



The Department of Energy
Washington, DC 20585

November 20, 1995

EPA RCRA Docket (5305)
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Docket Number F-95-PH4P-FFFFF

Dear Sir or Madame:

Re: 60 FR 43654, "Land Disposal Restrictions--Phase IV: Issues Associated With Clean Water Act Treatment Equivalency, and Treatment Standards for Wood Preserving Wastes and Toxicity Characteristic Metal Wastes"

On August 22, 1995, the Environmental Protection Agency (EPA) published a Notice of Proposed Rulemaking (NPRM) to amend the regulations for implementing the Land Disposal Restrictions (LDR) program (known as the LDR Phase IV proposed rule). As part of this NPRM, EPA presents and requests comment on options for regulating potential releases of hazardous constituents from surface impoundments treating wastes that were hazardous when generated, but have been diluted to render them nonhazardous (i.e., decharacterized wastes). In addition, the NPRM includes proposed treatment standards for toxicity characteristic (TC) metal wastes. Furthermore, the NPRM suggests a number of regulatory modifications intended to clarify and "clean up" existing LDR requirements, and proposes procedures for streamlining state authorization to implement certain LDR regulations.

The Department of Energy (DOE) appreciates the opportunity to raise concerns and provide input in response to the LDR Phase IV proposed rule. The enclosed comments refer to potential regulatory approaches and topics covered by the NPRM, and are presented for your consideration in finalizing changes to the LDR requirements. These comments combine the viewpoints and concerns identified by DOE Field Organizations and Program Offices.

Many of DOE's comments on the LDR Phase IV proposed rule relate to the options being considered to control releases of hazardous constituents from surface impoundments that manage decharacterized wastes. DOE's primary comments in this regard relate to concerns that dual regulation may be proliferated, concerns that implementation of the second option that EPA is considering would be overly complex, and concerns about possible delays in operating the high-level radioactive waste vitrification system at the Savannah River Site if the LDR Phase III and Phase IV rules are applied to some of the component facilities. Regarding the proposed LDR treatment standards for TC metal wastes (D004 - D011), DOE fully supports EPA's proposal not to require re-treatment prior to final land disposal of mixed radioactive and characteristic metal wastes that are treated to meet existing LDR standards

before the LDR Phase IV rule becomes effective, but that are not disposed until after the effective date.

DOE also supports EPA's continuing efforts to clarify and simplify the LDR regulations. Nevertheless, the Department has several comments on the specific regulatory language proposed by the Agency. Finally, DOE generally agrees with EPA's concept of streamlining the RCRA State authorization process for minor changes to the existing RCRA LDR program. However, DOE believes that the streamlining procedure should be available for any future minor RCRA program change, not just for the particular minor changes to the LDR program that EPA has included in this proposed rule.

The enclosed comments have been divided into two sections: general and specific. The general comments address broad concerns. The specific comments relate directly to potential regulatory approaches and issues raised in particular sections of the NPRM. For clarity, each specific comment is preceded by a reference to the section of the NPRM to which it applies and a brief description in bold-face type of the issue within that section to which DOE's comment is directed.

Sincerely,

Raymond F. Pelletier
Director
Office of Environmental Policy and Assistance

Enclosure

cc: M. Petruska, EPA, OSW, Waste Treatment Branch (5302W)
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UNITED STATES DEPARTMENT OF ENERGY
COMMENTS ON LAND DISPOSAL RESTRICTIONS -- PHASE IV:
ISSUES ASSOCIATED WITH CLEAN WATER ACT TREATMENT EQUIVALENCY,
AND TREATMENT STANDARDS FOR WOOD PRESERVING WASTES AND
TOXICITY CHARACTERISTIC METAL WASTES

PROPOSED RULE (60 FR 43654; August 22, 1995)

GENERAL COMMENTS

- 1. DOE provided a number of comments (submitted to EPA on May 1, 1995) in response to the Land Disposal Restrictions (LDR) Phase III proposed rule. Several of these comments are pertinent, and therefore reiterated, in regards to topics addressed in the LDR Phase IV proposal.**

On March 2, 1995, EPA published the LDR Phase III proposed rule [60 FR 11702]. In part, the preamble discussed potential regulatory approaches being considered by EPA that would address, through controls on cross-media transfers of hazardous constituents, the issue as to whether treatment received by decharacterized wastes in Clean Water Act (CWA) and CWA-equivalent impoundment-based wastewater treatment systems would be equivalent to the RCRA §3004(m) treatment standard. DOE offered several comments in regards to the discussions on cross-media transfer and equivalency issues.¹ Some of these comments are reiterated in this response to the LDR Phase IV proposed rule.

Specific DOE comments made in response to the LDR Phase III proposed rule that are reiterated herein concern: (1) the advisability of adopting, under RCRA Subtitle C (Hazardous Waste Management) authority, regulations applicable to nonhazardous waste management units, especially when existing or forthcoming regulatory programs under other statutes may provide adequate control; and (2) support for applying the change of treatability group principle to sludges generated by impoundment-based CWA wastewater treatment systems that receive decharacterized wastes.

- 2. With respect to the options presented in the LDR Phase IV proposed rule for addressing potential cross-media releases of hazardous constituents (from surface impoundments managing decharacterized wastes), DOE encourages EPA to choose the regulatory scheme referred to as Option 1.**

EPA explains that (based on available information) decharacterized waste streams may contain hazardous constituents at concentration levels of concern, and that such hazardous constituents

¹ DOE Comments, Proposed Rule regarding Land Disposal Restrictions -- Phase III, General Comment 3, p. 2, and Specific Comments regarding III.A., pp. 3-9 (05/01/95).

could potentially be released from surface impoundments handling these waste streams. The Agency also points out that the risks due to cross-media releases could vary from insignificant to significant. Hence, EPA is considering three regulatory options to address the potential for cross-media transfer of hazardous constituents.

Under Option 1, no separate LDR regulations would be issued. Rather, other Agency programs (either existing or future) would be relied upon to address releases. Under Option 2, controls would be promulgated under the LDR program which would apply only to situations where releases pose excessive risks, and the risks are not adequately minimized as a result of other existing or currently planned EPA requirements. Under Option 3, LDR regulations would be adopted that require all decharacterized wastes to be treated to meet Universal Treatment Standards (UTS) before entering any CWA wastewater treatment system surface impoundment.

One of the Department's primary concerns with respect to establishing new requirements to control potential cross-media transfer of hazardous constituents, is that these new requirements not overlap or conflict with standards developed pursuant to other regulatory programs (e.g., RCRA Subtitle D, CWA, Clean Air Act (CAA) requirements). DOE acknowledges that all three options proposed by EPA, if carefully implemented, could avoid dual regulation (and the Department supports this aspect of the options). However, as is indicated more fully in the specific comments below, DOE prefers Option 1 over Option 2 because of concerns about the complexity of the regulatory framework that would be required to implement Option 2, and the cost of implementation. In fact, DOE believes that the complexity associated with implementing Option 2 would likely compel members of the regulated community, including some DOE sites, to treat decharacterized wastes to meet UTS prior to placing them in surface impoundments, just to avoid the confusion (and accompanying potential for noncompliance). Furthermore, DOE prefers Option 1 over Option 3 because the Department agrees with EPA's assessment that Option 3 would destroy any accommodation between the CWA and RCRA (which the court in *Chemical Waste Management v. EPA* expressly recognized as congressionally intended) and would be very costly to implement, without proportionate risk reduction.

- 3. DOE suggests that EPA publish for comment a supplemental notice of proposed rulemaking indicating the option selected for addressing cross-media transfers of hazardous constituents from impoundment-based CWA, CWA-equivalent and other nonhazardous wastewater treatment systems covered under the LDR Phase IV rule. The supplemental notice should include EPA's suggested regulatory language for implementing the selected option.**

While DOE recognizes that EPA may not be legally required to solicit public comment on actual proposed regulatory language for implementing the selected option for addressing cross-media transfers from the surface impoundments covered by LDR Phase IV, the Department believes that EPA and the regulated community would benefit if EPA sought such comment. Providing the regulated community with the opportunity to examine and respond

to proposed regulatory language would serve to reduce or minimize problems with the implementation of any new requirements.

4. **DOE suggests that, in order to avoid possible confusion, EPA define the term "decharacterized wastes," since receipt of such wastes designates the surface impoundments to which the LDR Phase IV rule applies.**

DOE suggests that the terms "decharacterized wastes" and "decharacterization" may not be entirely self-explanatory. Therefore, since these terms are repeatedly used in the preamble of the LDR Phase IV proposed rule to delineate the surface impoundments to which the proposed rule will apply, DOE believes it would be helpful to the regulated community if one or both terms were defined, either in 40 CFR 260.10 or 40 CFR 268.2.

SPECIFIC COMMENTS

I. Options to Ensure That Underlying Hazardous Constituents in Decharacterized Wastes are Substantially Treated Rather Than Released Via Leaks, Sludges, and Air Emissions from Surface Impoundments

I.B. Background

1. **pp. 43655, col. 2 - 43657, col. 2 -- EPA explains that portions of the LDR treatment standards promulgated in the Third Third rule (55 FR 22520; 06/01/90) were vacated and remanded by the District of Columbia Court of Appeals in *Chemical Waste Management, Inc. v. EPA*, 976 F. 2d 2, cert. denied 113 S.Ct. 1961 (1992). EPA indicates that one of the Court's holdings was that "situations where characteristic hazardous wastes are diluted, no longer exhibit a characteristic(s), and are then managed in centralized wastewater management land disposal units (i.e., subtitle D surface impoundments or injection wells) are legal only if it can be demonstrated that hazardous constituents are reduced, destroyed, or immobilized [in the centralized wastewater management system] to the same extent as they would be pursuant to otherwise-applicable RCRA treatment standards." EPA refers to this as an "equivalency demonstration". In the proposed LDR Phase III rule, EPA suggested standards to address one portion of the equivalency demonstration issue (i.e., treatment standards for end-of-pipe discharges from CWA and CWA-equivalent wastewater treatment systems were proposed).²**

² The LDR Phase III proposed rule also suggested treatment standards for decharacterized wastes injected into deep wells regulated under the Safe Drinking Water Act. Such standards would require either treatment prior to injection to meet the UTS for those underlying hazardous constituents reasonably expected to be present at the point of generation, or removal from the waste stream through pollution prevention measures of a mass of hazardous constituents equivalent to the mass that would be removed or immobilized by treatment to meet the UTS. An exception from LDR treatment standards was proposed

Pursuant to a settlement agreement regarding the court's mandate, the Agency is also required to address a remaining issue associated with equivalency of CWA and CWA-equivalent wastewater treatment systems (i.e., options are being considered for regulating cross-media transfer of hazardous constituents from CWA treatment systems to assure that RCRA treatment requirements are not thwarted).

a. In response to the LDR Phase III proposed rule, DOE expressed concern that, although the preamble language indicated that the final rule will apply only in situations where decharacterized wastes are being managed in CWA, CWA-equivalent (including zero-discharge), or other non-hazardous wastewater treatment systems involving surface impoundments, the actual scope encompassed by the proposed regulatory language was much broader.³ As a result of the breadth of the proposed regulatory language, DOE is concerned that the treatment standards established by the LDR Phase III rule for end-of-pipe discharges from CWA, CWA-equivalent and other non-hazardous wastewater treatment systems receiving decharacterized wastes might be applied to outputs from certain integral facilities of the DOE Savannah River Site's (SRS) treatment system for mixed high-level wastes. These integral facilities are CWA-permitted facilities without liquid discharges that could be construed as administering CWA-equivalent treatment. Because the LDR Phase III rule has not yet been finalized, and the proposed LDR Phase IV rule sets additional requirements to control releases of hazardous constituents via air emissions, sludges and leaks from the same wastewater treatment systems as were addressed by the LDR Phase III proposed rule, DOE is now concerned that the LDR Phase IV final rule could also be applied in the case of the CWA-permitted integral facilities of the SRS mixed high-level waste treatment system. It is DOE's understanding that this concern may be alleviated by a clarification that EPA intends to include in the LDR Phase III final rule, but since DOE is not yet aware of the exact nature of the clarification, the Department offers below, and in Attachment A, additional information concerning the SRS situation. Alternatives that EPA might adopt to allay DOE's concerns are also provided.

Introduction

The SRS has designed and constructed an elaborate inter-connected treatment system for its mixed high-level wastes. The system has several integral facilities which perform various separation and treatment processes, some with an element of land disposal. The majority of this integrated system is operated under Industrial Wastewater Treatment Facility Permits issued by the South Carolina Department of Health and Environmental Control (SCDHEC). One of the system's treatment facilities, the Effluent Treatment Facility (ETF), has a National

for situations where characteristic wastes would comprise only a *de minimis* portion of an injected waste stream [60 FR 11702, 11712-11713 (Mar. 2, 1995)].

³ DOE Comments, Proposed Rule regarding Land Disposal Restrictions -- Phase III, Appendix A, section II, pp. A-2 through A-4 (05/01/95).

Pollutant Discharge Elimination System (NPDES) Permit, while another treatment facility, the Saltstone Processing Facility, is permitted under the CWA. The Saltstone Disposal Facility is permitted as an Industrial Waste Disposal Facility (Subtitle D). A third very important part of the treatment system, the Defense Waste Processing Facility (DWPF), will vitrify high-level waste under a CWA permit. Attachment A describes in detail the relationships of and permits held by the various integral facilities of the SRS mixed high-level waste treatment system.

DOE believes that, as proposed, the LDR Phase III and Phase IV rules could have a detrimental impact on the ability of some of the integral facilities of the SRS mixed high-level waste treatment system to support operation of the system as currently planned. This comment centers primarily on the Saltstone Processing and Disposal Facilities, although the DWPF is also of concern. This discussion does not address the DWPF at length because it is felt that EPA does not intend the LDR Phase III and Phase IV rules to impose treatment restrictions on high-level waste beyond the existing requirement to apply the specified technology of vitrification.

DOE Recommendations

DOE's primary concern in the LDR Phase III and Phase IV rulemakings with regard to the SRS is the status of the Saltstone Processing and Disposal Facilities which are currently permitted, respectively, under the CWA and as a Subtitle D Industrial Waste Disposal Facility. The Saltstone Processing Facility treats a mostly inorganic, characteristically hazardous, radioactive wastewater (i.e., mixed waste) to form a non-hazardous, pumpable, low-level radioactive waste known as saltstone. The saltstone is pumped from the Processing Facility into the Disposal Facility, where it is placed into covered, above-ground concrete vaults. The pozzolanic saltstone solidifies within these vaults into a monolithic, non-hazardous waste. However, there is a potential for this stabilized waste to contain total concentrations of at least two organics at levels slightly above the UTS. Neither the Saltstone Processing Facility nor the Saltstone Disposal Facility contains surface impoundments.

According to the proposed LDR Phase III rule, end-of-pipe equivalency requires that discharges from CWA and CWA-equivalent wastewater treatment facilities (including zero dischargers) meet the limitations and standards imposed on UHCs by an applicable CWA permit or authorization. If no such limitations or standards have been set, the UTS apply. Therefore, if the SRS Saltstone Processing Facility were to be governed by the LDR Phase III Rule (because this facility was construed to be an affected zero-discharge wastewater treatment facility administering CWA-equivalent treatment), then DOE believes the pumpable saltstone and/or the solidified saltstone could be required to meet the UTS since placement in the SRS Saltstone Disposal Facility represents ultimate land disposal. However, application of these new requirements to the Saltstone Processing and Disposal Facilities seems to go beyond the type of waste treatment systems EPA intended to cover (i.e., wastewater treatment facilities with surface impoundments).

The proposed regulatory language [60 FR 11742] that appears to encompass the Saltstone Processing and Disposal Facilities within the scope of the LDR Phase III rule, and subsequently within the scope of the LDR Phase IV rule, even though neither facility contains surface impoundments, reads as follows:

§268.39 Waste specific prohibitions -- spent aluminum potliners, carbamates and organobromine wastes.

* * *

(b) On *[Insert date two years from date of publication of the final rule]*, characteristic wastes that are managed in systems whose discharge is regulated under the Clean Water Act (CWA), or that are zero dischargers that engage in CWA-equivalent treatment before ultimate land disposal, are prohibited from land disposal. . . .

* * *

DOE is of the opinion that such language could require the SRS (under the LDR Phase III rule) to demonstrate that all underlying constituents in the pumpable saltstone and/or solidified saltstone meet the UTS through some treatment mechanism other than dilution, prior to disposal in the permitted Subtitle D Saltstone Disposal Facility. Further, DOE believes that such language could also require the SRS, under the LDR Phase IV rule, to comply with additional controls on air emissions, sludges and leaks from the SRS Saltstone Processing and Disposal Facilities. The wastes managed in the SRS Saltstone Facilities are byproducts of pretreating high-level radioactive waste before vitrification, which is the LDR-specified treatment technology for high-level waste. If process changes were required in the SRS Saltstone Facilities to comply with the LDR Phase III and Phase IV proposed rules, delays in the high-level waste treatment program would undoubtedly result. Hence, DOE requests that EPA consider clarifying the proposed regulatory language quoted above in order to make clear that it did not intend to include facilities such as the SRS Saltstone Processing and Disposal Facilities within the scope of the LDR Phase III and Phase IV final rules.

Since EPA has stated in preamble language that the LDR Phase III and Phase IV rules are intended to apply to CWA and CWA-equivalent wastewater treatment facilities utilizing surface impoundments, DOE suggests the three alternatives described below for EPA's consideration as possible ways to achieve the clarification requested above. DOE requests that EPA adopt a combination of the first two alternatives in order to comprehensively address the Department's concerns.

Alternative 1 -- Clarify the Regulatory Language Defining the Scope of the LDR Phase III Rule

DOE suggests that the language proposed for codification in 40 CFR 268.39(b) by the LDR Phase III notice of proposed rulemaking (60 FR 11742) be changed to clearly state that decharacterized wastes managed in surface impoundments are the wastes to which the new restrictions from land disposal apply. The following modifications are recommended:

§268.39 Waste specific prohibitions -- spent aluminum potliners, carbamates and organobromine wastes.

* * *

(b) On *[Insert date two years from date of publication of the final rule]*, characteristic ~~decharacterized~~ wastes that are managed in systems ~~a surface impoundment~~ whose discharge is regulated under the Clean Water Act (CWA), or ~~decharacterized wastes~~ that are ~~managed by~~ zero dischargers ~~in surface impoundments~~ that engage in CWA-equivalent treatment before ultimate land disposal, are ...

* * *

Alternative 2 -- Specifically exclude certain CWA and CWA-equivalent wastewater treatment facilities from the LDR Phase III and Phase IV rules

DOE suggests that EPA also consider specifically excluding from the LDR Phase III and Phase IV rules (regardless of which Phase IV option EPA chooses to adopt) facilities like the SRS Saltstone Processing and Disposal Facilities that are permitted under State-implemented CWA and solid waste disposal legislation, but that have no surface impoundments, no "end-of-pipe" discharge to surface waters or to publicly owned treatment works (POTWs), and no permitted outfall locations. It appears that EPA does not intend such facilities to be regulated by either the LDR Phase III or the LDR Phase IV rules. Nevertheless, since EPA has not specifically proposed excluding facilities of this type, DOE is uncomfortable that future interpretations of applicability may somehow result in the inappropriate application of LDR controls. For this reason, DOE requests that EPA consider incorporating specific exclusions in both the LDR Phase III and LDR Phase IV final rules.

Alternative 3 -- Adopt the proposed LDR Phase IV, Option 1

The proposed LDR Phase IV rule offers three options for adding (to the end-of-pipe standards proposed by the LDR Phase III rule) controls on hazardous constituent releases in air emissions, sludges and leaks from CWA and CWA-equivalent surface impoundments that manage decharacterized wastes. Under Option 1, EPA proposes that no added controls be mandated. Instead, existing or forthcoming regulatory mechanisms which tend to protect against releases would be relied upon. Included among the federal and State regulations which the proposed LDR Phase IV preamble describes as possibly providing control of excessive releases from surface impoundments receiving decharacterized wastes are those

under RCRA §3004(u) requiring that corrective action be performed to remediate releases of hazardous constituents from solid waste management units at permitted RCRA treatment, storage, or disposal facilities (TSDFs) [60 FR 43659, col. 3]. The preamble notes that surface impoundments which manage decharacterized wastes at RCRA TSDFs would meet the definition of a solid waste management unit. A similar approach, with regard to surface impoundments receiving decharacterized wastes at RCRA TSDFs, is also proposed as a component of Option 2 [see 60 FR 43660, col. 3 - 43661, col. 1].

The SRS is operated as a RCRA TSDF under a site-wide permit. As such, all solid waste management units at the SRS site (including those located within the Saltstone Processing and Disposal Facilities) are subject to corrective action requirements under RCRA §3004(u). Therefore, although the SRS Saltstone Facilities are not impoundment based, if EPA chooses to implement the proposed LDR Phase IV rule, Option 1, it appears that such SRS Facilities would not be subjected to added controls for the purpose of containing certain hazardous constituent releases. For this reason, DOE supports the adoption of Option 1 in order to alleviate concerns about the applicability of the LDR Phase IV rule to the SRS Saltstone Facilities.

The adoption by EPA of the proposed LDR Phase IV rule, Option 1 would similarly alleviate DOE's concerns about added controls on the SRS Saltstone Processing and Disposal Facilities if State environmental controls on facilities that receive decharacterized wastes, such as ground water monitoring for hazardous constituents and cleanup authorities, were recognized as a basis for not subjecting the Saltstone Facilities to such added controls. EPA mentions this approach in the proposed LDR Phase IV rule, Option 1 preamble [60 FR 43660, cols. 1&2]. The Saltstone Processing and Disposal Facilities operate, respectively, under a SCDHEC Industrial Wastewater Treatment Facility permit and a SCDHEC Industrial Solid Waste Disposal Facility permit. These permits require periodic Toxicity Characteristic Leaching Procedure (TCLP) analyses to insure that no hazardous waste is placed into the concrete vaults. Equally important, the State requires that ground water monitoring wells be installed around the disposal vaults. This monitoring is routinely performed to identify potential releases from the vaults. If releases are identified, corrective measures must be investigated. Therefore, the SCDHEC permit conditions require the SRS Saltstone Facilities to routinely demonstrate compliance with State requirements that the proposed LDR Phase IV rule preamble recognizes as potentially sufficient to satisfy the need for added controls on CWA and CWA-equivalent wastewater management systems in order to contain certain hazardous constituent releases. Hence, DOE urges EPA to adopt the proposed LDR Phase IV, Option 1, with recognition of the South Carolina wastewater treatment operating standards as sufficient to provide any necessary added controls. This would alleviate DOE's concerns about the applicability of the LDR Phase IV rule to the SRS Saltstone Facilities.

b. As the discussion above indicates, DOE is extremely concerned that the LDR treatment requirements established under the LDR Phase III and Phase IV rules might be applied to outputs from certain integral facilities of the SRS treatment system for mixed high-level wastes (particularly, the Saltstone Processing and Disposal Facilities). Certain of the

proposed requirements have the potential to detrimentally impact the ability of these facilities to support operation of the mixed high-level waste treatment system as currently planned. As also indicated in the preceding discussion, the Department believes that EPA does not intend the LDR Phase III and Phase IV rules regarding equivalency to apply to Clean Water Act permitted facilities that have no surface impoundments (such as the SRS Saltstone Processing Facility). This aside, DOE remains somewhat unclear as to the exact applicability of the LDR program to characteristically hazardous wastes being managed by the SRS Saltstone Processing and Disposal Facility. Therefore, the Department requests that EPA provide clarification and describe its regulatory interpretation of the specific applicability of the LDR requirements to such facilities (i.e., non-surface impoundment wastewater treatment facilities operating under State-issued CWA and Industrial Waste Disposal Facility (Subtitle D) permits).

Specifically, the SRS Saltstone Processing Facility conducts CWA-equivalent treatment of characteristically hazardous, radioactive wastewaters (i.e., the waste stream contains corrosive, EP and TC metals, and TC organic wastes) in a RCRA-exempt CWA-permitted tank-based centralized wastewater treatment system. This treatment system forms a non-hazardous pumpable low-level radioactive wastestream which is pumped into the Saltstone Disposal Facility where it is placed into covered, above-ground concrete vaults. The waste solidifies within these vaults into a monolithic, non-hazardous waste. In other words, the CWA-equivalent treatment administered by this treatment system produces no liquid effluents. Considering this particular component of the high-level waste treatment system, the Department requests that EPA clarify how the LDR program will apply to the treated wastes produced by these facilities (i.e., pumpable and/or solidified saltstone) after the LDR Phase III and Phase IV rules are finalized?

As previously stated, if process changes were required in the SRS Saltstone Facilities to comply with certain requirements of the LDR Phase III and Phase IV proposed rules, delays in the high-level waste treatment program would undoubtedly result. When the SRS vitrification system for managing high-level radioactive wastes was designed, those portions of the system for managing the low-level waste fraction (i.e., the Saltstone Processing and Disposal Facilities) were planned and permitted in accordance with existing standards. Now, as years of design and construction are nearly complete, it appears that new LDR treatment standards could be imposed on the low-level waste component of the high-level waste vitrification system, jeopardizing the schedule and viability of the entire project. Furthermore, in light of the design of the Saltstone Disposal Facility (i.e., above-ground concrete vaults with ground water monitoring), compliance with the LDR treatment requirements applicable to UHCs is unlikely to significantly reduce risks to human health and the environment associated with the solidified saltstone.

DOE urges EPA to consider implementing the following regulatory approach to ensure that the SRS high-level waste treatment system is not unintentionally or unduly impacted by these new LDR rules. The suggested approach would be to extend the LDR treatment standard for high-level mixed wastes to recognize the inter-dependence of the specified technology for

treating high-level waste (i.e., vitrification) and the technology for managing the low-level waste fraction of such high-level waste (i.e., immobilization/stabilization). In other words, DOE suggests that EPA adopt a specified technology treatment standard of immobilization/stabilization for the low-level waste fraction of high-level mixed wastes being treated by vitrification at SRS. DOE also requests that EPA clarify that treatment of UHCs is not required for either treated high-level mixed wastes, or the treated low-level waste fraction, from the SRS vitrification system.

To explain the Department's concerns related to this issue in further detail and to support the proposed approach discussed above, DOE would welcome the opportunity to provide additional technical information about the SRS vitrification system, and to meet with EPA staff regarding such information (at the Agency's request and convenience).

I.C. Applicability of Potential Approaches to "Industrial D" Management Units

- 1. p. 43657, col. 2 -- EPA states that the three options being considered in the proposed rule to ensure that underlying hazardous constituents in decharacterized wastes are substantially treated rather than released via leaks, sludges and air emissions from surface impoundments will specifically apply to Subtitle D (nonhazardous) surface impoundments that receive decharacterized wastes.**

As DOE has indicated in response to previous LDR-related notices,⁴ the Department is concerned with the potential proliferation of overlapping regulatory requirements developed pursuant to different statutory authorities. The occurrence of such overlapping environmental requirements under separate regulatory programs should be avoided to minimize confusion within the regulated community and to eliminate conflicting standards. With this concern in mind, DOE continues to encourage EPA not to impose RCRA Subtitle C requirements on waste management units which are not managing hazardous wastes. Instead, if regulations on leaks, air emissions and sludges from Subtitle D surface impoundments managing decharacterized wastes are deemed necessary to ensure treatment of underlying hazardous constituents, DOE believes these regulations should be implemented under RCRA Subtitle D (40 CFR part 258, or another appropriate Subtitle D set of regulations) for leaks and the Clean Air Act (CAA) for volatilization, rather than in the LDR program under RCRA Subtitle C (40 CFR part 268).

I.F. Overview of Options

⁴ DOE Comments, Proposed Rule regarding Land Disposal Restrictions -- Phase III, General Comment 3, p. 2 (05/01/95); DOE Comments, Notice of Data Availability and Request for Comments regarding Response to Court Decision, General Comment 7, p. 4 (03/04/93).

1. **p. 43659, col. 2 -- After outlining the three regulatory options being considered by EPA (i.e., for addressing cross-media transfer of hazardous constituents), the Agency states that none of the options would apply to units which satisfy the Minimum Technology Requirements [MTRs] or the statutory no-migration standard.**

With respect to the applicability of the three options, DOE supports EPA's intention to exclude units that satisfy MTRs or the no-migration standard. Waste management units meeting MTRs or the no-migration standard are designed and operated to prevent releases of hazardous constituents to the environment, even when they manage wastes containing higher concentrations of hazardous constituents than are likely to be present in decharacterized wastes. For this reason, it should not be necessary to impose additional controls on such units under the LDR Phase IV rule.

I.G. Option 1

1. **p. 43659, col. 2 -- EPA describes Option 1, which relies on the end-of-pipe standards proposed in the LDR Phase III rule to satisfy the requirement articulated by the court in *CWM v. EPA*, that treatment of decharacterized wastes in impoundment-based CWA wastewater management systems to address underlying hazardous constituents (UHCs) must be equivalent to treatment that would otherwise be administered under RCRA. EPA also describes how federal and State regulations may otherwise provide for control of excessive releases due to air emissions, sludges and leaks from surface impoundments receiving decharacterized wastes.**

As DOE has commented in response to previous notices regarding the LDR program,⁵ the Department is concerned that proliferation of overlapping regulatory requirements (stemming from various statutory authorities) should be avoided to minimize confusion within the regulated community and to eliminate conflicting standards. DOE has also previously urged EPA not to establish equivalency demonstration requirements in response to *CWM v. EPA* that go beyond demonstrating end-of-pipe equivalence.⁶ Consistent with these earlier comments, DOE now supports Option 1 (i.e., not to issue additional requirements under the LDR program, but rather to rely on other federal and State regulatory programs).

⁵ DOE Comments, Proposed Rule regarding Land Disposal Restrictions -- Phase III, General Comment 3, p. 2 (05/01/95); DOE Comments, Notice of Data Availability and Request for Comments regarding Response to Court Decision, General Comment 7, p. 4 (03/04/93).

⁶ DOE Comments, Proposed Rule regarding Land Disposal Restrictions--Phase III, Specific Comment III.A.2, item 1, pp. 3-5 (05/01/95); DOE Comments, Notice of Data Availability and Request for Comments regarding Response to Court Decision, Specific Comment III.B through III.C., pp. 12-16 (03/04/93).

As EPA indicated in the preamble, a number of other federal and State regulations already provide environmental controls on surface impoundments that receive nonhazardous wastewaters. For example, there are CAA regulations that have been promulgated or are under development which impose controls on hazardous air pollutants (e.g., the Hazardous Organics National Emission Standards for Hazardous Air Pollutants (NESHAP)) and would apply to certain CWA impoundment-based treatment systems. Furthermore, surface impoundments that manage decharacterized wastes are solid waste management units when they are co-located with a unit subject to a RCRA permit. In this case, all releases from such units will require an evaluation in accordance with RCRA corrective action regulations to determine whether releases from those units pose a threat to human health and the environment. Considering the coverage offered by these other regulatory programs (i.e., CAA, RCRA Corrective Action, State environmental programs, and others), DOE believes Option 1 will provide protection that is basically comparable to Option 2 -- but will be less costly to implement because of the reliance on existing and planned regulations.

I.H. Option 2

- 1. p. 43660, col. 2 -- EPA lists seven objectives that the Agency tried to accomplish in defining regulatory Option 2 for controlling leaks, sludges and air emissions from impoundment-based CWA wastewater treatment systems. Included among this list are the following three objectives: focus controls on those situations that present risks that amount to significant permanent disposal; avoid duplication with other EPA requirements; and, minimize implementation burden.**

DOE approves of EPA's efforts to avoid duplication of other requirements, as indicated in the preceding comments. The Department also appreciates EPA's efforts to focus only on higher risk situations. However, it appears that the Agency's effort to minimize implementation burdens may fail in regards to this option. In fact, DOE believes that the implementation approaches associated with Option 2 could be expensive, and so complex that members of the regulated community, including some DOE sites, would likely elect to treat decharacterized wastes to meet UTS prior to placing them in surface impoundments (just to avoid the confusion and the accompanying potential for noncompliance). More specific information about this concern is provided below.

I.H.2 Applicability

- 1. p. 43660, col. 3 --EPA explains that the management standards being considered under Option 2 (for leaks, sludges and air emissions from surface impoundments accepting decharacterized waste) would be applicable to certain facilities (or wastes) which are not addressed by other EPA regulatory programs or which do not meet proposed criteria for screening out low risk situations.**

Since EPA is not proposing actual regulatory language, it is unclear exactly how Option 2 would be implemented. However, it appears that implementation could greatly complicate the management and treatment of decharacterized waste streams, especially in the area of deferrals to existing regulatory requirements, or requirements under development. For example, EPA states for air emissions that:

- Standards (unspecified) regulating total volatile organics will be considered to adequately cover air emissions of UHCs.
- Facilities subject to CAA standards for hazardous air pollutants will not be covered by Option 2.
- Facilities subject to CAA standards that are under development will not be covered by Option 2.

DOE requests clarification as to how EPA will evaluate individual impoundment-based CWA wastewater treatment systems to determine whether any of these deferrals apply. Will each facility be required to make its own determination and file a certification? If so, how will individual facilities know whether they will be covered by standards that are still being developed? Will EPA adopt additional standards under the LDR program for facilities that are not eligible for deferrals? If so, will facilities have the option to demonstrate compliance with such LDR standards in lieu of seeking deferrals, even though they may qualify for deferrals? DOE believes that determining whether deferrals are available to facilities could become a complex process. Therefore, facilities may feel compelled to comply with promulgated LDR standards instead of seeking deferrals, in order to ensure proper compliance and avoid mistakes involving regulatory interpretation.

DOE has similar concerns about deferrals related to sludges and releases to ground water.

In addition to deferring regulation of facilities to other programs, EPA mentions that it expects to exclude certain wastes and waste management facilities from control under Option 2 LDR regulations because such wastes and facilities present low risk. DOE supports this concept, but again, it is unclear how these criteria for screening out low risk situations will be specifically implemented. For example, will the exclusions all be self-implementing so that facilities to which the Phase IV rule applies will simply need to maintain adequate records on-site to demonstrate applicability? Or will facilities be required to submit certification either with or without supporting documentation?

Because of the concerns stated above, DOE encourages EPA not to choose Option 2 for regulating surface impoundments that receive decharacterized wastes. While Option 2 attempts to focus the applicability of proposed management standards on a smaller subset of situations (i.e., by excluding wastes and facilities that do not present excessive risk, and deferring wastes and facilities covered by other regulatory programs), DOE believes any advantages of this approach could be lost because both regulators and the regulated community would be confounded by the complicated implementation scheme. Further, if the implementation scheme turns out to be as complex as DOE believes it could, adopting Option

2 would seem to contradict EPA's goals to "simplify and streamline" the LDR program in order to make it more efficient and easier to implement.⁷ It is also questionable whether the development of such a complicated regulatory framework is warranted when considering the overall environmental risks associated with the management of decharacterized waste in CWA treatment systems.

2. **p. 43663, col. 2 -- EPA indicates that management standards are described for controlling leaks, sludges, and air emissions from surface impoundments accepting decharacterized wastes. EPA seeks comment on these standards, "including the possibility of adopting standards for certain of the potential problems and not others, e.g., finalizing standards for leaks and air emission control, but not for sludge control."**

If EPA decides to promulgate an Option 2 regulatory program, DOE would support not adopting standards for sludge control. As in previous Departmental comments on LDR-related notices,⁸ DOE urges EPA to allow evaluation of wastewater treatment system surface impoundment sludges on their own merit, using either sampling and analysis or process knowledge to determine what management is warranted in order to protect human health and the environment. This approach would allow control of such residuals when appropriate, but would not require continued control when the residuals no longer pose risks to human health or the environment. Comment I.H.5.b, item 1 below offers additional remarks on why it should not be necessary to impose controls on sludges.

I.H.3. Proposed Management Standards for Air Emissions

1. **p. 43663, col. 3 -- EPA explains that Option 2 would borrow requirements from 40 CFR Part 264, Subpart CC regulations to develop standards for air emissions from surface impoundments in CWA, CWA-equivalent, or other nonhazardous wastewater treatment systems accepting decharacterized wastes. The proposed air emission standards would apply only if the decharacterized waste (containing UHCs above UTS at the point of generation) placed in the unit is determined to have an average volatile organic concentration greater than or equal to 100 ppmw based on the organic composition of the waste at the point of generation.**

⁷ See Proposed Rule regarding LDRs for Newly Identified and Listed Hazardous Wastes and Hazardous Soil, September 14, 1993, 58 FR 48097; Proposed Rule regarding Land Disposal Restrictions -- Phase III, March 2, 1995, 60 FR 11725.

⁸ DOE Comments, Proposed Rule regarding Land Disposal Restrictions--Phase III, Specific Comment III.A.2.a, item 1, pp. 5-6 (05/01/95); DOE Comments, Proposed Rule regarding Land Disposal Restrictions for Newly Identified and Listed Hazardous Wastes and Hazardous Soil, Specific Comment III.C.5.a., item 1, p. 29-30 (11/15/93).

a. In previous comments,⁹ DOE has expressed concern about extending the applicability of RCRA Subtitle C air emission controls to nonhazardous waste management facilities, such as surface impoundments in CWA, CWA-equivalent or other nonhazardous wastewater treatment systems, as part of the LDR Phase IV rule. DOE continues to question whether EPA has authority under RCRA Subtitle C to impose controls on air emissions from nonhazardous waste management facilities.

As was stated in the Department's earlier comments on the LDR Phase III proposed rule, EPA promulgated 40 CFR Parts 264, Subpart CC and 265, Subpart CC based on specific authority to regulate air emissions from hazardous waste treatment, storage and disposal facilities (TSDFs) granted by the Hazardous and Solid Waste Amendments of 1984, which added §3004(n) [Air Emissions] to RCRA Subtitle C. Additionally, EPA had determined that existing and future Federal standards under the CAA and State air standards would not adequately address the control of organic emissions from such TSDFs [59 FR 62906, col. 2-3 (Dec. 6, 1994)]. Similar circumstances are not present to justify adopting controls on surface impoundments in CWA, CWA-equivalent, or other nonhazardous wastewater treatment facilities that receive only nonhazardous and decharacterized wastes. To the contrary, on its face, RCRA §3004(n) does not apply to the nonhazardous waste management facilities which will be the subject of the LDR Phase IV rule. Further, the court in *CWM v. EPA* made no ruling requiring EPA to conclude that Congress intended RCRA §3004(n) to extend to nonhazardous waste management facilities. Meanwhile, §112 of the CAA establishes authority whereby EPA can regulate hazardous air emissions from nonhazardous waste management facilities, and RCRA §1006(b) requires EPA to coordinate its regulations under RCRA with the CAA, and to avoid duplication, to the maximum extent practicable. Based on this analysis, DOE continues to believe that EPA may not be authorized by RCRA Subtitle C to impose requirements on surface impoundments in CWA, CWA-equivalent and other nonhazardous wastewater treatment facilities simply because they receive decharacterized wastes. Therefore, DOE again urges EPA to defer regulation of air emissions from such surface impoundments to the appropriate CAA regulatory program.

b. DOE requests clarification of the sentence which reads: "However, substantive requirements, borrowed from [40 CFR Part 264, Subpart CC], could apply to surface impoundments receiving prohibited, decharacterized wastes." In the sentence that immediately precedes this one in the preamble, EPA states that Subpart CC rules would not apply directly to surface impoundments covered by LDR Phase IV. Does this mean that, if EPA goes forward with Option 2, the Agency will promulgate LDR regulations in 40 CFR Part 268 which essentially copy certain sections of 40 CFR Part 264, Subpart CC? Or, will selected sections of the Subpart CC regulations be referenced? DOE suggests that, if EPA goes forward with a regulatory approach that applies certain requirements from Subpart CC to

⁹ DOE Comments, Proposed Rule regarding Land Disposal Restrictions--Phase III, Specific Comment III.A.2.c, item 2, pp. 8-9 (05/01/95).

surface impoundments covered by the LDR Phase IV rules, referencing pertinent sections of Subpart CC would be preferable to creating a duplicate set of regulations.

I.H.4. Proposed Management Standards for Leaks

- 1. pp. 43666, col. 2 - 43673, col. 1 -- EPA describes a sequence of monitoring, detection, and correction mechanisms to assure that impoundments do not leak UHCs at levels which invalidate the treatment function of the impoundment (i.e., which constitute an impermissible cross-media transfer of hazardous constituents). EPA proposes that facilities choosing to comply with the proposed management standards could continue to use impoundment-based CWA, CWA-equivalent and other nonhazardous wastewater treatment systems to treat decharacterized wastes.**

Using conservative assumptions, the M&O (management and operating) contractor at DOE's Oak Ridge reservation (Lockheed Martin Energy Systems, Inc.) has estimated some of the costs that may be associated with implementing the management standards for leaks proposed under Option 2 for a large national research laboratory (i.e., assuming a facility similar in size, mission and operation to the Department's Oak Ridge National Laboratory). A summary of the results is provided below.

New Waste Stream Testing

EPA proposes that if a new decharacterized wastewater is accepted by a surface impoundment subject to LDR Phase IV requirements, then the owner or operator would be required to characterize the new decharacterized wastewater at the point of generation to identify additional regulated constituents prior to the next annual sampling of the contents of the impoundment [p. 43669, col. 2].

Assumptions

- (1) Consider the point of generation of the waste to be the "end-of-pipe," rather than the initial point of accumulation. For example, acid waste generated in a laboratory hood (i.e., the point of generation) is assumed to require characterization rather than accumulated waste acids at some collection point.
- (2) Estimate 500 research technicians/laboratory analysts (i.e., generators).
- (3) Estimate 10 new waste streams/generator/year (low estimate).
- (4) Assume that each waste stream would require an initial analysis of all UHCs. Estimate \$5,600/waste stream for analysis of all UHCs for nonwastewaters and \$4,900/waste stream for wastewaters. Assume half of new decharacterized wastes will be wastewaters and half nonwastewaters. Includes cost of analysis

by outside laboratory for dioxins and furans. Includes all shipping and overhead costs. Assumes samples will be returned to the customer.

Results (i.e., estimated cost for UHC analysis of new waste streams)

\$14 million annually for nonwastewaters

\$12.25 million annually for wastewaters

Surface Impoundment Monitoring

EPA proposes that, at a minimum, the owner or operator of a surface impoundment subject to the LDR Phase IV requirements would be required to conduct at least four sampling events of the liquid contents of the impoundment (i.e., quarterly), with a minimum of four independent samples per event [p. 43669, col. 2].

Assumptions

- (1) Estimate \$4,900/waste stream for analysis of UHCs in wastewaters.

Results

\$78,400 annually

Ground Water Monitoring

EPA proposes that if trigger levels are exceeded in the contents of the surface impoundment, ground water monitoring must commence within one year [p. 43670, col. 2]. DOE estimates that installation of a typical ground water monitoring system for a surface impoundment would be \$500,000. Annual operating costs are estimated at \$100,000.

Total

DOE concludes that analytical requirements alone (i.e., annual new waste testing and surface impoundment monitoring) could cost a staggering total in excess of \$26 million. Compliance with Option 2 would incur other costs as well that were not included in this estimate (such as the cost of installing a cover on the surface impoundment or the cost of sludge treatment). In addition, this total cost does not include the \$500,000 capital cost of installing a ground water monitoring system.

I.H.4.b. Applicability

- 1. p. 43669, col. 1 -- EPA defines the term "regulated constituents" as UHCs that are present in characteristic wastes at the point of generation and prior to**

decharacterization at concentrations that are greater than UTS levels. The Agency further indicates that:

"Only these regulated constituents must be considered in complying with the management standards for leaks. UHCs present in a characteristic waste at levels less than or equal to UTS are not subject to the proposed management standards for leaks."

DOE believes that defining the term "regulated constituents" in the manner suggested here is unnecessary and will likely cause confusion. EPA has promulgated a definition for "underlying hazardous constituent" (UHCs) which reads as follows:

Underlying hazardous constituent means any constituent listed in §268.48, Table UTS -- Universal Treatment Standards, except vanadium and zinc, which can reasonably be expected to be present at the point of generation of the hazardous waste, at a concentration above the constituent-specific UTS treatment standards [40 CFR 268.2(i); 60 FR 244, January 3, 1995].

However, EPA seems to ignore the existing definition of UHC in its formulation of the new definition for "regulated constituents." DOE suggests that by using "UHC" in a manner inconsistent with its regulatory definition, EPA creates confusion. Further, in the past, EPA has used the term "regulated constituents," without specifically defining it, to mean the constituents in a listed hazardous waste for which LDR treatment standards have been set (e.g., see 60 FR 11702, 11727 (referring to a table showing "regulated constituents, by waste code," where adding either a wastewater or nonwastewater UTS was proposed)). Therefore, it seems inconsistent and confusing to create a new, definition for "regulated constituents" for use in the limited context of the LDR Phase IV proposed management standards for leaks from surface impoundments. DOE suggests that proper use of the term "UHC" [i.e., as defined under 40 CFR 268.2(i)] would make such a definition unnecessary.

I.H.4.c. Surface impoundment management standards

- 1. p. 43669, col. 2 -- Initially in section I.H.4.c of the preamble, EPA states that "[t]he Agency is proposing to use *annual sampling* of the wastewaters in the surface impoundment to determine if regulated constituents (i.e., UHCs) are present at concentrations that exceed the trigger level" (emphasis added). EPA states that UHCs are to be determined by characterizing each new decharacterized wastewater at its point of generation. Later, EPA states that "[t]o determine if a trigger level has been exceeded, the owner or operator would *calculate an annualized average concentration* for each regulated constituent identified" (emphasis added). It is further explained that a minimum of four sampling events (i.e., quarterly) would be required for calculating the annualized average concentration.**

If EPA chooses Option 2 for regulating surface impoundments that manage decharacterized wastes, DOE requests that EPA clarify in the final rule whether impoundment sampling will be required *annually*, or four times per year (i.e., *quarterly*) in order to support calculation of an *annualized average*. DOE suggests that, rather than quarterly, each facility be required to sample in a manner and at a frequency which appropriately reflects the nature of the wastewaters and operations undertaken at the facility, and that an annualized average (based on such sampling) be used to evaluate whether the trigger levels have been exceeded.

I.H.4.d. Ground water and corrective action management standards

I.H.4.d.i. MSWLF rule

- 1. p. 43670, cols. 1&2 -- EPA proposes to adopt only the self implementing provisions of the Municipal Solid Waste Landfill (MSWLF) rule, but seeks comment on whether the multi-unit provision (allowing state approval of a multi-unit ground-water monitoring system based on site-specific considerations) and any other site-specific provisions in the MSWLF rule should be allowed to be self-implemented.**

DOE agrees that multi-unit monitoring may be the most efficient and reasonable approach in circumstances involving closely spaced surface impoundments. Therefore, if EPA chooses Option 2 to regulate surface impoundments that manage decharacterized wastes, DOE would support including regulatory language flexible enough to allow facilities to use multi-unit ground-water monitoring when appropriate (i.e., when such a ground-water monitoring system is as protective of human health and the environment as an individual monitoring system). Furthermore, DOE would favor making such regulations self-implementing.

I.H.4.d.ii. Ground water monitoring

- 1. p.43670, col. 2 -- EPA proposes to require that, within one year of triggering ground water monitoring, the owner/operator install a ground water monitoring system and begin monitoring.**

DOE believes that designing, installing and beginning operation of a ground water monitoring system within one year of detection of regulated levels of hazardous constituents in a surface impoundment will be difficult for federal facilities for budgetary reasons. Federal facilities need at least one year to allocate funding for new activities. Therefore, DOE suggests that EPA allow owner/operators to submit requests for extensions beyond the one year limit for installing a ground water monitoring system. Alternatively, EPA could allow the ground water monitoring system installation schedule to be negotiated on a case-by-case basis.

- 2. p. 43671, cols. 1& 2 -- EPA indicates that owner/operators would be required to move directly to an assessment of corrective measures upon detecting statistically**

significant levels of UHCs above the constituent-specific ground water protection standards as determined by 40 CFR 258.55(h) of the MSWLF rule.

DOE believes that the ground-water monitoring program under Option 2 (if implemented) should provide an opportunity for rebuttal of the presumption that assessment of corrective measures is required upon detecting UHCs in the ground water at statistically significant levels above the constituent-specific ground water protection standards as determined by § 258.55(h). Incorporating such a provision would be consistent with regulations proposed by EPA for corrective action of solid waste management units (SWMUs) at hazardous waste management facilities [*see* Preamble to Proposed 40 CFR Part 264, Subpart S, 55 FR 30798, 30814, cols. 2 & 3 (07/27/90)]. Under the proposed Subpart S regulations, permittees of RCRA treatment, storage and disposal facilities would be allowed to rebut the presumption that a corrective measure study is required when action levels are exceeded in ground water. For example, a rebuttal might be successful if the permittee established that the contamination did not result from leaks in the surface impoundment, or that risk from the constituents being released was within an acceptable range. DOE favors basing corrective action decisions on the potential for threats to human health and the environment.

I.H.4.d.iii. Integration of Option 2 with existing programs

- 1. p. 43671, col. 3 -- EPA observes that many of the facilities that would be subject to the requirements of Option 2 will be undergoing ground water monitoring and corrective action under existing state or federal authorities. The Agency states that it will defer to such programs if they are substantially similar to the Option 2 ground water and corrective action management standards (i.e., the programs include the UTS constituents of concern, and have substantially similar requirements regarding the monitoring wells and the frequency of monitoring).**

EPA has not proposed a mechanism whereby facilities can ascertain whether ongoing ground-water monitoring and/or corrective actions are "substantially similar" to the Option 2 program. DOE requests that the final LDR Phase IV rule provide clarification as to what constitutes a finding of substantial similarity (i.e., identify the associated criteria), and how and by whom a determination will be made that existing ground water monitoring and corrective action requirements at a facility are substantially similar. Since DOE funds are limited, the Department is especially concerned about how new ground water monitoring requirements will be integrated with the existing requirements under CERCLA, consent orders, and compliance agreements at DOE facilities.

- 2. p. 43672, col. 1 -- EPA requests comment on whether, as an alternative to requiring facilities to commence directly with a corrective measures assessment upon detecting UHCs in the surface impoundment (at levels "above regulatory concern"), the requirement should be to undertake a detection monitoring program. Under this alternative, if trigger levels were exceeded in the surface impoundment, ground water monitoring would be required for a set of indicator**

parameters that provide a reliable indication of the presence of hazardous constituents. The focus of the initial ground water monitoring, therefore, would be the detection of releases, rather than the detection of site-specific UHCs that are regulated.

DOE would support a program that allowed confirmation of a release *before* requiring assessment of corrective measures.

I.H.5. Proposed Management Standards for Sludges

I.H.5.b. Rationale

- 1. p. 43673, cols. 2&3 -- EPA states that the evaluation of sludges under Option 2 (i.e., to determine if the sludges pose a significant risk) will not be required until the sludges are removed from the surface impoundment. This is because in-place sludges are not believed to be a release pathway separate from the leaks pathway. When removed from the impoundment, if sludges contain hazardous constituents in excess of the UTS, treatment will be required prior to disposal. EPA notes that it could be argued that even no treatment of sludges would satisfy the requirement of RCRA-equivalent treatment since generation of sludges constitutes a new point of generation.**

DOE agrees that in-place sludges should not be considered a separate release pathway for hazardous constituents, and that controls directed at leaks should provide adequate protection for human health and the environment (i.e., without placing additional controls on in-place sludges). The Department also concurs that nonhazardous sludges need not be treated at all in order to achieve equivalency with the treatment required by RCRA Subtitle C LDR standards. Treatment of sludges is unwarranted unless, upon removal, the sludge is independently found to be characteristically hazardous, and therefore, pose a threat to human health or the environment. DOE holds the view that for characteristic wastes, treatment residues (such as impoundment sludges) having a different physical form, and possibly different treatability group, than the original waste should not be managed based on the characteristics of the original waste. Instead, such treatment residues should be judged based on their own characteristics. This position is consistent with the rules regarding treatability groups articulated by EPA in the LDR Third Third Final Rule [55 FR 22520, 22661-22662 (June 1, 1990)]. Hence, DOE believes that sludges removed from surface impoundments receiving decharacterized wastes should not be required to undergo treatment, unless such sludges exhibit a hazardous characteristic themselves. However, as EPA has pointed out, a compliant Subtitle D surface impoundment would (by definition) never produce sludge that exhibits a hazardous characteristic.

Consistent with this position DOE's comments on prior LDR proposed rulemakings encouraged EPA to apply the change of treatability group principle (instead of "waste code carry-through") to certain treatment residues, including sludges generated in wastewater

treatment surface impoundments accepting decharacterized wastes.¹⁰ DOE continues to encourage EPA to allow evaluation of such treatment residuals on their own merit.

I.H.7. Sampling and Analysis

- 1. p. 43675, cols. 2 & 3 -- EPA states that sampling and analysis requirements under Option 2 would not be burdensome, and that generator knowledge could be used in lieu of sampling and analysis. Section I.D.3.c is indicated as discussing what constitutes acceptable generator knowledge.**

DOE supports allowing generator knowledge as an alternative to sampling and analysis. For that reason, the Department is interested in EPA guidance on what constitutes acceptable generator knowledge. Since the LDR Phase IV proposed rule contains no section I.D.3.c providing such guidance, DOE requests that, if Option 2 is chosen, EPA include in the preamble to the final rule, the guidance it intended to put in section I.D.3.c. of the proposed rule preamble.

I.I Option 3

- 1. p. 43675, col. 3 -- EPA indicates that a third option, Option 3, for addressing the potential problem of releases of hazardous constituents from decharacterized wastes in surface impoundments would be to require wastes to meet UTS for the UHCs before entering the impoundment (unless the impoundment met MTRs or was qualified for a "no-migration" exemption). EPA expresses its view that Option 3 should not be the exclusive approach for reasons of law and policy.**

DOE agrees that treatment of characteristic wastes to meet UTS for UHCs should not be adopted as the exclusive method for addressing the potential problem of releases of hazardous constituents from decharacterized wastes in surface impoundments. As EPA has stated, adoption of the approach presented by Option 3 would be contrary to the position held by the D.C. Circuit (in *CWM v. EPA*) that "RCRA requires some accommodation with the CWA." Also, requiring all treatment of characteristic wastes to occur upstream of CWA, CWA-equivalent and other nonhazardous impoundment-based wastewater treatment systems reduces flexibility of waste management operations. As previously stated, DOE favors Option 1.

¹⁰ DOE Comments, Proposed Rule regarding Land Disposal Restrictions--Phase III, Specific Comment III.A.2.a, item 1, pp. 5-6 (05/01/95); DOE Comments, Proposed Rule regarding Land Disposal Restrictions for Newly Identified and Listed Hazardous Wastes and Hazardous Soil, Specific Comment III.C.5.a, item 1, p. 29-30 (11/15/93); DOE Comments, Interim Final Rule regarding LDR Treatment Standards for Certain Ignitable and Corrosive Wastes, Specific Comment III.E, item 1, p. 15 (07/09/93); DOE Comments, Notice of Data Availability and Request for Comments regarding Response to Court Decision, Specific Comment V.E, item 1, p.25 (03/04/93).

II. Proposal Not to Ban Nonamenable Wastes From Land-Based Biological Treatment Systems

II.B Rationale for Proposing Not to Ban Nonamenable Wastes From Biological Treatment Systems

1. **p. 43677, col. 2 -- EPA explains its reasons for deciding not to prohibit certain decharacterized wastes from land-based wastewater treatment systems on the basis of whether the constituents in those wastes are "amenable" to biological treatment.**

DOE agrees that the key issue in deciding whether nonamenable decharacterized wastes should be banned from impoundment-based wastewater treatment systems concerns whether cross-media transfers of hazardous constituents would occur in the absence of such a ban. DOE also agrees that the provisions of the LDR Phase III and IV rules (i.e., end-of-pipe limits on hazardous constituents coupled with a regulatory option to address potential hazardous constituent releases), when effective, will protect human health and the environment from risks caused by cross-media transfers of hazardous constituents from impoundment-based wastewater treatment systems, including those accepting nonamenable wastes. Therefore, DOE supports EPA's decision to not ban nonamenable decharacterized wastes from impoundment-based wastewater treatment systems.

III. Improvements to Land Disposal Restrictions Program

III.A. Cleanup of Part 268 Regulations

1. **p. 43677, col. 2 -- EPA states that it is proposing to "clean up" existing regulatory language that is outdated, confusing, or unnecessary by clarifying some sections, and by condensing or removing other sections.**

DOE supports EPA's continuing efforts to improve and simplify the regulations governing the Land Disposal Restrictions Program. The following comments are provided in response to the specific changes suggested within this proposed rule.

2. **p. 43677, col. 3, Sec. 268.5 -- EPA states that 40 CFR 268.5(e) would be amended to clarify that an applicant could be granted additional time (up to one year) beyond the one-year case-by-case extension to comply with LDR treatment standards. The preamble further indicates that a showing of the need for the additional time would have to be made in the application first submitted for the case-by-case extension.**
 - a. DOE agrees that giving individual waste generators an opportunity to request additional time as part of the application for the original case-by-case extension of the

effective date is an appropriate revision to the regulations. An approach of this type could be applied to DOE mixed wastes. For instance, certain mixed waste streams generated by DOE are not presently amenable to treatment using typical hazardous waste treatment technologies, and it is known that more than one year will be required for technology development. Therefore, allowing the application for a case-by-case extension to cover two years would improve the efficiency of the case-by-case extension process.

- b. DOE believes that the preamble language which discusses giving individual waste generators an opportunity to request additional time on a case-by-case extension could be misleading. As written, the preamble seems to indicate that additional time may be granted *only* if requested when first applying for a case-by-case extension. The proposed regulatory language presented at 60 FR 43691, on the other hand, does not contain the limitation implied by the preamble language. In fact, it specifically states that additional time can be requested either in the original application, or at a later date. DOE supports the proposed regulatory language, and requests that EPA clarify, in the preamble to the final rule, its intent with respect to when requests for additional time (beyond a one-year case-by-case extension) may be made.
3. **pp. 43677, col. 3 and 43678, cols. 1&2, Sec. 268.7 -- EPA proposes to rewrite 40 CFR 268.7 to reflect changes in LDR notification requirements, to clarify existing LDR notification requirements, and to generally simplify LDR notification requirements. The simplifications proposed include requiring generators to submit notifications to receiving facilities only once for wastes that meet the appropriate LDR treatment standards (i.e., a notice and certification with each shipment would no longer be mandated; if the waste composition or the process generating the waste changes, a new notice and certification must then be submitted) and deleting the requirement that generators submit waste analysis plans to States and Regions.**
- a. DOE supports EPA's proposal to eliminate the existing requirement for a hazardous waste generator to submit a waste analysis plan to the EPA or authorized state when treatment occurs in an accumulation container, tank or containment building for the purposes of compliance with LDR regulations. This approach will reduce the burden on the generator, as well as on EPA or the authorized state by eliminating the need to review such documents.
 - b. DOE agrees with removal of the requirement to send a notice and certification to the treatment or storage facility with each shipment of waste that meets the treatment standards. Under the new requirements, a generator (whose waste meets the appropriate treatment standards) will be required to submit a one-time notice and certification to the receiving facility unless the waste stream or process changes. The new requirements will provide major relief from burdensome paperwork requirements.

c. DOE has the following specific comments on the proposed regulatory language for 40 CFR 268.7:

(1) **pp. 43691, col. 3 - 43693, col. 3**

(a) **40 CFR 268.7(a)(1)** -- This rewritten section contains, in part, the following sentences:

In addition, some hazardous wastes must be treated by particular treatment methods before they can be land disposed. These treatment standards are also found in §268.40 and are described in detail in §268.42, Table 1. These wastes do not need to be tested.

DOE suggests that the last sentence quoted above may cause confusion in cases where more than one waste code are present in a waste stream, and only one of the waste codes present has a treatment standard that is a specified technology. In such cases, testing may be necessary. DOE requests that EPA revise the quoted language to clarify testing requirements in situations where more than one waste code are present, and the LDR treatment standard for only one waste code is a specified technology.

(b) **40 CFR 268.7(a)(2)** -- This rewritten section indicates that a generator who determines that its waste does not meet the LDR treatment standards must notify the treatment or storage facility, and the notice must include the information in column "268.7(a)(2)" of the "*Notification* Requirements Table" in §268.7(a)(4) [emphasis added].

(i) The table in §268.7(a)(4) is actually titled "*Paperwork* Requirements Table." DOE suggests consistency between the regulatory text and the table. This comment also applies to the proposed §§268.7(a)(3) and 268.7(a)(4).

(ii) Based on existing 40 CFR §268.7(a)(1) [see 60 FR 244-245 (01/03/95)], it seems like a check (✓) should appear next to item 4 in column "268.7(a)(2)" of the Paperwork [sic] Requirements Table in §268.7(a)(4) [requiring the notice to state the date that the waste is subject to the LDR prohibition on land disposal]. DOE requests clarification on whether EPA intended to change the existing information requirement by omitting the check (✓).

(c) **40 CFR 268.7(a)(3)** -- The first sentence of this rewritten section reads, "If the waste meets the treatment standard: The generator must send a one-time notice

and certification to each *treatment or storage facility* receiving the waste."
[emphasis added]

In writing the above-quoted sentence, it appears that the existing requirement (*see* existing 40 CFR 268.7(a)(2)) that the generator provide a notice and certification to land disposal facilities that receive waste meeting the treatment standard (as well as to treatment or storage facilities) was inadvertently omitted. Therefore, DOE suggests that the phrase italicized and underlined above be revised to say, "treatment, storage, or land disposal facility."

- (d) **40 CFR 268.7(a)(3)** -- The second and third sentences of this rewritten section read, "The notice must state that the waste meets the applicable treatment standards set forth in §268.40 or §268.45. The notice must also include the information indicated in column "268.7(a)(3)" of the Notification Requirements Table in §268.7(a)(4)."

Based on existing 40 CFR 268.7(a)(2), it seems like checks (✓) should appear next to items 2 and 3 in column "268.7(a)(3)" of the Paperwork [sic] Requirements Table in §268.7(a)(4) [requiring, respectively, that the notice state the constituents of concern in certain wastes, as well as the wastewater/nonwastewater category and subcategory within the waste code (if any), and include waste analysis data, when available]. DOE requests clarification on whether EPA intended to change the existing information requirement by omitting the checks (✓).

- (e) **40 CFR 268.7(a)(3)** -- The fourth sentence of this rewritten section reads, "However, generators of hazardous debris excluded from the definition of hazardous waste under §261.3(e)(2) of this chapter are not subject to these requirements."

On March 3, 1992 [57 FR 7628], EPA promulgated an interim final rule which simultaneously removed and reissued 40 CFR 261.3, including the "mixture" and "derived- from" rules. The revised 40 CFR 261.3 included a termination date or "sunset provision" (40 CFR 261.3(e)) for the reinstated "mixture" and "derived-from" rules. On October 30, 1992, EPA removed the sunset provision (40 CFR §261.3(e)) from the regulations because many commenters on the interim final rule urged the Agency to provide additional time for evaluation of revisions to the "mixture" and "derived-from" rules and expressed concern about the expiration date [*see* 57 FR 49279].

Since 40 CFR 261.3(e) has been removed from the regulations, and since, even before it was removed, §261.3(e) did not address hazardous debris, DOE believes the reference to §261.3(e)(2) in the above-quoted sentence from proposed 40 CFR 268.7(a)(3) is an error. Based on the existing regulatory

language in 40 CFR 268.7(a)(2), DOE believes that the reference in the quoted sentence should be to either 40 CFR 261.3(f)(1) or 261.3(f)(2) [excluding certain hazardous debris from regulation], instead of to 40 CFR 261.3(e)(2).

- (f) **40 CFR 268.7(a)(4)** -- DOE requests clarification of this rewritten section. Existing regulations at 40 CFR 268.7(a)(3) require generators of hazardous waste that is subject to an exemption from LDR treatment standards (e.g., a case-by-case extension under §268.5, an exemption under §268.6, or a nation-wide capacity variance under subpart C) to include the following information on a notice to any facility receiving the waste:
- i. EPA Hazardous Waste Number;
 - ii. Constituents of concern for certain wastes, as well as the wastewater/nonwastewater category and subcategory (if any) within the waste code;
 - iii. Manifest number;
 - iv. Waste analysis data, when available;
 - v. Certain information for hazardous debris that will be treated using the alternative treatment technologies provided by §268.45;
 - vi. Certain information for hazardous debris that will be treated in accordance with the requirements applicable to the contaminating waste; and
 - vii. Date on which the waste is subject to the prohibition on land disposal.

These existing requirements are changed by rewritten section 40 CFR 268.7(a)(4). Specifically, items ii, iv, v, and vi are no longer required. Further, a new requirement for a certification statement has been added. EPA does not discuss or explain these changes in the preamble. Therefore, DOE requests clarification about whether EPA intended to make such changes. Generally, the changes seem appropriate for exempt wastes, and DOE would support them if they are being proposed.

- (g) **40 CFR 268.7(a)(4), Paperwork [sic] Requirements Table** -- DOE suggests that EPA consider expanding this table to include the paperwork requirements for lab packs.
- (h) **40 CFR 268.7(a), Paperwork [sic] Requirements Table (item 2)** -- This item, under the "Required Information" column, is worded as follows: "The constituents for F001-F005, F039, and underlying hazardous constituents, unless the waste will be treated and monitored for all constituents (in which case none are required to be listed). The notice must include the applicable wastewater/nonwastewater category (see §§268.2(d) and (f)) and subdivisions made within a waste code based on waste-specific criteria (such as D003 reactive cyanide)."

DOE requests clarification of the first sentence of proposed item 2. Should this sentence be modified to read, "The constituents of concern for F001-F005 and F039 wastes, and underlying hazardous constituents for all characteristically hazardous wastes (as defined by 40 CFR 261.21 - 261.24), unless the waste will be treated and monitored for all constituents (in which case none are required to be listed)" ?

- (i) **40 CFR 268.7(a), Paperwork [sic] Requirements Table (item 5)** -- This item, under the "Required Information" column, provides the wording for a certification statement, but neither the item nor accompanying regulatory text indicates who is required to sign the certification.

DOE suggests that the language of existing 40 CFR 268.7(a)(2)(ii) indicating that the certification must be signed by an authorized representative of the generator be included either in the Table, or in accompanying regulatory text.

- (j) **40 CFR 268.7(a)(5)(iii)** -- EPA's proposed language for this section reads: "(iii) Wastes shipped off-site pursuant to this paragraph must comply with the notification requirements of §268.7(a)(4)."

DOE requests verification that the cross-reference is correct. It appears that it should be §268.7(a)(3) (discussing generator notification requirements when waste meets the treatment standard) rather than §268.7(a)(4) (discussing reporting and recordkeeping for wastes that are excepted from treatment requirements).

- (k) **40 CFR 268.7(b)(3)** -- *See* comment III.A, item 3.c.(1)(e) above concerning the cross-reference in this section to 40 CFR 261.3(e). It appears that this provision [proposed §268.7(b)(3)] should be revised to refer to §261.3(f).
- (l) **40 CFR 268.7(b), Paperwork Requirements Table (item 2)** -- *See* comment III.A, item 3.c.(1)(h) above concerning the wording of this item. Should this item be modified to read, "The constituents of concern for F001-F005 and F039 wastes, and underlying hazardous constituents for all characteristically hazardous wastes (as defined by 40 CFR 261.21 - 261.24), unless the waste will be treated and monitored for all constituents (in which case none are required to be listed)" ?
- (m) **40 CFR 268.7(b)(4)** -- *See* comment III.A, item 3.c.(1)(e) above concerning the cross-reference in this section to 40 CFR 261.3(e). It appears that this provision [proposed §268.7(b)(4)] should be revised to refer to §261.3(f).

4. **p. 43678, col. 3, Sec. 268.30 - 268.37** -- EPA proposes to remove 40 CFR 268.31 through 268.37, and to replace the existing 40 CFR 268.30 with a new section that identifies the prohibition dates of the wastes covered by the LDR Phase IV rule.

a. The following specific comments are offered in response to the language proposed for new 40 CFR 268.30.

(1) **p. 43694, cols. 1-3**

(a) **40 CFR 268.30(a)** -- DOE requests that EPA confirm that the effective date for the prohibition from land disposal of D004-D011 and F032, F034 and F035 actually should be November 20, 1995 as stated in this section. DOE believes EPA intended this proposed regulatory language to contain the parenthetical "[insert date 90 days from publication of final rule]" rather than an actual date.

(b) **40 CFR 268.30(b)** -- DOE requests that EPA confirm that the effective date for the prohibition from land disposal of soil and debris contaminated with F032, F034 and F035 and radioactive wastes mixed with D004 - D011 wastes (as measured by the TCLP) actually should be August 22, 1997 as stated in this section. DOE believes EPA intended this proposed regulatory language to contain the parenthetical "[insert date two years from publication of final rule]" rather than an actual date.

(c) **40 CFR 268.30(c)** -- DOE requests that EPA confirm the correctness of the dates in this proposed section. DOE believes that, in the proposed language, the parenthetical "[insert date 90 days from publication of final rule]" should replace "November 20, 1995" and the parenthetical "[insert date two years from publication of final rule]" should replace "August 22, 1997."

5. **p. 43678, col. 3, Appendices** -- EPA proposes amending 40 CFR Part 268, Appendix VI to clarify that characteristic wastes that also contain UHCs must be treated not only by a "deactivating" technology to remove the characteristic, but also treated to achieve the UTS for UHCs.

DOE does not object to the clarification which EPA proposes. However, DOE notes that the treatment standard prescribed raises a troubling issue for deactivation by detonation of explosives (D003) containing toxic metals. In the LDR Phase III proposed rule, EPA proposed modifying the table in 40 CFR 268.40, "Treatment Standards for Hazardous Wastes," to indicate that the LDR treatment standard for both wastewater and nonwastewater forms of "D003 Explosives Subcategory" would be "DEACT and meet §268.48 standards." [60 FR 11702, 11742 (03/02/95)] This proposed treatment standard for the D003 Explosives Subcategory is replicated in the LDR Phase IV proposed language for the table in §268.40. [60 FR 43654, 43694 (08/22/95)] There is no obvious way, in certain explosive wastes, that UHC metals can be treated to meet UTS either before or after deactivation by detonation.

Since detonation is the primary method by which explosives are deactivated, DOE perceives this issue to be potentially significant. Therefore, the Department requests the Agency to address this issue and to provide the opportunity for the affected regulated community to submit information for the Agency's consideration.

III.B. Simplification of Treatment Standard for Waste Code F039

1. **p. 43679, col. 1-- EPA proposes that the LDR treatment standard for F039 be changed from specific concentrations for a list of hazardous constituents to the Universal Treatment Standards in §268.48, with the exception of fluoride, vanadium and zinc.**
 - a. DOE requests that EPA clarify the exclusion of concentrations for fluoride, vanadium and zinc from the LDR treatment standards for F039 wastes. The reasoning for this is unclear. The existing LDR treatment standards for F039 include concentration limits for fluoride and vanadium, but not zinc (*see existing* 40 CFR §268.40, Table - Treatment Standards for Hazardous Waste). The existing UTS (§268.48 Table UTS - Universal Treatment Standards) include concentration limits for all three constituents. If EPA is excluding these three constituents from the LDR treatment standards applicable to F039 because they are excluded from the definition of "underlying hazardous constituents,"¹¹ DOE is confused as to the connection and requests that EPA address this issue in the preamble to the final rule.
 - b. EPA appears to be broadening the scope of the F039 treatment standard by referencing the UTS Table because there are eight organic constituents on the UTS table that are not now covered by the F039 treatment standard. These constituents are Acrylamide, Benzal chloride, *p*-Chloro-*m*-cresol, *p*-Dimethylaminoazo-benzene, *o*-Nitroaniline, *o*-Nitrophenol, Pentachloroethane, and Phthalic acid. These eight organic constituents should also be designated as exceptions from the UTS that constitute the F039 treatment standard. This should be done either in the columns of the table in §268.40, "Treatment Standards for Hazardous Wastes," labeled "Wastewaters" and "Nonwastewaters," or in a footnote to the table.
 - c. DOE provides the following comments on the proposed regulatory language implementing this section of the preamble.
- (1) **p. 43697, 40 CFR 268.40, Table - Treatment Standards for Hazardous Wastes -- EPA proposes that the LDR treatment standards given on this table for F039**

¹¹ The existing definition of "underlying hazardous constituents" (40 CFR 268.2(i)), excludes vanadium and zinc. Also, the preamble to the LDR Phase III proposed rule indicated that "[f]luoride, like zinc, is not an underlying hazardous constituent in characteristic wastes, according to the definition at §268.2(i)" (60 FR 11702, 11727, col. 1 (03/02/95)).

wastes be changed, for both wastewater and nonwastewater forms, from a list of individual chemical constituent concentrations to the Universal Treatment Standards in §268.48, with the exceptions of vanadium and zinc.

- (a) DOE notes that the proposed regulatory language for the Table (i.e., proposed 40 CFR 268.40, Table - Treatment Standards for Hazardous Wastes) differs from the preamble (60 FR 43654, 43679, col. 1) in that the preamble states that fluoride will be an exception to the UTS for this waste stream in addition to vanadium and zinc. DOE requests that EPA resolve the inconsistency between the preamble and the proposed regulatory language.
- (b) In the proposed regulatory language for the Table (i.e., proposed 40 CFR 268.40, Table - Treatment Standards for Hazardous Wastes), the column labeled "Common Name" contains the following words for the F039 waste code: "Universal Treatment Standards in §268.48 apply, with the exceptions of fluoride, vanadium, and zinc." Such wording is inconsistent with the language proposed for the F039 columns labeled "Wastewaters" and "Nonwastewaters." Also, it appears that the words "multi-source leachate" might be more appropriate as the "Common Name" for the F039 waste code.

III.C POLYM Method of Treatment for High-TOC Ignitable D001 Wastes

1. **p. 43679, col. 1 -- EPA proposes to add polymerization (POLYM) to the set of required methods of treatment designated Best Demonstrated Available Technology (BDAT) for high-TOC ignitable (D001) wastes resulting from commercial polymerization processes.**

DOE believes that polymerization is a superior method for treating certain high-TOC ignitable D001 wastes, and supports its addition to the set of treatment methods designated as BDAT.

V. Treatment Standards for Newly Listed and Identified Wastes

V.D. Treatment Standards for Toxic Characteristic Metal Wastes

V.D.1 Rationale for Applying Universal Treatment Standards (UTS) to Toxic Characteristic Metal Wastes (D004-D011)

1. **p. 43682, col. 2 -- EPA proposes to change the treatment standard levels for characteristic metal wastes from those established in the Third Third rule at the characteristic levels to previously promulgated UTS levels for metal constituents. Furthermore, EPA indicates that characteristic metal wastes will also be required**

to meet treatment standards for any UHCs reasonably expected to be present in the wastes at the point of generation.

- a. DOE requests that EPA verify that the preamble description of the new treatment standards for characteristic metal wastes is consistent with the proposed regulatory language for the table in 40 CFR 268.40, "Treatment Standards for Hazardous Wastes" (60 FR 43695). It appears that the constituent concentration levels given on this table for waste codes D004 through D011 in the columns labeled "Wastewaters" and "Nonwastewaters" should all be followed by the phrase "and meet §268.48 standards."
- b. DOE anticipates that meeting the new LDR treatment standard for characteristic metal wastes may be a problem for certain radioactive waste streams at the Oak Ridge National Laboratory (ORNL). One such waste stream is stabilized supernatant from the ORNL Liquid Low-Level Waste System. This stabilized waste is destined for disposal at the Nevada Test Site. Some of the stabilized waste is currently in storage, but it will continue to be generated beyond the time the LDR Phase IV final rule becomes effective. Conducting analyses on such radioactive wastes has historically been a problem because of the need to use reduced volumes of samples which makes it difficult to meet the required detection limits. Based on past analyses, lead, selenium, cadmium, and/or chromium limits could either be above the laboratory's detection limits or exceeded in the final waste form. Although the proposed two-year national capacity variance for mixed wastes affected by the Phase IV rule and the proposed exception from the LDR Phase IV treatment standards for previously stabilized mixed wastes will provide a temporary exemption for some of these wastes, additional regulatory modifications are requested for addressing this situation.

DOE requests that EPA consider developing an LDR treatment standard of "stabilization" (i.e., establishing a specified technology as the standard) for certain mixed radioactive and characteristic metal wastes, provided adequate technical data is submitted to the Agency in support of such a standard. Since the stabilized waste is radioactive, disposal will be conducted in accordance with Atomic Energy Act (AEA) requirements (directed at providing adequate protection to human health and the environment), and further treatment of certain wastes with very low levels of toxic constituents would not seem warranted.

V.D.2. Proposed Revision of UTS for Beryllium

1. **p. 43683, col. 2 -- EPA proposes to change the UTS for beryllium to 0.04 mg/l TCLP from 0.014 mg/l TCLP.**

DOE supports the proposed change in the treatment standard for beryllium. Based on analytical results from surrogate samples spiked with beryllium, a level of 0.04 mg/l is achievable and appropriate. Utilizing stabilization technologies for waste streams which do not exceed 5000 parts per million beryllium, a level of 0.04 mg/l can be consistently met.

Conversely, the current treatment standard of 0.014 mg/l cannot be met, given the same beryllium levels and utilizing stabilization technologies.

V.D.3. Treatment Standard for Previously Stabilized Mixed Radioactive and Characteristic Metal Wastes

1. **p. 43683, col. 3 -- EPA proposes to allow characteristic metal mixed wastes (i.e., radioactive wastes which exhibit the toxicity characteristic for metals) that have undergone stabilization prior to the effective date of the Phase IV final rule, to comply with the LDR treatment standards for metals that were in effect at the time the waste was stabilized. Mixed radioactive/characteristic metal wastes that are stabilized after the effective date of the LDR Phase IV final rule would be subject to the metal treatment standards in the Phase IV rule.**
 - a. DOE fully supports EPA's proposal not to require re-treatment of mixed radioactive and characteristic metal wastes that have been treated (i.e., undergone stabilization) to meet currently applicable treatment standards, but that may not be land disposed until after the new treatment requirements of the LDR Phase IV rule become effective. Requiring re-treatment of previously stabilized wastes that have been in storage simply because of a change in standards that occurs before disposal can be accomplished makes no sense unless the benefits associated with re-treatment outweigh the risks to workers and the costs. DOE agrees with EPA's conclusion that in the case of previously stabilized mixed radioactive and characteristic metal wastes, the opposite may be true because the hazards from added worker radiation exposure associated with re-treatment would probably offset any gain in protection of human health and the environment resulting from compliance with the new metal treatment standards in the Phase IV rule.
 - b. As recognized in the preamble [60 FR 43683, col. 3], DOE has provided information to the Agency concerning treatment and storage of the low-level waste fraction of high-level reprocessing wastes at the West Valley Demonstration Project (WVDP). The Department brought this specific mixed waste example to the Agency's attention because it involves mixed radioactive and characteristic metal wastes that have been treated and stored to await the development of disposal capacity. DOE was concerned that if, as is proposed, the LDR Phase IV rule were to adopt more stringent treatment standards for characteristic metal wastes than the standards applicable when the WVDP wastes were treated, re-treatment might be necessary. This could occur unless disposal were accomplished before the LDR Phase IV rule became effective. DOE's concerns stemmed from the hazards (from added worker radiation exposure) and expense associated with re-treatment of these already treated wastes. With these concerns in mind, DOE requested that language be incorporated into the LDR Phase IV rule that would prevent any mixed radioactive and characteristic metal wastes that have been treated to previously applicable treatment standards, and that are being stored until disposal capacity is available, from having to be re-treated.

DOE believes EPA's proposed approach will address the Department's concern regarding the WVDP situation. As such, DOE supports the proposed approach, as indicated in the preceding comment. The Department also believes, however, that the scope of this regulatory proposal is too limiting. Therefore, the Department recommends that the proposed provision be broadened to cover mixed radioactive and characteristic metal wastes that have been treated by treatment methods other than stabilization (e.g., macroencapsulation of non-debris wastes). Stabilization is only one of many types of treatment that may be performed on characteristic metal wastes to comply with LDR treatment standards.

c. Because DOE supports EPA's proposal in this section of the preamble, the Department is concerned that EPA has not proposed any corresponding regulatory language to implement the section. DOE suggests that EPA add appropriate regulatory language to the proposed rule as follows:

(1) A section should be added to proposed 40 CFR 268.30 which would read:

§268.30 Waste specific prohibitions -- wood preserving wastes, and characteristic wastes that fail the toxicity characteristic.

* * * * *

(d) The requirements of paragraphs (a), and (b) of this section do not apply if:

* * * * *

(5) The wastes are radioactive wastes mixed with or containing D004-D011 wastes, which have been treated to meet Subpart D treatment standards in effect prior to [insert effective date of Phase IV regulations (including any applicable national capacity variance) for radioactive waste mixed with D004-D011]. Such wastes must have been treated prior to [insert effective date of Phase IV regulations (including any applicable national capacity variance) for radioactive waste mixed with D004-D011] to be excluded from application of paragraph (b).

d. Given the lack of sufficient disposal capacity for mixed wastes, DOE urges EPA to consider including exceptions similar to the one proposed in the LDR Phase IV proposed rule (i.e., in section V.D.3 of the preamble) in future LDR treatment standard proposals. An important lesson DOE learned from the WVDP situation is that more treated DOE mixed wastes (both characteristic and listed) could fall into similar situations if EPA continues to promulgate increasingly more stringent LDR treatment standards in the future without grandfathering treated wastes that are being stored while they await disposal capacity. DOE recently signed compliance orders that set up schedules to treat mixed wastes at over twenty-five sites. As a result, DOE will soon

be treating thousands of cubic meters of mixed waste to the existing LDR treatment standards and storing the treated wastes (potentially over the next several decades) until mixed waste disposal capacity becomes available. Therefore, if EPA changes applicable LDR treatment standards to more stringent levels while such treated wastes are in storage, then without an exception, DOE and the commercial sector (which also has insufficient disposal capacity), could potentially be required to re-treat the stored wastes. This re-treatment could not only be expensive, but also cause unnecessary worker radiation exposure.

VIII. Capacity Determinations

VIII.B. Capacity Analysis Results Summary

VIII.B.5 Mixed Radioactive Wastes

1. **p. 43686, col. 1 -- EPA states that any new commercial capacity that becomes available will be needed for mixed radioactive wastes that were regulated in previous LDR rulemakings and whose variances have already expired. Therefore, EPA is proposing to grant a two-year national capacity variance for mixed RCRA/radioactive wastewaters and nonwastewaters contaminated with wastes whose standards are being addressed in the LDR Phase IV proposed rule.**
 - a. DOE agrees with EPA's assessment that, regardless of the volume of mixed radioactive wastes that will require treatment for the first time as a result of the LDR Phase IV rule, there will be inadequate capacity to manage such additional mixed waste streams. Therefore, the Department supports EPA's proposal of a two-year national capacity variance for such mixed wastes.
 - b. EPA is proposing a two-year national capacity variance for "mixed RCRA/radioactive wastewaters and nonwastewaters contaminated with wastes whose standards are being proposed today" (i.e., Phase IV Mixed Radioactive Wastes). Assuming that the two-year national capacity variance proposed in 40 CFR 268.30(b) applies to characteristic metal mixed wastes whose treatment standards will be lowered by the LDR Phase IV rule, DOE requests that EPA clarify whether the exemption of previously stabilized characteristic metal mixed wastes from the LDR Phase IV treatment standards will apply to characteristic metal mixed wastes stabilized before the date on which the national capacity variance ends, or only to characteristic metal mixed wastes stabilized before the date which is 90 days from the date of publication of the LDR Phase IV final rule in the *Federal Register*. DOE favors the granting of a two-year national capacity variance for RCRA nonwastewaters consisting of toxicity characteristic metal waste mixed with low levels of radioactive waste.

IX. State Authority

B. Abbreviated Authorization Procedures for Specified Portions of the Land Disposal Restrictions Phase II, III, and IV Rules

1. **p. 43687, col. 3** -- EPA states that a new section 40 CFR 271.28 is being proposed which implements a streamlined State authorization procedure applicable only to specific parts of the LDR Phase II, III, and IV rules.

DOE generally supports streamlining the RCRA state authorization process for minor changes to the existing RCRA program. However, the Department has some concerns about the specific proposal as presented by EPA. Detailed comments are provided below, but in addition, it is unclear to DOE why EPA has chosen regulatory language that so narrowly limits the proposal. DOE believes the proposal should be broadened to describe a generic streamlined state authorization procedure that can be applied to any future minor revisions to a RCRA hazardous waste management program. Instead, the Agency is proposing streamlined state authorization that applies only to a specified list of existing rules and proposed rules (i.e., parts of the LDR Phase II, III and IV rules).

DOE suggests that EPA modify its proposal to contain a generic streamlined state authorization procedure. A regulatory section should be included listing: (1) the already existing regulations to which the streamlined procedure could be applied; (2) proposed regulations to which the streamlined procedure could be applied after such regulations are finalized; and (3) in either case, any conditions precedent to authorization (e.g., prior authorization for LDR rules through the Third Third). Then, after finalization of the generic procedure and the list, each subsequent proposed RCRA program change could request comment on whether the newly proposed regulations should be eligible for streamlined state authorization.

2. **p. 43687, col. 3 and p. 43698, proposed §271.28(a)** -- EPA proposes new regulatory section 40 CFR 271.28(a) listing the specific parts of the LDR Phase II, III and IV rules for which streamlined authorization will be available. In part, the proposed language reads as follows:

(a) The procedures contained in this section may be used by a State when revising its program by applying for authorization for the following rules, or parts of rules:

(1) The following changes promulgated by the [LDR Phase II] rule . . .

* * * * *

(2) The following changes proposed by the [LDR Phase III] rule . . .

* * * * *

(3) All provided regulatory provisions of the proposed [LDR Phase IV] rule ([insert date of publication of final rule]. . .

* * * * *

- a. DOE suggests that the proposed regulatory language clearly indicate when States can apply for authorization to implement eligible regulations. DOE requests clarification of whether States would be allowed to apply for authorization to implement proposed Federal RCRA regulations before the Federal regulations have been finalized.
- b. DOE believes the above-quoted language from 40 CFR 271.28(a)(3) is ambiguous. The Department suggests that the phrase "all provided regulatory provisions" be replaced with a list of the specific sections of the regulations that will be eligible for streamlined State authorization. This is important because the final LDR Phase IV rule will, presumably, include regulatory provisions implementing EPA's chosen option addressing the management of decharacterized waste in surface impoundments that are not subject to RCRA Subtitle C in addition to the final version of the regulatory provisions for which language has been presented with the NPRM. Therefore, in the context of the final LDR Phase IV rule, the phrase "all provided regulatory provisions" will have a completely different meaning than it does in the context of the proposed LDR Phase IV rule.

3. **p. 43699, col. 2, proposed §271.28(e) -- This proposed regulation reads:**

(e) Within 60 days after receipt of a complete final application from a State for final authorization to implement a rule or rules specified in paragraph (a) of this section, *absent information in the possession of EPA*, the administrator shall publish an immediate final notice of the decision to grant final authorization as follows: . . . [emphasis added]

It appears that some language may have been omitted from the phrase emphasized in the quoted language above.

COMMENTS ON PROPOSED REGULATORY LANGUAGE NOT DISCUSSED IN PREAMBLE

- 1. **p. 43694, col.3, 40 CFR 268.40(e) -- EPA proposes the following language for 40 CFR 268.40(e):**

(e) For characteristic wastes subject to treatment standards in the following table "Treatment Standards for Hazardous Wastes," all underlying hazardous constituents (as defined in §268.2(i)) must meet Universal Treatment Standards, found in §268.48, Table UTS, prior to land disposal.

The regulatory language in existing §268.42(d) states that "where treatment standards are specified for radioactive mixed wastes in the Table of Treatment Standards, those treatment standards will govern." In the existing table "Treatment Standards for Hazardous Wastes" [40 CFR 268.40], specified technologies are identified that apply to certain radioactive mixed wastes containing D004-D011 (e.g., radioactive high level wastes generated during the reprocessing of fuel rods). Under the LDR Phase IV proposed rule (i.e., the changes proposed to §268.40), however, the specified technologies for mixed radioactive wastes containing D004-D011 are not listed.

The wording in proposed §268.40(e) states (as noted above) that "for characteristic wastes subject to treatment standards in the following table "Treatment Standards for Hazardous Waste," all underlying hazardous constituents (as defined in §268.2(i)) must meet Universal Treatment Standards, found in §268.48, Table UTS, prior to land disposal." This specific language does not exclude characteristic mixed radioactive waste for which EPA has established a technology-based standard. As such, radioactive mixed wastes containing characteristic metal wastes [e.g., high-level radioactive wastes generated during the reprocessing of fuel rods and carrying waste codes D002 or D004 through D011, for which the "treatment standard" is vitrification (HLVIT)] would also be required to meet UTS for underlying hazardous constituents. DOE does not believe EPA intended such a requirement. With respect to high level mixed wastes, for instance, EPA stated in the Third Third final rule preamble that the potential hazards associated with exposure to radioactivity during the analysis of high-level waste precluded the establishment of concentration-based treatment standards to be applied to the final treated glass form resulting from vitrification [55 FR 22520, 22627 (06/01/90)].

Therefore, to avoid confusion, DOE suggests that the wording of 40 CFR 268.40(e) in the final LDR Phase IV rule be modified to read as follows:

For characteristic wastes subject to treatment standards in the following table "Treatment Standards for Hazardous Wastes," all underlying hazardous constituents (as defined in §268.2(i)) (except for those waste codes for which the treatment standard is a specified technology) must meet Universal Treatment Standards, found in §268.48, Table UTS, prior to land disposal.

- 2. p. 43695, 40 CFR 268.40, table of Treatment Standards for Hazardous Wastes -- EPA proposes the modify the LDR treatment standard for waste code D003, Explosives Subcategory based on §261.23(a)(6), (7) and (8).**

EPA has proposed that the columns of the Treatment Standards table labeled "Wastewaters" and "Nonwastewaters" be modified for waste code D003, Explosives Subcategory to read: "DEACT and meet §268.48 standards." DOE requests clarification as to why the D003, Reactive Sulfides Subcategory and the D003, Other Reactives Subcategory were not also modified to require meeting §268.48 standards. Will "DEACT" be the only required LDR treatment for such wastes?

ATTACHMENT A
to
DOE Comments on Land Disposal Restrictions -- Phase IV
(November 20, 1995)

SUPPLEMENTAL INFORMATION
ON THE
SAVANNAH RIVER SITE
HIGH-LEVEL WASTE TREATMENT SYSTEM

ATTACHMENT A

SUPPLEMENTAL INFORMATION
ON THE
SAVANNAH RIVER SITE
HIGH-LEVEL WASTE TREATMENT SYSTEM

Introduction

In June 1990, the Environmental Protection Agency (EPA) promulgated treatment standards for certain listed and characteristic hazardous wastes pursuant to the Resource Conservation and Recovery Act §3004(g) (i.e., Third Third Land Disposal Restrictions (LDR) rule, 55 FR 22520 (June 1, 1990)). Portions of these standards were vacated and remanded by the District of Columbia Court of Appeals in *Chemical Waste Management, Inc. v. EPA*, 976 F.2d 2, *cert. denied* 113 S.Ct. 1961 (1992). One of the Court's holdings was that situations where characteristic hazardous wastes are diluted, no longer exhibit a characteristic(s) (i.e., are "decharacterized"), and are then managed in centralized wastewater management land disposal units (i.e., subtitle D surface impoundments or injection wells) are legal only if it can be demonstrated that hazardous constituents are reduced, destroyed, or immobilized in the centralized wastewater management system to the same extent as they would be pursuant to otherwise-applicable RCRA treatment standards (referred to as an "equivalency demonstration").

In the proposed LDR Phase III rule [60 FR 11702 (Mar. 2, 1995)], EPA suggested standards to address one portion of the equivalency demonstration required by the court (i.e., treatment standards for end-of-pipe discharges) in the context of placing decharacterized wastes into impoundment-based Clean Water Act (CWA) or CWA-equivalent wastewater treatment systems. In the proposed LDR Phase IV rule [60 FR 43654 (Aug. 22, 1995), EPA suggests options for standards to address the remaining portion of the equivalency demonstration in the same context (i.e., treatment standards for cross-media releases of hazardous constituents from impoundment-based CWA and CWA-equivalent wastewater treatment systems that are so extensive as to constitute disposal).

In response to the LDR Phase III proposed rule, DOE expressed concern that, although the preamble language indicated that the final rule would apply only in situations where decharacterized wastes were being managed in impoundment-based Clean Water Act (CWA), CWA-equivalent (including zero-discharge), or other non-hazardous wastewater treatment systems, the regulatory language was unclear.¹ DOE was worried that the treatment standards established by the LDR Phase III rule for end-of-pipe discharges from CWA, CWA-equivalent and other non-hazardous wastewater treatment systems receiving decharacterized wastes might be applied to treated wastes exiting certain components of the Savannah River Site's (SRS) treatment system for mixed high-level wastes (i.e., the Defense Waste Processing Facility (DWPF) and the Saltstone Processing and Disposal Facilities). Because the LDR Phase III

¹ DOE Comments, Proposed Rule regarding Land Disposal Restrictions -- Phase III, Appendix A, p. A-2 (05/01/95).

rule has not yet been finalized, and the proposed LDR Phase IV rule sets additional standards to address releases of hazardous constituents via air emissions, sludges and leaks from the same wastewater treatment systems as were addressed by the LDR Phase III proposed rule, DOE is now concerned that the LDR Phase IV final rule could also be applied to these components of the SRS mixed high-level waste treatment system.

Generally, DOE is concerned that the proposed regulatory language defining the scope of the LDR Phase III and Phase IV rules is broad enough to encompass decharacterized wastes managed in the DWPF and the Saltstone Processing and Disposal Facilities, which could be construed as zero dischargers engaging in CWA-equivalent treatment, even though none of these Facilities includes land-based surface impoundments. If decharacterized wastes managed in the DWPF and the Saltstone Processing and Disposal Facilities are covered by the LDR Phase III and Phase IV rules, DOE believes that significant process modifications may be necessary in order to achieve compliance.

Currently, approximately 34 million gallons of high-level mixed (radioactive and hazardous) wastes are contained in 50 large, but aging, underground storage tanks at the SRS. Some storage tanks were installed in the 1950s. This high-level waste is slated for treatment by the LDR-specified technology of vitrification by way of complex, integrated treatment facilities at the SRS (including the DWPF, the Saltstone Processing and Disposal Facilities, and other facilities). Designing and installing process modifications to achieve compliance with the LDR Phase III and Phase IV rules, if they apply, would delay removal from the underground tanks and pretreatment to separate the low-level waste fraction of the mixed high-level wastes. Such delay would negatively affect the ultimate vitrification of the high-level waste fraction at the SRS.

It is DOE's understanding that its concern, as outlined above, may be alleviated by a clarification that EPA intends to include in the LDR Phase III final rule. However, since the clarification is not yet available to the Department, this report offers information concerning the SRS situation to support DOE's comments (i.e., Specific Comment I.B of DOE Comments on Land Disposal Restrictions -- Phase IV; Nov. 20, 1995) on the proposed LDR Phase IV rule [60 FR 43654; Aug. 22, 1995]. The comments, and much of the information presented in this supporting report, center primarily on the Saltstone Processing and Disposal Facilities, although the DWPF is also of concern. The DWPF is not addressed at length because it is felt that EPA does not intend the LDR Phase III and Phase IV rules to impose treatment restrictions on high level waste beyond the existing requirement to apply the specified technology of vitrification.

I. Overview of Potential Impacts

In preparation for start-up, the DWPF, the Saltstone Processing Facility, and the Saltstone Disposal Facility have all undergone numerous independent and in-house rigorous examinations to demonstrate their ability to safely treat, store, and dispose of mixed wastes. Nevertheless, if the LDR Phase III and IV regulations, as proposed, were applied to such SRS facilities, certain added requirements would be imposed. Under Phase III, at "end-of-pipe," the effluent from CWA and CWA-equivalent wastewater treatment facilities must contain concentrations of underlying hazardous constituents (UHCs) not exceeding the Universal Treatment Standards (UTSs) (see 40 CFR 268.48) at the point of final disposal. Under LDR

Phase IV, additional controls might be imposed on CWA and CWA-equivalent wastewater treatment facilities that receive decharacterized wastes to limit releases of hazardous constituents from such facilities via air emissions, sludges and leaks.

According to the finding of an independent review committee after four months investigating the SRS high-level waste system, there must be an "... appreciation for the risk penalty of delay. Until the wastes are transformed into less mobile forms, such as saltstone and glass, they represent a very real threat to the environment, both on and offsite." [Ref. 5]. Hence, DOE estimates that installing additional treatment in the SRS Saltstone Processing and Disposal Facilities for removing organics from the saltstone to achieve UTS levels in accordance with the proposed LDR Phase III rule would actually result in increased risk due to 1) releases and exposure resulting from the organic treatment process and from the treatment and disposal of the subsequent mixed wastes that would be generated from this process, 2) increased risks associated with the extended time the high level radioactive waste would have to remain in the aging million gallon storage tanks, and 3) environmental impacts associated with construction of additional process facilities. In other words, applying the LDR Phase III regulations alone to the SRS Saltstone Processing and Disposal Facilities would provide no additional benefit to the safe operation of the SRS, or to human health and safety or the environment. On the contrary, risks may be increased along with costs, and vitrification of high-level radioactive wastes may be significantly delayed. Similar results are expected from consideration of imposing the proposed LDR Phase IV added controls on the SRS Saltstone Processing and Disposal Facilities.

II. High Level Waste System Description Overview

A. Major Facilities

As a result of nuclear materials production over several decades, approximately 34 million gallons (129 million liters) of high-level radioactive waste have been accumulated at the SRS. The High Level Waste (HLW) System seeks to maintain safe storage until such time as the wastes have been treated and properly disposed. This system is comprised of operations initiating from the receipt of various waste streams, placement into large underground storage tanks used to store the wastes, transferring to processing facilities required to pretreat the waste, and treatment at the Defense Waste Processing Facility (DWPF), a one of a kind vitrification system. The HLW System includes the following key processing components:

Waste Storage:	Underground Storage Tanks (fifty-one tanks, one out of service)
Volume Reduction:	Evaporator Systems
Pre-Treatment:	In-Tank Precipitation Facility, Extended Sludge Processing Facility
Waste Treatment:	Defense Waste Processing Facility, Saltstone Processing Facility, F-Area and H-Area Effluent Treatment Facility
Waste Disposal:	Saltstone Disposal Facility, NPDES, Federal Repository

A schematic diagram has been included with this report as Figure 1 to depict the relationships between these components.

B. Underground Storage Tanks

Fifty large underground storage tanks located in two tank farms store approximately 34 million gallons of high-level mixed waste produced from a number of sources as a result of the separation of useful products from spent aluminum-clad nuclear fuels and targets. The wastes in these tanks are in the form of saltcake (approximately 14.1 million gallons), sludge including soluble salts and aluminum (approximately 4 million gallons), and salt supernate (approximately 15.9 million gallons) which contains the highest radioactive constituency. Each tank has a capacity of approximately one million gallons. The newest tank was placed into service in 1986, but some have been in service since 1954. [Ref.2]. The primary objective of the HLW System is shifting from mixed waste storage to removal of mixed waste from older tanks in preparation for treatment in the DWPF.

C. Evaporator Systems

The HLW System utilizes two evaporators to reduce the inventory of wastes in the tanks for the near term. Their operation is crucial to the success of the mission to remove wastes from the older tanks. To reduce the cost of storage and improve safety, liquid supernate in the tanks is evaporated to reduce its volume and mobility. The overheads are condensed and monitored to ensure that excessive amounts of radionuclides are not being entrained. [Ref. 3 at 23]. When necessary, the overheads are passed through an ion exchange column to remove radioactive cesium. Following the condensing and monitoring, the overheads are transferred to the Effluent Treatment Facility (ETF) for further decontamination and eventual release to the environment. The concentrated supernate is transferred to the In-Tank Precipitation (ITP) Facility where it is treated to remove the majority of the radionuclides so that the salt solution can be treated in the Saltstone Processing Facility. This ability to reduce the waste volumes is a key planning assumption for the HLW System due to the need for tank capacity at the time of the DWPF start-up.

D. In-Tank Precipitation Facility

The ITP Facility treats the salt solution from the evaporators to remove the soluble radioactive metal ions such as cesium, strontium, uranium, and plutonium. This removal is accomplished through the precipitation of the salt solution with sodium tetraphenylborate or adsorption on monosodium titanate to form insoluble solids. The resulting precipitate, which is filtered to concentrate the solids, contains most of the radionuclides. It is then sent on to the DWPF for vitrification in glass. The decontaminated salt solution or filtrate is passed through a stripper column to remove the benzene generated from the decomposition of the tetraphenylborate. The filtrate, containing primarily sodium salts of hydroxide, nitrate, and nitrite, is then transferred to the Saltstone facility for stabilization and disposal.

E. Extended Sludge Processing Facility

The insoluble sludge stored in the aging underground tanks is transferred to the Extended Sludge Processing Facility where it is washed to remove the aluminum and soluble

salts resulting from the addition of sodium hydroxide to the fresh waste being sent to the tanks. The washed sludge will be transferred to the DWPF for vitrification. The wash water will be returned to an evaporator system or reused to dissolve saltcake depending on the salt concentration. If the aluminum and soluble salts were not removed, then the DWPF would have to increase the ration of frit to waste which would increase the number of glass canisters produced.

F. Defense Waste Processing Facility

The one-of-a-kind DWPF was designed in the late 1970s with construction started in 1984 and completed in 1989. This facility has gone through numerous mechanical check-outs, modifications to existing systems and cold chemical runs to prepare for the start of radioactive operations in December 1995. High-level mixed waste streams (the precipitate from the ITP Facility and the washed sludge from the Extended Sludge Processing Facility) are immobilized by melting the waste with the borosilicate glass frit and pouring the radioactive mixture into stainless steel canisters. The canisters will then be placed temporarily into a temperature controlled glass waste storage building adjacent to the facility where they will remain until transported for disposal to a permanent federal geological repository. This process, known as vitrification, has been designated by EPA as the LDR specified-technology treatment standard for high-level mixed waste.

Within the DWPF, the removal of organics from the cesium-containing aqueous stream produces benzene in the salt process cell. The precipitate slurry feed would undergo acid hydrolysis to separate the low radioactive organic portion from the high radioactive water-based portion. The low radioactive organic portion containing principally benzene would be sent to the Organic Waste Storage Tank outside of the vitrification facility where it will later be destroyed by incineration at the Consolidated Incineration Facility. [Ref. 4]. The high radioactive portion will go into the melter to be vitrified.

The chemical process cell (also known as melter feed preparation) within the DWPF will receive the washed sludge from the Extended Sludge Processing Facility. In this cell, a condenser is used to remove moisture and mercury from the waste stream. This mercury is acid washed, water washed, and vacuum distilled in preparation for eventual disposition. The Department of Energy has explored the sale of this product to off-site vendors and is reviewing other options including amalgamation.

G. Saltstone Processing and Disposal Facilities

The Saltstone Processing and Disposal Facilities, major parts of the integrated radioactive waste management system, were permitted for construction by the South Carolina Department of Health and Environmental Control (SCDHEC) in October 1986 and construction was completed in 1988. The Saltstone facilities began processing mixed waste on June 14, 1990. The land upon which these facilities were constructed was chosen because of the water table depth, distance to surface water and the public, and its proximity to the waste generation site.

Pursuant to the policies and guidelines of the Department of Energy and other regulatory agencies, a radiological performance assessment (RPA) was prepared for the Saltstone facilities to provide reasonable assurance that the design and disposal methods

would comply with the performance objectives of the Department of Energy in a manner that would protect human health and safety, the environment, and the ground water resources.

Low-level mixed liquid (process aqueous salt solution) wastes from the ITP facility and the ETF are solidified in a safe and efficient pozzolanic process at the Saltstone Processing Facility. These wastes are combined with a blend of cement, flyash, and slag to generate a nonhazardous, pumpable, low-level waste known as saltstone grout.

The saltstone grout is then pumped to the Saltstone Disposal Facility consisting of covered, above-ground concrete vaults where the grout solidifies into a monolithic, nonhazardous solid waste.

H. Effluent Treatment Facility

Wastewater consisting of evaporator overheads and other low-level waste streams are sent to the ETF. At this facility, the wastewaters undergo decontamination through a series of pH adjustments, solids filtration, heavy metal and organic adsorption, reverse osmosis, and ion exchange. After these steps have been completed, the treated effluent is analyzed and discharged to the environment through a National Pollutant Discharge Elimination System permitted outfall. Each of the treatment processes has varying attributes. The spent resin used in the removal of heavy metals, such as mercury and lead, is not a hazardous waste since it does not fail the Toxicity Characteristic Leaching Procedure. The activated carbon is used for organics removal and could potentially become a mixed waste if the concentrations of benzene in the influent wastewaters are high. In the ETF evaporator, most of the contaminants go to the concentrate bottoms, but some species such as metallic mercury and ammonia are volatile if the pH is not low enough. The ETF evaporator bottoms are eventually transferred to the Saltstone facility for disposal in the grout.

III. Existing Treatment of Hazardous Constituents by the Saltstone Processing Facility

The quantities of the metals and organics in the waste streams fed to the Saltstone Processing Facility are quite small. The treatment to produce saltstone at the Saltstone Processing Facility converts characteristically hazardous wastewater (hazardous due to high pH, metals and benzene) into a non-hazardous solid waste that does not fail the TCLP. After the stabilization process is complete, the saltstone may possibly exceed the UTS limits for only two organics, n-butyl alcohol and phenol. Both of these organics result from a slow breakdown of chemicals used to treat HLW in the ITP facility to enable separation into high-level and low-level fractions. The n-butyl alcohol is a product of the hydrolysis of tributylphosphate, which is added to prevent foaming during processing and filtration to concentrate HLW solids in the ITP process. The phenol is generated as a by-product of radiolysis of tetraphenylborate, which is used as the precipitating agent to convert radioactive cesium into an insoluble compound that is removed by filtration. These chemical reactions occur continuously such that even if/when these two organics are removed, they would "grow" back into the solution. Furthermore, in the strong caustic environment of the salt solution (pH > 13), both phenol and n-butyl alcohol are actually present as soluble sodium salts of the parent organic compound, and are thus not amenable to removal using demonstrated techniques for removing trace levels of contaminants from wastewaters such as

distillation or adsorption on carbon beds. Therefore, in order to remove these two organics from the saltstone, a very costly (in terms of both time and money) addition to the Processing Facility would be needed. Also it is conceivable that even if such a system were installed, the two organics could not be removed to the UTS levels because of the continuous "growing in." However, since they are present as salts, they will not leach out at levels above the UTS limits when subject to the TCLP. Nevertheless, they will probably appear (converted back to solution) when subjected to a totals analysis as required by §268.48.

SRS removes n-butyl alcohol and phenol from the saltstone to the greatest extent possible in the Saltstone Processing Facility based upon current proven technologies. During the Processing Facility design phase, limits were placed on the concentrations of these constituents in incoming wastewaters in order to ensure concentrations in the saltstone acceptable to the Saltstone Disposal Facility (i.e., to meet regulatory requirements defined by the EPA and adopted by the SCDHEC) at the time of construction. The saltstone was also tested for toxicity over a range of metal concentrations to establish limits in the Saltstone Processing Facility feed that would be blended with flyash, cement, and slag. As a result of these limits, the saltstone produced was shown to be a non-hazardous waste as defined by regulatory tests. The CWA permit issued to the Saltstone Processing Facility requires periodic reports to the SCDHEC describing the incoming wastewater composition, both chemical and radioactive, as well as reports of the characteristics of the saltstone produced.

Migration of hazardous constituents from the Saltstone Disposal Facility was predicted using modelling of nitrate transport. Nitrate was selected for such modeling studies due to its high concentration in the waste and its solubility in water. Based on the limitations placed on organic and metals concentrations in wastewaters coming into the Saltstone Processing facility and the results of the modelling studies performed on the Saltstone Disposal Facility, the Disposal Facility was permitted as an industrial solid waste disposal landfill site. The disposal permit requires periodic reports to the SCDHEC of the results of ground water monitoring. To date, the Saltstone Processing and Disposal Facilities have complied fully with all of the terms and conditions contained in the permits.

The performance objectives of the Saltstone Facilities for protection of the ground water resources require that concentrations of chemicals and radioactive contaminants at any point of compliance not exceed the standards for public drinking water supplies as established by the EPA. Since the Saltstone Facilities safely commenced low-level radioactive waste operations in 1990, ground water monitoring at the points of compliance (located at the boundary of the disposal vault facility) have met or exceeded the safe drinking water standards. A detailed radiological performance assessment on the Saltstone Disposal Facility vaults clearly demonstrates that 1) organics are not released through leaching (TCLP results show leaching well below UTS for organics even though "total" organics in the waste form are above UTS levels), 2) the concrete vault provides an effective engineered barrier against migration of releases, 3) hydrogeological computer modeling has estimated the time required for nitrates to reach maximum ground water contamination concentration levels to be 7,100 years, 4) at no time will the ground water contamination exceed State ground water standards, and 5) the risk for the existing disposal system is less than 1E-06. Ground water monitoring is installed to verify compliance with ground water standards and provide detection of any releases that may occur.

IV. Existing Treatment of Hazardous Constituents at Other SRS Facilities

Benzene and other organics are generated as by-products from reactions such as the radiolysis of sodium tetrphenylborate. Portions of these organics are released into the atmosphere. For example, the benzene generated at the ITP is released through a tall stack at the Benzene Stripper Building and through the purge exhaust vents of the tanks associated with the ITP system. These emissions are regulated under permits issued by the South Carolina Bureau of Air Quality Control.

Wastewaters consisting of evaporator overheads and other low-level waste streams are sent to the ETF. At this facility, the wastewaters undergo decontamination through a series of pH adjustments, solids filtration, heavy metal and organic adsorption, reverse osmosis, and ion exchange. After these treatment steps have been completed, the treated effluent is analyzed and discharged to the environment through an NPDES permitted outfall. These treatment steps concentrate the contaminants into smaller volumes of waste which are further concentrated by evaporation. The ETF evaporator bottoms are eventually transferred to the Saltstone Processing Facility for disposal in the grout.

V. Conclusion

Facility design evaluations and ongoing monitoring results indicate that treating and disposing of the low-level waste fraction of high-level mixed wastes in the Saltstone Processing and Disposal Facilities results in no significant risks or impacts to human health and the environment. Installing additional treatment for removing organics to UTS levels would actually result in increased risk due to 1) releases and exposure resulting from the organic treatment process and from the treatment and disposal of the subsequent mixed wastes that would be generated from this process, 2) increased risks associated with the extended time the high level radioactive waste would have to remain in the aging million gallon storage tanks, and 3) environmental impacts associated with construction of additional process facilities. Therefore, DOE urges changes to the proposed LDR Phase III and Phase IV rules to preclude their applicability to the SRS Saltstone Processing and Disposal Facilities.

References

Ref. 1 *Radiological Performance Assessment for the Z-Area Saltstone Disposal Facility*, WSRC-RP-92-1360, December 18, 1992.

Ref. 2 *Annual Radioactive Waste Tank Inspection Report Program-1993*, WSRC-TR-94-166, May 1994.

Ref. 3 *High-Level Waste System Process Interface Description*, WSRC-TR-94-0442, September 1994.

Ref. 4 *Savannah River Site Waste Management Final Environmental Impact Statement*, DOE/EIS-0217, July 1995; and Department of Energy Record of Decision dated September 22, 1995.

Ref. 5 *Savannah River Site High-Level Waste Review Committee Report*, William H. Hamilton, Sr., Chairman, 1994.

Table of Acronyms

CWA	Clean Water Act
DOE	U.S. Department of Energy
DWPF	Defense Waste Processing Facility
EPA	U.S. Environmental Protection Agency
ESP	Extended Sludge Processing Facility
FR	Federal Register
HLW	High Level Waste
HSWA	Hazardous and Solid Waste Amendments
ITP	In-Tank Precipitation
LDR	Land Disposal Restrictions
NPDES	National Pollutant Discharge Elimination System
POG	Point of Generation
RCRA	Resource Conservation and Recovery Act
RPA	Radiological Performance Assessment
SCDHEC	South Carolina Department of Health and Environmental Control
SDF	Saltstone Disposal Facility
SPF	Saltstone Processing Facility
SRS	Savannah River Site
TCLP	Toxicity Characteristic Leachate Procedure
TSD	RCRA Treatment, Storage, and Disposal
UHC	Underlying Hazardous Constituents
U.S.C.	United States Code
UTS	Universal Treatment Standards
WSRC	Westinghouse Savannah River Company