher receptor scenario. The groundwater exposure pathway (i.e., ingestion of contaminated groundwater) was not evaluated for this analysis based on the results of the previously conducted analyses of risk from storage and disposal of CKD waste. Previous ground-water modeling results indicated limited potential for the transport of constituents bound in a CKD matrix. Although new ground-water modeling indicates that metals, including lead, barium, beryllium, chromium, and cadmium, may be more mobile under highly alkaline conditions, the Agency does not believe these conditions will occur in CKD-amended soils. CKD is added to raise the pH of acidic soils to neutral pHs. A pH range of 6.0–7.2 is optimal for most crops. Highly acidic or highly alkaline soils, on the other hand, have been associated with phytotoxicity and/or nutrient imbalance. Consequently, highly alkaline conditions are unlikely to occur in CKD-amended agricultural soils. Furthermore, the ground-water analyses conducted in support of the Report to Congress and the Regulatory Determination analyzed risks from the storage, management and disposal of CKD. Under neutral pHs, the groundwater risks associated with the management of large volumes of CKD in non-karst areas was estimated to be low. The volume of CKD applied in agricultural soils is far less than the volume typically managed in a disposal unit. Therefore, EPA believes that the risks from the ground-water pathway will be negligible based on the typical pH of CKD-amended soils and the limited volume of CKD applied to soils.

The exposure factors used in this risk analysis are from the Draft 1996 Exposure Factors Handbook. This is one of the first EPA risk assessments to use these factors in either a deterministic or probabilistic analysis. Therefore, the Agency used conservative consumption and exposure distributions in instances where there was uncertainty regarding how the data presented in this document should be used. The Agency specifically requests comment on the exposure factors used in this analysis.

7. Lead Risk Assessment

The human health risk assessment conducted for lead is unique. The primary indicator of exposures to lead is elevated blood lead levels. Therefore, exposure to lead is estimated based on comparison of predicted blood lead level in exposed individuals to a target blood lead level. In addition, evaluation of lead exposure focuses specifically on young children (birth to 7 years of age) because this age group is known to be highly sensitive to lead exposure. Given the unique nature of lead, EPA developed the Integrated Exposure Uptake Biokinetic Model (IEUBK) to evaluate child lead exposure from birth to age 7. EPA used the IEUBK model to assess lead risks from agriculturally applied CKD. This model integrates lead exposures from diet, soil, dust, drinking water, and air and considers elimination of lead from the body to predict blood lead levels. For the CKD agricultural use analysis for lead, estimates of risk to children are determined by comparing total blood lead level estimated by the IEUBK model with a threshold value of 10 μg Pb/dL. Adverse health effects from lead exposure have been observed to occur at or above this level.

For this analysis, blood lead levels were estimated using the default soil intake rates provided in the IEUBK model. Default IEUBK soil ingestion rates differ from those used elsewhere in this analysis to estimate risk from other hazardous constituents in CKD. Soil ingestion rates used for lead are presented in Section 6.0 of the technical background document. Soil ingestion rates used for other constituents are presented in Section 5.0 of the background document. With the exception of soil ingestion rates, EPA used the same model inputs (e.g., constituent concentrations, dietary ingestion rates, application rates) to estimate risks from exposures to both lead and other hazardous constituents in CKD.

8. Ecological Risk and Phytotoxicity

The Agency did not conduct a separate assessment of potential ecological risks or phytotoxic effects posed by use of CKD as a liming agent on agricultural fields. Rather, EPA relied on the assessment conducted by EPA's Office of Water for the Standards for the Use or Disposal of Sewage Sludge (40 CFR Part 503 et al.) as a basis for evaluating potential risks to ecological

receptors and/or toxic effects on plants resulting from land application of CKD. For this analysis, the range of soil concentrations for metals in soil estimated in the CKD risk analysis is compared to the phytotoxicity and soil organism benchmarks reported in the Technical Support Document for Land Application of Sewage Sludge—Volume I (NTIS publication number PB93–110575). Values for ecological benchmarks are only available for 4 constituents in CKD, lead, nickel, chromium, and cadmium. Results of this analysis are provided in the Risk Assessment for Cement Kiln Dust Used as an Agricultural Soil Amendment in the docket for this rule. In summary, a comparison of these ecological benchmarks to the constituent concentrations in CKD amended soil estimated by the CKD risk analysis shows that the CKD soil concentrations are well below these benchmarks in all cases. The Agency requests comment on whether phytotoxicity and ecological risk are adequately addressed by this analysis.

9. Risk Assessment Results

The results of the risk assessment show an estimated high-end individual lifetime cancer risk of 3×10^{-5} due to arsenic and an exceedance of the non-cancer effect threshold or hazard quotient for thallium for a farmer and child of farmer consuming products from animals raised on feed grown on CKD-amended fields. Based on these findings, EPA believes there is a need to establish standards to protect public health and the environment from adverse effects of certain constituents that may be present in CKD used agriculturally.

C. Approach to Establishing Limiting Concentrations

1. Risk-based Approach—Proposed Limiting Concentrations for Cadmium, Lead, and Thallium

The Agency used the exposure assessment modeling methodology described above to establish constituent-specific numerical limits for hazardous constituents (metals and chlorinated dioxins and furans) in CKD that is used in lieu of agricultural lime. As a first step, potential human health risks from exposure to hazardous constituents were evaluated for specified exposure scenarios using the constituent concentrations, toxicity data, exposure assumptions, soil property data and fate and transport models outlined in the previous section. The limiting concentrations for individual constituents were then derived using a point estimate approach as follows. All application parameters (rate, frequency, depth of incorporation) were set at constant at high end values (i.e., values that are at the upper end of the distribution of application practices). CKD was assumed to be applied over a period of up to 100 years. The Agency believes this to be a reasonably conservative assumption based on consultation with agricultural experts knowledgeable in the use of soil amendments. All other variables (e.g., exposure parameters) were varied between central tendency and high end values one or two at a time in order to obtain the highest risk value for each hazardous constituent. The highest risk value was then used to back calculate maximum constituent concentrations at which adverse health effects from any single constituent do not exceed a 1×10^{-5} individual lifetime cancer risk or a non-cancer hazard quotient of 1 for any potential human exposure route (e.g., air, food chain, etc.). For lead the maximum constituent concentration was back-calculated based on a target blood lead level of 10 µg Pb/dL.

EPA conservatively assumed a high rate and frequency of CKD application (within the range of application rates and frequencies that are considered to be agronomically viable) to set regulatory limits for hazardous constituents in CKD. The Agency assumed that CKD application will not exceed a high-end rate of 5 tons per acre every 2 years, and that CKD may be applied continually over a period of 100 years. EPA believes these assumptions ensure that limiting concentrations are protective given standard agricultural practices used for application and reasonably expected long term repeated applications of CKD.

Additionally, the Agency believes that establishing concentration limits that are protective at plausible high end application practices will make implementation of regulatory limits less burdensome on both the regulated community and EPA. Use of high end application assumptions allows the Agency to establish a single concentration that is considered to be protective for all reasonably expected application parameters.

As an alternative approach, the Agency could have established limiting concentrations that would vary based on the rate and frequency of CKD application. This approach would have resulted in higher (i.e., less stringent) cut-off concentrations in some cases, depending on application practices employed. However, under this approach, the Agency would have to impose tracking and recordkeeping requirements as a means of ensuring compliance with limits that would vary based on varying application rates. Such additional requirements would significantly increase the complexity of the proposed regulations and the implementation burden on the regulated community. By using conservative assumptions regarding application practices, the Agency will substantially reduce the recordkeeping burden associated with the implementation of today's proposal. Furthermore, the Agency believes that the constituent concentration limits so established will not unduly restrict the beneficial use of CKD for agricultural purposes (i.e., based on EPA's data, most CKD meets the proposed regulatory cut-off levels). In selecting this approach, the Agency also considered the fact that use of a less conservative methodology (in which application parameters were set at central tendency values) would still result in limits that, while higher or less restrictive, are still exceeded in some CKD for these five constituents. In essence, use of the conservative risk assessment methodology described above to establish maximum regulatory constituent concentrations enables EPA to reduce the recordkeeping and economic burden associated with regulation of agricultural use of CKD but does not result in levels that are so stringent that they prohibit substantial beneficial use of CKD as a substitute for agricultural lime. For these reasons, EPA chose to develop a single set of constituent concentrations that are protective at high-end application rates. The Agency recognizes that this approach represents a trade-off that favors reduction of recordkeeping and reporting burden over establishment of less restrictive standards. The Agency requests comment on the proposed approach.

Today's proposed rule assumes that CKD will be applied at rates needed to attain the required pH adjustment and will not be applied in excess of such rates. Based on consultation with agricultural experts, review of the literature, and considering physical and chemical properties of soil and CKD, EPA believes that application of 5 tons of CKD per acre every 2 years constitutes the maximum rate of agronomically viable application necessary to properly control pH in agricultural soils. Therefore, EPA's analysis assumes that CKD use will not exceed 5 tons per acre every two years. Given the inherent limitations on the amount of CKD that can be applied beneficially for the purpose of pH control, EPA is not proposing to impose

regulatory controls on the agronomically viable application of CKD. However, agronomic use of CKD to control pH in excess of 5 tons of CKD per acre every 2 years will be considered a form of waste disposal subject to RCRA regulation, rather than a legitimate beneficial use exempted under today's proposal.

As previously noted, a comparison between the risk-based limits established by the Agency using the above methodology and the concentrations of hazardous constituents known to be present in CKD indicates that four metals, arsenic, thallium, lead and cadmium, may be present in CKD at levels that pose unacceptable human health risk (adverse health effects in excess of a 1×10^{-5} individual lifetime cancer risk or non-cancer hazard quotient of 1 in certain instances). Therefore, EPA is proposing to establish regulatory limits for cadmium, lead, thallium, and arsenic in CKD that is applied to agricultural soil for purposes of pH adjustment. EPA is proposing to use the methodology described above to set protective limiting concentrations for cadmium, lead, and thallium. EPA is proposing to use a different methodology to establish a limit for arsenic, as explained later in this section. The Agency is not proposing limits for those constituents for which maximum concentrations in CKD are below concentrations determined by EPA to be protective of human health.

The proposed risk-based concentration limits for cadmium, lead, and thallium are: 22 mg/kg for cadmium, 1500 mg/kg for lead, and 15 mg/kg for thallium. Under today's proposal, CKD that exceeds the proposed concentration limits for these constituents cannot be used as a liming agent on agricultural soils. Based on EPA's data on the composition of CKD, most CKD meets the risk-based protective levels being proposed for these metals and would therefore not be prohibited from agricultural use based on the proposed limits.

2. Risk-Based Approach—Proposed Limiting Concentration for Chlorinated Dioxins and Furans

The process used for setting risk-based limiting concentrations for chlorinated dioxins and furans (hereafter referred to as dioxins) is similar to that used for metals. However, unlike metals, dioxins are comprised of multiple individual dioxin and furan congeners. Therefore, in order to derive a single limiting concentration for purposes of this regulation, the risks from individual dioxin and furan congeners were estimated using the TEF methodology referenced above (see Section VI.B.2—Human Health Criteria and Effects) and the risks from specific dioxin and furan congeners were summed to produce a single concentration in terms of 2,3,7,8-TCDD toxicity equivalents (TEQ). Based on EPA's risk modeling using the methodology described above, the estimated total indirect cancer risks for the farmer scenario from the average North American soil background concentrations of dioxins in the environment is approximately 1×10^{-5}. The average TEQ background concentration of dioxin and furan congeners in soil is 8 parts per trillion (ppt).

Therefore, to ensure that agricultural use of CKD does not pose risks from dioxins in excess of a 1×10^{-5} individual lifetime cancer risk, EPA used a target soil concentration of 8 ppt TEQ to derive risk-based limiting concentrations of dioxins in CKD. The Agency back-calculated maximum TEQ levels for dioxins in CKD used as a lime substitute that, when mixed with soil, would result in dioxin levels in soil levels at or below 8 ppt TEQ. For this analysis, the distribution of congeners in CKD was assumed to be the same as the congener composition or congener profile of background soil. This is essentially a default assumption because, based on available data on levels and distributions of dioxin congeners in CKD, there is no "typical" distribution of dioxin and furan congeners in CKD. Additionally, consistent with the methodology used to develop limiting concentrations for metals, EPA fixed all application parameters at high-end values in setting limiting concentrations for dioxins. In this manner, a limiting TEQ concentration for dioxins in CKD was established so that when CKD is applied at high application rates and frequency, soil concentrations do not exceed 8 ppt TEQ. Assuming high-end application parameters, the maximum TEQ concentration of dioxins in CKD that will result in soil concentrations at or below 8 ppt TEQ was determined to be 0.04 parts per billion (ppb). Based on this analysis, EPA is proposing to set protective limiting concentrations for dioxins in CKD that is used as a liming agent at 0.04 ppb TEQ. Under today's proposal, CKD that exceeds the proposed concentration limit for dioxins cannot be used as a liming agent on agricultural soils. Based on available data on dioxins in CKD, the Agency does not believe that the proposed limiting concentrations will significantly restrict use of CKD as a liming agent. EPA requests comment on the methodology and assumptions used to develop the risk-based limiting concentration for dioxins in CKD that is used as a substitute for agricultural lime.

3. Comparison to Agricultural Lime—Proposed Limiting Concentration for Arsenic

The Agency is not proposing to use the limit derived for arsenic using the risk-based methodology outlined above. Instead, EPA is proposing an alternative limit for arsenic based on arsenic concentrations found in commercially available agricultural liming materials. Total arsenic concentrations in agricultural lime range from < 1 to 13 mg/kg.[38] Based on this information, EPA is proposing a limiting concentration of 13 mg/kg for arsenic in CKD that is applied agriculturally to adjust soil pH.

Use of the risk-based approach results in a cut-off level for arsenic that is below concentrations typically found in agricultural lime and is in fact at or below background concentrations for arsenic in soils in many parts of the country. EPA believes that it is impractical and illogical to prohibit the use of a CKD as a liming agent if it contains levels of arsenic at lower concentrations than agricultural lime because such use would not increase any risks faced by anyone who uses CKD as a substitute for agricultural lime.

Agricultural limestone (aglime) is finely pulverized, naturally occurring, relatively pure limestone or dolomitic limestone. Aglime is added to agricultural soils to maintain optimum pH for crop production and is needed to offset the effects of fertilizers that lower soil pH. Aglimes are produced and sold throughout the United States. States typically regulate aglime by setting standards for minimum calcium carbonate equivalent and particle size but not for other properties such as metal concentrations. Since CKD is used as a substitute for aglime (i.e., it is used to control pH for production of crops), EPA is proposing to use arsenic levels typically found in agricultural lime as a basis for setting a regulatory limit for arsenic in CKD that is used in lieu of agricultural lime. The Agency believes that this approach provides a practical, common sense means of minimizing the risk from arsenic used as an agricultural liming agent. The alternative would be

[38] Kanare, H.M., 1997 Comparison of Trace Metal Concentrations in Cement Kiln Dust, Agricultural Limestone, Sewage Sludge, and Soil. Report to the American Portland Cement Alliance by Construction Technology Laboratories, Inc., Skokie, Illinois. 15p.

to effectively preclude the use of CKD as a liming agent without any reduction in environmental risk. The Agency requests comment on its proposed approach for setting regulatory limits for arsenic in CKD that is used as a substitute for agricultural lime. EPA also requests comment on whether it should consider setting limits for arsenic that are based on existing background concentrations of arsenic in areas where the CKD is applied.

4. Peer Review of the Risk Assessment

An external peer review of the agricultural use risk analysis and the methodology used to establish protective constituent concentration was conducted prior to publication of today's rule. The peer review was conducted by the United States Department of Agriculture's W–170 Committee, which is comprised of nationally known experts on agricultural use of soil amendments. Unfortunately, the Agency did not have time to revise the assessment based on peer review comments prior to publication of the CKD proposal. The committee's review is available in the docket for this rule for public review and comment. The Agency also requests public comments on all aspects of the risk assessment including the pathways evaluated, exposure assumptions, assumptions used regarding agricultural practices, etc.; and on all aspects of the methodology used to establish protective levels for hazardous constituents in CKD used agriculturally. EPA anticipates undertaking revisions to the risk assessment based on recommendations received through the peer review process as well as comments received from the public. The Agency also requests information on other existing and/or potential agricultural uses of CKD that may need to be evaluated. EPA requests comment on whether CKD used for other agricultural purposes should be subject to the same standards as those proposed for CKD used as an agricultural liming agent.

D. Implementation of Controls for the Agricultural Use of CKD

In today's proposed rule, §259.17 defines agricultural use of cement kiln dust as use of CKD as an agricultural lime substitute for the purpose of amending the soil to optimize pH or to promote the growth of crops or other foodstuffs. The Agency restricts this definition of use to CKD produced for use by the general public and not for the exclusive use of the owner or operator of the facility which generates the CKD waste. EPA believes that when an owner or operator applies CKD solely to his own land, the practice is actually disposal.

The Agency intends to ensure there is a high degree of confidence that any CKD sold for purposes as an agricultural lime substitute complies with today's proposed standards. Therefore, today's rule also proposes that for CKD sold for agricultural use, the persons managing CKD waste (e.g., the owner or operator of the facility which generated the waste) shall place in the operating record a notation listing the amount of CKD shipped as an agricultural lime substitute and a letter of certification signed by a company representative verifying compliance with the limiting concentrations specified under §§259.17(a) and (b). In today's rule, EPA is not proposing to impose regulatory limits or recordkeeping requirements on the rate and frequency of application of CKD used as an agricultural lime substitute because the Agency believes that today's proposed standards are protective across the range of anticipated, agronomically viable application parameters.

Today's rule also proposes that CKD destined for agricultural use be sampled and analyzed by the person managing the CKD waste whenever such CKD waste is destined for shipment. Such CKD waste must be tested prior to shipment to determine whether it has concentrations of toxic constituents in excess of the limiting concentrations proposed in §259.17(a). EPA believes that CKD waste destined for agricultural use must be analyzed prior to shipment for the person managing the CKD waste to determine whether or not such waste can be used for pH adjustment. The Agency is not specifying a sampling frequency in today's proposed rule. If the sampling frequency is less often than on a daily basis, however, and subsequent analysis determines that the CKD fails the test, then the Agency considers that all CKD transported for agricultural use since the previous successful analysis to have been mismanaged, and, therefore, would be hazardous waste absent documentation otherwise.

E. Alternative Standard to Limit Chlorinated Dioxins and Furans in CKD

As part of EPA's development of air emission standards for the Portland cement industry, the Agency has proposed operational and monitoring methods for cement kilns that burn hazardous waste (see 61 FR 17358, Hazardous Waste Combustors; Revised Standards; Proposed Rule, April 19, 1996 and 62 FR 24226, Revised Technical Standards for Hazardous Waste Combustion Facilities; Proposed Rule, May 2, 1997) and standards for hazardous air pollutants for cement kilns that do not burn hazardous waste (see 63 FR 14182, March 24, 1998, National Emission Standards for Hazardous Air Pollutants; Proposed Standards for Hazardous Air Pollutants Emissions for the Portland Cement Manufacturing Industry). These standards for air emissions include uniform technology-based standards for chlorinated dioxins and furans, and reflect the performance of Maximum Achievable Control Technologies (MACT) as specified under the Clean Air Act.

To limit the emission of these compounds, EPA has proposed in both rules a baseline air emission level for all cement kilns of 0.20 ng TEQ/dscm of chlorinated dioxins and furans, or 0.4 ng TEQ/dscm, and temperature at the inlet to the air pollution control device of less than or equal to 400°F. The Agency believes temperature control to 400°F or lower is an appropriate baseline control at the air pollution control device because: (1) The optimum temperature window for surface-catalyzed formation of chlorinated dioxins and furans is 450–750°F; and (2) Below 350°F, kiln gas can fall below the dew point which can increase corrosion in ESPs and fabric filters and reduce performance of the air pollution control devices. Available air emissions data from cement kilns show all but one data point of dioxins and furans at or below 0.2 ng TEQ/dscm at the air pollution control device when operating the device at temperatures less than or equal to 400°F. Thus, EPA believes a standard of 0.20 ng TEQ/dscm, or 0.4 ng TEQ/dscm and temperature at the inlet to the air pollution control device of less than or equal to 400°F is both reasonable and readily achievable.

The Agency solicits comment regarding whether the emission standards for dioxins and furans proposed for the cement industry are adequate to control the formation of dioxins and furans on CKD destined for agricultural use, and consequently whether dioxin and furan standards for CKD used for agricultural purposes are necessary.

VII. Relationships Between This Action and Other Regulatory Programs

A. Stormwater Regulations

As stated in its Regulatory Determination, the Clean Water Act, through existing effluent limitations guidelines, NPDES permits, water quality standards, and existing storm

water permits, provides considerable authority to control risks associated with the contamination of surface waters by the management of CKD. EPA's multisector stormwater general permit under the National Pollutant Discharge Elimination System (NPDES) program (see 60 FR 50804, September 29, 1995) contains limits to control effluent discharges specific to the cement industry (among other industries) and requires each plant to develop facility-specific pollution prevention plans and demonstrate best management practices (BMPs) to minimize the contact between storm water runoff and CKD or other pollutant sources, or else remove CKD (or other constituents) before the stormwater is discharged. These permits will be in addition to previously issued and effective storm water baseline general permits that were issued in 1992 by EPA and between 1991 and 1993 by the 40 States with authorized NPDES programs. The Agency believes that once the storm water permits are fully implemented, no further water permits or regulations will be needed to address CKD releases to surface water.

B. Clean Air Act

On the Federal level, air quality has been improved through implementation of controls on releases of CKD through kiln stacks and via fugitive dust emissions. Under the New Source Performance Standards (NSPS) for cement plants, a facility must comply with specific emission limitations for particulate matter. Prevention of Significant Deterioration (PSD) review also is required before a cement plant can be built in a geographic area that is classified as an attainment area. In addition, cement plants are subject to Nonattainment Review if they are located in an air quality control area that is not in compliance with the National Ambient Air Quality Standards (NAAQS) for a given pollutant (e.g., particulate matter or sulfur dioxide). Today's proposed rule augments regulations applicable to cement manufacturing facilities that have been issued under Clean Air Act mandates by addressing fugitive emissions from CKD storage areas, transportation, and disposal sites.

The NSPS for Portland cement plants in 40 CFR part 60, subpart F apply to plants that were constructed or modified after August 17, 1971.[39] Components of cement plants (referred to as "facilities") specifically affected are kilns, clinker coolers, raw mill systems, finish mill systems, raw mill dryers, raw material storage facilities, clinker storage facilities, finished product storage facilities, conveyor transfer points, and bagging and bulk-loading and unloading systems. For these plants, EPA has established performance standards that reflect the degree of emission limitation achievable through application of the best available control technology.[40]

In accordance with the NSPS, no Portland cement plant owner or operator may cause an affected facility to exceed the particulate matter emission limits. Owners or operators must monitor each kiln and clinker cooler stack using a continuous opacity monitoring (COM) system (or a certified visible emissions observer when a COM is not technically feasible). In all cases, each owner or operator must submit semi-annual reports of excess emissions, defined as all 6-minute periods during which the average opacity exceeds the standard, and of equipment malfunctions. The emission standards for these facilities are listed in of 40 CFR part 60, subpart F (Standards of Performance for Portland Cement Plants). In addition, owners or operators must record daily production rates and kiln feed rates and monitor the opacity of emissions.

The 1990 Clean Air Act Amendments established a program to regulate emissions of 189 toxic air pollutants through technology-based standards (the National Emission Standards for Hazardous Air Pollutants (NESHAPs)).[41] EPA is currently developing NESHAPs for Portland cement plants that will address stack emissions and fugitive emissions for the same facilities as listed under the NSPS. The NESHAPs, however, will not apply to transportation, storage, or disposal of CKD. Fugitive emissions from CKD landfills, trucks and storage piles are subject to today's proposed rule.

In its 1995 Regulatory Determination, EPA stated that it would use as appropriate the various authorities under the Clean Air Act to improve regulations for CKD to limit releases to the air (61 FR 7375, February 7, 1995). EPA did consider the use of its authorities under the Clean Air Act in its rulemaking approach to address the air pathway of potential contaminant release. However, existing Clean Air Act regulations do not fully address emissions from CKD piles. Accordingly, EPA is proposing to establish RCRA requirements to address emissions from transportation, storage, and disposal of CKD. To this extent, EPA is proposing to modify the conclusions of the 1995 Regulatory Determination, and solicits comment on that change. However, the Agency is not reversing the 1995 CKD Regulatory Determination entirely. EPA will continue to rely on its authorities under the Clean Air Act to control CKD emissions from stacks and pollution control devices (e.g., electrostatic precipitators and baghouses). Subsequent examination, however, revealed that current implementation of these authorities, do not specifically address CKD waste management.

Particulate emissions from cement manufacturing facilities are potentially subject to requirements adopted as part of a State Implementation Plan (SIP), adopted by States in order to achieve or maintain attainment of the NAAQS for PM, which are national standards applicable on a regional area basis.[42] However, SIPs do not routinely address emissions from landfills and storage piles and, thus, would likely not prevent local PM_{10} exceedances such as could result from fugitive CKD emissions. EPA believes that the risks from fugitive CKD from landfills, piles, and transportation, warrants control. Accordingly, EPA is today proposing to establish air emission requirements for CKD under its RCRA authorities.

As mentioned earlier, cement kilns that burn hazardous waste currently are regulated under RCRA, and implementing regulations found at 40 CFR Part 266, Subpart H. The Clean Air Act Amendments of 1990 require EPA to develop technology-based emission standards for sources listed by the Agency, including cement manufacturing plants. In April 1996, the Agency proposed revised stack emission standards and controls for cement kilns that burn hazardous waste. This proposal, which the Agency anticipates finalizing in late 1998, will require cement kilns to control stack emissions of mercury and dioxins and furans, as well as other hazardous air pollutants. The new emission standards, however, will not apply to transportation, storage, or disposal of CKD.

EPA believes that today's proposed rule will improve air quality and reduce health risks at and near CKD

[39] A "modification" is any physical or operational change to an existing facility that results in an increase in the emission rate of any air pollutant to which the standard applies.

[40] "Best Available Control Technology" (BACT) is defined as the best system of emission reduction determined by EPA to have been adequately demonstrated.

[41] 42 U.S.C. 7412(b)(1): The Act lists 189 pollutants, but the Agency has since delisted one.

[42] Under the revised NAAQS for particulate matter, States which currently are in attainment regarding existing PM standards must submit to EPA for approval a new SIP which meets newly adopted standards for PM (See 62 FR 38651, July 18, 1997).

management units by reducing fugitive emissions of CKD from these facilities.

VIII. State Authority

A. Statutory Authority

Under section 3006 of RCRA, EPA may authorize qualified States to administer and enforce the RCRA program within the State. (See 40 CFR Part 271 for the standards and requirements for authorization.) After receiving authorization, the State has primary enforcement responsibility, although EPA retains enforcement authority under RCRA sections 3007, 3008(a)(2), 3013, and 7003.

As mentioned above, although the Part 259 standards proposed today would likely be adopted as a matter of State law, Federal inspection authority would still be available for facilities regulated under those standards. Because significant violations of the standards would result in CKD being considered mismanaged and, therefore, hazardous waste, EPA (as well as State RCRA Subtitle C programs) would have authority to inspect such facilities to determine whether they were handling hazardous waste (i.e., mismanaged CKD waste). If the person managing CKD waste is managing CKD inconsistently or in a manner that does not comply with the Part 259 standards, it would be subject to Federal enforcement under regulations proposed today in § 261.4(8)(ii), to compel compliance with RCRA Subtitle C requirements proposed today in Part 266.

Prior to the Hazardous and Solid Waste Amendments of 1984 (HSWA), a State with final authorization administered its hazardous waste program entirely in lieu of the Federal program in that State. The Federal requirements no longer applied in the authorized State, and EPA could not issue permits for any facilities located in a State with permitting authorization. When new, more stringent Federal requirements were promulgated or enacted, the State was obligated to enact equivalent and no less stringent authority within specified time frames. These new Federal requirements did not take effect in an authorized State until the State adopted the requirements as State law and received authorization to implement the new requirements.

In contrast, under section 3006(g) of RCRA, 42 U.S.C. 6926(g), new requirements and prohibitions imposed by HSWA take effect in authorized States at the same time as they do in unauthorized States, if the new requirements are more stringent than the previous requirements. EPA implements these new requirements until the State is authorized for them.

Authorized States are required to modify their programs only when EPA promulgates Federal standards that are more stringent than existing Federal standards. Section 3009 of RCRA allows States to impose standards more stringent than those in the Federal program (see 40 CFR 271.1(I)). Federal (both HSWA and pre-HSWA) regulations that are considered less stringent are optional for the authorized States to adopt, and do not go into effect in authorized States until those States adopt them and are authorized to implement them.

B. Effect of Today's Proposed Rule

The RCRA sections of today's proposal are promulgated in part pursuant to pre-HSWA, and in part pursuant to HSWA. Pursuant to pre-HSWA authority, the proposal modifies the rule exempting CKD from hazardous waste regulation under § 261.4(b)(8), exempts from Subtitle C CKD that is either (a) managed in accordance with certain standards, or recycled or used for certain other beneficial purposes (§ 261.4(b)(8)), and lists as hazardous waste CKD that is not managed in compliance with the proposed standards. The proposal also includes tailored Subtitle C regulations for nonexempt CKD (noncharacteristic CKD and characteristic CKD from kilns burning non-hazardous waste which do not meet the proposed management standards) under Subpart I of 40 CFR Part 266. Characteristic CKD from kilns burning hazardous waste is not affected by this proposed rule and still is subject to full RCRA Subtitle C requirements as set forth in 40 CFR 266.112. The tailored Subtitle C standards are promulgated in part based on EPA's general pre-HSWA authority to set management standards for facilities that manage hazardous waste, and in part on the authority in section 3004(x), a HSWA provision, to modify certain requirements that would otherwise apply to any hazardous waste.

The portion of this proposal that lists nonexempt CKD as hazardous waste is more stringent than the current Federal requirements. Section 271.21(e)(2) of EPA's State authorization regulations (40 CFR Part 271) requires that States with final authorization modify their programs to reflect Federal program changes and submit the modifications to EPA for approval. The States must modify their programs and obtain authorization to include CKD requirements that are equivalent and not less stringent than the EPA's requirements for CKD. The procedures and time frames for State program modifications are described in 40 CFR 271.21. The deadline by which the States must modify their programs to adopt this proposed regulation, if it is adopted as a final rule, will be determined by the date of promulgation of the final rule in accordance with § 271.21(e)(2). Once EPA approves the modification, the State requirements become RCRA Subtitle C requirements.

Because the tailored regulations promulgated under both pre-HSWA and HSWA authorities are less stringent than full RCRA Subtitle C, States are not required to adopt the tailored regulations. While HSWA aspects of a rule usually become effective immediately, the only effect of the tailored regulations here is to relax full RCRA Subtitle C requirements for CKD failing to meet management standards in States authorized to regulate CKD. The flexibility provided by these tailored regulations is irrelevant until the States revise their programs and become authorized to regulate CKD.

Although the States do not have to adopt the tailored regulations proposed today under Part 259, EPA strongly encourages States to do so. The tailored regulations would contribute to more efficient State programs because they minimize the cost of compliance while providing sufficient protection of human health and the environment.

States seeking authorization under Subtitle C do not have to adopt new laws and regulations before submitting their authorization package to EPA for approval. States may use their existing laws and regulations, such as their solid waste laws,[43] as long as those laws and regulations cover all of the required elements for regulating CKD as part of the RCRA Subtitle C program.

IX. Regulatory Requirements

A. Regulatory Impact Analysis Pursuant to Executive Order 12866

Under Executive Order No. 12866 (58 FR 51735, October 4, 1993), EPA must determine whether a regulatory action is "significant." The Order defines a "significant" regulatory action as one that "* * * is likely to result in a rule that may: (1) Have an annual effect on the economy of $100 million or more or adversely affect, in a material way, the economy, a sector of the economy, productivity, competition, jobs, the

[43] Because the listing of mismanaged CKD is more stringent than the current Federal hazardous waste regulations, States with base authorization must revise their Subtitle C program and seek authorization for the CKD listing. However, although the States can use their existing solid waste laws to comply with the requirements for the regulation of CKD, States are not required to seek plan approval for a CKD program under Subtitle D.

environment, public health or safety, or State, local, or tribal governments or communities; (2) create serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order."

Pursuant to the terms of Executive Order 12866, the Agency has determined that this rule is a significant regulatory action because it raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order. Changes made in response to OMB suggestions or recommendations are documented in the public record and are available in the docket for this rule. Although today's rule is expected to affect the economy by substantially less than $100 million per year, the Agency conducted a relatively detailed cost and impact study to evaluate the effects of the rule on the U.S. Portland cement industry and the economy.

1. Scope and Approach for Estimating Economic Costs and Impacts

As described in Section III.G. (Today's Approach—Exclude Properly Managed CKD From Hazardous Waste Listing) of this preamble, today's proposed rule calls for a flexible approach to managing land-disposed CKD, a policy tailored to site-specific cement plant, climate, and geophysical conditions. In this context, the Agency has attempted to estimate, individually for each plant, the changes in management practices that might be required to meet the performance-based objectives of the proposed policy, and then to estimate the costs for carrying out these changes. This requires: first, a reasonably detailed understanding of current "baseline" CKD waste generation and management practices; second, a means of simulating likely plant-specific practice changes; and third, an approach to estimate the costs of the projected changes.

a. The Regulatory Baseline

There are currently 110 Portland cement plants in the United States and Puerto Rico. Based on previous work for the Report to Congress and Regulatory Determination, the Agency had acquired an extensive data base on general cement plant characteristics, CKD generation and management practices, and locational circumstances. General plant-specific data on the types, location, and capacity of cement plants is cataloged and updated annually by the American Portland Cement Association (APCA). In addition, the APCA conducted a detailed industry survey of plant CKD generation and management practices for the year 1995, and information from this survey, together with follow-up information from member companies of the Non-Hazardous Burner CKD Coalition, was used to update and expand the Agency's facility-specific data base on waste generation. Thus, the combined 1990 and 1995 survey data on CKD generation and disposition was available for 108 of the 110 cement plants in the cost study.

The 1995 baseline survey results indicated that 24 of the 110 plants (22%) recycle all collected dust back to the kiln, and an additional 12 plants (11%) reported shipping all generated dust off-site for beneficial use. For the present impact analysis, the Agency thus defined the potentially affected cement plant universe to include the remaining two-thirds of the plants, i.e., the 74 facilities currently disposing of CKD on-site, with a combined annual CKD land-disposal requirement of 3.3 million metric tons in 1995.[44] These facilities employ on-site disposal for CKD quantities ranging from less than 1,000 metric tons per year up to more than 200,000 tons per year. It is also possible that some off-site CKD market changes could result from the proposed policy, thus altering CKD disposal requirements for individual plants. This possibility is discussed further below.

With respect to baseline management practices at individual plants, the Agency had to rely primarily on the earlier 1990 survey information where available, or to assume typical baseline practices for many plants based on APCA-provided summaries of industry-wide 1995 survey information which characterized the general distribution of typical current practices but not plant-specific information. Based on available information, EPA then categorized each of the 74 potentially affected plants into one of nine prototype baseline groups for purposes of estimating baseline CKD management costs. The nine baseline groups differed according to three generic types of disposal configuration (placement in a quarry, land pile, or combination in-ground and land pile) and three degrees of engineering and operational complexity ("low," "medium," or "high"), depending on the types and degrees of release-prevention practices employed.

b. Projecting Plant-Level Compliance Responses

Under a tailored management policy, the new compliance requirements for individual cement plants could vary substantially from State to State, depending on current baseline regulations, or from plant to plant even within a given State, depending on plant-specific waste quantities and management practices and local geological conditions. Thus, some plants will require little or no change in present practices while others may require an extreme change from essentially simple open dumping of their CKD up to and including an engineered land disposal design equivalent to the Federal municipal solid waste landfill technical standards. In rare situations, plants with no available on-site landfill space or plants located in areas of highly adverse geological conditions may be required to dispose of CKD in off-site municipal or approved industrial landfills.

For purposes of simulating plant-specific compliance responses under these highly variable and in many cases uncertain conditions, the Agency made the simplifying assumption that the final compliance outcome for each plant would fall into one of four compliance groups or scenarios. Three compliance designs varied primarily by degree of control measure required to meet the regulatory performance criteria. A "CKD Low" design requiring relatively simple but comprehensive measures for controlling releases to the air, ground water and surface water, could be satisfactory, for example, under local conditions with high depth to ground water and low rainfall. A "CKD High" design, employing a more extensive liner and closure-cover configuration, was assumed as an intermediate design to limit or prevent infiltration of leachate. The most extensive design is the "Subtitle D Default," equivalent to the municipal landfill default requirement defined by today's rule. All three of these designs were costed in a mono-pile configuration as the least-costly available option. As a fourth generic option for cost-estimating purposes, the Agency estimated off-site disposal in a commercial landfill certified for contaminated media to accommodate facilities with inadequate landfill space or extremely adverse environmental locations that might preclude continued on-site disposal.

In assigning each of the 74 plants to one of these four compliance options, the Agency applied judgements based

[44] A small number of additional facilities could be affected if they were to loose off-site markets for CKD due to the Agency's proposed standards for use as an agricultural lime substitute.

on general knowledge and primarily public information regarding local geological conditions that would affect the need for groundwater protection. In addition, two specifically conservative assumptions affecting compliance costs were employed. The first assumed that disposal in quarries would not be allowed; the second assumed that in situations where karst terrain underlies a potential on-site land disposal location, the most extensive Subtitle D default design would be required for compliance. Since most baseline disposal is in quarries and a majority of cement plants are located over karst conditions, these assumptions will tend to overstate the degree of change required and the Agency's estimated cost of compliance for some fraction of the plants.

c. The Cost and Impacts Models

To estimate individual plant CKD disposal costs for both baseline and compliance scenarios, EPA adapted and updated the engineering costing model originally developed for the municipal landfill regulatory impact assessment. Essentially, the revised model sizes, designs, and calculates the capital and operating costs for specified land disposal options, including quarries, monopiles, and combination landfill/pile alternatives, and a wide variety of possible leachate and air emission release/control technologies, during the active-life, closure, and post-closure project phases. To estimate the costs of complying with today's rule, CKD management costs were estimated twice for each plant, first for the chosen baseline practice and then for the projected compliance design. The difference in cost between the two estimates is the Agency's incremental compliance cost estimate for each plant, the results of which are summarized below.

Additional details regarding the study design, baseline data, and engineering and costing assumptions for the study, as well as the estimated baseline costs and compliance costs for each of the 110 Portland cement plants, are presented in the technical background document titled Compliance Cost Estimates for the Proposed Land Management Regulation of Cement Kiln Dust (April 10, 1998) located in the RIC docket for today's rule.

In a second phase of the economic impact assessment, the Agency employed a Portland cement industry market impacts model designed to project regional cement price changes, plant capacity use changes, kiln closures, and shifts in international shipments. This industry or market-level impacts model was originally developed by the Agency's Office of Air Quality Planning and Standards for use in assessing cement industry impacts of proposed national emission standards for hazardous air pollutants. The methodology for estimating cement industry impacts, together with the results for 20 cement marketing regions and the United States as a whole, is contained in the document titled Regulatory Impact Analysis of the Cement Kiln Dust Rulemaking (June 1998) located in the RIC docket for this rule.

2. Summary of Cost and Impact Results

a. Nationwide Compliance Costs

Using the methods and data described above, the Agency estimates that today's rule would require incremental compliance costs for the Portland cement industry of about $44 million per year. These cost increases would initially fall on 68 of the 110 U.S. and Puerto Rican plants that currently manage CKD on site. Thirty-six of the remaining 42 plants would not have to undergo changes in management practices, either because they can recycle all collected dust back to the kiln or because they have off-site markets for all generated dust. In the case of the six remaining plants—all with small CKD quantities—the Agency estimates that off-site Subtitle D landfill disposal could be obtained at costs approximately at or below their current baseline costs. For the 68 negatively-affected plants, the average added cost per plant would be approximately $646,000 per year, or just over $13 per metric ton of CKD. For these 68 plants, estimated annual compliance costs ranged from under $100 thousand to over $3.5 million per year. Relative to its annual value of cement sales, the average affected plant would face additional costs of just under two percent of sales revenues.

Due to the wide variability in plant capacities, net CKD-to-clinker ratios, and required management practice changes, these costs would fall very unevenly among plants in the industry. The following table summarizes the distribution of costs across all plants in the industry, expressed as the percentage ratio of incremental compliance cost to annual Portland cement sales revenues at 1995 prices and capacity utilization levels.

TABLE 3.—INDUSTRY DISTRIBUTION OF COST AS A PERCENT OF SALES

$Cost/$sales	Number of plants	Percent of plants	Cumulative percent
Zero Cost or Cost reduction	42	38	38
>0 to 1%	29	26	64
>1 to 2%	19	17	82
>2 to 3%	9	8	89
>3 to 4%	4	4	94
>4 to 7%	7	6	100
Total	110	100%	

Although costs for individual plants may be either over-or understated, for various reasons the Agency believes that the pattern of compliance costs estimated here represents a "high end" projection for the industry as a whole. First, due to a lack of detailed site-specific geophysical data, the default assumption was made that any plant currently disposing of dust in a quarry would no longer be able to continue managing in the quarry. In reality, the proposed rule would only apply, on a site-specific basis, to management in a quarry where the natural (unpumped) ground-water level would lie above the base of the disposal area. Similarly, for plants located in areas of karst terrain (based on generally available regional geological mapping), the default assumption was made that all such plants would need to utilize a full municipal solid waste landfill default design, the most costly compliance option. In practice, many such plants may face less expensive compliance designs based on more detailed local

knowledge of the existence and hydrology of the underlying karst topography. Since a substantial majority of potentially affected cement plants fall into one or both of these categories, the assumed compliance option for purposes of the costing study was biased towards the high-end engineering design. In a few instances, it appeared from available information that no on-site option might be viable. In another respect, the Agency's costs are also biased upwards due the fact that plant-specific data on current management practices was lacking for most plants and, as noted above, reliance was placed primarily on information from a 1990 survey. Some States have been actively regulating CKD placement in the interim, or are in the process of actively upgrading disposal regulations. Thus, EPA's outdated information on baseline practices for those plants means that, for an unknown but not insignificant number of plants, the incremental compliance costs will have been overstated in this analysis because several of these plants would already have become partially or substantially in compliance with the performance standards being proposed today.

b. Economic Impacts

The second phase of industry cost and impact assessment employed a Portland cement industry impacts model to project regional cement market shifts and impacts that could be expected to result from the estimated pattern of individual plant-level compliance cost increases. In general, a major part of the compliance cost burden will be shifted to cement consumers (in both the private and public sectors) in the form of higher prices for construction goods and to government in the form of somewhat reduced corporate taxes. The remaining burden will be born by that segment of the industry most directly affected by the highest compliance costs. On average, cement industry profits will be reduced, at least for some period of time, but several plants and firms—those with little or no compliance cost burden—will see higher capacity utilization and profits due to the upward shift in regional prices brought about by the shifting of costs by affected plants.

Based on this model, which projects intermediate term effects but does not account for longer term technology innovation or new capacity expansions at lower cost units, the Agency estimated the following cement market effects from the proposed rule.

Cement Prices. Nationally, cement prices are projected to increase over their 1995 baseline by less than one dollar per metric ton, or about 1.3 percent. Regionally, price increases would range from about 1.1 to 3.8 percent across the twenty cement market regions of the country.

Cement Capacity and Production Changes. Five to seven kiln closures, including one possible plant closure, could result from today's rule. All told, these capacity reductions together with net capacity utilization changes in each region, associated with or in response to the market price increases noted above, could result in domestic output reductions of about 2.6 percent of the 1995 baseline production on a national basis.

Cement Imports. Price increases by affected domestic cement producers will be tempered by increased foreign imports, which are projected to increase by over 800 thousand metric tons (6.2 percent).

Employment Effects. Nationally, employment reductions in the primary cement industry equivalent to about 500 full-time jobs would be associated with the production changes noted above.

Again, it bears emphasis that the Agency believes these impact estimates to be high end estimates, both because of the default assumptions employed in the plant-level engineering cost estimates themselves and because the market impacts model does not account for longer-term industry responses to the initial compliance cost effects.

3. Benefits of the Rulemaking

The Agency has undertaken several efforts to estimate the impacts from the baseline management of CKD and, thus, identify the benefits from today's rule. In support of the Report to Congress on Cement Kiln Dust and the Regulatory Determination, the Agency performed an individual risk analysis to determine whether current CKD management practices may impact nearby individuals, including highly exposed individuals (e.g., subsistence farming). For today's proposed rulemaking, the Agency built upon the previous individual risk analysis to estimate population-level impacts associated with current management practices (see Section II.C.4.a.—Population Risks). The Agency also conducted a screening level analysis to determine whether current management practices may result in effects to ecological receptors. The Agency, however, has not quantitatively assessed how the proposed standards will reduce the human health, ecological, and other damages associated with current CKD management. For the purposes of this analysis, an upper-bound estimate of the benefits provided by this rule is to assume that all of the impacts described below are avoided.

For the 1993 Report to Congress and 1995 Regulatory Determination, the Agency modeled individual risks from direct and indirect pathways for 83 plants. The Agency concluded that the risks from direct pathways (i.e., drinking water ingestion, incidental ingestion, and chemical inhalation) were low or negligible. The Agency caveated these conclusions by noting that (1) about half of the plants are underlain by limestone formations in areas of karst landscape and may be susceptible to fissures and hydraulic characteristics that allow leachate to directly enter groundwater without dilution or attenuation and cannot be modeled with current techniques; (2) empirical evidence indicated groundwater contamination in areas of both karst and non-karst terrain; and (3) modeling results for fine particulate emissions for 28 cement plants out of 52 modeled may have exceedances of NAAQS at plant boundaries and may result in risks from fine particulate inhalation at nearby residences. Today's proposed rule addresses each of these areas and should result in the avoidance of these individual-level impacts. For the indirect pathways, the Agency concluded that releases from about 12 percent of the 83 plants studied may result in cancer risks greater than 1×10^{-5} for highly exposed individuals (i.e., subsistence fishers and subsistence farmers). Similarly, the Agency concluded that releases from about 12 percent of the 83 plants may result in noncancer hazard ratios greater than 1.0 for highly exposed individuals. Today's proposed action should help prevent these risks to highly exposed individuals.

As described in Section II.C.4.a.—Population Risks, the Agency expanded the individual risk assessment conducted for the 1993 Report to Congress and 1995 Regulatory Determination to evaluate population-level risks. Based on this expanded analysis, the proposed rule may result in a reduced risk of 0.0004 to 0.003 cancer cases per year (best estimate—0.0006) and 29 to 315 fewer persons (best estimate—43) exposed to potential non-cancer health effects due to food chain exposures (i.e., vegetables, beef, and/or milk) to "backyard" gardeners and subsistence farmers. In addition, the population analysis indicated that between 669 and 5,895 recreational fishers (best estimate—999) would avoid exposure to contaminant levels that may result in noncancer health effects. The population analysis indicated that 18 to 4,118 individuals (best estimate—2,378)

would avoid exposure to particulate matter in excess of the NAAQS.

As described in Section II.C.4.b.—Additional Ground-water Modeling, the Agency conducted additional groundwater analyses to determine whether the high alkalinity leachate associated with CKD may result in elevated groundwater concentrations of constituents of concern. The analysis indicated that the highly alkaline nature of CKD leachate resulted in elevated levels of lead, chromium, and cadmium in the groundwater and suggested that beryllium and barium also may be more mobile in CKD leachate. The analysis also indicated that all of these metals were more likely to be transported to the groundwater. Thus, today's action should help prevent contaminated CKD leachate from impacting groundwater resources.

The proposed rule will provide other benefits that have not been estimated quantitatively, but can be qualitatively described. These include protecting groundwater resources near cement plants, including resources located in areas of karst terrain; preventing the corrosion of water distribution pipes by source waters with pHs elevated by CKD leachate; and protecting ecological receptors from adverse effects resulting from the atmospheric deposition and groundwater discharge of CKD.

B. Regulatory Flexibility Analysis

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small governmental jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant adverse economic impact on a substantial number of small entities.

SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities. The following discussion explains EPA's determination.

1. Identification of Small Cement Companies

The Small Business Administration (SBA) has defined small companies in the Portland cement industry to include independent companies with less than 750 employees. At the time of the CKD Regulatory Determination, the Agency had identified and published a list of possible small cement companies based on initial research in Dun and Bradstreet and similar corporate business publications. Subsequently, both the APCA and the Non-Hazwaste Burner CKD Coalition reviewed this initial list and provided changes based on their own research and consultations with member companies. This resulted in a mutually agreed-upon list of eight small U.S. cement companies, each operating a single plant, in an industry comprised of 42 companies operating 110 plants in the U.S. and Puerto Rico.

2. Outreach

In addition to working with industry groups to identify small cement companies, in July 1997 the Agency sent a letter to the president of each of the eight small companies explaining the SBREFA process, outlining several possible CKD regulatory approaches, and requesting comments and suggestions regarding these options. In addition, those small companies that had not previously responded to the 1995 APCA CKD generation and management practices survey were urged to return a completed APCA questionnaire to EPA to facilitate a more realistic cost and impact assessment. In response, all eight companies either returned their comments and questionnaires directly or provided their input indirectly through the Non-Hazwaste Burner CKD Coalition. In addition, six of the companies presented their own estimates of compliance costs for the most stringent of the EPA regulatory options. The Coalition subsequently presented SBREFA policy arguments and recommendations to the OSWER Deputy Assistant Administrator.

3. The Agency's RFA Screening Analysis

Based on the APCA Survey responses and the cost analysis described previously, the Agency completed plant-specific compliance cost estimates for each of the eight small companies. Where relevant for individual plants, major compliance costs included engineered land disposal units with ground water monitoring, pelletizing and compaction of the CKD, closure and post-closure management for disposal units, and covers on trucks and the watering of plant roads to control airborne dust. The Agency did not include costs for storage sheds and silos that might be required at some plants for controlling dust that could be blown from CKD stored prior to shipment for off-site use. If needed, the cost of such temporary storage units should be relatively modest, under $10,000 per year on an annualized basis. In summary, for the eight small companies:

- Four would not be negatively affected (unless they were to lose off-site CKD markets).
- Three would have incremental compliance costs as a percent of baseline sales between 0.3% and 1.0%.
- One small-company would have costs greater than 1.0%, but still less than 2% of baseline sales.

As noted, six of the eight small companies also compiled and presented independent cost estimates in response to EPA's letter requesting comments on alternative regulatory approaches. The companies' worst case incremental compliance cost projections were somewhat higher than EPA's estimates, with one company under one percent of sales, four in the one-to-two percent range, and one between three and four percent. The greatest part of the difference between these and the EPA's estimates stems from the companies' assumption that all of the five small companies that presently market CKD for off-site uses would lose their entire off-site CKD markets as a result of the rule. This assumption is particularly critical for three of the six plants that currently ship all of their CKD to off-site uses. In addition, the companies' projections also assumed the worst-case: that full municipal solid waste landfill design standards would be required, rather than the site specific control measures, tailored to local conditions, which are proposed in today's rule. On this basis, the companies' estimates projected an implicit compliance cost distribution in which at least four of the six companies would have costs between one and two percent of sales revenue, and one would see costs in excess of three percent.

While this double worst-case combination can not unequivocally be ruled out for each and every small plant individually, the Agency believes that it represents an extremely unlikely scenario for projecting impacts of the rule on the small companies as a group. In particular, there is little reason to assume a total loss of off-site markets due to the Subtitle C "stigma." The Agency is not proposing to list or otherwise regulate off-site beneficial uses generally. The only off-site use proposed for regulation is that of an agricultural lime substitute, and the Agency does not have information indicating that any of the small companies currently ship off-site for this use. Furthermore, current levels of

off-site CKD uses are continuing under the specter of EPA's Regulatory Determination decision to regulate CKD, and thus one might argue that any stigma associated with Federal regulation of CKD could already be in effect. For these and other reasons previously discussed, the Agency believes that its approach, based on continuance of off-site use markets and assuming location-specific flexibility in State program implementation, provides for a more realistic high end projection of initial compliance cost effects. Although the Agency believes that the stigma of Subtitle C will not result in the loss of off-site markets, EPA requests comment specifically on whether this rule will affect the availability of markets for beneficial use of CKD, and if so, to what extent and for which particular uses.

4. Agency Findings and Conclusions Regarding SBREFA Impacts

The Agency's RFA screening study does not indicate a significant negative impact on a substantial number of small companies as a likely outcome of the proposed rule. With respect to the per-cent-of-sales cost criterion, EPA's high end engineering cost estimates project that not more than one or two small companies will experience initial compliance costs greater than one percent of baseline sales. In addition, the economic impact analysis projects that regional cement price increases due to shifting of initial compliance costs to cement consumers will partially, if not totally, offset higher costs for small companies that might be required to alter their CKD management practices. In fact, several of the small companies—articularly those that do not land-dispose any wasted dust—ould thus realize higher net annual profits as a result of these market impacts.

For the reasons discussed above, I hereby certify that this rule will not have a significant adverse economic impact on a substantial number of small entities. This rule, therefore, does not require a regulatory flexibility analysis.

C. Environmental Justice—Applicability of Executive Order 12898

As part of its analysis of risks to human health posed by CKD, the Agency investigated whether there are environmental justice issues associated with the management of CKD. Executive Order 12898, dated February 11, 1994, and titled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," provides for Federal agencies to consider environmental justice issues. As explained in its Regulatory Determination (60 FR 7371, February 7, 1995), EPA announced the availability of a report titled Race, Ethnicity, and Poverty Status of Populations Living Near Cement Kilns in the United States.[45] In the report, the Agency examined the demographics around cement plants in order to determine if there exist any trends at the national level which indicate there might be environmental justice considerations with respect to cement kiln dust. EPA's study includes numerous analyses and summaries of demographic data, and is available in the RCRA docket. The results of the demographic studies of populations surrounding cement kilns indicate that cement plants are for the most part located in rural areas populated by varied types of communities. While the data do indicate that there are individual communities with high percentages of minority or low income populations surrounding specific cement kilns, they do not suggest that specific minorities or poverty-level populations are overly represented at the national level.

Today's rule is intended to reduce risks from the management of CKD and to benefit all populations. It is not expected to cause any disproportionately high and adverse human health and environmental effects on minority or low income communities versus affluent or non-minority communities. The Agency solicits comment and input on the implications of this rule for environmental justice, from all interested persons, including members of the environmental justice community and members of the regulated community. The Agency encourages all interested parties to provide comments or further information that might assist the Agency in further assessing impacts on minority or low-income populations.

D. Protection of Children—Applicability of Executive Order 13045

The Executive Order 13045, entitled "Protection of Children from Environmental Health Risks and Safety Risks (62 FR 19885, April 23, 1997) applies to any rule that EPA determines (1) is "economically significant" as defined under Executive Order 12866, and (2) the environmental health or safety risk addressed by the rule has a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children; and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This proposed rule is not subject to E.O. 13045 because this is not an economically significant regulatory action as defined by E.O. 12866.

However, the Agency has reason to believe that the environmental health risk addressed by this action may have an effect on children. The Agency has evaluated the environmental health effects of CKD on children. These documents are are summarized and discussed below and copies have been placed in the RCRA docket for this action.

Children's Health Protection. In accordance with §5(501), the Agency has evaluated the environmental health effects for CKD on children, and found that generally the risks to children are similar to risks estimated to adults. However, the Agency noted that exposure to CKD may result in elevated blood-lead levels in children that live near cement plants that manage CKD. The Agency evaluated children's health through three mechanisms: the risk assessment to support the Report to Congress, the examination of health effects associated with lead, and the assessment to set risk-based concentration limits for hazardous constituents in CKD used as an agricultural liming agent.

In the risk assessment to support the Report to Congress, the Agency evaluated the risks from exposure to CKD through incidental ingestion of soil and dermal absorption of contaminants in CKD. For these exposure pathways, the Agency adjusted exposure parameters (e.g., ingestion rate, body weight) to reflect a five-year childhood exposure. Based on this analysis, the Agency concluded that health effects to children through these exposure routes were negligible. The analysis is described in detail in the Technical Background Document for the Human Health and Environmental Risk Assessment in Support of the Report to Congress on Cement Kiln Dust Waste—December 1993.

The Agency also evaluated effects of exposure to CKD on blood-lead levels. For this analysis, the Agency estimated concentrations in air, soil, ground water, surface water, and diet using a fate and transport model and then input these concentrations in the Integrated Exposure Uptake Biokinetic Model (IEUBK) to estimate potential blood-lead levels for children near a cement plant. The analysis indicated that two of the five modeled plants may result in blood-levels above 10 ug of lead/dL of blood,

[45] This report is available in the RIC docket (No. F-4-C2A-0016).

a level at which adverse effects to children may occur. Based on this analysis, the Agency noted that CKD may contribute to elevated blood-lead levels in children living near uncontrolled CKD piles. This analysis is described in detail in Technical Background Document for the Notice of Data Availability to Support the Regulatory Determination on Cement Kiln Dust—August 31, 1994.[46]

For the agricultural use risk assessment, EPA conducted a separate assessment of risk from hazardous constituents (metals and dioxins) in CKD for the child of farmer receptor scenario. A detailed description of this analysis is provided in the Risk Assessment for Cement Kiln Dust Used as an Agricultural Soil Amendment. Pathways evaluated for the child of farmer scenario include incidental ingestion of contaminated soil, ingestion of plants grown on amended soil, and products from animals raised on feed from CKD amended fields. For these exposure pathways, the Agency adjusted exposure parameters (e.g., ingestion rate, body weight) to reflect an 18-year childhood exposure. Exposures to lead were evaluated separately for this analysis. The IEUBK model was used to evaluate lead exposure in young children (birth to 7 years of age). The constituent concentration limit proposed for lead in todays rulemaking is based on EPA's analysis of predicted blood lead levels in children due to ingestion of CKD amended soil. Risks from other hazard constituents in agriculturally applied CKD did not differ significantly between children and adult exposure scenarios.

Although the Agency has noted the potential for adverse effects to children based on the current management of CKD, today's proposed rule will provide measures to ensure the protection of children's health. In particular, the proposed management standards will limit exposures via the ground water route and air pathway. In addition, the Agency believes that the storm-water run-off regulations will be adequate to protect from exposures via the overland runoff routes. These measures will limit uncontrolled releases from CKD piles, preventing children's exposures, and thus, protecting children's health. Finally, the development of risk-based concentration limits for hazardous constituents in CKD used agriculturally will ensure that children are adequately protected against potential environmental health risks from CKD used in this manner.

E. National Technology Transfer and Advancement Act

Under section 12(d) of the National Technology Transfer and Advancement Act, the Agency is directed to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, business practices, etc.) that are developed or adopted by voluntary consensus standard bodies. Where available and potentially applicable voluntary consensus standards are not used by EPA, the Act requires the Agency to provide Congress, through the Office of Management and Budget, an explanation of the reasons for not using such standards. The Agency is not aware of any available or potentially applicable voluntary consensus standards that would be applicable to the CKD issues addressed in this proposed rule.

F. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal Agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written analysis, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

EPA's analysis of compliance with UMRA found that the proposed action imposes no enforceable duty on any State, local, or tribal governments and therefore does not include a Federal mandate that may result in estimated costs of $100 million or more to either State, local, or tribal governments in the aggregate. EPA also has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. In addition, as discussed above, the private sector is not expected to incur costs exceeding $100 million. EPA has fulfilled the requirement for analysis under the Unfunded Mandates Reform Act.

G. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* An Information Collection Request (ICR) document has been prepared by EPA (ICR No. 1870.01) and a copy may be obtained from Sandy Farmer by mail at: OPPE Regulatory Information Division, U.S. Environmental Protection Agency (2137), 401 M Street S.W., Washington D.C. 20460, or by calling the Agency directly at (202) 260–2740. A copy may also be obtained by email at *farmer.sandy@epamail.epa.gov*, or downloaded off of the internet at *http://www.epa.gov/icr*.

The bottom line annual burden[47] to respondents over three years is about 4,000 hours with a cost of approximately $21 million.

[46] Errata for this document are identified in the Supplemental Errata for this document are identified in the Supplemental Errata Document for the Technical Background Document for the Notice of Data Avialability on Cement Kiln Dust—September 30, 1994.

[47] Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to of for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

Approximately 88%, or $18.5 million of the total cost is attributable to O&M costs (consultant fees, sampling fees, and mailing costs). The capital costs incurred by facilities for the installation of ground-water monitoring systems, and the acquisition of new filing cabinets are approximately $206 thousand and $69 thousand per year, respectively. The bottom line annual burden to the Agency is about 1000 hours, with a cost of approximately $43 thousand, of which capital costs are insignificant.

EPA estimates that for each cement kiln dust landfill unit, there will be an average reporting burden of about 30 hours annually, which includes time for preparing and submitting demonstrations, notifications, and certifications to the EPA Regional Administrator. EPA estimates that each CKD landfill unit will incur an average annual recordkeeping burden of about 150 hours. This estimate includes time for reading regulations, and preparing demonstrations, notifications, and certifications to be placed in the operating record.

EPA estimates that cement manufacturing facilities that do not operate CKD landfills will incur an average reporting burden of less than one hour annually, and a recordkeeping burden of about three hours annually. The recordkeeping burden estimate includes time for reading the regulations, sampling and analyzing dust, and placing notations, certifications, and demonstrations in the operating record.

EPA may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the Agency's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

Comments are requested on EPA's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques. Send comments on the ICR to the Director, OPPE Regulatory Information Division; U.S. Environmental Protection Agency (2137), 401 M Street S.W., Washington, D.C. 20460, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street N.W., Washington D.C. 20503 marked "Attention: Desk Officer for EPA." Please include the ICR number in any correspondence. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after August 20, 1999, a comment to OMB is best assured of having its full effect if OMB receives it by September 20, 1999. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

H. Executive Order 12875: Enhancing the Intergovernmental Partnership

Under Executive Order 12875, EPA may not issue a regulation that is not required by statute and that creates a mandate upon a State, local or tribal government, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by those governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 12875 requires EPA to provide to the Office of Management and Budget a description of the extent of EPA's prior consultation with representatives of affected State, local and tribal governments, the nature of their concerns, any written communications from the governments, and a statement supporting the need to issue the regulation. In addition, Executive Order 12875 requires EPA to develop an effective process permitting elected officials and other representatives of State, local and tribal governments "to provide meaningful and timely input in the development of regulatory proposals containing significant unfunded mandates."

Today's proposed rule implements requirements specifically set forth by the Congress in RCRA without the exercise of any discretion by EPA. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this proposed rule.

I. Executive Order 13084: Consultation and Coordination with Indian Tribal Governments

Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian tribal governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the tribal governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide to the Office of Management and Budget, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected tribal governments, a summary of the nature of their concerns, and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian tribal governments "to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities."

Today's proposed rule implements requirements specifically set forth by the Congress in RCRA without the exercise of any discretion by EPA. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this proposed rule.

List of Subjects

40 CFR Part 259

Environmental protection, Administrative practice and procedures, Air pollution control, Reporting and recordkeeping requirements, Waste treatment and disposal, Water pollution control.

40 CFR Parts 261 and 266

Environmental protection, Hazardous waste, Recycling, Reporting and recordkeeping requirements.

40 CFR Part 270

Environmental protection, Administrative practice and procedure, Hazardous waste.

Dated: July 30, 1999.

Carol M. Browner,

Administrator.

Appendix I to the Preamble—Justification for CKD Listing

Subtitle C of RCRA, as amended, establishes a Federal program for the comprehensive regulation of hazardous wastes. Hazardous waste is defined at section 1004(5) of RCRA, 42 U.S.C. 6903(5) as: (1) those solid wastes which may cause or significantly contribute to an increase in mortality, serious irreversible illness, or incapacitating reversible illness; and (2) those solid wastes which may pose a substantial present or potential hazard to human health or the environment when improperly managed.

Section 3001 of RCRA requires that EPA define which solid wastes are hazardous by either identifying the hazardous characteristics of hazardous wastes or listing particular hazardous wastes. Section 3001(a) of RCRA provides the Agency with flexibility in deciding whether to list or identify a waste as hazardous and to consider the need for regulation. Specifically, RCRA section 3001 requires that EPA, in determining whether to list a waste as hazardous waste, or to otherwise identify a waste as hazardous waste, decide whether a waste "should be subject to the requirements of Subtitle C." Hence, RCRA section 3001 authorizes EPA to determine when Subtitle C regulation is appropriate. The Agency may evaluate

wastes from either specific or nonspecific sources and decide to list a waste as hazardous if it meets one of the three criteria codified at 40 CFR 261.11. The criteria for identifying characteristics and for listing wastes as hazardous are: (1) wastes may be classified as "characteristic" wastes if they have the properties described at 40 CFR 261.21–261.24 which would cause them to be classified as having the characteristics of ignitability, corrosivity, reactivity or toxicity; (2) wastes may be classified as acutely hazardous if they are fatal to humans at low doses, lethal in animal studies at particular doses designated in the regulation, or otherwise capable of causing or significantly contributing to an increase in serious illness; and (3) wastes may be listed as hazardous if they contain hazardous constituents identified in Appendix VIII of 40 CFR Part 261 and the Agency concludes, after considering eleven factors enumerated in 40 CFR 261.11(a)(3), that the waste is capable of posing a substantial present or potential hazard to human health or the environment when improperly managed. A substance is listed in Appendix VIII if it has been shown in scientific studies to have toxic, carcinogenic, mutagenic, or teratogenic effects on humans or other life forms. One of the factors the Administrator is to consider is the potential of the constituent (from Appendix VIII to 40 CFR Part 261) or any toxic degradation product of the constituent to migrate from the waste into the environment under the plausible types of improper management to which the waste could be subjected (see 40 CFR 261.11(a)(3)(iii)).

EPA has evaluated CKD against the listing criteria and determined that CKD meets the criteria at §261.11(a)(3), as summarized in Table 1 follows:

TABLE 1.—CKD LISTING DETERMINATION RATIONALE

Criteria at §261.11(a)(3)	Rationale
Nature of the Toxicity Presented by the Constituents (§261.11(a)(3)(i))	CKD contains toxic metals and organics listed in Appendix VIII to Part 261 for which non-cancer and cancer RfDs have been established.
Concentration of the Constituent in the Waste (§261.11(a)(3)(ii))	Amount of Appendix VIII constituents in CKD are high due to mass loadings into the cement manufacturing process.
Potential of the Constituent or Any Toxic Degradation Product of the Constituent to Migrate From the Waste Into the Environment Under Specified Types of Improper Management (§261.11(a)(3)(iii)).	The 13 cases of documented damage to ground water which are discussed in today's proposal, the Technical Background Document on Ground Water Controls at CKD Landfills, the 1993 Report to Congress, and subsequent NODA, demonstrate a high potential for Appendix VIII constituents to migrate from CKD into ground water. As discussed in the EPA's 1995 Regulatory Determination (60 FR 7370), Agency modeling of risks to human health due to fine particulate dust (10 microns or less) and 36 cases of documented damage to air demonstrate a high potential for contaminants to migrate into the environment via fugitive dust emissions. Modeling results discussed in the NODA on human health and environmental risk assessment (59 FR 47133) indicate human health risks of concern from CKD-derived chemical contaminants via indirect food chain pathways.
The Persistence of the Constituent or Any Toxic Degradation Product of the Constituent (§261.11(a)(3)(iv)).	Metals found in CKD are highly persistent in the environment.
The Potential for the Constituent or Any Toxic Degradation Product of the Constituent to Degrade Into Non-Harmful Constituents and the Rate of Degradation (§261.11(a)(3)(v)).	Constituents of concern in CKD are primarily metals which, unlike organics, do not have the potential to degrade into non-harmful constituents.
Degree to Which the Constituent or Any Degradation Product of the Constituent Bioaccumulates in Ecosystems (§261.11(a)(3)(vi)).	Where CKD is used in agricultural applications, there is a potential for 2,3,7,8-substituted dioxin and 2,3,7,8-substituted dibenzofuran, which are found in CKD, to bioaccumulate in living tissue.
Plausible Types of Improper Management to Which the Waste Could Be Subjected (§261.11(a)(3)(vii)).	As discussed in the Report to Congress and subsequent Regulatory Determination (60 FR 7368), CKD is typically managed on-site in unlined and uncovered landfills and piles located in abandoned quarries, retired portions of operating quarries or nearby ravines. Some active piles are also managed underwater or adjacent to surface water and/or agricultural lands. A review of 1995 CKD management practices suggested that, overall, management practices had not substantially changed from those reported in the 1993 Report to Congress. Current management practices are similar to past management scenarios, which are inadequate to limit contaminant releases from CKD management units. Moreover, additional damage cases have been identified which suggest current management practices are inadequate.
Quantities of the Waste Generated at Individual Generation Sites or on a Regional or National Basis (§261.11(a)(3)(viii)).	Cement plants average 47,000 metric tons CKD generated per year (1995 average). In 1995, the cement industry generated an estimated 4.1 million metric tons of CKD.
Nature and Severity of the Human Health and Environmental Damage That Has Occurred as a Result of the Improper Management of Wastes Containing the Constituent (§261.11(a)(3)(ix)).	As of 1997, EPA has documented evidence of damage to ground water and surface water at 16 sites, three of which have been listed on the Superfund NPL under CERCLA, and one of which remains on the NPL. 36 cases of damage to air have been documented at different sites.
Action Taken By Other Governmental Agencies or Regulatory Programs Based on the Health or Environmental Hazard Posed by the Waste or Waste Constituents (§261.11(a)(3)(x)).	Some States have recognized that mismanagement of CKD can cause substantial environmental problems, including Michigan, Pennsylvania, Texas, and Washington; however, the Agency believes State regulatory controls need to be improved as existing requirements vary substantially from State to State. Problems with repeated releases of CKD to the environment suggest that the implementation of existing regulations is uneven.

TABLE 1.—CKD LISTING DETERMINATION RATIONALE—Continued

Criteria at § 261.11(a)(3)	Rationale
Such Other Factors As May Be Appropriate (§261.11(a)(3)(xi))	When mixed with water, CKD often exhibits the characteristic of corrosivity (40 CFR 261.22).

Based on the § 261.11(a)(3) criteria, the Agency believes that additional control of improperly managed CKD is warranted to protect the public from human health risks and to prevent environmental damage resulting from current management practices for this waste. The primary concerns to be addressed through the additional controls are documented damages to ground water and potable water supplies, and potential human health risks from inhalation of airborne CKD and ingestion via food chain pathways. There is the potential for ground-water contamination in both karst and non-karst areas, however, and EPA is particularly concerned about areas underlain by limestone with karst features. The Agency believes these potential risks can be eliminated through the implementation of more comprehensive management standards.

Although improperly managed CKD can create significant risks, the Agency believes that these risks can effectively be addressed by adopting certain basic management techniques. CKD poses risks to human health and the environment only in specific circumstances under particular conditions (e.g., disposal of uncompacted CKD in unlined, uncovered landfills exposed to winds and the influx of ground water and rain water). Therefore, EPA is proposing to exclude from listing as hazardous waste CKD that is properly managed according to standards specified in today's proposal (e.g., disposal of wet, compacted CKD, otherwise known as "conditioned" CKD, in covered, lined landfills located above the natural water table), or in a landfill with an alternative design that meets the performance standard and has been approved by the EPA Regional Administrator (or the State Director, in authorized States).

Appendix II to the Preamble—Reportable Quantities

All hazardous wastes listed under RCRA and codified in 40 CFR 261.31 through 261.33, as well as any solid waste that is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b) and that exhibits one or more of the characteristics of a RCRA hazardous waste (as defined in §§ 261.21 through 261.24), are hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended (see CERCLA section 101(14)(C)). CERCLA hazardous substances are listed in Table 302.4 at 40 CFR 302.4 along with their reportable quantities (RQs). If a hazardous substance is released in an amount that equals or exceeds its RQ, the release must be reported immediately to the National Response Center (NRC) pursuant to CERCLA section 103.

A. Reporting Requirements

Under CERCLA section 103(a), the person in charge of a vessel or facility from which a hazardous substance has been released in a quantity that is equal to or exceeds its RQ must immediately notify the NRC as soon as that person has knowledge of the release. The toll-free telephone number of the NRC is 1-800-424-8802; in the Washington, D.C., metropolitan area, the number is (202) 267-2675. In addition to this reporting requirement under CERCLA, section 304 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) requires owners or operators of certain facilities to report releases of extremely hazardous substances and CERCLA hazardous substances to State and local authorities. EPCRA section 304 notification must be given immediately after the release of an RQ or more to the community emergency coordinator of the local emergency planning committee for any area likely to be affected by the release and to the State emergency response commission of any State likely to be affected by the release.

Under section 102(b) of CERCLA, all hazardous substances (as defined by CERCLA section 101(14)) have a statutory RQ of one pound, unless and until the RQ is adjusted by regulation. In today's rule, EPA is proposing to list cement kiln dust waste that is not beneficially used and not managed in accordance with 40 CFR Part 259, or cement kiln dust waste that is beneficially used for agricultural purposes and does not meet the requirements in 40 CFR 259.17. Such CKD would be added to the CERCLA list of hazardous substances and would have an unadjusted statutory RQ of one-pound. The Agency is also proposing today to adjust the one-pound statutory RQ for CKD hazardous waste.

B. Basis for Proposed RQ Adjustment

EPA's methodology for adjusting the RQs of individual hazardous substances begins with an evaluation of the intrinsic physical, chemical, and toxicological properties of each hazardous substance. The intrinsic properties examined, called "primary criteria", are aquatic toxicity, mammalian toxicity (oral, dermal, and inhalation), ignitability, reactivity, chronic toxicity, and potential carcinogenicity.

Generally, for each intrinsic property, EPA ranks the hazardous substance on a five-tier scale, associating a specific range of values on each scale with an RQ value of 1, 10, 100, 1,000, or 5,000 pounds. Based on the various primary criteria, the hazardous substance may receive several tentative RQ values. The lowest of the tentative RQs becomes the "primary criteria RQ" for that substance.

After the primary criteria RQ is assigned, the substance is evaluated further for its susceptibility to certain degradative processes, which are used as secondary RQ adjustment criteria. These natural degradative processes are biodegradation, hydrolysis, and photolysis (BHP). If a hazardous substance, when released into the environment, degrades relatively rapidly to a less hazardous form by one or more of the BHP processes, its primary criteria RQ is generally raised one level. Conversely, if a hazardous substance degrades to a more hazardous product after its release, the original substance is assigned an RQ equal to the RQ for the more hazardous substance, which may be one or more levels lower than the RQ for the original substance.

The standard methodology used to adjust the RQs for RCRA hazardous waste streams differs from the methodology applied to individual hazardous substances. The procedure for assigning RQs to RCRA waste streams is based on an analysis of the hazardous constituents of the waste streams. The constituents of each RCRA hazardous waste stream are identified in 40 CFR part 261, Appendix VII. EPA determines an RQ for each constituent within the waste stream and establishes the lowest RQ value of these constituents as the adjusted RQ for the waste stream. Therefore, in today's rule, the Agency is proposing a one-pound RQ for listed hazardous CKD waste based on the one-pound RQs for arsenic and mercury (i.e., the two constituents within this waste with the lowest RQ).

C. Application of the CERCLA Mixture Rule to Listed Hazardous CKD Waste.

Although in today's rule EPA is proposing a one-pound RQ for listed hazardous CKD waste, EPA is also proposing to modify its interpretation of the mixture rule, as described below, to allow facilities to use the maximum observed concentrations of the constituents within listed hazardous CKD waste in determining when to report releases of this waste.

For listed hazardous CKD waste, where the actual concentrations of the hazardous constituents are not known, EPA is today proposing that persons managing CKD waste have the option of reporting on the basis of the maximum observed concentrations that have been identified by EPA (see Table 2 below). Thus, although actual knowledge of constituent concentrations may not be known, constructive knowledge of the EPA-identified maximum concentrations has been assumed. This assumption is based on actual sampling data, specifically the maximum observed concentrations of hazardous constituents in Listed hazardous CKD waste.[48] Table 2 below identifies the

[48] To review these sampling data, see Appendix E of the Technical Background Document—Analysis of CKD Characteristics and Generation Data, Office of Solid Waste, U.S. EPA, August 1994;

Continued

hazardous constituents for Listed hazardous CKD waste, their maximum observed concentrations in parts per million (ppm), the constituents' RQs, and the number of pounds of the waste needed to contain an RQ of each constituent.

TABLE 2.—POUNDS REQUIRED TO CONTAIN RQ FOR EACH CONSTITUENT OF LISTED HAZARDOUS CKD WASTE

Waste stream constituent	Maximum ppm	RQ (lb)	Pounds required to contain RQ
CKD			[1]
antimony	360	5,000	13,888,889
arsenic	518	1	1,931
barium	1,402	1,000	713,267
beryllium	12	10	817,661
cadmium	1,540	10	6,494
chromium	450	5,000	11,111,111
lead	7,390	10	1,353
mercury	60	1	16,667
nickel	110	100	909,091
selenium	307	100	325,733
silver	58	1,000	17,271,157
thallium	776	1,000	1,288,660

For example, if Listed hazardous CKD waste is released from a facility, and the actual concentrations of the waste's constituents are not known, it may be assumed that the concentrations will not exceed those listed above in Table 2. Thus, applying the mixture rule, the RQ threshold for lead in this waste is 1,353 pounds, assuming the maximum concentration listed in Table 2. Reporting would be required only when an RQ or more of any hazardous constituent is released.

Where the concentration levels of all hazardous constituents are known, the traditional mixture rule would apply. Under this scenario, if the actual concentration of lead is 100 ppm, 100,000 pounds of the Listed hazardous CKD waste would need to be released to reach the RQ for lead. As applied to Listed hazardous CKD waste, EPA's proposed approach reduces the burden of notification requirements for the regulated community and adequately protects human health and the environment.

The modified interpretation of the mixture rule as it applies to Listed hazardous CKD waste in today's proposal is consistent with EPA's approach in a recent final rule listing four petroleum refining wastes (K169, K170, K171, and K172) as RCRA hazardous wastes and CERCLA hazardous substances (See 63 FR 42110, August 6, 1998). In that rule, the Agency promulgated a change in its interpretation of the mixture rule to allow facilities to consider the maximum observed concentrations for the constituents of the petroleum refining wastes in determining when to report releases of the four wastes. EPA codified this change to its mixture rule interpretation in 40 CFR 302.6(b)(1) as a new subparagraph (iii). If the Agency should take the rule final, EPA will revise this same subparagraph to extend the modified interpretation of the mixture rule to include Listed hazardous CKD waste.

D. Unlisted RCRA Characteristic Waste

Kiln dust waste that is beneficially used (other than for agricultural purposes) or managed in accordance with 40 CFR Part 259, would not be listed as a RCRA hazardous waste or CERCLA hazardous substance by this rulemaking. Nevertheless, such wastes may be a listed hazardous waste if there is a significant violation of the 40 CFR Part 259 standards, or considered unlisted CERCLA hazardous substances (as described in 40 CFR 302.4(b)) when all of the following conditions are met:

(1) the waste is a solid waste, as defined by 40 CFR 261.2;

(2) the waste is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b); and,

(3) the waste exhibits any of the characteristics (i.e., ignitability, corrosivity, reactivity, or toxicity) of a RCRA hazardous waste (defined in 40 CFR 261.20 through 261.24).

Under proposed revisions to 40 CFR 261.4(b) included in today's rule, most CKD wastes have been excluded from regulation as a hazardous waste. Of the CKD wastes that are not excluded, few are expected to exhibit RCRA characteristics. As stated elsewhere in this preamble, cement kiln dust itself does not exhibit the RCRA hazardous waste characteristic of corrosivity, and the waste exhibits the toxicity characteristic infrequently, and only for certain metals. Therefore, CKD waste only rarely is expected to qualify as a RCRA characteristic waste and, thus, an unlisted CERCLA hazardous substance.

For the reasons set out in this preamble, title 40, chapter I of the Code of Federal Regulations is proposed to be amended as follows:

1. Part 259 is added to read as follows:

PART 259—MANAGEMENT STANDARDS FOR CEMENT KILN DUST WASTE

Subpart A—General Provisions

Sec.
259.1 Purpose, scope, and applicability.
259.2 Definitions.
259.3–259.9 [Reserved]

Subpart B—Location Restrictions

259.10 Placement above the natural water table.
259.11 Floodplains.
259.12 Wetlands.
259.13 Fault areas.
259.14 Seismic impact zones.
259.15 Unstable areas.
259.16 Karst terrains.
259.17 Regulation of agricultural use.
259.18–259.19 [Reserved]

Subpart C—Air Criteria

259.20 Air criteria for tanks, containers, or buildings.
259.21 Air criteria for trucks transporting cement kiln dust.
259.22 Air criteria for landfills.
259.23 Recordkeeping requirements.
259.24–259.29 [Reserved]

Subpart D—Design Criteria

259.30 Design criteria.
259.31–259.39 [Reserved]

Subpart E—Ground-Water Monitoring and Corrective Action

259.40 Applicability.
259.41 Ground-water monitoring systems.
259.42 [Reserved]
259.43 Ground-water sampling and analysis requirements.
259.44 Detection monitoring program.
259.45 Assessment monitoring program.
259.46 Assessment of corrective measures.
259.47 Selection of remedy.
259.48 Implementation of the corrective action program.
259.49 [Reserved]

Subpart F—Closure and Post-Closure Care

259.50 Closure criteria.
259.51 Post-closure care requirements.
259.52–259.59 [Reserved]

Subpart G—Financial Assurance Criteria

259.60 Applicability.
259.61 Financial assurance for closure.
259.62 Financial assurance for post-closure care.

[1] The document is located in the EPA RIC docket No F-94-RCKA-FFFFF.

259.63 Financial assurance for corrective action.
259.64 Allowable mechanisms.
259.65 Discounting.

Appendix I to Part 259—Constituents for Detection Monitoring

Authority: 42 U.S.C. 6912(a), 6912(b)(3)(C) and 6924(x).

Subpart A—General Provisions

§ 259.1 Purpose, scope, and applicability.

(a) The purpose of this part is to establish minimum national criteria for all cement kiln dust waste landfill (CKDLF) units. These minimum national criteria ensure the protection of human health and the environment.

(b) Regulations in this part apply to any cement kiln dust (CKD) waste actively managed [90 days after the effective date of the final rule], except as otherwise specifically provided in paragraph (d) of this section, including CKD managed in new CKDLF units, existing CKDLF units, and expansions.

(c) These criteria do not apply to CKD managed prior to 90 days after the date of publication of the final rule, except as otherwise specifically provided in paragraph (d) of this section.

(d) CKDLF units that receive waste after the date of publication of this proposal, but stop receiving waste before [the effective date of the final rule], are exempt from all the requirements of this part 259, except the final cover requirement specified in § 259.50. The final cover must be installed within six months of last receipt of CKD waste. Units described in this paragraph that do not have a complete cover installation within this six month period will be subject to all of the requirements of this part 259, unless otherwise specified.

(e) The compliance date for all requirements of this part 259, unless otherwise specified, is [two years after the effective date of the final rule], for all CKDLF units that receive waste after [the effective date of the final rule].

(f) Nothing in this part prevents, restricts, or regulates the beneficial use of CKD as a stabilizer or solidifier during RCRA cleanups under sections 3004(u), 3004(v) and 3008(h), CERCLA response actions that are carried out in accordance with the requirements of 40 CFR Part 300—the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), or when the EPA Regional Administrator (or the State, in authorized States) finds that the beneficial use of CKD in other cases for remedial purposes is protective of human health and the environment.

§ 259.2 Definitions.

This section contains definitions for terms that appear throughout this part; additional definitions appear in the specific sections to which they apply.

Active life means the period of operation beginning with the initial receipt of CKD waste and ending at completion of closure activities in accordance with § 259.50.

Active management means a facility or unit that receives CKD waste and that has not been closed in accordance with § 259.50.

Aquifer means a geological formation, group of formations, or portion of a formation capable of yielding significant quantities of ground water to wells or springs.

Beneficial Use of CKD means the substitution of CKD for another product based on similar properties. For purposes of today's proposed rule, beneficial use of CKD includes, but is not restricted to, waste stabilization and general construction (e.g., off-site management of CKD as surface material in unpaved roads and parking lots).

Carbonate terrain means terrain composed of carbonate bedrock (e.g., limestone or dolomite) that consists chiefly of carbonate minerals such as calcite and dolomite. In addition to limestone and dolomite, carbonate terrains may also contain variable amounts of aluminous shale, calcareous muds, and sands.

Cement kiln dust waste (CKD) means the fine particulate solids, associated with the production of Portland cement, which are collected by air pollution control devices used to clean the kiln exhaust.

Cement kiln dust waste landfill (CKDLF) unit means a discrete area of land or an excavation that receives CKD waste, and that is not a land application unit, surface impoundment, waste pile, as those terms are defined under § 257.2 of this chapter, or injection well as defined by 40 CFR Parts 144 and 146. A CKDLF unit may receive other types of non-hazardous industrial wastes, such as kiln brick, construction debris, mining overburden and other commercial solid waste (as defined in § 258.2 of this chapter). A CKDLF unit may be a new CKDLF unit, an existing CKDLF unit, or an expansion of an existing CKDLF unit.

EPA Regional Administrator means the chief administrative officer of the EPA Region responsible for implementing the Subtitle C solid waste permit program. This reference only applies to a State that has not chosen to create a CKD regulatory program under State law. In States with an authorized RCRA program, all references to the EPA Regional Administrator should be read as referring to the State Director, or other State official responsible for implementing the CKD regulatory program.

Existing CKDLF unit means any cement kiln dust waste landfill unit that is receiving CKD as of 90 days after the effective date of the final rule. Waste placement must be consistent with past operating practices or operating practices modified to ensure good management.

Facility means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of CKD.

Ground water means water below the land surface in a zone of saturation.

Expansion means a lateral or vertical expansion of the waste boundaries of an existing CKDLF unit.

Leachate means a liquid that has passed through or emerged from CKD and contains soluble, suspended, or miscible materials removed from such waste.

New CKDLF unit means any cement kiln dust landfill unit or lateral expansion of an existing CKDLF unit, that has not received waste prior to 90 days after the effective date of the final rule.

Person(s) managing CKD waste means any person responsible for transport, disposal or sale of any CKD waste, including owners and operators of CKD waste landfills.

Run-off means any rainwater, leachate, or other liquid that drains over land from any part of a facility.

Run-on means any rainwater, leachate, or other liquid that drains over land onto any part of a facility.

Saturated zone means that part of the earth's crust in which all voids are filled with water.

Uppermost aquifer means the geologic formation nearest the natural ground surface that is an aquifer, as well as, lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary. This definition specifically includes discontinuous aquifers which are perched.

Waste management unit boundary means a vertical surface located at the hydraulically downgradient limit of the unit. This vertical surface extends down into the uppermost aquifer.

§§ 259.3–259.9 [Reserved]

Subpart B—Location Restrictions

§ 259.10 Placement above the natural water table.

(a) CKD must be managed in a CKDLF unit with a base that is located above

the upper limit of the natural water table.

(b) For purposes of this section *natural water table* means the natural level at which water stands in a shallow well open along its length and penetrating the surficial deposits just deeply enough to encounter standing water at the bottom. This level is uninfluenced by ground-water pumping or other engineered activities.

§259.11 Floodplains.

(a) CKD shall not be managed in a CKDLF unit located in a 100-year floodplain unless a demonstration is made to the EPA Regional Administrator that the unit will not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human health and the environment. The person managing CKD waste must place a demonstration in the operating record and notify the EPA Regional Administrator that the demonstration has been placed in the operating record.

(b) For purposes of this Section:

(1) *Floodplain* means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, that are inundated by the 100-year flood.

(2) *100-year flood* means a flood that has a 1-percent or greater chance of recurring in any given year or a flood of a magnitude equaled or exceeded once in 100 years on the average over a significantly long period.

(3) *Washout* means the carrying away of solid waste by waters of the base flood.

§259.12 Wetlands.

(a) CKD shall not be managed in CKDLF units located in wetlands, unless the following demonstrations are made to the EPA Regional Administrator:

(1) Where applicable under section 404 of the Clean Water Act or applicable State wetlands laws, the presumption that a practicable alternative to the proposed landfill is available which does not involve wetlands is clearly rebutted;

(2) The construction and operation of the CKDLF unit will not:

(i) Cause or contribute to violations of any applicable State water quality standard,

(ii) Violate any applicable toxic effluent standard or prohibition under section 307 of the Clean Water Act,

(iii) Jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of a critical habitat, protected under the Endangered Species Act of 1973, and

(iv) Violate any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972 for the protection of a marine sanctuary;

(3) The CKDLF unit will not cause or contribute to significant degradation of wetlands. The integrity of the CKDLF unit and its ability to protect ecological resources must be demonstrated by addressing the following factors:

(i) Erosion, stability, and migration potential of native wetland soils, muds and deposits used to support the CKDLF unit;

(ii) Erosion, stability, and migration potential of dredged and fill materials used to support the CKDLF unit;

(iii) The volume and chemical nature of the waste managed in the CKDLF unit;

(iv) Impacts on fish, wildlife, and other aquatic resources and their habitat from release of the solid waste;

(v) The potential effects of catastrophic release of waste to the wetland and the resulting impacts on the environment; and

(vi) Any additional factors, as necessary, to demonstrate that ecological resources in the wetland are sufficiently protected.

(4) To the extent required under section 404 of the Clean Water Act or applicable State wetlands laws, steps have been taken to attempt to achieve no net loss of wetlands (as defined by acreage and function) by first avoiding impacts to wetlands to the maximum extent practicable as required by paragraph (a)(1) of this Section, then minimizing unavoidable impacts to the maximum extent practicable, and finally offsetting remaining unavoidable wetland impacts through all appropriate and practicable compensatory mitigation actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands); and (5) Sufficient information is available to make a reasonable determination with respect to these demonstrations.

(b) For purposes of this section, wetlands means those areas that are defined in 40 CFR 232.2(r).

(c) Nothing in this section affects the applicability of any other statute or regulation affecting management of CKD in wetlands, including the permitting requirements under section 404 of the Clean Water Act.

§259.13 Fault areas.

(a) CKD shall not be managed in a CKDLF unit located within 200 feet (60 meters) of a fault that has had displacement in Holocene time unless a demonstration is made to the EPA Regional Administrator that an alternative setback distance of less than 200 feet (60 meters) will prevent damage to the structural integrity of the CKDLF unit and will be protective of human health and the environment.

(b) For the purposes of this section:

(1) *Fault* means a fracture or a zone of fractures in any material along which strata on one side have been displaced with respect to that on the other side.

(2) *Displacement* means the relative movement of any two sides of a fault measured in any direction.

(3) *Holocene* means the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch to the present.

§259.14 Seismic impact zones.

(a) CKD shall not be managed in CKDLF units located in seismic impact zones, unless a demonstration is made to the EPA Regional Administrator that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site. The person managing CKD waste must place the demonstration in the operating record and notify the EPA Regional Administrator that it has been placed in the operating record.

(b) For the purposes of this Section:

(1) *Seismic impact zone* means an area with a ten percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g (i.e., 98.0 centimeters per second per second) in 250 years.

(2) *Maximum horizontal acceleration in lithified earth material* means the maximum expected horizontal acceleration depicted on a seismic hazard map, with a 90 percent or greater probability that the acceleration will not be exceeded in 250 years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.

(3) *Lithified earth material* means all rock, including all naturally occurring and naturally formed aggregates or masses of minerals or small particles of older rock that formed by crystallization of magma or by induration of loose sediments. This term does not include man-made materials, such as fill, concrete, and asphalt, or unconsolidated earth materials, soil, or regolith lying at or near the earth surface.

§ 259.15 Unstable areas.

(a) CKD shall not be managed in CKDLF units located in an unstable area unless a demonstration is made to the EPA Regional Administrator that engineering measures have been incorporated into the CKDLF unit's design to ensure that the integrity of the structural components of the CKDLF unit will not be disrupted. The person managing CKD waste must place the demonstration in the operating record and notify the EPA Regional Administrator that it has been placed in the operating record. The following factors, at a minimum, must be considered when determining whether an area is unstable:

(1) On-site or local soil conditions that may result in significant differential settling;

(2) On-site or local geologic or geomorphologic features; and

(3) On-site or local human-made features or events (both surface and subsurface).

(b) For purposes of this Section:

(1) *Unstable area* means a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains.

(2) *Structural components* means liners, leachate collection systems, final covers, run-on/run-off systems, and any other component used in the construction and operation of the CKDLF that is necessary for protection of human health and the environment.

(3) *Poor foundation conditions* means those areas where features exist which indicate that a natural or human-induced event may result in inadequate foundation support for the structural components of a CKDLF unit.

(4) *Areas susceptible to mass movement* means those areas of influence (i.e., areas characterized as having an active or substantial possibility of mass movement) where the movement of earth material at, beneath, or adjacent to the CKDLF unit, because of natural or human-induced events, results in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, soil fluction, block sliding, and rock fall.

§ 259.16 Karst terrains.

(a) CKD shall not be managed in CKDLF units located in karst terrain unless a demonstration is made to the EPA Regional Administrator that engineering measures have been incorporated into the CKDLF unit's design to ensure that the integrity of the structural components of the CKDLF unit will not be disrupted. The person managing CKD waste must place the demonstration in the operating record and notify the EPA Regional Administrator that it has been placed in the operating record. The following factors, at a minimum, must be considered when determining whether a terrain is karstic:

(1) On-site or local geologic or geomorphologic features;

(2) On-site or local soil conditions that may result in significant differential settling, collapse, or puncture of a landfill liner;

(3) On-site hydrology, including the character and direction of ground-water flow and points of discharge for the karst ground-water basin the facility may affect; and

(4) On-site or local human-made features or events (both surface and subsurface).

(b) For purposes of this Section:

(1) *Karst terrains* means areas where karst landscape, with its characteristic hydrogeology and/or landforms are developed. In karst terrain, ground-water flow generally occurs through an open system with both diffuse and conduit flow end member components, and typically has rapid ground-water flow velocities which exceed Darcian flow velocities. Composed of limestone, dolomite, gypsum and other soluble rock, karst terrain typically has well developed secondary porosity enhanced by dissolution. Landforms found in karst terrain include, but are not limited to, sinkholes, sinking streams, caves, springs and blind valleys. Karst terrains always include one or more springs for each ground-water basin, and underground streams except where ground-water flow is diffuse or the host rock has megaporosity.

(2) *Structural components* means liners, leachate collection systems, final covers, run-on/run-off systems, and any other component used in the construction and operation of the CKDLF that is necessary for protection of human health and the environment.

(3) *Conduit flow* means nonlinear to turbulent ground-water flow through an integrated system of conduits which behave hydraulically as a system of pipes. Conduit flow is typical of ground-water flow through thick, massive soluble rock such as limestone, where ground water is concentrated, flow is rapid and specific discharges are high. Turbulent conduit flow can be initiated in fractures as thin as 5 to 10 millimeters.

(4) *Darcian flow* means ground-water flow which follows Darcy's law, where the specific discharge is proportional to the hydraulic gradient. Darcian ground-water flow is typically linear and laminar, travels from 1×10^{-11} to 1×10^{2} centimeters per second, and is characteristic of ground-water flow through granular porous media.

(5) *Diffuse flow* means ground-water flow which is laminar and slow (within the range of Darcian flow velocities) through a system of joints and bedding planes that have had minimal solution enlargement.

§ 259.17 Regulation of agricultural use.

CKD shall not be used for agricultural purposes unless the CKD is mixed with sewage sludge and subject to 40 CFR Part 503 standards, or the waste meets the following requirements:

(a) CKD must not contain the toxic constituents arsenic, cadmium, lead, and thallium in excess of the following limits: arsenic—13 mg/kg, cadmium—22 mg/kg, lead—1500 mg/kg, and thallium—15 mg/kg.

(b) CKD must not contain chlorinated dioxins and furans in excess of 40 parts per trillion toxicity equivalent (TEQ).

(c) CKD destined for agricultural use must be sampled and analyzed by the generator prior to shipment for agricultural use to determine whether the waste has concentrations of toxic constituents in excess of those established in paragraphs (a) and (b) of this section.

(d) For all CKD shipped for beneficial agricultural use, the person generating CKD waste shall place in the operating record a notation listing the amount of CKD shipped and a letter of certification signed by a company representative verifying compliance with the provisions specified under paragraphs (a) and (b) of this section.

(e) For purposes of this section, *agricultural use* is defined as use of CKD as an agricultural lime substitute for the purpose of amending the soil to optimize pH or to promote the growth of crops or other foodstuffs. The Agency restricts this definition of use to CKD produced for use by the general public and not for the exclusive use of the owner or operator of the facility which generates the CKD waste.

§§ 259.18–259.19 [Reserved]

Subpart C—Air Criteria

§ 259.20 Air criteria for tanks, containers, or buildings.

(a) This section applies to cement kiln dust waste placed in temporary storage.

Such CKD must be covered or otherwise managed to control wind dispersal of dusts, or stored in tanks, containers or buildings that meet the following minimum standards:

(1) The tank, container, or building should be an engineered structure with a human-made floor, walls, and a roof all of which prevent water from reaching the stored CKD and are made of non-earthen materials providing structural support.

(2) The tank, container, or building must be free standing and not a surface impoundment (as defined in 40 CFR 257.2), be manufactured of a material suitable for storage of its contents, and meet appropriate specifications such as those established by either ASTM, API, or UL standards.

(b) For purposes of this section, *temporary storage* means interim storage of CKD designated for recycling, sale or final disposal.

(c) Alternative measures for fugitive dust control may be approved by the EPA Regional Administrator if a demonstration is made to the EPA Regional Administrator that the alternative measures are at least as effective in controlling wind dispersal of CKD as the minimum standards defined in paragraph (a) of this section. The person managing CKD waste must place the demonstration in the operating record and notify the EPA Regional Administrator that it has been placed in the operating record.

§ 259.21 Air criteria for trucks transporting cement kiln dust.

(a) CKD waste transported in trucks or other vehicles must be covered or otherwise managed to control wind dispersal of dust.

(b) Alternative measures for fugitive dust control may be approved by the EPA Regional Administrator if a demonstration is made to the EPA Regional Administrator that the alternative measures are at least as effective in controlling wind dispersal of CKD as the standards defined in paragraph (a) of this section. The person managing CKD waste must place the demonstration in the operating record and notify the EPA Regional Administrator that it has been placed in the operating record.

§ 259.22 Air criteria for landfills.

(a) CKD disposed in all CKDLF units must be managed in a manner that does not violate any applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the Administrator pursuant to section 110 of the Clean Air Act, as amended.

(b) CKD must be disposed in CKDLF units and expansions constructed so that such CKD is:

(1) Covered or otherwise managed to control wind dispersal of dust, or

(2) Emplaced as conditioned CKD to control wind dispersal, and

(3) Covered with a sufficient thickness of earthen material at the end of each operating day, or at more frequent intervals if necessary, except as provided in paragraph (d) of this section, to control blowing dust.

(c) For purposes of this section *conditioned CKD* means cement kiln dust that has been compacted in the field at appropriate moisture content using moderate to heavy equipment to attain 95% of the standard Proctor maximum dry density value according to ASTM D 698 or D 1557 test methods.

(d) Alternative measures for fugitive dust control may be approved by the EPA Regional Administrator if a demonstration is made to the EPA Regional Administrator that the alternative measures are at least as effective in controlling wind dispersal of CKD as the minimum standards defined in paragraphs (a), (b), and (c) of this section. The person managing CKD waste must place the demonstration in the operating record and notify the EPA Regional Administrator that it has been placed in the operating record.

§ 259.23 Recordkeeping requirements.

(a) An operating record of a CKDLF unit must be retained at the facility and/or in an alternative location approved by the EPA Regional Administrator. The following information must be recorded in the operating record as it becomes available:

(1) Any notification of violation required under paragraph (c) of this section;

(2) Any certification of compliance required under paragraph (d) of this section;

(3) Any location restriction demonstration required under Subpart B;

(4) Any CKDLF unit design documentation;

(5) Any demonstration, certification, finding, monitoring, testing, or analytical data required by Subpart E;

(6) Any demonstration, certification, testing, or analytical data required by § 259.17(d);

(7) Any plans for selected remedies as required by § 259.47;

(8) Closure and post-closure care plans and any monitoring, testing, or analytical data as required by §§ 259.50 and 259.51; and

(9) Any cost estimates and financial assurance documentation required by Subpart G of this part G.

(b) The person managing CKD waste must notify the EPA Regional Administrator when the documents from paragraph (a) of this section have been placed or added to the operating record, and all information contained in the operating record must be made available for inspection by the public at all reasonable times, and furnished upon request to the EPA Regional Administrator.

(c) The person managing CKD waste must notify the EPA Regional Administrator, in a letter signed by company management, whenever any standard of this rule is violated.

(d) The person managing CKD waste must submit a certification to the EPA Regional Administrator, signed by company management, once each year: throughout the active life and post-closure care period that a new or existing CKDLF unit is in compliance with the air criteria, ground-water monitoring, and corrective action provisions of subparts C and E of this part; and throughout the active life of the facility that all CKD managed on-site or sent off-site for beneficial use is disposed in compliance with all applicable provisions of this part. The certification must also certify that all records from paragraph (a) of this section are properly maintained and available to the public in accordance with the provisions of paragraph (b) of this section.

(e) The EPA Regional Administrator can set alternative schedules for recordkeeping and notification requirements as specified in paragraphs (a), (b), (c), (d) and (e) of this section.

§§ 259.24–259.29 [Reserved]

Subpart D—Design Criteria

§ 259.30 Design criteria.

(a) Prior to construction of a CKDLF unit in carbonate terrain, a karst ground-water investigation must be conducted to define the direction of ground-water flow and points of discharge for the karst ground-water basin(s) the facility may affect. The karst ground-water investigation shall include, but not be limited to, a karst inventory and a dye tracer study to identify springs which are hydrologically related to the CKDLF unit. The investigation must be certified by a qualified ground-water scientist and approved by the EPA Regional Administrator.

(b) The requirement for a karst ground-water investigation under this part may be suspended by the EPA Regional Administrator for a CKDLF unit if a demonstration is made that there is no potential for migration of

hazardous constituents from that CKDLF unit to the uppermost aquifer (as defined in § 259.2) during the active life of the unit and the post-closure care period. This demonstration must be certified by a qualified ground-water scientist and approved by the EPA Regional Administrator, and must be based upon:

(1) Site-specific field collected measurements, sampling and analysis of physical, chemical, and biological processes affecting contaminant fate and transport, and

(2) Contaminant fate and transport predictions that maximize contaminant migration and consider impacts on human health and environment.

(c) CKD must be managed in CKDLF units and lateral expansions constructed:

(1) In accordance with a design which ensures that the concentration values listed in Table 1 of this section shall not be exceeded in the uppermost aquifer at the relevant point of compliance (POC), as specified under paragraph (d) of this section, or

(2) With a composite liner, as defined in paragraph (d) of this section and a leachate collection system that is designed and constructed to maintain less than a 30 cm depth of leachate over the liner.

(d) For purposes of this Section, *composite liner* means a system consisting of two components; the upper component must consist of a minimum 30 mil flexible membrane liner (FML), and the lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than $1x10E^{-7}$ cm/sec. FML components consisting of high density polyethylene (HDPE) shall be at least 60 mil thick. The FML component must be installed in direct and uniform contact with the compacted soil component.

(e) When designing a CKDLF unit that complies with paragraph (c)(1) of this section, the following factors, at a minimum, must be considered:

(1) The hydrologic characteristics of the facility and surrounding land, especially the presence of karst terrain;

(2) The climatic factors of the area; and

(3) The volume and physical and chemical characteristics of the leachate.

(f) The relevant POC shall be no more than 150 meters from the waste management unit boundary and shall be located on land owned by the owner of the CKDLF unit. In determining the relevant POC, the following factors shall be considered:

(1) The hydrogeologic characteristics of the facility and surrounding land;

(2) The volume and physical and chemical characteristics of the leachate;

(3) The quantity, quality, and direction of flow of ground water;

(4) The proximity and withdrawal rate of the ground-water users;

(5) The availability of alternative drinking water supplies;

(6) The existing quality of the ground water, including other sources of contamination and their cumulative impacts on the ground water, and whether the ground water is currently used or reasonably expected to be used for drinking water; and

(7) Public health, safety, and welfare effects.

Table 1.—Concentration Limits for Metals in the Uppermost Aquifer

Chemical	MCL (mg/l)
Antimony	0.006
Arsenic	0.05
Barium	2.0
Beryllium	0.004
Cadmium	0.005
Chromium (total)	0.1
Lead	0.015[a]
Mercury	0.002
Selenium	0.05
Silver	0.01[b]
Thallium	0.002

[a] EPA Action level.
[b] Federal Secondary Drinking Water MCL.

(g) The person managing CKD waste must notify the EPA Regional Administrator when the documents from paragraph (a) of this section have been placed or added to the operating record, and all information contained in the operating record must be made available for inspection by the public at all reasonable times, and furnished upon request to the EPA Regional Administrator.

(h) Alternative CKDLF unit designs may be approved by the EPA Regional Administrator if a demonstration is made that the alternative unit designs protect ground water without presenting a threat to human health and the environment.

§§ 259.31-259.39 [Reserved]

Subpart E—Ground-Water Monitoring and Corrective Action

§ 259.40 Applicability.

(a) The requirements in this part apply to all new and existing CKDLF units, except as provided in paragraph (b) of this section.

(b) Ground-water monitoring requirements under §§ 259.41 through 259.45 may be suspended by the EPA Regional Administrator for a CKDLF unit if a demonstration is made that there is no potential for migration of hazardous constituents from that CKDLF unit to the uppermost aquifer (as defined in § 259.2) during the active life of the unit and the post-closure care period. This demonstration must be certified by a qualified ground-water scientist and approved by the EPA Regional Administrator, and must be based upon:

(1) Site-specific field collected measurements, sampling, and analysis of physical, chemical, and biological processes affecting contaminant fate and transport, and

(2) Contaminant fate and transport predictions that maximize contaminant migration and consider impacts on human health and the environment.

(c) Persons managing CKD waste in CKDLF units must comply with the ground-water monitoring requirements of this part according to the following schedule:

(1) Existing CKDLF units must be in compliance with the ground-water monitoring requirements specified in §§ 259.41 through 259.45 by two years after the effective date of the rule;

(2) New CKDLF units and expansions of existing CKDLF units must be in compliance with the ground-water monitoring requirements specified in §§ 259.41 through 259.45 before cement kiln dust waste can be placed in the unit.

(d) The person managing CKD waste must notify the EPA Regional Administrator once each year throughout the active life and post-closure care period that a new or existing CKDLF unit is in compliance with the ground-water monitoring and corrective action provisions of this Subpart.

(e) Once established at a CKDLF unit, ground-water monitoring shall be conducted throughout the active life and post-closure care period of that CKDLF unit as specified in § 259.51.

(f) For the purposes of this subpart, a *qualified ground-water scientist* is a scientist or engineer who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields as may be demonstrated by State registration, professional certifications, or completion of accredited university programs that enable that individual to make sound professional judgements regarding ground-water monitoring, contaminant fate and transport, and corrective action, particularly as they relate to karst terrain.

§259.41 Ground-water monitoring systems.

(a) A ground-water monitoring system must be installed that consists of a sufficient number of wells and/or springs, installed at appropriate locations and depths, to yield ground-water samples from the uppermost aquifer (as defined in §259.2). The ground-water monitoring system must include at a minimum one up-gradient and three down-gradient wells. Ground-water samples must:

(1) Represent the quality of background ground water that has not been affected by leakage from the unit being monitored. A determination of background quality may include sampling of wells and/or springs that are not hydraulically upgradient of the waste management area where:

(i) Hydrogeologic conditions do not allow the person managing CKD waste to determine what wells and springs are hydraulically upgradient; or

(ii) Sampling at other wells and springs will provide an indication of background ground-water quality that is as representative or more representative than that provided by the upgradient wells and springs; and

(2) Represent the quality of ground water passing the relevant POC. The downgradient monitoring system must be installed at the relevant POC (or at the waste management unit boundary) that ensures detection of ground-water contamination in the uppermost aquifer. When physical obstacles preclude installation of ground-water monitoring wells at the relevant POC at existing units, the down-gradient monitoring system may be installed at the closest practicable distance hydraulically down-gradient from the relevant POC that ensures detection of ground-water contamination in the uppermost aquifer.

(b) A multi-unit ground-water monitoring system may be installed instead of separate ground-water monitoring systems for each CKDLF unit when the facility has several units, provided the multi-unit ground-water monitoring system meets the requirement of paragraph (a) of this section and will be as protective of human health and the environment as individual monitoring systems for each CKDLF unit, based on the following factors:

(1) Number, spacing, and orientation of the CKDLF units;

(2) Hydrogeologic setting;

(3) Site history; and

(4) Engineering design of the CKDLF units.

(c) Monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of ground-water samples. The annular space (i.e., the space between the bore hole and well casing) above the sampling depth must be sealed to prevent contamination of samples and the ground water.

(1) The person managing CKD waste must notify the EPA Regional Administrator that the design, installation, development, and decommission of any monitoring wells, piezometers and other measurement, sampling, and analytical devices documentation has been placed in the operating record; and

(2) The monitoring wells, springs, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program.

(d) The number, spacing, and depths of monitoring systems shall be:

(1) Determined based upon site-specific technical information that must include thorough characterization of:

(i) Aquifer thickness, ground-water flow rate, ground-water flow direction including seasonal and temporal fluctuations in ground-water flow; and

(ii) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer; including, but not limited to: thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.

(2) Certified by a qualified ground-water scientist or approved by the EPA Regional Administrator. Within 14 days of this certification, the person managing CKD waste must notify the EPA Regional Administrator that the certification has been placed in the operating record.

§259.42 [Reserved]

§259.43 Ground-water sampling and analysis requirements.

(a) The ground-water monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of ground-water quality at the background and downgradient wells (and at springs respective to site hydrogeology) installed in compliance with §259.41(a). The person managing CKD waste must notify the EPA Regional Administrator that the sampling and analysis program documentation has been placed in the operating record and the program must include procedures and techniques for:

(1) Sample collection;

(2) Sample preservation and shipment;

(3) Analytical procedures;

(4) Chain of custody control; and

(5) Quality assurance and quality control.

(b) The ground-water monitoring program must include sampling and analytical methods that are appropriate for ground-water sampling and that accurately measure hazardous constituents and other monitoring parameters in ground-water samples. Ground-water samples shall not be field-filtered prior to laboratory analysis.

(c) The sampling procedures and frequency must ensure protection of human health and the environment.

(d) Ground-water elevations must be measured in each well immediately prior to purging, each time ground water is sampled. The rate and direction of ground-water flow must be determined each time ground water is sampled. Ground-water elevations in wells which monitor the same waste management area must be measured within a period of time short enough to avoid temporal variations in ground-water flow which could preclude accurate determination of ground-water flow rate and direction.

(e) The background ground-water quality must be established in a hydraulically upgradient or background well(s) (and spring(s) if appropriate) for each of the monitoring parameters or constituents required in the particular ground-water monitoring program that applies to the CKDLF unit, as determined under §259.44(a) or §259.45(a). Background ground-water quality may be established at wells (and springs if appropriate) that are not located hydraulically upgradient from the CKDLF unit if it meets the requirements of §259.41(a)(1).

(f) The number of samples collected to establish ground-water quality data must be consistent with the appropriate statistical procedures determined pursuant to paragraph (g) of this section. The sampling procedures shall be those specified under §259.44(b) for detection monitoring, §259.45(b) and (d) for assessment monitoring, and §259.46(b) for corrective action.

(g) One of the following statistical methods to be used in evaluating ground-water monitoring data must be specified in the operating record for each hazardous constituent. The statistical test chosen shall be

conducted separately for each hazardous constituent in each well (and spring if appropriate).

(1) A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.

(2) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.

(3) A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.

(4) A control chart approach that gives control limits for each constituent.

(5) Another statistical test method that meets the performance standards of paragraph (h) of this section. The person managing CKD waste must place a justification for this alternative in the operating record and notify the EPA Regional Administrator of the use of this alternative test. The justification must demonstrate that the alternative method meets the performance standards of paragraph (h) of this section.

(h) Any statistical method chosen under paragraph (g) of this section shall comply with the following performance standards, as appropriate:

(1) The statistical method used to evaluate ground-water monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the person managing CKD waste to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed.

(2) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a ground-water protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type I experimental error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts.

(3) If a control chart approach is used to evaluate ground-water monitoring data, the specific type of control chart and its associated parameter values shall be protective of human health and the environment. The parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(4) If a tolerance interval or a predictional interval is used to evaluate ground-water monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain shall be protective of human health and the environment. These parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(5) The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit (pql) that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

(6) If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

(i) The person managing CKD waste must determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the particular ground-water monitoring program that applies to the CKDLF unit, as determined under § 259.44(a) or § 259.45(a).

(1) In determining whether a statistically significant increase has occurred, the person managing CKD waste must compare the ground-water quality of each parameter or constituent at each monitoring well (and spring if appropriate) designated pursuant to § 259.41(a)(2) to the background value of that constituent, according to the statistical procedures and performance standards specified under paragraphs (g) and (h) of this section.

(2) Within 14 days after completing sampling and analysis, the person managing CKD waste must determine whether there has been a statistically significant increase over background at each monitoring well and spring.

§ 259.44 Detection monitoring program.

(a) Detection monitoring is required at CKDLF units at all ground-water monitoring wells (and springs if appropriate) defined under §§ 259.41 (a)(1) and (a)(2). At a minimum, a detection monitoring program must include the monitoring for the constituents listed in Appendix I to this part.

(1) The EPA Regional Administrator may delete any of the Appendix I of this part monitoring parameters for a CKDLF unit if it can be shown that the removed constituents are not reasonably expected to be in, mobilized by, or derived from the CKD contained in the unit.

(2) The EPA Regional Administrator may establish an alternative list of inorganic indicator parameters for a CKDLF unit, in lieu of some or all of the heavy metals, if the alternative parameters provide a reliable indication of inorganic releases from the CKDLF unit to the ground water. In determining alternative parameters, the EPA Regional Administrator shall consider the following factors:

(i) The types, quantities, and concentrations of constituents in wastes managed at the CKDLF unit;

(ii) The mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the CKDLF unit;

(iii) The detectability of indicator parameters, waste constituents, and reaction products in the ground water; and

(iv) The concentration or values and coefficients of variation of monitoring parameters or constituents in the ground-water background.

(b) The monitoring frequency for all constituents listed in Appendix I to this part, or in the alternative list approved in accordance with paragraph (a)(2) of this section, shall be at least semiannual during the active life of the facility (including closure) and the post-closure period. A minimum of four independent samples from each background and downgradient well (and spring if appropriate) must be collected and analyzed for the constituents listed in Appendix I of this part, or the alternative list approved in accordance with paragraph (a)(2) of this section,

during the first semiannual sampling event.

(c) At least one sample from each background and downgradient well (and spring if appropriate) must be collected and analyzed during subsequent semiannual sampling events. The EPA Regional Administrator may specify an appropriate alternative frequency for repeated sampling and analysis for constituents listed in Appendix I of this part, or the alternative list approved in accordance with paragraph (a)(2) of this Section, during the active life (including closure) and the post-closure care period. The alternative frequency during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the following factors:

(1) Lithology of the aquifer and unsaturated zone;
(2) Hydraulic conductivity of the aquifer and unsaturated zone;
(3) Ground-water flow rates;
(4) Minimum distance between upgradient edge of the CKDLF unit and downgradient monitoring well screen (minimum distance of travel);
(5) Storm hydrograph of springs, if appropriate; and
(6) Resource value of the aquifer.

(d) If the person managing CKD waste determines, pursuant to §259.43(g), that there is a statistically significant increase over background for one or more of the constituents listed in Appendix I to this part at any monitoring well (or spring if appropriate) at the boundary specified under §259.41(a)(2), the person managing CKD waste:

(1) Must, within 14 days of this finding, place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels, and notify the EPA Regional Administrator of this finding that this notice was placed in the operating record; and

(2) Must establish an assessment monitoring program meeting the requirements of §259.45 within 90 days, except as provided for in paragraph (c)(3) of this section.

(3) The owner/operator may demonstrate that a source other than a CKDLF unit caused the contamination or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting this demonstration must be certified by a qualified ground-water scientist and be placed in the operating record. If a successful demonstration is made and documented, the person managing CKD waste may continue detection monitoring as specified in this Section. If, after 90 days, a successful demonstration is not made, the person managing CKD waste must initiate an assessment monitoring program as required in §259.45.

§259.45 Assessment monitoring program.

(a) Assessment monitoring is required whenever a statistically significant increase over background has been detected for one or more of the constituents listed in the Appendix I of this part.

(b) Within 90 days of triggering an assessment monitoring program, and annually thereafter, the person managing CKD waste must sample and analyze the ground water for the following hazardous metal constituents identified in Appendix VIII of Part 261 of this chapter: antimony, arsenic, barium, beryllium, cadmium, chromium (total), lead, mercury, nickel, selenium, silver, and thallium. A minimum of one sample from each downgradient well (and spring if appropriate) must be collected and analyzed during each sampling event. For any constituent detected in the downgradient wells (and springs if appropriate) as a result of the metal constituent analysis of Appendix VIII of Part 261 of this chapter, a minimum of four independent samples from each background and downgradient well (and spring if appropriate) must be collected and analyzed to establish background for the constituents. The EPA Regional Administrator may specify an appropriate subset of wells (and springs if appropriate) to be sampled and analyzed for metal constituents (as listed in Appendix VIII of Part 261 of this chapter) during assessment monitoring. The EPA Regional Administrator may delete any of the metal constituent monitoring parameters required by paragraph (b) of this section for a CKDLF unit if it can be shown that the removed constituents are not reasonably expected to be in, mobilized by, or derived from the waste contained in the unit.

(c) The EPA Regional Administrator may specify an appropriate alternate frequency for repeated sampling and analysis for the set of metal constituents (as listed in Appendix VIII of Part 261 of this chapter) required by paragraph (b) of this Section, during the active life (including closure) and post-closure care of the unit considering the following factors:

(1) Lithology of the aquifer and unsaturated zone;
(2) Hydraulic conductivity of the aquifer and unsaturated zone;
(3) Ground-water flow rates;
(4) Minimum distance between upgradient edge of the CKDLF unit and downgradient monitoring well screen (minimum distance of travel);
(5) Storm hydrograph of springs if appropriate: and
(6) Resource value of the aquifer; and
(7) Nature (fate and transport) of any constituents detected in response to this Section.

(d) After obtaining the results from the initial or subsequent sampling events required in paragraph (b) of this Section, the person managing CKD waste must:

(1) Within 14 days, place a notice in the operating record identifying the metal constituents (as listed in Appendix VIII of Part 261 of this chapter) that have been detected and notify the EPA Regional Administrator of the identified constituents and that this notice has been placed in the operating record;

(2) Within 90 days, and on at least a semiannual basis thereafter, resample all wells (and springs if appropriate) specified by §259.41(a), conduct analyses for all constituents in Appendix I of this part, and for those metal constituents in Appendix VIII of Part 261 of this chapter that are detected in response to paragraph (b) of this Section, and record their concentrations in the facility operating record. At least one sample from each background and downgradient well (and spring if appropriate) must be collected and analyzed during these sampling events.

(3) Establish background concentrations for any constituents detected pursuant to paragraph (b) or (d)(2) of this Section; and

(4) Establish ground-water protection standards for all constituents detected pursuant to paragraph (b) or (d) of this Section. The ground-water protection standards shall be established in accordance with paragraph (h) of this Section.

(e) If the concentrations of all metal constituents (as listed in Appendix VIII of Part 261 of this chapter) are shown to be at or below background values, using the statistical procedures in §259.43(g), for two consecutive sampling events, the person managing CKD waste must notify the EPA Regional Administrator of this finding prior to returning to detection monitoring.

(f) If the concentrations of any metal constituents (as listed in Appendix VIII of Part 261 of this chapter) are above background values, but all concentrations are below the ground-water protection standard established under paragraph (h) of this Section,

using the statistical procedures in § 259.43(g), the person managing CKD waste must continue assessment monitoring in accordance with this Section.

(g) If one or more metal constituents (as listed in Appendix VIII of Part 261 of this chapter) are detected at statistically significant levels above the ground-water protection standard established under paragraph (h) of this section in any sampling event, the person managing CKD waste must, within 14 days of this finding, place a notice in the operating record identifying the metal constituents that have exceeded the ground-water protection standard and notify the EPA Regional Administrator and all appropriate local government officials that the notice has been placed in the operating record. The person managing CKD waste must also:

(1)(i) Characterize the nature and extent of the release by installing additional monitoring wells as necessary;

(ii) Install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with paragraph (d)(2) of this Section;

(iii) Notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off-site if indicated by sampling of wells (and springs if appropriate) in accordance with paragraph (g)(1) of this section; and

(iv) Initiate an assessment of corrective measures as required by § 259.46 within 90 days; or

(2) May demonstrate that a source other than a CKDLF unit caused the contamination, or that the SSI increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting this demonstration must be certified by a qualified ground-water scientist and placed in the operating record. If a successful demonstration is made, the person managing CKD waste must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the metal constituents (as listed in Appendix VIII of part 261 of this chapter) are at or below background as specified in paragraph (e) of this section. Until a successful demonstration is made, the person managing CKD waste must comply with paragraph (g) of this section including initiating an assessment of corrective measures.

(h) The person managing CKD waste must establish a ground-water protection standard for each metal constituent (as listed in Appendix VIII of Part 261 of this chapter) detected in the ground water. The ground-water protection standard shall be:

(1) For constituents for which a maximum contaminant level (MCL) has been promulgated under section 1412 of the Safe Drinking Water Act (codified) under 40 CFR Part 141, the MCL for that constituent;

(2) For constituents for which MCLs have not been promulgated, the background concentration for the constituent established from wells in accordance with § 259.41(a)(1); or

(3) For constituents for which the background level is higher than the MCL identified under paragraph (h)(1) of this section or health based levels identified under paragraph (i)(1) of this section, the background concentration.

(i) The Director of an approved State may establish an alternative ground-water protection standard for constituents for which MCLs have not been established. These ground-water protection standards shall be appropriate health based levels that satisfy the following criteria:

(1) The level is derived in a manner consistent with Agency guidelines for assessing the health risks of environmental pollutants;

(2) The level is based on scientifically valid studies conducted in accordance with the Toxic Substances Control Act Good Laboratory Practice Standards (40 CFR Part 792) or equivalent;

(3) For carcinogens, the level represents a concentration associated with an excess lifetime cancer risk level (due to continuous lifetime exposure) with the $1x10^{-4}$ to $1x10^{-6}$ range; and

(4) For systemic toxicants, the level represents a concentration to which the human population (including sensitive subgroups) could be exposed to on a daily basis that is likely to be without appreciable risk of deleterious effects during a lifetime. For purposes of this subpart, systemic toxicants include toxic chemicals that cause effects other than cancer or mutations.

(j) In establishing ground-water protection standards under paragraph (i) of this section, the Director of an approved State may consider the following:

(1) Multiple contaminants in the ground water;

(2) Exposure threats to sensitive environmental receptors; and

(3) Other site-specific exposure or potential exposure to ground water.

§ 259.46 Assessment of corrective measures.

(a) Within 90 days of finding that any of the metal constituents listed in Appendix VIII of Part 261 of this chapter have been detected at a statistically significant level exceeding the ground-water protection standards defined under § 259.45(h), the person managing CKD waste must initiate an assessment of corrective measures. Such an assessment must be completed within 90 days, or within an alternative period of time decided by the EPA Regional Administrator.

(b) The person managing CKD waste must continue to monitor in accordance with the assessment monitoring program as specified in § 259.45.

(c) The assessment shall include an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives of the remedy as described under § 259.47, addressing at least the following:

(1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;

(2) The time required to begin and complete the remedy;

(3) The costs of remedy implementation; and

(4) The institutional requirements such as State or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedies.

(d) The person managing CKD waste must discuss the results of the corrective measures assessment, prior to the selection of remedy, in a public meeting with interested and affected parties.

§ 259.47 Selection of remedy.

(a) Within 90 days of completing an assessment of corrective measures conducted under § 259.46, the person managing CKD waste must select a remedy that, at a minimum, meets the standards listed in paragraph (b) of this section. Within 14 days of selecting a remedy, the person managing CKD waste must submit to the EPA Regional Administrator a report describing the selected remedy which demonstrates how the remedy meets the standards in paragraph (b) of this section. The report must include a notification that the owner and operator has placed a copy of the report in the operating record.

(b) Remedies must:

(1) Be protective of human health and the environment;

(2) Attain the ground-water protection standard as specified pursuant to §259.45(h);

(3) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of metal constituents (as listed in Appendix VIII of Part 261 of this chapter) into the environment that may pose a threat to human health or the environment; and

(4) Comply with standards for management of wastes as specified in §259.48(d).

(c) In selecting a remedy that meets the standards of paragraph (b) of this section, the person managing CKD waste shall consider the following evaluation factors:

(1) The long- and short-term effectiveness and protectiveness of the potential remedies, along with the degree of certainty that the remedy will prove successful based on consideration of the following:

(i) Magnitude of reduction of existing risks;

(ii) Magnitude of residual risks in terms of likelihood of further releases due to waste remaining following implementation of a remedy;

(iii) The type and degree of long-term management required, including monitoring, operation, and maintenance;

(iv) Short-term risks that might be posed to the community, workers, or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redisposal of containment;

(v) Time until full protection is achieved;

(vi) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, redisposal, or containment;

(vii) Long-term reliability of the engineering and institutional controls; and

(viii) Potential need for replacement of the remedy.

(2) The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:

(i) The extent to which containment practices will reduce further releases; and

(ii) The extent to which treatment technologies may be used.

(3) The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors:

(i) Degree of difficulty associated with constructing the technology;

(ii) Expected operational reliability of the technologies;

(iii) Need to coordinate with and obtain necessary approvals and permits from other agencies;

(iv) Availability of necessary equipment and specialists; and

(v) Available capacity and location of needed treatment, storage, and disposal services.

(4) Practicable capability of the person managing CKD waste, including a consideration of the technical and economic capability.

(5) The degree to which community concerns are addressed by a potential remedy(s).

(d) The person managing CKD waste shall specify as part of the selected remedy a schedule(s) for initiating and completing remedial activities. Such a schedule must require the initiation of remedial activities within 90 days taking into consideration the factors set forth in paragraphs (d) (1) through (8) of this section. The person managing CKD waste must consider the following factors in determining the schedule of remedial activities:

(1) Extent and nature of contamination;

(2) Practical capabilities of remedial technologies in achieving compliance with ground-water protection standards established under §259.45 (g) or (h) and other objectives of the remedy;

(3) Availability of treatment or disposal capacity for wastes managed during implementation of the remedy;

(4) Desirability of utilizing technologies that are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives;

(5) Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy;

(6) Resource value of the aquifer including:

(i) Current and future uses;

(ii) Proximity and withdrawal rate of users;

(iii) Ground-water quantity and quality;

(iv) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

(v) The hydrogeologic characteristics of the facility and surrounding land;

(vi) Ground-water removal and treatment costs; and

(vii) The cost and availability of alternative water supplies.

(7) Other relevant factors.

(e) The EPA Regional Administrator may determine an alternative period of time for the person managing CKD waste to initiate or complete remedial activities pursuant to paragraph (d) of this section.

(f) The EPA Regional Administrator may determine that remediation of a release of a constituent (as listed in Appendix VIII of Part 261 of this chapter) from a CKDLF unit is not necessary if the person managing CKD waste demonstrates to the satisfaction of the EPA Regional Administrator that:

(1) The ground water is additionally contaminated by substances that have originated from a source other than a CKDLF unit and those substances are present in concentrations such that cleanup of the release from the CKDLF unit would provide no significant reduction in risk to actual or potential receptors; or

(2) The constituent(s) is present in ground water that:

(i) Is not currently or reasonably expected to be a source of drinking water; and

(ii) Is not hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in a concentration(s) that would exceed the ground-water protection standards established under §259.45(h); or

(3) Remediation of the release(s) is technically impracticable; or

(4) Remediation results in unacceptable cross-media impacts.

(g) This section shall not affect the authority of the EPA Regional Administrator to require the person managing CKD waste to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the ground water, to prevent exposure to the ground water, or to remediate the ground water to concentrations that are technically practicable and significantly reduce threats to human health or the environment.

§259.48 Implementation of the corrective action program.

(a) Based on the schedule established under §259.47(d) for initiation and completion of remedial activities, the owner/operator must:

(1) Establish and implement a corrective action ground-water monitoring program that:

(i) At a minimum, meets the requirements of an assessment monitoring program under §259.45;

(ii) Indicates the effectiveness of the corrective action remedy; and

(iii) Demonstrates compliance with ground-water protection standards pursuant to paragraph (e) of this section.

(2) Implement the corrective action remedy selected under § 259.47; and

(3) Take any interim measures necessary to ensure the protection of human health and the environment. Interim measures should, to the greatest extent practicable, be consistent with the objectives of and contribute to the performance of any remedy that may be required pursuant to § 259.47. The following factors must be considered by a person managing CKD waste in determining whether interim measures are necessary:

(i) Time required to develop and implement a final remedy;

(ii) Actual or potential exposure of nearby populations or environmental receptors to hazardous constituents;

(iii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;

(iv) Further degradation of the ground water that may occur if remedial action is not initiated expeditiously;

(v) Weather conditions that may cause hazardous constituents to migrate or be released;

(vi) Potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and

(vii) Other situations that may pose threats to human health and the environment.

(b) A person managing CKD waste may determine, based on information developed after implementation of the remedy has begun or other information, that compliance with requirements of § 259.47(b) are not being achieved through the remedy selected. In such cases, the person managing CKD waste must implement other methods or techniques that could practicably achieve compliance with the requirements, unless the person managing CKD waste makes the determination under paragraph (c) of this section.

(c) If the person managing CKD waste determines that compliance with requirements under § 259.47(b) cannot be practically achieved with any currently available methods, the person managing CKD waste must:

(1) Obtain certification of a qualified ground-water scientist or approval by the EPA Regional Administrator that compliance with requirements under § 259.47(b) cannot be practically achieved with any currently available methods;

(2) Implement alternate measures to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment; and

(3) Implement alternate measures for control of the sources of contamination, or for removal or decontamination of equipment, units, devices, or structures that are:

(i) Technically practicable; and

(ii) Consistent with the overall objective of the remedy.

(4) Notify the EPA Regional Administrator within 14 days that a report justifying the alternative measures prior to implementing the alternative measures has been placed in the operating record.

(d) All solid wastes that are managed pursuant to a remedy required under § 259.47, or an interim measure required under paragraph (a)(3) of this section, shall be managed in a manner:

(1) That is protective of human health and the environment; and

(2) That complies with applicable RCRA requirements.

(e) Remedies selected pursuant to § 259.47 shall be considered complete when:

(1) The person managing CKD waste complies with the ground-water protection standards established under §§ 259.45(h) at all points within the plume of contamination that lie beyond the ground-water monitoring well (and spring system if appropriate) established under § 259.41(a).

(2) Compliance with the ground-water protection standards established under § 259.45(h) has been achieved by demonstrating that concentrations of metal constituents (as listed in Appendix VIII of Part 261 of this chapter) have not exceeded the ground-water protection standards for a period of three consecutive years using the statistical procedures and performance standards in § 259.43 (g) and (h). The EPA Regional Administrator may specify an alternative length of time during which the person managing CKD waste must demonstrate that concentrations of metal constituents (as listed in Appendix VIII of Part 261 of this chapter) have not exceeded the ground-water protection standards taking into consideration:

(i) Extent and concentration of the release;

(ii) Behavior characteristics of the hazardous constituents in the ground water;

(iii) Accuracy of monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy; and

(iv) Characteristics of the ground water.

(3) All actions required to complete the remedy have been satisfied.

(f) Upon completion of the remedy, the person managing CKD waste must notify the EPA Regional Administrator within 14 days that a certification that the remedy has been completed in compliance with the requirements of paragraph (e) of this section has been placed in the operating record. The certification must be signed by the person managing CKD waste and by a qualified ground-water scientist or approved by the EPA Regional Administrator.

(g) When, upon completion of the certification, the person managing CKD waste determines that the corrective action remedy has been completed in accordance with the requirements under paragraph (e) of this section, the person managing CKD waste shall be released from the requirements for financial assurance for corrective action under § 259.63.

§ 259.49 [Reserved]

Subpart F—Closure And Post-Closure Care

§ 259.50 Closure criteria.

(a) A final cover system must be installed at all CKDLF units that is designed to minimize infiltration and erosion. The final cover system must be designed and constructed to:

(1) Have a saturated hydraulic conductivity less than or equal to the saturated hydraulic conductivity of any bottom liner system or natural subsoils present, or a saturated hydraulic conductivity no greater than $1x10^{-5}$ cm/sec, whichever is less, and

(2) Minimize infiltration through the closed CKDLF by the use of an infiltration layer that contains a minimum 18-inches of earthen material, and

(3) Minimize erosion of the final cover by the use of an erosion layer that contains a sufficient thickness of earthen material that is capable of sustaining native plant growth, and

(4) Minimize the disruption of the final cover through a design that accommodates settling and subsidence.

(b) The EPA Regional Administrator may approve an alternative final cover design that includes:

(1) An infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (a)(1) and (a)(2) of this section, and

(2) An erosion layer that provides equivalent protection from wind and water erosion as the erosion layer specified in paragraph (a)(3) of this section.

(c) The person managing CKD waste must prepare a written closure plan that describes the steps necessary to close all CKDLF units at any point during their active life in accordance with the cover design requirements in paragraphs (a) or (b) of this section, as applicable. The closure plan, at a minimum, must include the following information:

(1) A description of the final cover, designed in accordance with paragraph (a) of this section and the methods and procedures to be used to install the cover;

(2) An estimate of the largest area of the CKDLF unit ever requiring a final cover as required under paragraph (a) of this section at any time during the active life;

(3) An estimate of the maximum inventory of wastes ever on-site over the active life of the landfill facility; and

(4) A schedule for completing all activities necessary to satisfy the closure criteria in this section.

(d) The person managing CKD waste must notify the EPA Regional Administrator that a closure plan has been prepared and placed in the operating record no later than the effective date of this rule, or by the date of initial receipt of waste, whichever is later.

(e) Prior to beginning closure of each CKDLF unit as specified in paragraph (f) of this section, the person managing CKD waste must notify the EPA Regional Administrator that a notice of the intent to close the unit has been placed in the operating record.

(f) The closure activities of each CKDLF unit must begin no later than 30 days after the date on which the CKDLF unit receives the known final receipt of wastes or, if the CKDLF unit has remaining capacity and there is a reasonable likelihood that the CKDLF unit will receive additional wastes, no later than one year after the most recent receipt of wastes. Extensions beyond the one-year deadline for beginning closure may be granted by the EPA Regional Administrator if the person managing CKD waste demonstrates that the CKDLF unit has the capacity to receive additional wastes and the person managing CKD waste has taken and will continue to take all steps necessary to prevent threats to human health and the environmental from the unclosed CKDLF unit.

(g) The closure activities of all CKDLF units must be completed in accordance with the closure plan within 180 days following the beginning of closure as specified in paragraph (f) of this Section. Extensions of the closure period may be granted by the EPA Regional Administrator if the person managing CKD waste demonstrates that closure will, of necessity, take longer than 180 days and he or she has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed CKDLF unit.

(h) Within 14 days following closure of each CKDLF unit, the person managing CKD waste must notify the EPA Regional Administrator that a certification, signed by an independent registered professional engineer, facility management, or approved by the EPA Regional Administrator, verifying that closure has been completed in accordance with the closure plan, has been placed in the operating record.

(i)(1) Within 14 days following closure of all CKDLF units, the person managing CKD waste must record a notation on the deed to the landfill facility property, or some other instrument that is normally examined during title search, and notify the EPA Regional Administrator that the notation has been recorded and a copy has been placed in the operating record.

(2) The notation on the deed must in perpetuity notify any potential purchaser of the property that the land has been used for disposal of CKD waste.

(j) The person managing CKD waste may request permission from the EPA Regional Administrator to remove the notation from the deed if all CKD waste has been removed from the facility.

§ 259.51 Post-closure care requirements.

(a) Following closure of each CKDLF unit, the person managing CKD waste must conduct post-closure care. Post-closure care must be conducted for 30 years, except as provided under paragraph (b) of this Section, and consist of at least the following:

(1) Maintaining the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;

(2) Maintaining and operating the leachate collection system in accordance with the requirements in § 259.30, if applicable. The EPA Regional Administrator may allow the person managing CKD waste to stop managing leachate if the person managing CKD waste demonstrates that leachate no longer poses a threat to human health and the environment; and

(3) Monitoring the ground water in accordance with the requirements of Subpart E of this part and maintaining the ground-water monitoring system, if applicable.

(b) The length of the post-closure care period may be:

(1) Decreased by the EPA Regional Administrator if the person managing CKD waste demonstrates that the reduced period is sufficient to protect human health and the environment and this demonstration is approved by the EPA Regional Administrator; or

(2) Increased by the EPA Regional Administrator if the EPA Regional Administrator determines that the lengthened period is necessary to protect human health and the environment.

(c) For all CKDLF units the person managing CKD waste must prepare a written post-closure care plan that includes, at a minimum, the following information:

(1) A description of the monitoring and maintenance activities required in paragraph (a) of this Section for each CKDLF unit, and the frequency at which these activities will be performed;

(2) Name, address, and telephone number of the person or office to contact about the facility during the post-closure period; and

(3) A description of the planned uses of the property during the post-closure period. Post-closure use of the property shall not disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements in this part. The EPA Regional Administrator may approve any other disturbance if the person managing CKD waste demonstrates that disturbance of the final cover, liner or other component of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment.

(d) The person managing CKD waste must notify the EPA Regional Administrator that a post-closure care plan has been prepared and placed in the operating record no later than the effective date of this rule, or by the date of initial receipt of waste, whichever is later.

(e) Within 14 days following completion of the post-closure care period for each CKDLF unit, the person managing CKD waste must notify the EPA Regional Administrator that a certification, signed by an independent, registered professional engineer or approved by the EPA Regional Administrator, verifying that post-closure care has been completed in accordance with the post-closure plan, has been placed in the operating record.

§§ 259.52–259.59 [Reserved]

Subpart G—Financial Assurance Criteria

§ 259.60 Applicability.

(a) The requirements of this section apply to owners and operators of all CKDLF units, except owners or operators who are State or Federal Government entities whose debts and liabilities are the debts and liabilities of a State or the United States.

(b) In this part, Owner means the person(s) who owns a CKDLF unit or part of a CKDLF unit.

Operator means the person(s) responsible for the overall operation of a CKDLF unit or part of a CKDLF unit.

§ 259.61 Financial assurance for closure.

(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to close the largest area of all CKDLF units ever requiring a final cover as required under § 259.50 at any time during the active life in accordance with the closure plan. The owner or operator must notify the EPA Regional Administrator that the estimate has been placed in the operating record.

(1) The cost estimate must equal the cost of closing the largest area of all CKDLF unit ever requiring a final cover at any time during the active life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan (see § 259.50(c)(2)).

(2) During the active life of the CKDLF unit, the owner or operator must annually adjust the closure cost estimate for inflation.

(3) The owner or operator must increase the closure cost estimate and the amount of financial assurance provided under paragraph (b) of this Section if changes to the closure plan or CKDLF unit conditions increase the maximum cost of closure at any time during the remaining active life.

(4) The owner or operator may reduce the closure cost estimate and the amount of financial assurance provided under paragraph (b) of this Section if the cost estimate exceeds the maximum cost of closure at any time during the remaining life of the CKDLF unit. Within 14 days of this finding, the person managing CKD waste must notify the EPA Regional Administrator that the justification for the reduction of the closure cost estimate and the amount of financial assurance has been placed in the operating record.

(b) For each CKDLF unit receiving CKD waste after the effective date of the rule, the owner or operator must establish financial assurance for closure in compliance with § 259.64. The owner or operator must provide continuous coverage for closure until released from financial assurance requirements by demonstrating compliance with § 259.50 (h) and (i).

§ 259.62 Financial assurance for post-closure care.

(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to conduct post-closure care for the CKDLF unit in compliance with the post-closure care plan developed under § 259.51. The post-closure care cost estimate used to demonstrate financial assurance in paragraph (b) of this Section must account for the total costs of conducting post-closure care, including annual and periodic costs as described in the post-closure care plan over the entire post-closure care period. The owner or operator must notify the EPA Regional Administrator that the estimate has been placed in the operating record.

(1) The cost estimate for post-closure care must be based on the most expensive costs of post-closure care during the entire post-closure care period.

(2) During the active life of the CKDLF unit and during the post-closure care period, the owner or operator must annually adjust the post-closure cost estimate for inflation.

(3) The owner or operator must increase the post-closure care cost estimate and the amount of financial assurance provided under paragraph (b) of this section if changes in the post-closure plan or CKDLF unit conditions increase the maximum costs of post-closure care.

(4) The owner or operator may reduce the post-closure care cost estimate and the amount of financial assurance provided under paragraph (b) of this section if the cost estimate exceeds the maximum costs of post-closure care remaining over the post-closure care period. Within 14 days of this finding, the owner or operator must notify the EPA Regional Administrator that the justification for the reduction of the post-closure cost estimate and the amount of financial assurance has been placed in the operating record.

(b) The owner or operator of each CKDLF unit must establish, in a manner in accordance with § 259.64, financial assurance for the costs of post-closure care as required under § 259.51. The owner or operator must provide continuous coverage for post-closure care until released from financial assurance requirements for post-closure care by demonstrating compliance with § 259.51(e).

§ 259.63 Financial assurance for corrective action.

(a) An owner or operator in a CKDLF unit required to undertake a corrective action program under § 259.48 must have a detailed written estimate, in current dollars, of the cost of hiring a third party to perform the corrective action in accordance with the program required under § 259.48. The corrective action cost estimate must account for the total costs of corrective action activities as described in the corrective action plan for the entire corrective action period. Prior to undertaking corrective action under § 259.48, the owner or operator must notify the EPA Regional Administrator that the estimate has been placed in the operating record.

(1) The owner or operator must annually adjust the estimate for inflation until the corrective action program is completed in accordance with § 259.48(f).

(2) The owner or operator must increase the corrective action cost estimate and the amount of financial assurance provided under paragraph (b) of this section if changes in the corrective action program or CKDLF unit conditions increase the maximum costs of corrective action.

(3) The owner or operator may reduce the amount of the corrective action cost estimate and the amount of financial assurance provided under paragraph (b) of this section if the cost estimate exceeds the maximum remaining costs of corrective action. Within 14 days of making an annual adjustment under paragraph (a)(1) of this section, the owner or operator must notify the EPA Regional Administrator that the justification for the reduction or increase of the corrective action cost estimate and the amount of financial assurance has been placed in the operating record.

(b) An owner or operator in a CKDLF unit, if required to undertake a corrective action program under § 259.48 must establish financial assurance using the allowable mechanisms defined under § 259.64. An owner or operator in a CKDLF unit must establish financial assurance for all corrective action programs initiated during the active life of the unit, closure, and post-closure care periods. The owner or operator must provide continuous coverage for corrective action until released from financial assurance requirements for corrective action by demonstrating compliance with §§ 259.48 (f) and (g).

§ 259.64 Allowable mechanisms.

The mechanisms used to demonstrate financial assurance under this Section must ensure that the funds necessary to meet the costs of closure, post-closure care, and corrective action for known releases will be available whenever they are needed. Persons managing CKD waste must choose from the options specified in paragraphs (a) through (j) of this section.

(a) *Trust Fund.* (1) The owner or operator may satisfy the requirements of this section by establishing a trust fund which conforms to the requirements of this paragraph. The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency. A copy of the trust agreement must be placed in the facility's operating record.

(2) Payments into the trust fund must be made annually by the owner or operator over the term of the initial control mechanism or over the remaining life of the CKDLF unit, whichever is shorter, in the case of a trust fund for closure or post-closure care, or over one-half of the estimated length of the corrective action program in the case of corrective action for known releases. This period is referred to as the pay-in period.

(3) For a trust fund used to demonstrate financial assurance for closure and post-closure care, the first payment into the fund must be at least equal to the current cost estimate for closure or post-closure care, except as provided in paragraph (k) of this section, divided by the number of years in the pay-in period as defined in paragraph (a)(2) of this section. The amount of subsequent payments must be determined by the following formula:

Next Payment = [CE−CV]/Y

Where:

CE is the current cost estimate for closure or post-closure care (updated for inflation or other changes), CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(4) For a trust fund used to demonstrate financial assurance for corrective action, the first payment into the trust fund must be at least equal to one-half of the current cost estimate for corrective action, except as provided in paragraph (k) of this section, divided by the number of years in the corrective action pay-in period as defined in paragraph (a)(2) of this Section. The amount of subsequent payments must be determined by the followingformula:

Next Payment = [RB−CV]/Y

Where:

RB is the most recent estimate of the required trust fund balance for corrective action (i.e., the total costs that will be incurred during the second half of the corrective action period), CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(5) The initial payment into the trust fund must be made before the initial receipt of waste or before two years elapse after the effective date of this rule, whichever is later; in the case of closure and post-closure care, or no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of § 259.48.

(6) If the owner or operator establishes a trust fund after having used one or more alternate mechanisms specified in this Section, the initial payment into the trust fund must be at least the amount that the fund would contain if the trust fund were established initially and annual payments made according to the specifications of this paragraph and paragraph (a) of this section, as applicable.

(7) The owner or operator, or other person authorized to conduct closure, post-closure care, or corrective action activities may request reimbursement from the trustee for these expenditures. Requests for reimbursement will be granted by the trustee only if sufficient funds are remaining in the trust fund to cover the remaining costs of closure, post-closure care, or corrective action, and if justification and documentation of the cost is placed in the operating record. Prior to reimbursement, the owner or operator must notify the EPA Regional Administrator that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.

(8) The trust fund may be terminated by the owner or operator only if the owner or operator substitutes alternate financial assurance as specified in this Section or if he is no longer required to demonstrate financial responsibility in accordance with the requirements of § 259.61(b), § 259.62(b), or § 259.63(b).

(b) *Surety Bond Guaranteeing Payment or Performance.* (1) The owner or operator may demonstrate financial assurance for closure or post-closure care by obtaining a payment or performance surety bond which conforms to the requirements of this paragraph. The owner or operator may demonstrate financial assurance for corrective action by obtaining a performance bond which conforms to the requirements of this paragraph. The bond must be effective before the initial receipt of waste or before two years elapse after [the effective date of this rule], whichever is later; in the case of closure and post-closure care, the bond must be effective no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of § 259.48. Within 14 days after demonstrating financial assurance according to this section, the owner or operator must notify the EPA Regional Administrator that a copy of the bond has been placed in the operating record. The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.

(2) The penal sum of the bond must be in an amount at least equal to the current closure, post-closure care or corrective action cost estimate, whichever is applicable, except as provided in paragraph (k) of this section.

(3) Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond.

(4) The owner or operator must establish a standby trust fund. The standby trust fund must meet the requirements of paragraph (a) of this Section except the requirements for initial payment and subsequent annual payments specified in paragraphs (a)(2), (3), (4) and (5) of this section.

(5) Payments made under the terms of the bond will be deposited by the surety directly into the standby trust fund. Payments from the trust fund must be approved by the trustee.

(6) Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation by certified mail to the owner and operator and to the EPA Regional Administrator 120 days in advance of cancellation. If the surety cancels the bond, the owner or operator must obtain alternate financial assurance as specified in this section.

(7) The owner or operator may cancel the bond only if alternate financial assurance is substituted as specified in this Section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with § 259.61(b), § 259.62(b) or § 259.63(b).

(c) *Letter of Credit.* (1) The owner or operator may satisfy the requirements of this Section by obtaining an irrevocable standby letter of credit which conforms to the requirements of this paragraph. The letter of credit must be effective before the initial receipt of waste or before two years elapse after the effective date of this rule, whichever is later; in the case of closure and post-

closure care, the letter of credit must be effective no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of § 259.48. Within 14 days after obtaining a letter of credit, the owner or operator must notify the EPA Regional Administrator that a copy of the letter of credit has been placed in the operating record. The issuing institution must be an entity which has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a Federal or State agency.

(2) A letter from the owner or operator referring to the letter of credit by number, issuing institution, and date, and providing the following information: Name, and address of the facility, and the amount of funds assured, must be included with the letter of credit in the operating record.

(3) The letter of credit must be irrevocable and issued for a period of at least one year in an amount at least equal to the current cost estimate for closure, post-closure care or corrective action, whichever is applicable, except as provided in paragraph (k) of this Section. The letter of credit must provide that the expiration date will be automatically extended for a period of at least one year unless the issuing institution has canceled the letter of credit by sending notice of cancellation by certified mail to the owner and operator and to the EPA Regional Administrator 120 days in advance of cancellation. If the letter of credit is canceled by the issuing institution, the owner or operator must obtain alternate financial assurance.

(4) The owner or operator may cancel the letter of credit only if alternate financial assurance is substituted as specified in this Section or if the owner or operator is released from the requirements of this Section in accordance with § 259.61(b), § 259.62(b) or § 259.63(b).

(d) *Insurance.* (1) The owner or operator may demonstrate financial assurance for closure and post-closure care by obtaining insurance which conforms to the requirements of this paragraph. The insurance must be effective before the initial receipt of waste or before two years elapse after the effective date of the requirements of this rule, whichever is later; in the case of closure and post-closure care, the insurance must be effective no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of § 259.48. At a minimum, the insurer must be licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States. Within 14 days after obtaining insurance, the owner or operator must notify the EPA Regional Administrator that a copy of the insurance policy has been placed in the operating record.

(2) The closure or post-closure care insurance policy must guarantee that funds will be available to close the CKDLF unit whenever final closure occurs and/or to provide post-closure care for the CKDLF unit whenever the post-closure care period begins, whichever is applicable. The policy must also guarantee that once closure or post-closure care begins, the insurer will be responsible for the paying out of funds to the owner or operator or other person authorized to conduct closure or post-closure care, up to an amount equal to the face amount of the policy.

(3) The insurance policy must be issued for a face amount at least equal to the current cost estimate for closure or post-closure care, whichever is applicable. The term face amount means the total amount the insurer is obligated to pay under the policy. Actual payments by the insurer will not change the face amount, although the insurer's future liability will be lowered by the amount of the payments.

(4) A owner or operator, or any other person authorized to conduct closure or post-closure care, may receive reimbursements for closure or post-closure expenditures, whichever is applicable. Requests for reimbursement will be granted by the insurer only if the remaining value of the policy is sufficient to cover the remaining costs of closure or post-closure care, and if justification and documentation of the cost is placed in the operating record. Within 14 days after reimbursement, the owner or operator must notify the EPA Regional Administrator that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.

(5) Each policy must contain a provision allowing assignment of the policy to a successor owner or operator. Such assignment may be conditional upon consent of the insurer, provided that such consent is not unreasonably refused.

(6) The insurance policy must provide that the insurer may not cancel, terminate or fail to renew the policy except for failure of payment of premium. The automatic renewal of the policy must, at a minimum, provide the insured with the option of renewal at the face amount of the expiring policy. If there is a failure to pay the premium, the insurer may cancel the policy by sending notice of cancellation by certified mail to the owner and operator and to the EPA Regional Administrator 120 days in advance of cancellation. If the insurer cancels the policy, the owner or operator must obtain alternate financial assurance as specified in this section.

(7) For insurance policies providing coverage for post-closure care, commencing on the date that liability to make payments pursuant to the policy accrues, the insurer will thereafter annually increase the face amount of the policy. Such increase must be equivalent to the face amount of the policy, less any payments made, multiplied by an amount equivalent to 85 percent of the most recent investment rate or of the equivalent coupon-issue yield announced by the U.S. Treasury for 26-week Treasury securities.

(8) The owner or operator may cancel the insurance policy only if alternate financial assurance is substituted as specified in this Section or if the owner or operator is no longer required to demonstrate financial responsibility in accordance with the requirements of § 259.61(b), § 259.62(b) or § 259.63(b).

(e) *Corporate Financial Test.* The owner or operator that satisfies the requirements of this paragraph may demonstrate financial assurance up to the amount specified herein:

(1) Financial Component.

(i) The owner or operator must satisfy one of the following three conditions:

(A) A current rating for its senior unsecured debt of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's; or

(B) A ratio of less than 1.5 comparing total liabilities to net worth; or

(C) A ratio of greater than 0.10 comparing the sum of net income plus depreciation, depletion and amortization, minus $10 million, to total liabilities.

(ii) The tangible net worth of the owner or operator must be greater than:

(A) The sum of the current closure, post-closure care, corrective action cost estimates and any other environmental obligations, including guarantees, covered by a financial test plus $10 million except as provided in paragraph (e)(1)(ii)(B) of this section.

(B) $10 million in net worth plus the amount of any guarantees that have not been recognized as liabilities on the financial statements, provided all of the current closure, post-closure care, and corrective action costs and any other environmental obligations covered by a financial test are recognized as liabilities on the owner's or operator's audited financial statements, and

subject to the approval of the EPA Regional Administrator.

(iii) The owner or operator must have assets located in the United States amounting to at least the sum of current closure, post-closure care, corrective action cost estimates and any other environmental obligations covered by a financial test as described in paragraph (e)(3) of this Section.

(2) Recordkeeping and reporting requirements.

(i) As they become available, the owner or operator must place the following items into the facility's operating record:

(A) A letter signed by the owner's or operator's chief financial officer that:

(*1*) Lists all the current cost estimates covered by a financial test, including, but not limited to, cost estimates required for municipal solid waste management facilities under 40 CFR Part 258, cost estimates required for UIC facilities under 40 CFR Part 144, if applicable, cost estimates required for petroleum underground storage tank facilities under 40 CFR Part 280, if applicable, cost estimates required for PCB storage facilities under 40 CFR Part 261, if applicable, and cost estimates required for hazardous waste treatment, storage, and disposal facilities under 40 CFR Parts 264 and 265, if applicable; and

(*2*) Provides evidence demonstrating that the firm meets the conditions of either paragraph (e)(1)(i)(A) or (e)(1)(i)(B) or (e)(1)(i)(C) and paragraphs (e)(1)(ii) and (e)(1)(iii) of this Section.

(B) A copy of the independent certified public accountant's unqualified opinion of the owner's or operator's financial statements for the latest completed fiscal year. To be eligible to use the financial test, the owner's or operator's financial statements must receive an unqualified opinion from the independent certified public accountant. An adverse opinion, disclaimer of opinion, or other qualified opinion will be cause for disallowance, with the potential exception for qualified opinions provided in the next sentence. The EPA Regional Administrator may evaluate qualified opinions on a case-by-case basis and allow use of the financial test in cases where the EPA Regional Administrator deems that the matters which form the basis for the qualification are insufficient to warrant disallowance of the test. If the EPA Regional Administrator does not allow use of the test, the owner or operator must provide alternate financial assurance that meets the requirements of this Section.

(C) If the chief financial officer's letter providing evidence of financial assurance includes financial data showing that owner or operator satisfies paragraphs (e)(1)(i)(B) or (e)(1)(i)(C) of this section that are different from data in the audited financial statements referred to in paragraph (e)(2)(i)(B) of this Section or any other audited financial statement or data filed with the Securities and Exchange Commission (SEC) then a special report from the owner's or operator's independent certified public accountant to the owner or operator is required. The special report shall be based upon an agreed upon procedures engagement in accordance with professional auditing standards and shall describe the procedures performed in comparing the data in the chief financial officer's letter derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements, the findings of that comparison, and the reasons for any differences.

(D) If the chief financial officer's letter provides a demonstration that the firm has assured for environmental obligations as provided in paragraph (e)(1)(ii)(B) of this section, then the letter shall include a report from the independent certified public accountant that verifies that all of the environmental obligations covered by a financial test have been recognized as liabilities on the audited financial statements, how these obligations have been measured and reported, and that the tangible net worth of the firm is at least $10 million plus the amount of any guarantees provided.

(ii) The owner or operator must place the items specified in paragraph (e)(2)(i) of this section in the operating record and notify the EPA Regional Administrator that these items have been placed in the operating record before the initial receipt of waste or before two years elapse after the effective date of this rule, whichever is later; in the case of closure, and post-closure care, items specified in paragraph (e)(2)(i) of this section must have been placed in the operating record no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of § 259.48.

(iii) After the initial placement of items specified in paragraph (e)(2)(i) of this section in the operating record, the owner or operator must annually update the information and place updated information in the operating record within 90 days following the close of the owner or operator's fiscal year. The EPA Regional Administrator may provide up to an additional 45 days for a owner or operator who can demonstrate that 90 days is insufficient time to acquire audited financial statements. The updated information must consist of all items specified in paragraph (e)(2)(i) of this section.

(iv) The owner or operator is no longer required to submit the items specified in paragraph (e)(2) of this section or comply with the requirements of this paragraph when:

(A) The person substitutes alternate financial assurance as specified in this section that is not subject to these recordkeeping and reporting requirements; or

(B) The person is released from the requirements of this section in accordance with § 259.61(b), § 259.62(b), or § 259.63(b).

(v) If the owner or operator no longer meets the requirements of paragraph (e)(1) of this section, the owner or operator must, within 120 days following the close of the owner or operator's fiscal year, obtain alternative financial assurance that meets the requirements of this section, place the required submissions for that assurance in the operating record, and notify the EPA Regional Administrator that the owner or operator no longer meets the criteria of the financial test and that alternate assurance has been obtained.

(vi) The EPA Regional Administrator may, based on a reasonable belief that the owner or operator may no longer meet the requirements of paragraph (e)(1) of this section, require at any time the owner or operator to provide reports of its financial condition in addition to or including current financial test documentation as specified in paragraph (e)(2) of this section. If the EPA Regional Administrator finds that the owner or operator no longer meets the requirements of paragraph (e)(1) of this section, within 120 days of this finding the owner or operator must provide alternate financial assurance that meets the requirements of this section.

(3) *Calculation of costs to be assured.* When calculating the current cost estimates for closure, post-closure care, corrective action, or the sum of the combination of such costs to be covered, and any other environmental obligations assured by a financial test referred to in paragraph (e) of this section, the owner or operator must include cost estimates required for cement kiln dust solid waste management facilities under this part, as well as cost estimates required for the following environmental obligations, if the person assures them through a financial test: obligations associated with UIC facilities under 40 CFR Part 144, petroleum underground storage tank facilities under 40 CFR Part

280, PCB storage facilities under 40 CFR Part 261, and hazardous waste treatment, storage, and disposal facilities under 40 CFR Parts 264 and 265.

(f) *Corporate Guarantee.* (1) The owner or operator may meet the requirements of this section by obtaining a written guarantee. The guarantor must be the direct or higher-tier parent corporation of the owner or operator, a firm whose parent corporation is also the parent corporation of the owner or operator, or a firm with a "substantial business relationship" with the owner or operator. The guarantor must meet the requirements for owners or operators in paragraph (e) of this section and must comply with the terms of the guarantee. A certified copy of the guarantee must be placed in the facility's operating record along with copies of the letter from the guarantor's chief financial officer and accountants' opinions. If the guarantor's parent corporation is also the parent corporation of the owner or operator, the letter from the guarantor's chief financial officer must describe the value received in consideration of the guarantee. If the guarantor is a firm with a "substantial business relationship" with the owner or operator, this letter must describe this "substantial business relationship" and the value received in consideration of the guarantee.

(2) The guarantee must be effective and all required submissions placed in the operating record before the initial receipt of waste or before the effective date of the requirements of this section, whichever is later, in the case of closure and post-closure care, or in the case of corrective action no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of § 259.48.

(3) The terms of the guarantee must provide that:

(i) If the owner or operator fails to perform closure, post-closure care, and/or corrective action of a facility covered by the guarantee, the guarantor will:

(A) Perform, or pay a third party to perform, closure, post-closure care, and/or corrective action as required (performance guarantee); or

(B) Establish a fully funded trust fund as specified in paragraph (a) of this section in the name of the owner or operator (payment guarantee).

(ii) The guarantee will remain in force for as long as the owner or operator must comply with the applicable financial assurance requirements of this Subpart unless the guarantor sends prior notice of cancellation by certified mail to the owner or operator and to the EPA Regional Administrator. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the owner or operator and the EPA Regional Administrator, as evidenced by the return receipts.

(iii) If notice of cancellation is given, the owner or operator must, within 90 days following receipt of the cancellation notice by the owner or operator and the EPA Regional Administrator, obtain alternate financial assurance, place evidence of that alternate financial assurance in the facility operating record, and notify the EPA Regional Administrator. If the owner or operator fails to provide alternate financial assurance within the 90-day period, the guarantor must provide that alternate assurance within 120 days of the cancellation notice, obtain alternative assurance, place evidence of the alternate assurance in the facility operating record, and notify the EPA Regional Administrator.

(4) If a corporate guarantor no longer meets the requirements of paragraph (e)(1) of this section, the owner or operator must, within 90 days, obtain alternative assurance, place evidence of the alternate assurance in the facility operating record, and notify the EPA Regional Administrator. If the owner or operator fails to provide alternate financial assurance within the 90-day period, the guarantor must provide that alternate assurance within the next 30 days.

(5) The owner or operator is no longer required to meet the requirements of paragraph (g) of this section when:

(i) The owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The owner or operator is released from the requirements of this section in accordance with § 259.61(b), § 259.62(b), or § 259.63(b).

(g) *State-Approved Mechanism.* In an authorized State, the owner or operator may satisfy the requirements of this section by obtaining any other mechanism that meets the criteria specified in paragraph (j)(1) Of this section, and that is approved by the State Director.

(h) *State Assumption of Responsibility.* If the State Director either assumes legal responsibility for the person's compliance with the closure, post-closure care and/or corrective action requirements of this part, or assures that the funds will be available from State sources to cover the requirements, the owner or operator will be in compliance with the requirements of this section. Any State assumption of responsibility must meet the criteria specified in paragraph (j)(1) of this section.

(i) *Use of multiple mechanisms.* The owner or operator may demonstrate financial assurance for closure, post-closure, and corrective action, as required by § 259.61, § 259.62, and § 259.63 by establishing more than one mechanism per facility, except that mechanisms guaranteeing performance rather than payment, may not be combined with other instruments. The mechanisms must be as specified in paragraphs (a), (b), (c), (d), (e), (f), (g), (h), and (i) of this section, except that financial assurance for an amount at least equal to the current cost estimate for closure, post-closure care, and/or corrective action may be provided by a combination of mechanisms rather than a single mechanism.

(j) The language of the mechanisms listed in paragraphs (a), (b), (c), (d), (e), (f), (g), (h), and (i) of this section must ensure that the instruments satisfy the following criteria:

(1) The financial assurance mechanisms must ensure that the amount of funds assured is sufficient to cover the costs of closure, post-closure care, and corrective action for known releases when needed;

(2) The financial assurance mechanisms must ensure that funds will be available in a timely fashion when needed;

(3) The financial assurance mechanisms must be obtained by the owner or operator by the effective date of these requirements or prior to the initial receipt of solid waste, whichever is later, in the case of closure and post-closure care, and no later than 120 days after the corrective action remedy has been selected in accordance with the requirements of § 259.48, until the owner or operator is released from the financial assurance requirements under §§ 259.61, 259.62 and 259.63.

(4) The financial assurance mechanisms must be legally valid, binding, and enforceable under State and Federal law.

§ 259.65 Discounting.

The EPA Regional Administrator may allow discounting of closure cost estimates in § 259.61(a), post-closure cost estimates in § 259.62(a), and/or corrective action costs in § 259.63(a) up to the rate of return for essentially risk free investments, net of inflation, under the following conditions:

(a) The EPA Regional Administrator determines that cost estimates are complete and accurate and the owner or operator has submitted a statement from a Registered Professional Engineer so stating;

(b) The EPA Regional Administrator finds the facility in compliance with applicable and appropriate permit conditions;

(c) The EPA Regional Administrator determines that the closure date is certain and the owner or operator certifies that there are no foreseeable factors that will change the estimate of site life; and

(d) Discounted cost estimates must be adjusted annually to reflect inflation and years of remaining life.

APPENDIX I TO PART 259—CONSTITUENTS FOR DETECTION MONITORING

Common name[1]
pH
Conductivity
Total Dissolved Solids
Potassium
Chloride
Sodium
Sulfate

[1] Common names are those used widely in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

1. The authority citation for Part 261 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, 6922, 6924(y), and 6938.

2. Section 261.4 is amended by revising paragraph (b)(8) to read as follows:

§ 261.4 Exclusions.

* * * * *

(b) * * *

(8)(i) Except as provided in § 266.112 of this chapter for facilities that burn or process hazardous waste, CKD waste, so long as it is managed in accordance with Part 259 of this chapter.

(ii) CKD waste is not managed in accordance with Part 259 of this chapter when a facility:

(A) Fails to comply with:

(*1*) air requirements for landfills, as specified § 259.22 of this chapter, by 90 days after the effective date of the final rule, unless granted approval by the EPA Regional Administrator (or the State, in authorized States) under § 259.22(d) of this chapter to implement alternative measures for fugitive dust control;

(*2*) the containment standards, as specified under § 259.20 of this chapter, for CKD destined for sale or beneficial use within two years after the effective date of the final rule, unless granted approval by the EPA Regional Administrator under § 259.20(c) of this chapter to implement alternative measures for fugitive dust control;

(*3*) design requirements for CKD landfills, as specified under § 259.30(c) of this chapter by two years after the effective date of the final rule, unless granted approval by the EPA Regional Administrator under the provisions of § 259.30(h) of this chapter for a unit design, or a finding is made of no potential for migration under § 259.40(b) of this chapter;

(*4*) ground-water monitoring systems requirements, as specified under § 259.41 of this chapter, by two years after the effective date of the final rule, unless granted approval by the EPA Regional Administrator under the provisions of § 259.30(h) of this chapter for a unit design, or a finding is made of no potential for migration under § 259.40(b) of this chapter;

(*5*) the time frames for appropriate corrective action proposed today under §§ 259.41, 259.44, 259.45, 259.46, and 259.47 of this chapter;

(*6*) any applicable demonstration requirements for new CKD landfills as specified under §§ 259.11(a), 259.12(a), 259.13(a), 259.14(a), 259.15(a) and 259.16(a) of this chapter;

(*7*) any requirement identified in a notice received from the Regional Administrator because of repeated violations the requirements of Part 259 of this chapter, other than those specified in paragraphs (b)(8)(ii)(A)(*1*) through (b)(8)(ii)(A)(*6*) of this section; or,

(B) Fails to comply with any section of Part 259 of this chapter, other than those specified in paragraphs (b)(8)(ii)(A) of this section, within 30 days of receiving a written notice of non-compliance with any of those sections from the Regional Administrator

(iii) Clinker manufactured with CKD waste that has been listed in Subpart D of this part and has been reintroduced to the cement manufacturing process.

* * * * *

PART 266—STANDARDS FOR THE MANAGEMENT OF SPECIFIC HAZARDOUS WASTES AND SPECIFIC TYPES OF HAZARDOUS WASTE MANAGEMENT FACILITIES

1. The authority citation for Part 266 continues to read as follows:

Authority: 42 USC 1006, 2002(a), 3004, 3014, 6905, 6906, 6912, 6922, 6924, 6925, and 6937.

2. Subpart I is added to Part 266 to read as follows:

Subpart I—Management Standards For Hazardous Cement Kiln Dust Waste

Sec.
266.120 Applicability and requirements.
266.121 Removal of the hazardous waste designation.

§ 266.120 Applicability and requirements.

(a) The purpose of this part is to establish national criteria under the Resource Conservation and Recovery Act (RCRA or the Act), as amended, for cement kiln dust waste that is not characteristically hazardous waste under the provisions of 40 CFR 266.112 and is not managed in accordance with the provisions of Part 259 of this chapter.

(b) Persons who generate, transport or store CKD that is regulated under this Subpart are subject to the requirements in paragraphs (b)(1) through (7) of this section. These requirements operate in lieu of requirements in 40 CFR Parts 262–265, and 40 CFR Part 268 except where portions of those Parts are specifically cross-referenced.

(1) All applicable provisions of Part 262 (Standards Applicable to Generators of Hazardous Waste) of this chapter;

(2) Sections 264.4 and 265.4 of Subpart A (Imminent hazard action) of this chapter;

(3) Sections 264.11 and 265.11 (Identification number), 264.12 and 265.12 (Required notices), 264.14 and 265.14 (Security), 264.15 and 265.15 (General inspection requirements), 264.16 and 265.16 (Personnel training), and 264.19 and 265.19 (Construction quality assurance program) of Subpart B (General Facility Standards) of this chapter.

(4) Subparts C, D, and E of both Parts 264 and 265 (Preparedness and Prevention, Contingency Plan and Emergency Procedures, and Manifest System, Recordkeeping, and Reporting) of this chapter;

(5) All provisions of 40 CFR Part 259 of this chapter.

§ 266.121 Removal of the hazardous waste designation.

(a) If any CKD waste loses the exemption under § 261.4(b)(8) of this chapter and becomes subject to § 266.120, the owner or operator of the facility managing such waste may apply to the Regional Administrator for removal of the hazardous designation for such CKD waste. The application must include:

(1) A statement that the CKD waste is now being managed in accordance with Part 259;

(2) A statement explaining the circumstances of the non-compliance; and,

(3) A demonstration that the non-compliance is not likely to recur.

(b) The Regional Administrator may remove the hazardous waste designation by reinstating the exclusion, as listed under § 261.4(b)(8) of this chapter, if the Regional Administrator finds that the owner or operator of the facility has satisfactorily explained the circumstances of the non-compliance, has demonstrated that the non-compliance is not likely to recur and that removal of the hazardous waste designation will not pose a threat to human health or the environment. The Regional Administrator may remove the hazardous waste designation by reinstating the exclusion (as listed under § 261.4(b)(8) of this chapter) with additional conditions if the Regional Administrator finds that such additional conditions are necessary to ensure protection of human health and the environment.

(c) The Regional Administrator should take action on an application for removal of a hazardous waste designation within 60 days after receipt of the application. If the Regional Administrator does not take action on the application within that time period, then the application for removal of the hazardous waste designation (i.e., reinstatement of the exclusion under § 261.4(b)(8) of this chapter) is deemed granted, retroactive to the date of the application. However, the Regional Administrator may terminate a removal (i.e., reinstatement of the exclusion under § 261.4(b)(8) of this chapter) by default under this subsection if the Regional Administrator finds that the removal of the hazardous waste designation is not appropriate based on the factors specified in paragraph (b) of this Section.

PART 270—EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

1. The authority citation for Part 270 continues to read as follows:

Authority: 42 USC 6905, 6912, 6924, 6925, 6927, 6939, and 6974.

2. Section 270.10 is amended by adding a sentence to the end of paragraph (a) to read as follows:

Subpart B—Permit Application

§ 270.10 General application Requirements.

(a) *Permit application.* * * * Procedures for application, issuance and administration of permits for cement kiln facilities that do not comply with the provisions of Part 259 are found exclusively in 40 CFR 270.69.

* * * * *

Subpart F—Special Forms of Permits

2. Subpart F is amended to add a new § 270.69 to read as follows:

§ 270.69 Permits for the Management of Cement Kiln Dust

(a) The EPA Regional Administrator may issue a permit for continued operation of cement manufacturing facilities that do not comply with the provisions of 40 CFR Part 259. Any such permit shall contain such terms and conditions as will assure protection of human health and the environment. Such permits:

(1) Shall provide for the operation of the facility in accordance 40 CFR Part 259, and

(2) May include such additional requirements as the EPA Regional Administrator deems necessary to protect human health and the environment, including, but not limited to requirements regarding monitoring, operation, financial responsibility, closure and remedial action.

(b) In issuing such permits, the EPA Regional Administrator may modify or waive permit application and permit issuance requirements in 40 CFR Parts 124 and 270, except procedures regarding public participation, provided the modifications or waivers protect human health and the environment.

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