ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 260, 262, 264, 265, and 270

[SWH-FRL 2791-1]

Hazardous Waste Management System; Standards for Hazardous Waste Storage and Treatment Tank Systems

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) today proposes to amend its regulations under the Resource Conservation and Recovery Act (RCRA) for tank systems storing or treating hazardous waste. These proposed amendments would substantially revise, delete, and add to the existing tank standards that apply under interim status and through RCRA permits.

DATES: EPA will accept comments from the public on the proposed amendments until August 26, 1985. Three public hearings will be held on this proposed rulemaking. See Section X of this Preamble for the schedule and location of these public hearings and a brief summary of how they will be conducted.

ADDRESSES: Comments may be mailed to the Docket Clerk (Docket No. 3004, Revised Tank System Standards), Office of Solid Waste (WH-562), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460. Comments received by EPA and all references used in this document may be inspected in Room S-212(C), U.S. Environmental Protection Agency, 401 M Street SW., Washington, D.C., from 9:00 am to 4:00 pm, Monday through Friday, excluding holidays.

FOR FURTHER INFORMATION CONTACT: The RCRA/Superfund Hotline, at (800) 424-9346 (toll free) or (202) 382-3000 in Washington, D.C., or William J. Kline, Office of Solid Waste (WH-565), U.S. Environmental Protection Agency, Washington, D.C. 20460, (202) 382-7917.

SUPPLEMENTARY INFORMATION: The contents of today's preamble are listed in the following outline:

I. Authority

These regulations are issued under the authority of Sections 1006, 2002, 3001–3007, 3010, 3014, 3015, 3017, 3018, 3019, and 7004 of the Solid Waste Disposal Act of 1970, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912, 6921–6927, 6930, 6934, 6935, 6937, 6938, 6939, and 6974).

II. Background

A. The RCRA Hazardous Waste Program

Subtitle C of the Resource Conservation and Recovery Act (RCRA) creates a "cradle-to-grave" management system intended to ensure that hazardous waste is identified and safely transported, stored, treated, and disposed. Subtitle C requires EPA to identify hazardous waste and to promulgate standards for generators and transporters of such waste. This includes the creation of a manifest system designed to track the movement of hazardous waste and requires hazardous waste generators and transporters to employ appropriate management practices to ensure the effective operation of such system. Under section 3004 of RCRA, owners and operators of treatment, storage, and disposal facilities are required to comply with standards "necessary to protect human health and the environment." These standards are generally implemented through permits issued under authorized State programs or by EPA.

B. Status of Subtitle C Rulemaking For Tanks

On December 18, 1978, EPA proposed rules for storage and treatment tanks containing hazardous waste (43 FR 59007–59008). These proposed technical standards took into considertion primarily Occupational Safety and Health Administration (OSHA) standards and EPA Spill Prevention Control and Countermeasures (40 CFR 112) requirements for tanks (issued under Section 311 of the Clean Water Act).

In May 1980, EPA promulgated interim status standards for the storage or treatment of hazardous waste in tanks (Part 265, Subpart J, 45 FR 33244–33245). These standards focused on operating measures designed to prevent releases of hazardous waste from tanks.

On January 12, 1981 (46 FR 2867–2868), the Agency promulgated RCRA permitting standards for those hazardous waste storage and treatment tanks that can be entered for inspection. These standards, which emphasize the structural integrity of tanks to protect against leaks, ruptures, and collapse of the shell, require adequate design, maintenance of minimum shell thickness, and inspections. Concurrent with the promulgation of these permitting standards, EPA requested public comments on numerous issues of concern for future rulemaking, including, for example, secondary containment for all tanks and the banning of underground tanks.

C. The Hazardous and Solid Waste Amendments of 1984

On November 8, 1984, the President signed into law the Hazardous and Solid Waste Amendments of 1984. Two of these amendments directly address the storage or treatment of hazardous waste in underground tank systems. Today's proposed regulations, in part, attempt to respond to these new congressional mandates.

The first amendment (new section 3004 (o)(4)) mandates that EPA promulgate standards requiring any new underground tank system to utilize an "approved leak detection system," defined as a system or technology capable of detecting leaks of hazardous constituents at the earliest practicable time. EPA has examined several types of leak-detection systems and has considered the advantages and disadvantages of each. (See Section IV.B. of this Preamble for a detailed discussion of the different protective measures.) Today's proposal would mandate a leak-detection system as an integral part of secondary containment for all new tank systems, including underground tank systems. The Agency believes this proposal, if finalized, will meet the congressional mandate to detect leaks from new underground tank systems at the earliest practicable time.

The second amendment (new section 3004(w)) requires EPA to promulgate by March 1, 1985, final permitting standards for hazardous waste underground storage tanks that cannot be entered for inspection. This statutory deadline obviously has not been achieved. Today EPA is proposing to apply the revised tank permitting standards in Part 264, Subpart J, to such tanks. When this proposed rule is finalized, it will enable EPA to permit these tanks under Section 3005 and satisfy the requirements in Section 3004(w).

D. Universe of Hazardous Waste Tanks

1. Overview

EPA sponsored a national survey of hazardous waste facilities in 1982–1983 to support an Agency assessment of the environmental effects of hazardous waste facilities and the alternative regulatory approaches for controlling them. A report prepared for EPA, "National Survey of Hazardous Waste Generators and Treatment, Storage, and Disposal Facilities Regulated under RCRA in 1981," presents the survey's methodology and conclusions. A copy of this document has been placed in the public docket for today's proposed rulemaking. (See Section IX of this Preamble for additional information regarding the availability of this document.) According to the data in this survey, approximately 9,100 tanks were used at 1,700 facilities to store or treat hazardous waste in the United States in 1981. (Each facility typically has 5 tanks.) These tanks contained about 13.8 billion gallons of such waste. As seen below, this is less than the amount managed in surface impoundments (35.8 billion gallons), but more than the amount managed by all other methods combined (11 billion gallons).

QUANTITY OF HAZARDOUS WASTES MANAGED IN 1981 (EXCLUDING 90-DAY ACCUMULATION TANKS) IN BILLIONS OF GALLONS

Surface Impoundments	35.8
Tanks (Storage and Treatment)	13.8
Injection Wells	8.6
Landfills	.81
Incinerators	.45
Waste Piles	.39
Storage Containers (Drums)	.16
Land Treatment	.10

Under § 262.34, tanks used by generators to accumulate hazardous waste for less than 90 days (referred to as 90-day accumulation tanks) are subject to a selected portion of the 40 CFR Part 265 standards. The survey showed that, in addition to the 9,100 tanks used to store or treat hazardous wastes, there are about 6,400 90-day accumulation tanks nationwide at 2,100 facilities (each facility typically consisted of 3 tanks).

Survey data show the 90-day accumulation tanks are similar in two respects to other hazardous waste management tanks. First, the typical design capacity for a 90-day accumulation tank is 4,000 gallons while, for tanks requiring permits it is 5,000 gallons. Second, the typical annual throughput for a 90-day accumulation tank is 18,000 gallons; for tanks requiring permits it is 21,000 gallons. EPA did not collect data concerning other characteristics associated with 90-day accumulation tanks, and, therefore, additional statistical comparisons cannot be made.

EPA's experience in inspecting and permitting tank facilities has, however, persuaded the Agency that 90-day accumulation tanks are similar in other respects to the hazardous waste storage tanks being permitted under RCRA.

2. Characteristics of Hazardous Waste Tanks

The survey revealed several significant characteristics of tanks covered by RCRA that were considered in today's proposed rulemaking. These findings are summarized briefly below:

• *Location.* Most hazardous waste tanks (71 percent) are located on or aboveground; 17 percent are partially underground; and 12 percent are completely underground.

• *Secondary containment.* Many hazardous waste tanks (63 percent) already have some type of partial or full secondary containment. In addition, 50 percent have some type of partial or total secondary containment for ancillary equipment and/or piping. The EPA survey did not examine the types of secondary containment at tank facilities. On the basis of its inspection and permitting experiences, EPA has concluded, however, that in-place secondary-containment systems for tanks vary widely in the quality of environmental protection they provide. Thus, it can be concluded that many of the secondary-containment systems reported to be used by hazardous waste tanks covered by the survey may not meet the containment requirements for tanks being proposed today.

• *Inspections.* Approximately 84 percent of all hazardous waste tanks can be entered for inspection, ranging from 97 percent for open-topped tanks to 61 percent for underground tanks.

• *Material of construction.* Steel is the most common material of construction for hazardous waste tanks (75 percent). Other materials reported include concrete (13 percent) and fiberglass (9 percent). The primary materials for construction of inground tanks is concrete (60 percent); for underground tanks, primarily steel (73 percent); and for aboveground tanks, steel also (84 percent).

• *Types of wastes.* A wide variety of wastes are managed in tanks, and many tanks handle several types of hazardous waste or wastes with more than one hazardous characteristic. Of all the tanks, 38 percent store or treat corrosive wastes; 38 percent, ignitable wastes; 35 percent, toxic wastes; and 18 percent, reactive wastes.

• *Age.* The typical age of a hazardous waste tank is 7 years. The age of tanks varies, however, over a range of 1 to 55 years.

III. Summary of the Proposed Rule

A. Overview

As mentioned previously in this Preamble, EPA has already promulgated interim status and permitting standards for hazardous waste storage or treatment tanks that can be entered for inspection. Further data gathering and analysis by the Agency, as well as experiences in permitting, have revealed that several changes and additions are needed to meet more adequately the goal of protecting human health and the environment. Today's proposal sets forth requirements that address causes of releases at tank facilities. (See a more detailed discussion of the Agency's regulatory strategy for storage facilites, including tanks, in Section IV.D. of this Preamble.) The more stringent controls that are proposed should substantially improve the owner's or operator's ability to contain releases from tank systems and therefore provide needed protection of human health and the environment. In addition, the Agency has concluded that the cost of these controls are not significantly greater than other technologies the Agency evaluated that provide similar protection against leaks. The Agency plans to conduct a risk assessment of the technologies proposed in this rule and of the alternative control measures to protect human health and the environment described in Section IV.C. of this preamble. The results of this assessment may change the Agency's conclusions about the cost-effectiveness of the technologies proposed today. (See Section VIII of the Preamble for a detailed discussion of the economic aspects of the requirements being proposed today.)

B. Objectives of the Proposal

Today's proposal has a number of important objectives. First, these revisions are an important step in meeting mandates of the Hazardous and Solid Waste Amendments of 1984. Second, EPA is proposing requirements that fulfill aspects of EPA's regulatory strategy for tanks that were left unaddressed and for which public comment was requested when the existing regulations for tanks were promulgated in 1981 (see 46 FR 2867–2868). For example, EPA is today proposing the selection of a secondary containment approach for tank systems. The opinions of those who commented were taken into consideration in developing today's proposal.

Third, EPA is announcing the availability of new information and analyses that provide the basis for the proposed revisions. This information is listed in Section IX of this Preamble and has been placed in the rulemaking docket for public inspection. This information will be supplemented by the risk assessment now being conducted to support the final rule. Fourth, EPA is soliciting comment on several regulatory alternatives to the secondary containment approach proposed in this rule.

Finally, the Agency in this rule gives notice that the standards applicable to large quantity generators are also being considered for small quantity generators under Section 3001(d) of RCRA. Consequently, the Agency requests comments on how such an extension might affect the cost estimates, scope, and impact of this rule, especially on the small business community (see Section VI.A. for a detailed discussion).

C. Existing Regulatory Strategy

EPA's regulatory approach to storage facilities was discussed in the **Federal Register** of January 12, 1981 (see 46 FR 2807–2808). The Agency's overall strategy for hazardous waste storage facilities is based on a policy decision that the best way to accomplish the statutory goal of protecting human health and the environment is to contain the waste for the term of the storage. This containment approach focuses on the prevention of releases to the soil and to ground and surface waters where such releases may present a risk to human health or the environment.

The containment strategy for hazardous waste storage resulted in a regulatory approach that requires the following: the proper design and operation of a primary containment device to prevent leakage and overflow as long as the waste remains in storage; an inspection program to monitor deterioration of the primary-containment system and the area around the storage unit; and the use of secondary containment where the primary-containment devices are easily damaged and/or inspection is difficult. The existing Part 264 tank standards implement a portion of this three-tiered regulatory approach for tanks that can be entered for inspection in the following manner. The design and operation of a primary-containment system are achieved through minimum tank shell thickness requirements (§ 264.191) and tank overfilling and freeboard controls (§ 264.192(b)). An inspection program for the primary-containment and overfilling controls is also required (§ 264.194).

Several aspects of the Agency's strategy for regulating storage tanks were left unaddressed by the existing regulations. First, a secondary-containment standard was deferred pending public comment on, and EPA consideration of, three possible containment options that were presented in the earlier Preamble (see 46 FR 2833). These options are discussed more fully in Section V.E.4. of this Preamble.

Secondly, the existing Part 264 standards pertain only to tanks that can be entered for inspection. Implementation of standards for underground tanks that cannot be entered for inspection were deferred pending public comment on, and EPA's consideration of, a ban on the treatment or storage of hazardous waste in underground tanks that cannot be entered for inspection or tanks located in the water table (see 46 FR 2831).

Finally, the existing standards do not require corrosion protection for steel tanks whose surfaces are exposed to corrosion-inducing soil. In the January

12, 1981 preamble, the Agency requested comment on the requirement of cathodic protection for partially buried steel tanks.

D. Today's Proposal

Today, EPA is proposing regulatory measures for storage tanks that would fulfill the regulatory approach for storage tanks described in the January 12, 1981 preamble by developing permitting standards under Part 264 for underground tanks that cannot be entered for inspection, by developing corrosion protection requirements for metal tank systems that are susceptible to corrosion, and by selecting a secondary containment approach. These revisions would also fulfill mandates of the 1984 amendments that new underground tanks be equipped with leak detection systems (RCRA §3004(o)(4)) and that EPA issue permitting standards for underground tanks that cannot be entered for inspection (RCRA § 3004(w)). In addition, EPA is proposing revisions to certain existing standards that have proven unworkable and ineffective. These proposed revisions and additions do not depart from the regulatory strategy announced in the January 12, 1981 preamble, but rather reinforce and complete the strategy.

The major elements of today's proposal include the following: Under proposed revisions to the Part 264 permitting standards, structural integrity of all tank systems for which permits are sought would be assessed by a qualified registered professional engineer and submitted to the Regional Administrator. Included in this assessment for metal tank systems would be a determination by a corrosion expert of the type and degree of corrosion protection needed to ensure the integrity of the system for its intended life. This requirement would replace the existing minimum shell thickness requirements.

Proposed Part 264 requirements would also establish installation standards for new tank systems and require that a qualified registered professional engineer or a qualified inspector trained in the installation of tank systems prepare a written statement to be kept on file at the facility attesting to the proper installation of the system. Supervision and certification by a corrosion expert of the installation of cathodic protection systems would also be required.

Proposed Part 264 regulations would require that all new tank systems have secondary containment and that existing tank systems either have full secondary containment or implement a ground-water monitoring program. Facilities with existing tanks that elect to implement ground-water monitoring rather than retrofit full secondary containment would be required to construct partial secondary containment for any above-ground portions of their systems. In addition, existing underground tank systems that do not have secondary containment would be required to test the integrity of their systems every six months. Tank systems that have secondary containment would have to maintain a leak detection system that detects leaks within 24 hours of entry of liquid into the containment system.

Part 264 inspection requirements would be revised to ensure that structures or devices required under the new regulations, such as corrosion protection devices and leak detection systems, are periodically inspected. In addition, these revisions would require owners and operators to establish a schedule for assessing the integrity of aboveground and inground tanks.

Part 264 would also be amended to establish procedures for responding to leaks once they are detected.

Proposed revision to the Part 265 interim status standards would require that the structural integrity of all tank systems that have interim status be assessed within six months of the effective date of these proposed regulations (by internally inspecting aboveground and inground tanks that can be entered for inspection and by leak testing underground tanks).

Proposed Part 265 regulations would also provide a secondary containment option similar to that proposed for existing permitted tanks under Part 264. The regulations would require that tank systems either have full secondary containment or that a groundwater monitoring program be implemented. Tank systems that do not have secondary containment would have to have partial secondary containment for any above-ground portions of the tank system without secondary containment and would have to be leak tested every six months.

Inspection requirements for interim status tanks would also be revised to ensure that structures or devices required under the new regulations are inspected.

Part 265 would be amended to establish procedures for responding to leaks and to repair or replace unfit tanks.

Finally, today's proposal would require that all tanks subject to the 90-day accumulator provisions of 40 CFR § 262.34 have full secondary containment.

These proposed revisions and additions to the existing regulations are discussed in detail in Part V of this Preamble. The following sections discuss the factors and alternatives considered in developing today's proposal.

IV. Considerations Influencing Today's Proposal

This section of today's Preamble discusses factors that influenced the revision of the current standards for hazardous waste tank systems. A detailed discussion of the various protective measures that were considered in developing today's proposal is also included.

A. Limitations of the Existing RCRA Tank Standards

1. Incompleteness of Existing Standards

As stated above, on January 12, 1981, EPA published interim final permit standards for hazardous waste storage and treatment tanks that can be entered for inspection. The Agency requested public comment on these permitting standards and on several specific issues. The latter included: (1) Banning the treatment or storage of hazardous wastes in tanks located in the water table or in underground tanks that cannot be entered for inspection; (2) the need for and effectiveness of three secondary-containment options for tanks; and (3) cathodic-protection measures for partially buried tanks (see 46 FR 2831–2834).

The Agency was unable to consider all the public comments and to complete the regulations within a short time. As a consequence, there are, for example, no standards for permitting underground hazardous waste tanks that cannot be entered for inspection and no requirements for secondary containment or external corrosion protection.

2. Unworkableness of Existing Standards

EPA's experience in writing RCRA permits reveals that certain existing Subpart J tank standards are impractical to implement at many types of facilities. Other standards are effectively applied at some facilities but not at others.

EPA has identified several flaws in the current tank design standard requiring the establishment and maintenance of a minimum shell thickness (§ 264.191). This standard can be applied effectively only to aboveground steel tanks; many of the testing mechanisms for shell thickness do not work adequately for other types of tanks (e.g., concrete and underground tanks); and many existing tank facilities have nonspecification tanks for which detailed design information about the shell is not available.

EPA is concerned that inspection requirements are less protective of the environment for underground tanks than aboveground tanks because the exterior of the former cannot be inspected. Owing to the serious potential for accelerated corrosion of metal tanks that are placed in the ground, internal inspections may not be adqeuate to detect corrosion.

3. Necessity for Additional Requirements

The Agency has received new information indicating that some tank systems are leaking and may be threatening human health and the environment. This new information comes primarily from three sources: Several EPA-sponsored studies completed in 1984; information from the public, industry, and State and local governments, including survey results and studies; review of internal Agency information pertaining to damages, or threats of damage, caused by releases of hazardous wastes from tank systems. These sources can be found in the rulemaking docket. (See Section IX of the Preamble for information concerning the docket and for a summary of the sources.)

The new information documents over 30 cases where hazardous waste tank facilities have leaked or spilled hazardous waste into the environment. (Twenty of them are suspected of impacting, or threatening to impact, community ground-water well systems.) In addition to the cases mentioned above are 20 that were reported in the background document supporting the May 19, 1980, regulations. Numerous other cases are cited in State or local survey data.

EPA plans to supplement these case examples with an analysis of the risks to human health and the environment from hazardous waste tank releases under different environmental conditions.

The existing Subpart J permitting standards emphasize the importance of adequate tank shell design (i.e., establishment of minimum shell thickness) and periodic assessments of the shell's integrity to ensure that tanks do not rupture or leak hazardous waste into the environment. A recent EPA report, *Assessment of the Technical, Environmental, and Management Aspects of Storage and Treatment of Hazardous Waste in Aboveground and Inground Tanks*, indicates, however, that structural design deficiency is among the least common factors that cause releases. The existing tank design standards (§ 264.191) do not adequately address the factors that actually contribute to the releases.

B. Protective Measures Considered

In developing today's proposed revisions, EPA has concluded that certain management practices, such as proper design (adequate structure), proper installation, and good day-to-day operating rules are applicable and appropriate for hazardous waste tank systems. The Agency believes, however, that although these baseline practices are of crucial importance in ensuring the overall proper management of a tank system, they do not provide sufficient protection of human health and the environment from releases of hazardous waste from these systems. Studies indicate that some releases from primary-tank systems are inevitable over time and that all releases cannot be prevented by tank design and operating requirements. On the basis of the information available at this time, therefore, EPA has concluded that a secondary containment approach, as was contemplated in the January 12, 1981 Federal Register is necessary. EPA recognizes, however, that protection of human health and the environment may not require the containment of all releases by means of an impervious secondary containment structure surrounding or beneath the primary containment device in all situations. An approach may be to rely upon early release detection systems and a rapid response program to prevent releases from endangering human health or the environment. Other options are presented in Section IV.B. of this preamble.

In the course of deciding the most effective regulatory approach for properly managing the storage or treatment of hazardous waste in tank systems, EPA has considered several technical protective measures. Each protective measure was assessed with respect to its sole effectiveness in detecting and containing releases of hazardous waste. The Agency invites comment on these measures and on their applicability to the proper management of hazardous waste tank systems.

1. Inventory Monitoring

Inventory monitoring, by which inputs and outputs from the tank system are recorded daily, is one means of detecting leakage from the system. Gasoline stations have long made checks with dipsticks and taken readings of the gasoline pump meters. Inventory monitoring, if regularly and properly conducted, can serve as a useful tool for detecting leaks at motor fuel dispensing stations. These two measurements enable the station operator to determine if the inventory coincides with the quantity of product delivered minus the amount of product sold. Low inventories may indicate leakage from the tank, theft, or underdeliveries, while high inventories could indicate overdeliveries or leakage of water into the tank.

EPA has examined the techniques of inventory monitoring to detect leaks from hazardous waste storage or treatment tanks and found that, for the reasons given below, there are numerous constraints in applying these techniques to the universe of hazardous waste tanks.

The Agency believes that, because of the chemical and physical dynamics that are often involved, there is considerable room for error in inventory monitoring of tanks used for treatment of hazardous waste. Sludge removal, chemical additions, and recirculation, among other similar processes, could make accurate monitoring in a treatment tank difficult. Furthermore, treatment tanks are often open topped and, therefore, subject to climatic conditions (e.g., losses from evaporation and gains from precipitation).

Accurate inventory monitoring may also be difficult to achieve when hazardous waste is delivered to the storage or treatment tank via gravity flow. Methods available for gauging volume in gravity flow pipes include liquid level sensors and venturi meters. Liquid level measurements, which require computation of flow using pipe slope and roughness coefficients, are inaccurate for relatively small-diameter piping. A venturi meter requires that the pipe be full, which may not be a typical condition at many hazardous waste storage or treatment facilities.

Several techniques, such as magnetic, venturi, mass, vortex, turbine, and positive displacement flow meters, make inventory monitoring feasible in pump-fed systems. The accuracy of a flow measurement varies from 0.25 percent of the measured flow to 10 percent of the full-scale flow, depending on the type of pump, manufacturer, and application. In order to provide adequate detection of releases in hazardous waste tanks, the error in flow measurement needs to be on the low end of this range. For example, a flow meter with an accuracy of 1 percent of the measured flow would not be capable of detecting a leak of less than 1 gallon per day in a tank system handling 3,000 gallons of hazardous waste per month.

An alternative to measuring pipe flow for the purpose of monitoring inventory is the gauging of the liquid level in the tank. Because of the dynamic nature of treatment tank processes, EPA believes that this method is not appropriate for most treatment tanks. Monitoring of liquid level can either be manual (with a dipstick) or automatic (by float or electronic monitor). Use of dipsticks is very inexpensive, but the accuracy of the method appears to be relatively low because of the opportunity for human error. EPA is presently evaluating this method to determine if greater accuracy may be achieved through the use of different inventory monitoring procedures. An added concern with the use of dipsticks in hazardous waste storage tanks is safety—the potential for direct contact or exposure to the hazardous waste being stored. There is, furthermore, the risk of damaging the tank (especially fiberglass-reinforced plastic [FRP] tanks) as a result of repeated impacts of the dipstick on the tank's bottom. Likewise, the repeated impact of a dipstick can damage linings of steel tanks. Nonmanual-level sensors, which are more accurate than dipsticks, are readily available but are considerably more expensive. Regardless of which tank gauging method is used, however, temperature can have a major impact on the accuracy of this type of monitoring. For example, a change in temperature of 1 degree Fahrenheit for 10,000 gallons of a liquid with a coefficient of expansion of 0.0006 (e.g., carbon tetrachloride) will result in a change in volume of 6 gallons. As a consequence, variations in temperature between level readings, unless strictly minimized, may result in misleading readings. EPA is not convinced that such variations can be minimized. Public comment on these deficiencies in the use of level readings is invited.

Although inventory monitoring can detect large leaks, it cannot be depended on for detecting smaller leaks (fewer than 15 gallons per day). Aside from the numerous technical problems involved in conducting accurate inventory monitoring at hazardous waste storage or treatment tanks, there is considerable room for human error (taking readings, making calculations, bookkeeping, etc.). In many cases, inventory monitoring for any given day cannot be truly relied on for positive identification of a release from a tank system; thus, under this detection method, a gradual but significant release could conceivably go undetected for an extended period of time. For all the reasons discussed above, EPA has decided not to propose the use of inventory monitoring for the purpose of detecting leaks from hazardous waste tanks.

2. Leak Testing

Another potential means of determining releases of hazardous waste from tanks is testing of the tanks for leaks, but to date, methods for testing are available only for underground tanks. The major reason for this restriction is that the accuracy of available leak-testing methods depends on the relative stability of the temperature of the tank's contents. Aboveground tanks have much wider temperature fluctuations occuring over short periods of time than do underground tanks. Other factors, such as wind action and vibrations, also make leak testing of aboveground tanks unreliable.

EPA's evaluation of available leak testing methods reveals a number of major concerns, principally, compatibility of the testing equipment with hazardous waste, the minimum detectable size of a leak, the reliability and consistency of test results, and the availability of equipment and trained personnel.

Because available leak-testing methods were developed primarily for detecting and measuring leaks in underground gasoline storage tanks, there is limited information regarding their applicability to the full spectrum of hazardous wastes. The applicability of some leak-testing methods may be restricted in certain cases as a result of the waste's characteristics (e.g., corrosivity, viscosity, etc.). It is reported, however, that several of the methods have been used to detect leaks in commercial, nonpetroleum tank systems. For this reason, EPA believes that many current testing methods could be used or modified to test the majority of underground hazardous waste storage or treatment tanks without imposing insurmountable technical testing problems.

Another concern with current methods is the minimum size leak they can detect. The ideal is to be able to detect all leaks, regardless of their size, but the current state of the art does not achieve this proficiency. The National Fire Protection Association (NFPA) has established a target leak rate of 0.05 gallons per hour (approximately 1 gallon per day) as the standard that some tests can legitimately and accurately attain.

EPA is studying the achievability of this target rate. Public comment is requested on whether this rate is realistic in light of the current state of the art in tank leak testing. Any leak-testing methods capable of detecting a leak of 0.05 gallon per hour must take into consideration, among other factors, the volumetric coefficient of expansion of the liquid being tested relative to any change in temperature during the test. Since reliable measurements of leaks at a rate of less than 0.05 gallon per hour are supposedly beyond the scope of current testing methods, a tank system that is tested and shows no leakage down to 0.05 gallon per hour is assumed to be tight (nonleaking).

A third concern associated with leak testing is quality control. Because of the many variables that must be considered (e.g., changes in temperature, variation of temperatures of the tank's contents, the tank's end deflection, characteristics of the liquid stored, etc.) and the potential for human error, there is undoubtedly considerable room for significant variability in the test results. EPA is concerned, for example, with how reliably and consistently a test methodology detects the rate of a leak (using a criterion such as the NFPA's 0.05 gallon per hour rate as the point at which a tank is considered leaking) from a tank, given the potential for a wide margin of error in the testing.

The Agency is undertaking a research program of volumetric and nonvolumetric leak-testing methods in order to determine their accuracy and reliability. The results of this research will enable EPA to define more accurately the applicability and usefulness of leak testing in the management of hazardous waste tanks.

Yet another concern with current leak-testing methods is the availability of equipment and trained personnel nationwide. Although several of the methods are widely available, many are limited to a geographical area. There are restrictions, however, even on those few methods that are nationally available. One company, for instance, has a number of branch offices across the U.S., but allows only its own personnel to perform the testing. The leak-detection equipment is not separately marketed. By means of this approach, the company ensures the accuracy and reliability of its tests. In contrast, another company has taken the opposite approach, focusing primarily on marketing the test equipment. It certifies anyone who purchases the equipment and passes a test given after three days of classroom and field study. Recertification is encouraged on an annual basis.

Both of these approaches present problems. While the first assures a higher level to testing quality control, the number of leak testers may prove inadequate to meet the demand if leak testing is required on a nationwide basis. EPA's concern with the second approach relates to the quality of testing, which stems in part from the limited experience to date in the testing of hazardous waste tank systems. Furthermore, even though a leak test indicates no leakage at the time the test is conducted, there is no guarantee that a leak will not begin soon thereafter. In order to ensure the ongoing integrity of the tank system, frequent testing would be necessary. Because each leak test costs at least $500 per tank, this alternative could, however, be burdensome for many facilities.

In light of the problems discussed above, the Agency does not believe that leak testing *alone* will ensure adequate protection of human health and the environment. It can play an important role, however, in the proper management of a hazardous waste tank system. Such testing can be used to identify underground hazardous waste tanks and piping that are presently leaking (over 0.05 gallons per hour) so that immediate remedial actions can be taken. In addition to a nationwide screening of all underground hazardous waste tank systems, leak testing could be employed in combination with a ground-water monitoring program to identify leaks in certain cases prior to their being detected by a ground-water monitoring system. For the above reasons, EPA is proposing a nationwide one-time testing of all interim status underground tanks within six months of the effective date of these proposed regulations. EPA is also proposing that underground tanks be tested as a condition to obtaining a permit and that all existing underground tanks that do not have or retrofit full secondary containment be tested on a semi-annual basis. Public comment is requested on these requirements and the applicability of present leak-testing methods in complying with these requirements.

3. Corrosion Protection

Corrosion is the major cause of failure in metal tank systems; nonmetal systems are, of course, not affected. An American Petroleum Institute (API) survey of leaks in underground tank systems at gasoline stations revealed that over 90 percent of tank leaks and 60 percent of pipe leaks were attributable to corrosion resulting from contact of the metal tank system with corrosion-inducing soils. Although this survey involved gasoline rather than hazardous waste storage tanks (according to an estimate by the Agency, approximately 90 percent of the aboveground and underground tanks used to store or treat hazardous waste are constructed of carbon steel), EPA believes there is no appreciable difference in their susceptibility to corrosion. If any difference does exist, EPA expects that the corrosion rate may be higher for hazardous waste tanks because of the corrosive nature of many such wastes stored or treated in tanks.

Corrosion protection under today's proposal would be required for the metal components of tank systems that are found to be susceptible to corrosive conditions. EPA believes that such protective measures are an important facet of the proper management of hazardous waste in metal tank systems and should be addressed in the design of such systems. Although corrosion protection may significantly prolong the life of a metal tank system, it cannot by any means be considered a cure-all. Other significant contributors to the failure of tank systems include operators' errors, overfilling, and failure of ancillary equipment or piping. In addition, unless corrosion-protection devices are properly installed and maintained over the entire life of the tank system, corrosion will occur, and the risk of releases will increase. Improper maintenance of corrosion-protection devices can, in fact, accelerate corrosion beyond what might occur if no protective measures are taken. For these reasons, EPA believes that other protective measures, including those provided by the proposed secondary containment approach and ground-water monitoring alternative, must be used to supplement the proposed corrosion protection requirements. Public comment is requested on the use of corrosion protection measures in the context of today's proposal.

4. Inspections

The existing regulatory approach to hazardous waste storage or treatment tanks relies largely on inspections as the means for detecting and preventing releases (see 46 FR 2808, 2829, and 2831, January 12, 1981). Inspections can detect actual tank leaks, potential locations of leaks resulting from corrosion, or other visible damage to the tank, liner, or coating material. In developing today's proposal, EPA has reevaluated the effectiveness of inspections relative to the proper management of tank systems.

External visual inspections of aboveground tanks (or otherwise accessible portions of tanks) are useful from the standpoint of identifying leaks or other problems before a major release occurs. The role of external inspections is, however, limited in many instances. For example, the exterior of underground and inground tanks and the bottoms of aboveground tanks (unless the tank in cradled or otherwise elevated off the ground) are usually not susceptible to external inspection.

The usefulness of internal inspections has also been reevaluated. Such inspections enable many potential leaks or other impending structural failures to be identified prior to their being viewed from the exterior of the tank or to being released to the environment. The existing standards rely on internal inspections to ensure continued tank integrity.

EPA believes, however, that internal visual inspection of tanks is of limited value because it is only possible to observe obvious cracks and major structural deficiencies. Thus, such inspections must be supplemented by the use of special equipment (e.g., ultrasonic measurements), but even ultrasonic measurements are not appropriate or applicable to many hazardous waste storage or treatment tanks (e.g., concrete tanks). Internal inspections seem to be most effective for steel tanks, while they are of questionable usefulness for FRP tanks and for concrete tanks.

Internal inspections pose a number of problems. Safety is a large concern. The Agency believes that sending people inside a tank to conduct an internal inspection that potentially exposes them to toxic constituents and hazards from fire or explosion is a questionable practice. The cost of emptying a tank to make it safe for entry and to allow a reliable internal inspection involves a number of expensive steps: removal and disposal of the contents, decontamination of the atmosphere in the tank, cleaning (e.g., sandblasting, hydroblasting, steam or chemical cleaning), possible shutdown of the processing operation when the tank is taken out of service. In addition, in order to be an important tool in preventing releases, internal inspections must be done frequently. It is common industry practice, however, to take tanks out of service periodically for routine maintenance so that, if inspections were performed during the routine shutdown of a tank, the cost to the owner or operator of a hazardous waste storage or treatment tank would be considerably less significant.

Owing to the factors discussed above, EPA is reluctant to continue depending primarily on internal inspections for the prevention of releases to the environment from hazardous waste storage or treatment tanks. The Agency does not believe, however, that the use of such inspections should be entirely eliminated. In certain circumstances they may be a necessity. For instance, internal inspection of roofed tanks enables the owners or operators to check for corrosion or other structural failure of the roof-supporting structure. Also, as previously stated, periodic internal inspections may be useful for detecting obvious structural deficiencies in the tank.

5. Unsaturated Zone Monitoring

The Agency evaluated unsaturated zone monitoring (which refers to monitoring conducted in the area immediately beneath or adjacent to a tank system) for use in detecting releases from these systems. Such monitoring differs from ground-water monitoring which is, usually conducted in the saturated zone.

For unsaturated zone monitoring of tank systems, EPA evaluated the viability of using observation wells combined with thermal conductivity or electrical resistivity sensors or vapor sensors. Lysimeters were also evaluated.

The Agency believes that unsaturated zone monitoring could result in early detection of a release and, thus, facilitate remedial actions to remove or decontaminate the released hazardous constituents prior to the ground water's becoming contaminated. Unsaturated zone monitoring (except for lysimeters) is also continuous. Although the initial cost of this type of equipment is higher than that for ground-water monitoring, the annualized cost is less.

While there are a number of advantages to unsaturated zone monitoring, there also appear to be certain restrictions to its use. Because it is relatively new, experience in using it with a wide variety of chemical substances is limited. Although EPA allows lysimeters to monitor land treatment of hazardous waste, they are largely unproven in monitoring the integrity of tanks. In addition, lysimeters do not provide continuous monitoring and are susceptible to clogging.

Owing to the uncertainties associated with current state-of-the-art unsaturated zone monitoring, EPA is reluctant at this time to endorse this technology as a substitute for ground-water monitoring. EPA invites public comment on the substitution of unsaturated zone monitoring for ground-water monitoring and on its dependability in the early detection of releases of hazardous waste from hazardous waste tank systems.

6. Ground-Water Monitoring

Ground-water monitoring is not presently required for tanks that store or treat hazardous waste. Because of the apparent inevitability of many types of releases from tanks, the Agency believes that ground-water monitoring should be required for any tank system that is not provided with full secondary containment. Thus, there would be periodic (usually semiannual unless otherwise specified by the permitting authority) sampling from wells around the waste management area and analysis of samples for hazardous constituents. The Agency believes that ground-water monitoring equipment can be retrofitted around existing tanks, which would enable such facilities to continue present storage operations relatively unchanged.

EPA is proposing ground-water monitoring for all existing hazardous waste storage or treatment tanks that now are nonleaking and choose not to install full secondary containment. For the reasons discussed in Sections III.C. and V.C., however, the Agency has decided that reliance on ground-water monitoring for new tank systems is inappropriate because of the relative cost-effectiveness of installing full secondary containment for tank systems and the potential costs of corrective action where ground water is allowed to be contaminated.

7. Secondary Containment

The Agency has been evaluating for some time the need for secondary containment for hazardous waste storage or treatment tank systems. ("Secondary containment," as used in this discussion, includes the means for collecting a release and thus preventing its escape into the ground water and/or surface water; it also includes the capability of detecting the presence of liquid within the secondary-containment device ["leak monitoring device"], thus signaling the failure of either the primary- or secondary-containment structures.) Three secondary containment approaches for tank systems were discussed in the Preamble to the January 12, 1981, tank permitting regulations (46 FR 2833). These included "complete containment" (i.e., an impervious base underlying the tanks in the storage area); "variable containment" (i.e., varying levels of containment depending on the likelihood of spills or leaks in the area); and "run-off collection containment" (i.e., diking and drainage to contain catastrophic failures in the primary containment). EPA has subsequently conducted further study of secondary containment for tank systems.

EPA has determined, based upon this study and other studies of leak incidents, that since it is likely that, over time, tank systems will experience failure of one sort or another, a strategy that properly manages the storage or treatment of hazardous waste in tank systems should be capable of not only preventing failure of the tank and its components, but also of containing any release that does occur.

Secondary containment as a technical alternative has a number of advantages. It provides a second line of defense against deficiencies in tank and ancillary equipment and piping design. It minimizes the number of problems associated with undetected leakage. It protects against failures of equipment and against releases resulting from operational errors.

The manner in which secondary containment is achieved depends on whether the tank system is existing or new and on whether the system is aboveground, inground, or underground. (See Section V.E.4. for a more detailed discussion of secondary containment for tanks.)

C. Alternative Regulatory Strategies Considered

Section IV.B. described technical alternatives for controlling hazardous releases from tank systems. These technical measures may be used alone or in combination to protect human health and the environment. This section describes several regulatory options that employ one or several of these measures. The Agency has chosen to propose secondary containment, as described in Section IV.D., based on the information available today. However, EPA will perform an analysis of the costs and risks involved in all of these regulatory options as well as the options described in the 1981 proposal (see 46 FR 2833–34) before the final rule. The Agency requests comments, therefore, on these regulatory options as well as on the option of secondary containment.

1. Combination of Secondary Containment and Ground-Water Monitoring

EPA considered requiring both secondary containment and ground-water monitoring for all tank systems rather than permitting the use of either protective measure. This approach would be consistent with the approach required for surface impoundments and landfills under the 1984 Amendments to RCRA. Under new section 3004(o), each new, replacement, and lateral expansion of existing landfills and surface impoundments is required to install two or more liners and a leachate collection system *and* groundwater monitoring.

With respect to tanks with full secondary containment, EPA believes that an additional requirement to implement a groundwater monitoring requirement would be unnecessary. If a release between the primary containment and secondary containment did occur, the Agency believes that the noncomplex nature of the tank system (i.e., the relative confined area involved and the high reliability of the leak detection devices) would enhance the prompt detection of any release into the secondary containment system. In addition, unlike most landfills and surface impoundments, if a release is detected, the contents of the tank system can be completely and quickly withdrawn.

With respect to tank systems for which the ground-water monitoring alternative is selected, EPA believes that the combination of semi-annual leak testing for underground tanks, the groundwater monitoring program, and the response, closure, and postclosure care requirements proposed today provide safeguards that will adequately protect human health and the environment. The Agency invites public comment on the need to require both secondary containment and ground-water monitoring for all tank systems.

2. National Risk-Based Standards

As an alternative to across-the-board design and operating standards, EPA evaluated the concept of risk-based standards. Risk-based standards vary according to the degree and type of risk presented based on such factors as site location, type of hazardous waste managed, nearness to ground water, proximity to populated areas, etc. Such factors could be arrayed in the form of a matrix, with different levels of control prescribed according to the relative risk posed by a particular combination of factors.

The Agency chose not to incorporate this option in the proposed rule because of concerns about the difficulty of implementing it, and a lack of quantitive data to justify the selection of control measures for particular sets of factors. The Agency solicits comments on the merits of pursuing this approach in light of its administrative concerns. EPA is especially interested in receiving samples of relevant matrices that have been found to be both analytically sound and capable of being readily understood and followed by the regulated community.

3. Minimum National Standards With a Variance From Containment Requirements Based Upon Risk

In lieu of national risk-based standards, EPA also considered using a risk-based approach via a variance to a set of uniform design/operation standards. For example, assume that full secondary containment is established as the uniform national standard for all hazardous waste tank systems. Then, an owner or operator of a tank system could request a variance to the secondary containment requirement if he could demonstrate that, even if a release did occur from his tank system, it would not present a danger to human health or the environment. Such a determination of low or no risk might be based on the type of waste stored, hydrogeological characteristics of the area, current and future uses of the water, etc. such as is now requried to establish ground-water monitoring of an alternate concentration lmit for a hazardous constituent (see § 264.94(b)).

This option was not included in this rule because of preliminary data indicating that the cost of demonstrating compliance with the terms of such a variance is generally higher than actually complying with the technical standards proposed today. We solicit comment on the costs of demonstrating that releases from a hazardous waste tank pose a low risk to human health and the environment. Based on this data and further information that EPA plans to compile over the next months, we will re-evaluate the merits of including a risk-based variance in the final rule.

4. Minimum Performance Standards

Yet another alternative evaluated by EPA is the concept of a minimum federal performance standard for hazardous waste tank systems. Such a performance standard might be: all new tank systems must be located, designed, operated, maintained, and closed in a manner that will assure protection of human health and the environment. Under this approach, States would have the option of expanding upon the federal performance standard by promulgating more specific, and possibly more stringent, standards if so desired. In States choosing not to elaborate upon the federal performance standard, owners or operators of tank systems would have the responsibility to demonstrate that their tank systems do not endanger human health and the environment. This would require a case-by-case assessment of the protective measures needed to achieve the performance standard through the permit process. The reader is referred to § 267.10 for examples of the factors that could be taken into consideration in determining these protective measures.

EPA's decision to not include this option in the proposed rule stems from the same concerns expressed with the previous two options. That is, the cost of demonstrating compliance with the performance standard may be considerable, as too may be the difficulty of implementing the approach. Comments received on the previous two options will enable EPA to further examine the merits of this option.

5. Ban of Underground Tanks

As another means of controlling the problem of leaks from underground hazardous waste tanks, EPA considered banning such waste from being stored or treated in underground tanks. A proposal to this effect was discussed in the Preamble to the January 12, 1981, regulations (see 46 FR 2831). The comments were overwhelmingly against such a provision for a number of reasons. One of the comments was that many local fire codes require that tanks be underground. Second, underground tanks are reported to be advantageous where land is scarce or where pumping costs can be eliminated by using gravity flow. Third, it was pointed out that if underground tanks were eliminated, the waste would have to be placed in aboveground tanks, containers, or surface impoundments—a costly move, and, depending on the type of waste stored, perhaps an unsafe alternative.

EPA agrees that the use of underground tanks for the storage of certain wastes may be the safest alternative. EPA also believes that the protective measures proposed today for underground tanks would prevent or detect releases in time to provide necessary protection of human health and the environment. Thus, it is not necessary to ban underground tanks for the storage or treatment of hazardous waste.

6. Forced Retirement of Underground Tanks

As an alternative to secondary containment for underground tanks, EPA considered the option of forced retirement of a tank when it reaches a predetermined age. For example, a new underground bare steel tank could be allowed to operate without secondary containment for, say, 10 years—the age at which there is typically reason to expect corrosion-induced leaks.

There are, however, some significant drawbacks to this approach. As discussed in Section V.E.2.c. of this Preamble, the age of tanks is not a reliable basis on which to predict the existence of corrosion-induced leaks in steel tanks and is irrelevant with respect to releases from FRP and other nonmetal tanks. Depending on the conditions to which a metal tank is exposed, failure resulting from corrosion could occur at any time between 2 and 50 or more years. Even if the environment in which a steel tank is placed can be accurately assessed with regard to its potential for influencing corrosion, EPA does not believe that it is feasible to predict, for regulatory purposes, the age at which a tank would begin to exhibit leaks.

Because of the many uncertainties involved in this approach to managing hazardous waste in underground tanks, EPA ruled out its use.

D. Today's Proposal for Implementing EPA's Strategy for Tank Systems

Today's proposed revisions to the existing tank standards reflect currently available information and are designed to prevent leaks from tank systems. During the next few months, EPA intends to do more analysis to evaluate the regulatory options and technical measures described in the previous sections to determine their effectiveness at protecting human health and the environment. Based on this new information, as well as the information currently available, EPA will reconsider today's strategy.

As previously stated, the proper management of a hazardous waste storage or treatment tank system involves and to a large extent relies on proper design and operation practices. The protective measures discussed in Section IV.B. were evaluated with respect to their ability to prevent releases from entering the environment. Several measures or combinations of these measures were identified as being appropriate for the purpose of achieving good design and operation of a tank system. Thus, such measures as proper design and installation and the use of corrosion protection are incorporated into today's proposed regulatory strategy to ensure the integrity of the primary tank system. For example, comprehensive assessment of the tank system design is proposed with particular attention given to corrosion protection. Proper installation is also focused on as a means of precluding many of the types of failures (e.g., corrosion-related failures) now being encountered.

EPA's experience and studies since early 1981 have led the Agency to believe that some releases from primary-tank systems are inevitable over time, that all releases cannot be prevented by tank design and operating requirements. Such factors as the accelerated corrosion of metal tanks in contact with the soil, breaks and leaks in ancillary equipment and piping, breakdowns in and spills from overflow equipment, and operators' errors have caused the Agency to conclude that full secondary containment is the most effective means of preventing releases from tank systems. Thus, the Agency today proposes to require, whenever feasible, full secondary containment for hazardous waste tank systems (i.e., tanks and ancillary equipment). For new tank systems, EPA has determined that full secondary containment is always the least costly means of containing releases. Today's proposal, therefore, would require all new tank systems to have secondary containment.

The Agency has determined, however, that full secondary containment may not be the most practical means of containing releases from existing tank systems. Thus, the Agency is proposing an alternative to full secondary containment for existing tanks systems. This alternative would require secondary containment of any portion of a tank system that is aboveground, (i.e., partial secondary containment) plus a ground-water monitoring program. In addition, underground tank systems would be required to be leak tested every six months. For purposes of this Preamble, the alternative to full secondary containment will be termed simply the "ground-water monitoring alternative."

This alternative containment option would apply only to existing tank systems that are operating under either interim status or are already permitted. Because of the need for interaction between the facility owner or operator and EPA whenever ground-water monitoring is implemented, such an option would not be viable for 90-day accumulation tank systems. Thus, these facilities must either be provided with full secondary containment within one year of the effective date of these regulations or apply for a RCA Part 264 permit (see Section V.B. of this Preamble). The chart below illustrates the containment strategy being proposed.

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CONTAINMENT APPROACH

Type of Tank System	Containment Requirements
All permittable hazardous waste storage/treatment tank systems	
- new	full secondary containment
- existing (aboveground and inground)	within one year of effective date, provide full secondary containment or partial secondary containment and ground-water monitoring
- existing (underground)	within one year of effective date, provide full secondary containment or ground-water monitoring and leak testing every six months
90-day accumulation tank systems	
- new	full secondary containment
- existing	full secondary containment within one year of effective date or apply for a Part 264 permit

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EPA believes that the ground-water monitoring alternative would provide essentially equivalent protection to full secondary containment. This protection is further ensured by the requirement that the owner or operator take immediate response measures should a release occur.

In addition, EPA is proposing to expand the closure standards for tank systems without full secondary containment to require removal of contaminated soil at closure and post-closure care if all hazardous waste residues and contaminated soil are not removable at closure. The remainder of the proposed strategy is similar to the present strategy (e.g., inspections).

Finally, although the requirement for secondary containment constitutes perhaps the major difference between the existing standards and today's proposed regulatory strategy, there are also other notable changes. One such change is the increased emphasis on the proper design, installation, and operation of ancillary equipment (e.g., pipes, pumps).

V. Analysis of Today's Proposed Revisions to the RCRA Tank Rules

This section contains a detailed discussion of numerous technical and policy issues and the Agency's rationale for proposing today's revisions to the RCRA tank regulations. It also presents EPA's findings and conclusions in support of the specific revisions. These revisions are intended to remedy significant deficiencies in the existing regulations, such as addressing releases from tank piping and ancillary equipment; operators' errors in managing tank systems (e.g., tank overfilling); corrosion of metal tank systems in contact with the soil; and improper installation practices.

A. Definitions

Today's proposed regulations cover only tank systems that are used to store or treat hazardous waste. In these regulations, a "tank system" is comprised of the tank(s) and the ancillary equipment associated with the tank(s) (e.g., pipes, valves, pumps). For example, in the case of a facility at which a waste is pumped from an indoor process tank to an outside hazardous waste storage tank, the term "tank system" would include: the waste storage tank; all piping, along with any valves and pumps going from the process tank to the storage tank; and any vent lines, empty-out lines, or other appurtenances (e.g., monitoring equipment) associated with the waste storage tank.

Today's proposed regulations make some distinctions among aboveground tanks, inground tanks, and underground tanks. This categorization reflects the tank's degree of contact with soil and its capacity to be viewed externally. By means of these categories, one can determine the specific causes of the tanks system's failure, the associated risks posed to the environment, and the practices needed to prevent such failures. Furthermore, as allowed by RCRA and as suggested by numerous comments in response to the January 12, 1981 proposal, EPA is proposing standards that differentiate in some respects between existing and new hazardous waste storage or treatment tanks.

To clarify these and other concerns, EPA is proposing to add in 40 CFR Part 260 several definitions of terms used extensively in today's proposal.

1. Aboveground Tank

An aboveground tank is situated in such a manner that the bottom of the tank is at or above the plane of ground level. It may be placed directly on a foundation, on the soil (at the plane of ground level), on cradles, or elevated on legs.

2. Inground Tank

A tank is considered to be inground if its base is to any degree situated below the plane of ground level and is in direct contact with the soil such that a portion of the tank wall is above the ground and a portion of the tank wall is below the ground (not externally viewable). Tanks that might be typically referred to as inground but that do *not* meet this definitional requirement include tanks situated below floor level inside a building and tanks located in a topographical depression. Such tanks are not different from aboveground tanks because they are not (except for perhaps the base) in direct contact with soil and are externally viewable.

3. Leak Detection System

The Agency believes the ability to detect promptly a release from a tank system is crucial in protecting human health and the environment. Even with systems that have secondary containment, it is important to know when a release from either the tank system or the secondary-containment system has occurred. EPA has concluded that, for tanks with secondary containment, the most effective way of attaining these objectives is to require quick detection of a breach in either the primary- or secondary-containment structure through leak detection and monitoring, which, in its simplest form, might be achieved by a visual inspection by an operator. Thus, EPA today is proposing to define leak detection system as one that provides the capability to detect, within 24 hours, the failure of either the primary- or secondary-containment structure or the presence of liquid in the secondary containment structure.

A number of automatic leak-detection and monitoring devices are commercially available that could satisfy the proposed definition (e.g., interstitial monitoring between double-walled tanks). These can include probes to monitor for liquid accumulation between the primary- and secondary-containment structures (i.e., flow of waste out of the primary structure into the secondary-containment system or inflow of water into the secondary-containment system from the exterior) or means to maintain a vacuum or pressure between the primary- and secondary-containment structures (loss of vacuum or pressure indicates a leak in the system).

4. Underground Tank

The entire surface area of an underground tank is situated completely below the plane of ground level. The phrase "entire surface area" is intended to mean that, for horizontal tanks, the entire circumference of the tank is within the ground; for vertical tanks, the tank top is situated below the plane of ground level. In most cases, an underground tank is in direct contact with the soil.

5. Ancillary Equipment

EPA considers any equipment used to monitor, distribute, meter, or otherwise control the flow of hazardous waste to or from the storage or treatment tank as ancillary equipment. As discussed below, the Agency is concerned with the failure of ancillary equipment such as piping and pumps and the ensuing releases of hazardous waste to the environment. It is, therefore, subject to the proposed regulations.

6. Existing Tank System

An existing tank system is defined as one that is already in operation or for which installation has commenced on or prior to the effective date of these regulations. The determination of "installation" is tied to several factors, including whether all necessary Federal, State, and local preconstruction and installation approvals or permits have been obtained and whether either physical onsite construction has been undertaken or contractual obligations have been agreed to by the owner or operator that cannot be canceled or modified without substantial losses if the construction of the site or installation of the tank system is to be completed within a reasonable time.

7. New Tank System

In order for a tank system to be considered "new," its installation must have commenced after the effective date of these regulations. As in the case of existing tank systems, installation will be considered to have commenced if the owner or operator has obtained all necessary Federal, State, and local preconstruction or installation approvals or permits and if either physical onsite construction has been undertaken or contractual obligations have been agreed to by the owner or operator that cannot be canceled or modified without substantial losses if the construction of the site or installation of the tank system is to be completed within a reasonable time.

8. Corrosion Expert

EPA believes that the capability to evaluate the potential for corrosion of a tank system in a particular environment and determine those protective measures needed to prevent corrosion of the tank system is unique to persons trained in this area of expertise. As such, the Agency is requiring that a corrosion expert be used in both the design and installation of tank systems to ensure proper corrosion protection.

A corrosion expert is being defined as a person who, by reason of his knowledge of the physical sciences and the principles of engineering and mathematics, acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. Such person may be a registered professional engineer or may be a person certified as being qualified by the National Association of Corrosion engineers if such licensing or certification includes suitable experience in corrosion control on buried or submerged metal piping systems and metal tanks.

B. Storage in Tanks for Less Than 90 Days (§ 262.34)

Under the existing rules, generators storing hazardous waste onsite in tanks are exempt from having to apply for a RCRA permit if, within 90 days after it was generated, the hazardous waste is moved. (See § 262.34.) Such facilities, referred to as accumulation tanks, must only comply with a limited subset of the Part 265 requirements, including, for example, inspection and operating requirements. As part of the effort to implement more adequately its strategy of protecting human health and the environment from the storage and treatment of hazardous waste in tank systems (see Section IV.D.), EPA is today proposing to require full secondary containment at such 90-day accumulation tank facilities.

The final standards promulgated on February 26, 1980, for generators of hazardous waste did not allow for the accumulation of such waste in storage tanks. As stated in the Preamble to those standards (45 FR 12730), EPA intended to amend the Part 262 generator regulations, subsequent to promulgation of the Parts 264 and 265 regulations, so that accumulation in storage tanks would be allowed.

On May 19, 1980, EPA promulgated interim status Part 265, Subpart J, tank standards. The Part 262 standards were also revised to allow the accumulation of hazardous waste in tanks that meet certain of these interim status standards. The Preamble to the Part 262 amendment (45 FR 33141) stated that Part 262 might be amended again to include the final Part 264 standards. EPA's intent was clearly indicated in the background document to the May 19, 1980, amendment to Part 262: "there is little difference between [short term] accumulation and [long term] storage so far as potential damage to human health and the environment is concerned, and therefore, the same standards for protection of human health and the environment should apply." No additional amendments to the Part 262 standards have been promulgated, however, subsequent to the May 19, 1980 revisions.

EPA continues to believe there is little difference between these 90-day accumulation tanks and other storage tanks. For example, additional EPA data have indicated that the annual throughput of waste in these tanks and the types of wastes stored at 90-day facilities are, generally, the same as at other hazardous waste tank facilities. Thus, the potential for release resulting from failure of the tank system is probably the same. In fact, because waste is handled more when it is moved from tanks within a 90-day period, the probability of a release owing to a spill, accident, or other incident may be increased at these accumulation facilities. Also, because of the high throughput of wastes at many of these facilities, the amount of waste released may be greater if it remains undetected for a long period of time.

In light of the above, EPA has reevaluated the existing regulations for 90-day accumulation tanks and has decided that these standards are inadequate. The Agency considered two basic technical options in attempting to upgrade these standards.

1. Add a Secondary-Containment Requirement to the 90-Day Rule

Under this option, a significant degree of environmental protection would be attained by adding full secondary containment for all 90-day accumulation tanks to the existing requirements. Under this option there would probably be little, if any, involvement of the owner or operator with EPA in establishing the secondary-containment system; thus, there could be some uncertainty about the proper design, installation, and maintenance of such systems.

2. Require Ground-Water Monitoring

The Agency considered the ground-water monitoring option as an amendment to § 262.34, but decided that this would be unworkable because such an approach would require significant contacts between facilities and the Agency. Thus, EPA is not allowing 90-day accumulators the option of ground-water monitoring because, in the absence of requiring a permit, the implementation of such monitoring would not be feasible without the interaction that would be needed to assure proper compliance.

In reviewing these two options, EPA became aware that no one option presents an ideal solution, but concluded that full secondary containment would be the most feasible. As a result, EPA has decided that such tanks should be allowed to continue operation under the 90-day accumulation exemption provided that the owner or operator of the facility installs full secondary containment. The risk assessment the Agency is preparing for the final rule may change this conclusion.

Under today's proposed revisions to the 90-day accumulation rule, full secondary containment would be phased in over a 1-year period to provide sufficient time for installation of the secondary-containment system. (See proposed § 262.34(a)(2).) At those tank facilities where full secondary containment is not provided, the owner or operator has the option of closing or—if it is an existing facility—applying for a RCRA permit, which would allow the ground-water monitoring alternative to be selected. The Agency believes that this approach will provide necessary protection of human health and the environment in a relatively short period of time and still afford the owner or operator of each facility some flexibility in determining the appropriate method of protection for his particular situation.

As with any metal tank system, EPA is concerned about corrosion in 90-day accumulation tank systems. (A discussion of corrosion and its control is presented in Section V.E.2. of this Preamble). Since corrosion is the primary cause of failures in metal tank systems, the Agency is considering requiring an assessment of the need for and the installation of corrosion-protection measures for 90-day accumulation tank systems. This approach is similar to that for interim-status and permitted hazardous waste tank facilities. Public comment on the appropriateness of corrosion protection at these facilities is requested.

C. Ground-Water Protection for Tank Systems

EPA recognizes that there are certain situations (especially when the retrofitting of existing tanks is involved) where it is impractical, perhaps impossible, to provide full secondary containment at individual tank facilities. For example, it may be impractical to retrofit secondary containment beneath the tank system without completely dismantling (and perhaps destroying) the tank. In order to provide an option to full seconday containment for such facilities, while at the same time ensuring protection of human health and the environment, EPA is proposing that owners or operators of existing tank systems be allowed to provide partial secondary containment for above-ground portions of the system, leak testing every six months of underground tanks, thorough periodic assessments of inground and aboveground tanks, and a ground-water monitoring program. EPA believes that such a program will protect human health and the environment for a number of reasons. First, leak testing underground tanks every six months and performing a periodic thorough assessment of inground and aboveground tanks should assist in detecting leaks so that they can be responded to before they enter the ground water. Secondly, spills and leaks from above-ground portions of the system will be contained by the partial secondary containment system. Finally, ground-water monitoring will guarantee that releases that do enter the ground water are detected and responded to.

Because ground-water monitoring is one of the components to the alternative to full secondary containment, it will have to be assessed by the owner or operator for feasibility of implementation. Inherent in a ground-water monitoring program is the need for corrective action should a hazardous constituent from a tank enter the ground-water at unacceptable levels. Owners or operators will have to weigh carefully the liabilities associated with this provision. They will also need to consider such other factors as the complexity of a monitoring and response program, the size of the tank facility, and the costs of retrofitting it with secondary containment. In many cases analyzed by the Agency, full secondary containment for existing tank systems, although initially capital intensive, proves to be comparable in cost with the ground-water monitoring alternative when the costs are annualized over a 20-year life of the tank system.

EPA is also proposing that the ground-water monitoring alternative not be allowed at new facilities. (See Section V.E.4.f. for a description of this proposed Part 264 requirement.) The Agency has concluded that it is less expensive to install full secondary containment when a new tank system is being constructed than to conduct a ground-water monitoring program for the life of the facility (even when not including post-closure care). The Agency specifically requests public comment on this conclusion and the Agency's decision to require full secondary containment for all new tank systems.

Proposed § 264.193 requires that owners and operators of tank systems that do not have full seconday containment implement a ground-water monitoring program unless they obtain a waiver from these requirements under § 264.193(i).

Proposed § 264.193(g) sets forth the requirements of this ground-water monitoring program. Under this section, an owner or operator would be required to install a ground-water monitoring system at a compliance point specified in the facility's permit. The owner or operator would then be required to monitor for indicator parameters, waste constituents, or reaction products also specified in the permit. The owner or operator would be required to sample the ground-water quality at each monitoring well at the compliance point at least semi-annually and determine whether there has been a statistically significant increase over background values for any parameter or constituent specified in the permit. Upon a determination that there has been a statistically significant increase in such parameters or constituents, the owner or operator would have to notify the Regional Administrator and assess the integrity of the tank system.

The requirements of proposed § 264.193(g) are nearly identical to several requirements of Part 264, Subpart F, specifically the general ground-water monitoring requirements of § 264.97 and the detection monitoring requirements of § 264.98(a)–(g). Rather than adopt all Subpart F requirements for tank systems § 264.193(g) would incorporate only those requirements of Subpart F that are applicable to a detection monitoring program. Thus, owners and operators would not be subject to compliance monitoring or corrective action requirements similar to those required under Subpart F, §§ 264.99 and 264.100.

EPA chose this modified version of the Part 264, Subpart F standards for incorporation into Subpart J because of the new corrective action authority it has under RCRA section 3004(u). Section 3004(u), which was added to RCRA by the 1984 amendments, provides EPA authority to require corrective action at any solid waste management unit located at a facility seeking a permit under Section 3005. Once a release is detected under proposed Section 264.193(g) and the Regional Administrator is notified, therefore, EPA will have the authority to require whatever measures are appropriate to confirm the leak and to implement corrective action where necessary to protect human health and the environment. EPA believes that reliance upon this authority, rather than incorporation of Subpart F compliance monitoring and corrective action requirements, will give the Agency greater flexibility to fashion response and corrective action measures that are appropriate for tank systems.

EPA seeks comment on this approach it is proposing today and upon the alternative of simply applying the existing complete Part 264, Subpart F Ground-Water monitoring requirements to tank systems.

Although EPA is proposing to adopt certain subpart F requirements for permitted tank systems, the Agency believes that it is not necessary to follow this same approach for interim status tank systems. The existing Part 265, Subpart F standards are appropriate for the detection of releases from interim status tank systems. Any subsequent corrective action can be implemented via the authority granted in 3008(h) of RCRA. Public comment is sought on the appropriateness of applying the Part 265, Subpart F Ground-Water Protection standards to interim status tank systems.

One area of concern regarding the application of the proposed ground-water requirements of § 264.193(g) to tank systems is defining the waste management area to be monitored. EPA is concerned that extensive waste management areas (as could be the case when long lengths of piping are included) could pose a problem with respect to specifying the number and placement of monitoring wells necessary to ensure detection of a release from the tank system. Another important issue with ground-water monitoring of tank systems is how to monitor effectively for a leak from any individual tank system if it is in a conglomeration of tanks, for instance, in a tank farm. Public comment on this issue is requested.

Under the existing tank standards, releases from tanks can enter the environment and could go undetected indefinitely. Thus, pollution of ground water could continue unabated until it has a significant impact on human health or the environment. Imposition of the ground-water protection requirements as well as the requirement for partial secondary containment for above-ground portions of the tank system, tank assessments for inground tanks, and leak testing for underground systems at existing tank facilities should prevent such events.

D. Financial Responsibility (Parts 264 and 265, Subpart H)

Today's EPA is proposing amendments to the existing tank closure standards that require certain postclosure responsibilities for tank systems not using full secondary containment. These post-closure requirements would apply at such facilities if, at closure, contaminated soils and/or ground water (if any) cannot be removed or decontaminated. (See V.E.8. for a more detailed discussion of these new post-closure requirements for tank systems). In addition to the above amendments to the existing tank closure standard, today's proposal also includes a change in the applicability section of § 264.140(b): financial assurance for post-closure care requirements. This change proposes that a financial assurance mechanism for post-closure be established for tank systems subject to proposed § 264.197 postclosure requirements. Under this provision, each tank system not using the full secondary-containment approach must have sufficient resources to carry out post-closure care if, at closure, hazardous waste is found to have been released into the environment and all such waste cannot be practicably removed or decontaminated.

EPA is also proposing changes to Part 265, Subpart H, that require tank systems without full secondary containment to obtain financial assurance for post-closure care. These revisions are the same as those being proposed under Part 264, Subpart H.

E. Tank System Design, Installation, and Operating Standards (Part 264, Subpart J)

In order to provide for better management of hazardous waste in tank systems, today's proposal makes several changes in the existing design, management, and operating standards for permitting tank systems (Part 264, Subpart J). These revisions propose to delete some of the existing standards (e.g., minimum tank shell thickness), modify others (e.g., inspection requirements), and add new ones (e.g., secondary containment and ground-water monitoring program). Because of the large number of changes to Subpart J proposed today, only the standards that are being deleted, modified, and added are discussed in this Preamble.

In developing today's proposed revisions to the existing design and operating standards, EPA has considered all of its previous rulemaking activities (see the discussion in Section II.B.), comments received on these earlier actions, and data obtained from EPA studies on the management of hazardous waste in tank systems.

1. Applicability (§ 264.190)

The existing RCRA permitting standards apply to all tank systems that treat or store hazardous waste, except for covered underground tanks that cannot be entered for inspection. In the Preamble to the January 12, 1981, regulations (46 FR 2831), EPA revealed it had knowledge of several significant damage cases caused by releases from nonenterable underground tanks, but had no sure strategy for preventing such disasters. Public comment was requested on the option of completely banning treatment or storage of hazardous waste in such tanks. Opponents of a ban were asked to provide information on adequate protection methods at such facilities. The Agency indicates that covered underground tanks that cannot be entered for inspection could continue to operate under interim status, but could not receive RCRA permits until final rules were established for them. As discussed in Section IV.C., those who commented suggested several reasons why this type of tank should not be banned, including: local fire codes, the scarcity of space for storage in aboveground tanks, and the costs of developing alternatives. The consensus was that underground tanks can be designed, installed, and operated in a manner that will protect human health and the environemnt.

Today's proposed changes to the technical requirements have been developed to ensure the proper management of these tank systems. Therefore, this proposal deletes the existing § 264.190(b), thereby making the Subpart J standards applicable to all tank systems, including underground tanks that cannot be entered.

In the Preamble to the January 12, 1981, tank permitting standards, EPA solicited comments on the advisibility of allowing the storage of hazardous waste in tanks that are situated in the water table (46 FR 2833). Most of those who commented believed such a ban was unreasonable and unnecessary and that proper design, installation, and operating practices would ensure that hazardous waste is not released to ground water. In light of the tank system permitting standards proposed today (e.g., corrosion protection, installation requirements, secondary containment, leak detection, etc.), EPA believes that tank systems can be managed in an environmentally safe manner even if not enterable for inspection or when located in ground water.

In sum, today's proposed Subpart J standards close an existing gap in the coverage of the RCRA tank standards by making them applicable to all tank systems managing hazardous wastes.

2. Design of Tank Systems (§ 264.191)

As discussed in Section III.C., the Agency has previously adopted a three-part regulatory strategy for storage of hazardous waste. For tank systems, this consists of proper design and operation of primary containment, inspections, and secondary containment. The following discussion relates to the proposed deletions, revisions, and additions to the existing § 264.191 design requirements for tank systems; inspection and secondary containment are addressed later in this Preamble.

a. *Minimum Shell Thickness.* The Preamble to the January 12, 1981, regulations (46 FR 2831–2832) includes a discussion on minimum tank shell thickness that is provided in support of the existing design requirements. Those standards require the establishment and preservation of a minimum tank shell thickness supplemented by an inspection program to ensure that the tank's integrity is maintained.

Because they were interim final standards, EPA received several comments on them. Most of those who commented strongly opposed the design requirements for minimum shell thickness. One of their main reasons for opposing this requirement was the belief that EPA should not be involved in the establishment of such standards since tanks are typically designed in accordance with nationally acceptable standards established by, for example, API, Underwriters' Laboratories (UL), and the American Society of Mechanical Engineers. Those who commented considered EPA's involvement in such design considerations to be redundant and time consuming. They also pointed out that many existing tanks are nonspecification tanks (not built to nationally established standards), for which much of the original design information may not be available, and suggested that such tanks be granted a permit based on a demonstration to EPA that the tank is sufficiently sound to justify its use for storage or treatment of hazardous waste.

Other comments concerned the technical aspects of measuring shell thickness. Several of those who commented indicated that it is extremely difficult, if not impossible, to measure tank shell thickness. They pointed out that, in many cases, such measurements can only be taken from the inside of tanks whose interiors may be inaccessible. They also expressed their belief that considerable burden is placed on facilities that must shut down a manufacturing process in order to take the tank out of service for internal inspection. In addition, they reported that the costs of emptying and cleaning a tank and disposing of its contents are unjustified. For example, EPA estimates that the cost of emptying, cleaning, and properly disposing of contents of an 8,000-gallon steel tank is approximately $1,000.

Among the other concerns associated with shell thickness, those who commented pointed out the following. In many cases, measurements can give unpredictable and inaccurate results and may be of no value in fiberglass, lined, coated, or insulated tanks. It is impractical to measure tank bottoms because of the high cost of cleaning to the point where measurements can be taken. Standard practice in measuring metal thickness is to make "spot checks" of the tank shell rather than measuring the entire shell surface. These spot checks usually cover as little as 1 to 10% of the shell surface. For the portion of the tank universe constructed of concrete, the requirement may be unimplementable because wall composition for this type of tank is comprised of a variable distribution and orientation of aggregate so that it is unlikely that ultrasonic testing devices could be easily calibrated to accurately test such tanks. The safety of personnel taking measurements inside tanks must also be considered. Unless effective cleaning procedures have been used, there is the possibility that toxic fumes will be present or that an explosion may occur. Several of those who commented suggested that alternative inspection methods (e.g., hydrostatic testing, x-raying) for metal tanks should be allowed or that internal inspections should be performed only during normal tank shutdowns.

EPA generally agrees with those who commented that the minimum shell thickness requirement should be deleted, given the following facts. This requirement has proven difficult to implement. It has been an unjustified burden on many owners or operators of tank facilities, especially those with secondary containment. It is of limited effectiveness in controlling releases from tanks.

EPA has reviewed data regarding the failure of tank systems and has concluded that the overwhelming number of reported releases from such systems have resulted from occurrences other than failure of the shell. An analysis of over 2,000 incidents of spills of oil or hazardous substances reported under EPA's Spill Prevention Control and Countermeasures Plans (SPCC) and the Coast Guard's Pollution Incident Reporting System (PIRS) reveals that between 40 and 50 percent of the spills resulted from failure of piping or ancillary equipment (pumps, valves, etc.). Another approximately 40 percent of the reported spills were attributed to operational deficiencies (overfilling, operators' errors). Less than 10 percent of the spills could be related to releases resulting from failure of the shell.

On the basis of information it has accumulated, public comments, and permitting officials' experiences with implementing the shell thickness requirement, EPA has reconsidered the effectiveness of shell thickness determinations in the overall regulatory strategy for managing hazardous wastes at tank facilities. The Agency concludes that in view of all the technical, safety, and cost issues associated with the determination of tank shell thickness, the existing standard is not effective and, therefore, not warranted. Accordingly, today's amendments propose to delete this requirements from § 264.191.

b. *Tank Systems.* The existing Subpart J requirements focus primarily on the storage or treatment tank itself and generally ignore ancillary equipment. Today's proposal emphasizes the term "tank system," which is meant to assure that both ancillary equipment and the tank itself are covered. Thus, any equipment used to distribute, meter, or control the flow of hazardous waste to or from the storage or treatment tanks as well as the tanks themselves are included in the term "tank system."

The significance of including a hazardous waste tank's ancillary equipment (including piping) is demonstrated by the SPCC and PIRS data, which show that piping and ancillary equipment failures may account for up to 50 percent of releases from tank systems. A survey by API of leaks from gasoline storage tanks corroborates these data. In addition, discussions between the Agency and several tank-testing companies verify that at least 50 percent of leaks from tank systems can be attributed to piping problems.

As a result of all this evidence, the Agency has concluded that both the tank and its ancillary equipment must be considered in EPA's regulatory strategy to protect human health and the environment from the release of hazardous waste from tank facilities.

c. *Corrosion Protection.* As discussed in Section IV.B.3., corrosion is the major cause of failure of metal tank systems. Internal corrosion (which according to a recent report accounts for between 10%–29% of corrosion-induced tank failures) is usually prevented by assuring compatibility of the inner surfaces of the tank system with the material to be stored in the tank system. Although corrosion of metal owing to atmospheric conditions is also of concern, the most serious corrosion problems are associated with metal tanks that are in direct contact with surrounding soils. Information received since the January 1981 regulation was promulgated has persuaded EPA that, as part of the process of designing a tank system, it is important to assess the potential for corrosion specific to the soils in which the metal components of the system are placed. It would seem prudent, therefore, to situate the tank system at the location with the least corrosion potential and, when necessary, to incorporate appropriate measures to control corrosion.

A study by API of nearly 2,000 leaks from underground gasoline tanks demonstrates the impact of corrosion in the management of tanks. This study found that between 75 and 80 percent of the leaks were attributable to tank and/or piping failure resulting from subsurface corrosion. Additional studies of leaks from underground tank systems by New York, California, and Michigan also point to corrosion as a leading factor in the failure of metal tanks and piping. It is inevitable that the majority of unprotected metal tank systems in contact with the ground will experience some degree of corrosion over the life of the system. Data from the API study show a significant increase in detected leaks in both steel tanks and steel piping older than 5 years of age. It is assumed that the higher incidence rate of leaks at older facilities is caused primarily by corrosion.

In order to evaluate the occurrence of leaks in tanks resulting from subsurface corrosion, it is necessary to go beyond the general conclusions that can be derived from the API survey results. A separate statistical study on tank leaks was conducted for API entitled "Underground Unprotected Steel Tank Study: Statistical Analysis of Corrosion Failures." This study showed that the tank's age, by itself, is not necessarily the best predictor of a corrosion-induced failure. The prediction must also take into account such factors as soil resistivity, pH, moisture, the level of sulfides in the immediate backfill materials that are in contact with metal components, the influence of nearby underground metal structures, and the effects of stray current. The information gathered under this study indicates that 77 percent of steel tanks will point-corrode (develop holes caused by accelerated corrosion at localized areas in the tank system), while the other 23 percent of tanks may corrode on a more uniform basis (and thus not develop holes) over even a longer period of time. The study cautions, however, that certain corrosion-inducing conditions could cause a leak in a steel tank system within as short a time as a year or two of its installation.

This study also concluded that (taking into account the various factors mentioned above) tanks of 12 years of age in saturated soil conditions have a 50 percent probability of leaking. In unsaturated conditions the 50 percent probability of leaking occurs at 21 years of age. Overall, the data indicate that the mean age for tank leakage is around 16 years; that is, 50 percent of all tanks will have developed a leak as a result of subsurface corrosion by the time they are 16 years of age.

A company specializing in cathodic protection has reported on the age to leak rates of 800 tanks in Ohio. Their data show that at leas one underground metal tank failure can be expected in 55 percent of the gasoline stations over a 15-year period and that failures can be expected at 70 percent of the stations in 20 years. It was also reported that the life of the tanks in areas such as New Jersey, Pennsylvania, Ohio, Indiana, Michigan, and Illinois rarely exceeds 12 years.

There have been a number of studies on the occurrence of leaks in underground piping. The National Association of Corrosion Engineers (NACE) reports that, if the accumulated number of leaks in underground piping is plotted against time, an exponential curve is derived. This exponential curve is noticed starting at approximately 5 years from installation. The curve indicates that the cumulative number of leaks subsequently increases by a factor of 10 every 6 years.

EPA believes that the foregoing data indicate that once a steel tank system that is in contact with surrounding soil is 5 years of age, concern for leaking should be intensified. Extreme caution should be exercised once such an unprotected steel tank system reaches 10 years of age.

EPA data show that over 60 percent of the underground tanks and 30 percent of the inground tanks used to store hazardous waste are constructed of carbon steel. Most large steel aboveground tanks are placed directly on the ground or a concrete foundation and, thus, may be subject to bottom corrosion. The overwhelming majority of these tanks do not have corrosion protection. Taking into account the analyses provided above and considering the fact that 50 percent of the existing steel underground tank systems are over 8 years of age (25 percent are more than 15 years old), EPA has concluded that many existing steel tanks may now be leaking. In order to ensure the integrity of a steel tank system, one must establish and maintain corrosion protection over its entire life. Assessing the potential for corrosion at the site where the tank system is or will be established is the first step in this process. Specific requirements being proposed today for achieving corrosion protection at hazardous waste tank systems are discussed below.

d. *Engineer's Assessment of the Tank System's Design.* As discussed in Section III. C., the proper design and operation of the primary containment device is the first step in the Agency's three-part regulatory approach for the storage of hazardous waste. Therefore, to replace the minimum shell thickness requirements that are being deleted today, the Agency is proposing a substitute approach for ensuring that the design of hazardous waste tank systems is appropriate and adequate. The new approach requires owners and operators of all tank systems to submit, as part of the permit application, a written assessment and certification by a qualified registered professional engineer of the tank system's design and suitability for handling hazardous waste.

In using the term "qualified registered professional engineer," EPA intends that the person employed to provide the assessment and certification be a registered professional engineer who is qualified to provide such an assessment by reason of his knowledge of principles of engineering, acquired by professional education and related practical experience. As such, the Agency does not necessarily believe that *any* registered professional engineer can adequately fulfill this role. For example, an electrical engineer, although registered as a professional engineer, may not necessarily have the professional training or experience to assess the structural integrity of a tank system, secondary containment system, etc. EPA believes that persons trained in the fields of chemical and/or civil engineering are likely to be best qualified to provide the assessment required in § 264.191. Public comment on a definition of qualified registered professional engineer is invited.

This proposed requirement is partly intended to provide a substitute for the extensive engineering-related calculations and judgmental reviews that are now being required for permitting under the existing standards concerning minimum tank shell thickness. As discussed above, the limitations of this approach have convinced EPA that the structural integrity of a tank system can be more easily and quickly assessed by a professional engineer who attests to the system's overall capability for managing hazardous waste. Proposed § 264.191(a)–(e), discussed below, provide the specific design criteria that must be addressed in this assessment. The information required to be provided in this assessment differs slightly for new and existing tank systems.

Proposed § 264.191(a) (1)–(2) require that the engineer's assessment include the design standard to which new tank systems are constructed. Adherence to nationally accepted design standards such as those published by API, UL, and the American National Standards Institute would convince EPA of the structural integrity of the tank system. The assessment of each new nonspecification tank system would need to demonstrate that it was constructed in accordance with sound engineering principles. In assessing the appropriateness of a new tank system's design, the engineer must also determine whether the design will enable the system to handle the wastes planned for it. (See § 264.191(a)(3).)

The engineer's assessment of existing, used, and reused tank systems can likewise demonstrate that the tank system was constructed in accordance with a specific design standard. Such design information may not be available, however, at many existing facilities. Thus, the engineer's assessment must consider such design information only if it is available. (See proposed § 264.191(b)(1).) The assessment of existing, used, and reused tank systems must provide, at a minimum, a description of the tank system, including its size, age, and materials of construction. (See § 264.191(b)(2).) In addition, the assessment must address the ability of an existing system to contain the wastes to be handled, including a consideration of the wastes' characteristics (e.g., corrosivity, reactivity). (See § 264.191(b)(3).) For example, it must be determined that a used FRP tank that may have been built for storage of a certain chemical (thus requiring the use of a specific resin) is able to be used for the waste to be stored. Communication with a resin manufacturer may be necessary to determine compatibility of the tank with the waste.

In order to assess whether an existing underground tank's shell is structurally sound and able to handle the quantity and type of waste(s) to be managed, proposed § 264.191(b)(5) requires that testing methods be employed to ensure the structural integrity of existing underground tanks. (See Section IV.B. for a detailed discussion of such methods.) For existing aboveground and inground tanks that can be entered, the Agency believes that an internal inspection of the tank conducted within one year prior to permitting will provide sufficient information to complete the structural assessement of these types of tanks. EPA believes that a qualified registered professional engineer given the results of testing and inspection, the available data on design, and the tank's intended use, can assess and certify whether a particular tank should be used for storing or treating hazardous waste and estimate the remaining life of the tank system. (See § 264.191(b)(4).)

EPA believes that it is important for the engineer's assessment to consider some other factors as well. One such factor is the potential for corrosion. Therefore, as part of the process of assessing a metal tank system, the engineer must obtain an assessment from a corrosion expert of the potential for corrosion at the location where metal components of the tank system are or will be in contact with the soil. This assessment must incorporate, when necessary, appropriate measures to control corrosion of the tank system. Proposed § 264.191(c)(1) provide the criteria to be used in assessing the corrosion potential of a site and in establishing the need for corrosion-protection measures for tank systems.

Corrosion is influenced by many factors. This assessment should consider such factors as soil moisture content, soil pH, bacterial action (sulfides level), soil resistivity, structure to soil potential, stray electric current, influence of nearby underground metal structures and existing corrosion-protection measures (e.g., coatings). The presence of one or more of these parameters and their synergistic role in promoting corrosion must be determined on a site-by-site basis. Professional engineering judgement should determine other parameters as necessary in order to make a satisfactory assessment of corrosion potential. For example, this determination may depend on individual site conditions (e.g., the existence of another nearby tank system, fluctuating water table, etc.). EPA intends that this assessement be conducted for all metal tank system in contact with soil, including systems that have secondary containment. For example, a tank that is situated within a vault or a lined excavation and that is backfilled within the secondary containment may pose the same potential for corrosion of the external surface of the metal components of the tank system as would any metal tank system that is not isolated from the surrounding environment. Tank systems with secondary containment (e.g., those within a liner or concrete vault) may already be somewhat protected from corrosion by being constructed of corrosion-resistant materials or by the use of certain types of backfill materials within the containment system to deter corrosion. However, unless the ancillary equipment is also so protected and is isolated from the host soil, a galvanic current may be developed between the soil, piping, and tank, thereby resulting in corrosion.

The requirements of §§ 264.191(c) (1) and (2) provide the corrosion expert with factors that must be assessed in determining whether corrosion protection may be necessary and, if so, the types of such protection acceptable to EPA. The Agency believes that well-established engineering standards for each for the parameters listed in § 264.191(c)(1) are available to assess the corrosion potential of a site. Having conducted this assessement, the corrosion expert can then proceed to define what, if any, corrosion-protection measures are needed to control corrosion of the tank system. Any existing corrosion-protection measures already incorporated into the tank system should, of course, be considered in assessing the need to provide additional corrosion protection.

Other factors that the engineer must consider in assessing the overall design of a tank system are included in proposed §§ 264.191 (d) and (e). Section 264.191(d) requires a determination of measures to protect underground equipment from damage resulting from vehicular traffic, including the weight of the traffic and vehicular contact with exposed portions of tank systems (e.g., vent lines, fill pipes). Guard rails or similar types of barricades around the components susceptible to damage would be appropriate.

As part of the overall design of a tank, § 264.191(e) requries proper design of the tank's foundation so that a full tankload can be maintained. Also, in areas where tanks and piping are located in seismic fault zones subject to the location requirements of § 264.18(a), the tank system must be designed so that these factors will not pose adverse effects on it, e.g., dislodging or flotation. The same design consideration must also be given to tank systems situated in a saturated zone, even if saturated conditions exist at only certain times of the year. EPA also considered applying this requirement to tank systems that are located in floodplains subject to the requirements of § 264.18(b). The Agency chose not to propose this requirement for tank systems in floodplains because it is not sure whether this requirement is necessary given the requirements of § 264.18(b). Public comment on this issue is invited.

3. Installation of New Tank Systems (§ 264.192)

The Agency believes that the proper installation of new hazardous waste tank systems is as important as their proper design. Thus, the Agency has concluded that this facet of new tank system management must be regulated to assure that proper installation practices will be employed. Improper installation of tank systems can result in immediate or future releases of hazardous waste into the environment

Under § 264.192 facilities seeking a RCRA permit would have to adhere to the new installation standards discussed below.

Proposed § 264.192(a) requires that installation be observed by a person trained in the proper installation of tanks who will certify that the tank system was properly installed. EPA believes that persons such as a certified building inspector, fire marshal, qualified representative of the tank manufacturing company, or a registered professional engineer can fill this role. Public comment is welcome on the subject of certification of proper installation. Proper handling and installation practices are needed to protect against weld breaks, punctures, loose fittings, scrapes, cracks, or other structural damage to the tank system. EPA recommends that persons inspecting tank system installations use a checklist containing, at a minimum, all of these items which are required to be inspected under § 264.192(a).

A number of considerations are involved in the installation of new tank systems. First, the Agency believes the proper installation of new metal tank systems is important because of corrosion. This includes consideration of the design at the excavation location, appropriate choice of backfill material, and proper handling of metal components.

As discussed previously, corrosion plays an important role in debilitating the integrity of metal tank systems, thus causing failure of the system. Although corrosion of metal is to a certain degree a natural process, its initiation and progression can be significantly arrested by such precautions as providing corrosion-resistant materials of construction, coatings, cathodic protection, and isolation of the system. The primary goal of corrosion protection is to eliminate localized anode activity, that is, areas of concentrated corrosion. The extent of this problem is demonstrated by a study by the National Bureau of Standards, which found that over 90 percent of corrosion damage on underground pipelines results from this type of corrosion action. For corrosion-protection measures to work effectively, it is important that steps be taken to prevent damage to the tank system during installation. Unsuitable types of backfill or backfilling methods or improper or careless installation resulting in scrapes of protective coatings, cracks resulting from careless handling, or other structural damage to the tank system can lead to corrosion.

Second, the proper installation of fiberglass reinforced plastic (FRP) tanks is also critical. One of the leading causes of failure of FRP tanks is, in fact, faulty installation. The structural integrity of an underground FRP tank (as well as an underground metal tank) depends largely on the support provided by the surrounding soils. EPA has no evidence that the load-bearing strength of FRP tanks is less than that of underground steel tanks. The Agency believes, however, that FRP tanks are more vulnerable to certain other types of structural failure than underground steel tanks. FRP tanks seem, particularly, to be more susceptible to puncture and may be less able to tolerate torsional or flexural stress. It is crucial, therefore, that the type of backfill and the placement of the backfill material do not puncture the tank or result in voids or "soft spots" around the tank. Failure of an FRP tank owing to breakage resulting from faulty installation and backfilling presents significant risk to the environment because it could allow, in a short period of time, the release of a major portion of the tank's contents into the environment. Today's proposal requires the use of noncorrosive, porous substances such as sand or pea gravel for backfill material of tank systems inside a secondary containment system and that underground tanks are carefully backfilled so that the backfill is placed completely around the tank and compacted to ensure that the tank is fully and uniformly supported. Most manufacturer's specifications for backfilliing tanks satisfy these requirements and should thus be strictly adhered to. These requirements are intended not only to prevent structural failures, but also to reduce corrosion potential, which EPA believes can best be accomplished during the installation of tank systems. The inspector's checklist should also address this concern.

EPA also believes it is good practice to test or inspect all new hazardous waste tank and piping systems for tightness and integrity before they are actually put into service. The Agency considers it particularly important to test or inspect the components of new tank systems that will be in contact with or covered by the surrounding soil or backfill because, once in service, they will for the most part be inaccessible for routine visual inspections. Thus, § 264.192(c) proposes that components of new tank systems must be tested or inspected for tightness and repaired, if leaking, prior to being covered, enclosed, or put into service. Adherence to appropriate industry guidelines, such as API Publication 1615—*Installation of Underground Petroleum Storage Systems* and ANSI Standard B 31.3—*Petroleum Refinery Piping* and ANSI Standard B 31.4—*Liquid Petroleum Transportation Piping System*, will ensure that piping systems are adequately supported and protected against physical damage and stress as required in proposed § 264.192(d). Finally, § 264.192(e) requires that the corrosion protection measures determined to be needed by the Regional Administrator per § 264.191(c) be provided at the time the tank is installed and that the installation of such measures be overseen by a corrosion expert.

4. Secondary Containment for Tank System (§ 264.193)

EPA believes that tank systems (tanks and their ancillary equipment) used to store or treat hazardous waste should be managed in a fashion that prevents releases that pose a threat to human health and the environment. As discussed in Section IV.D., this approach carries out the Agency's regulatory strategy for storing hazardous waste, which emphasizes the containment of such releases.

Following promulgation of the January 12, 1981, regulations EPA undertook an extensive study of the causes of releases from tank systems and compared the results to the design, installation, operation, and maintenance practices that are required by the existing RCRA tank regulations. EPA has concluded that even if these existing requirements are strictly adhered to, releases to the environment are likely to occur at some time over the life of the system. For example, the existing requirements do not prevent releases from spills and overfilling caused by operators' errors and malfunctioning equipment, failures of ancillary equipment, and releases from tanks corroded by surrounding soils.

The Agency has evaluated several protective measures to determine whether their use might achieve the regulatory strategy of protecting human health and the environment. (See Section IV.B. for a brief discussion of the various protective measures considered.) This effort has resulted in today's proposal to require full secondary containment for new tank systems and full secondary containment or the ground-water monitoring alternative for existing tank systems.

EPA's proposal in §264.193, to require the use of full secondary containment for hazardous waste tank systems, is perhaps the most significant change to the Subpart J tank permit standards being proposed today. The following discussion highlights the issues considered by EPA in determining today's proposed approach to full secondary containment for tank systems. The Agency's rationale for this part of the proposal is also provided. Finally, each of the proposed requirements is discussed in detail, including the way they will be applied.

a. *Background to Today's Proposed Approach.* As mentioned previously, EPA first proposed standards applicable to the storage and treatment of hazardous wastes in tanks on December 18, 1978. That proposal included a requirement for an impervious, continuous base and spill-confinement structures (e.g., diking) completely surrounding aboveground tank storage areas. These proposed requirements were not included in the January 12, 1981 interim final rules for permitting hazardous waste tanks, however, because the Agency decided it did not have sufficient data at that time to determine what, if any, secondary containment was appropriate. Following suggestions by several of those who commented on the December 18, 1978, proposed rules, EPA instead decided to emphasize the establishment and maintenance of a minimum shell thickness as the means of assuring the tank's integrity.

In the Preamble to the January 12, 1981, regulations, EPA again raised the issue of secondary containment for tanks. The Agency indicated its intention to propose a future secondary containment for tanks, as an addition to Part 264, and solicited public comment on the need for and effectiveness of three secondary containment options for tanks: (1) Complete containment, (2) variable containment, and (3) runoff collection for the containment of catastrophic failures. Complete containment—the most protective approach—consisted of placing an impermeable barrier between the tank's primary containment structure and the environment. The variable containment approach would allow a varied degree of containment based on an assessment of the likelihood of a spill or leak in any given area of a particular tank facility (e.g., the placement of an impervious barrier in the vicinity of valves, pumps, pipe attachments, or at the base of the tank.) The runoff collection approach—the least stringent option—would simply consist of diking or a drainage system designed to prevent the surface spread of a catastrophic release, such as from complete failure of the tank, and would not be designed to protect ground water from leaks or spills. (See 46 FR 2833, January 12, 1981, for a more detailed description of these options.)

EPA received several comments concerning secondary containment. There were only a few exceptions to the consensus that it is appropriate to consider at least some form of secondary containment at hazardous waste tank facilities. One of those who commented expressd the view that secondary containment (of any type) is not justified because routine inspections provide adequate warning of releases. Two other commenters held the view that inspections significantly reduce the need for secondary containment.

The Agency has concluded, however, that the use of inspections alone will not detect all releases from tank systems. While inspections can detect some problems before they actually result in a release, they cannot detect all potential problems (e.g., faulty equipment). Furthermore, some releases actually occur when facility personnel are present, as, for example, when operators overfill tanks. Finally, releases from tank systems with components hidden from view (for example, underground piping) cannot be detected through routine inspections.

Among those who commented that some form of secondary containment should be considered, at least half believed that the curtailment of catastrophic releases (the third option) is the preferred approach for hazardous waste tanks, or that it should be at least the starting point in case-by-case determinations of whether an increased level of containment (the first or second option) is appropriate. The Agency has elected, based on preliminary data, however, not to adopt the third option in the proposed rule. Information from the risk assessment being prepared for the final rule may alter this decision, however.

As discussed in the Preamble to the January 12, 1981 rules, the major problem with this approach is that it does not protect ground-water resources; thus, even contained catastrophic surface releases could enter ground water and migrate offsite. In addition, the Agency has new information demonstrating that some of the most frequent releases from aboveground tanks are spills caused by operators' errors and malfunctioning equipment. Under the third option, these spills would be allowed to leak onto or under the ground's surface. Such releases could, over time, have the same adverse impacts on ground water as catastrophic releases. In the Agency's files are several damage cases where such spills have apparently had a significant cumulative impact on nearby ground water. The Agency also has significant new information about the most frequent releases from inground and underground tanks. The third option would allow most, if not all, of these releases to enter the environment. For example, releases caused by corrosion of the primary containment system in the soil (e.g., metal tanks or pipes) would not be covered. Although the Agency has chosen not to propose the third option, it is still concerned that catastrophic surface releases may occur (albeit in frequently) at some aboveground tank facilities. The Agency's preliminary conclusion is that this threat is best addressed as part of a complete containment approach (the first option).

Approximately half of those who commented suggested that the level of secondary containment provided by the first or second option should be decided on a case-by-case basis. Several stated that the Agency must consider the feasibility and costs associated with retrofitting complete secondary containment before requiring it for existing tank systems. They suggested a number of other factors to be considered in these individual decisions: the waste's toxicity, the site's location and hydrogeology, and the facility's past history of releases. Although this option was not chosen for today's proposed rule, it will be evaluated further between now and promulgation of the final rule.

About one-fourth of all comments favored requiring complete containment (the first option) for all hazardous waste tanks and did not suggest a case-by-case approach. One did propose, however, that ground-water monitoring be allowed as an alternative.

EPA has concluded that, for most tanks, both new and existing, complete secondary containment is the most cost-effective means of addressing almost any cause of release and eliminating the possibility that releases will go undetected and enter the environment. If properly designed, installed, and operated, it provides virtually fail-safe protection of human health and the environment. The Agency acknowledges, however, that there may be significant problems in retrofitting *some* existing tank systems (e.g., inground concrete tank systems), and that there may be no need to provide secondary containment at some locations because of such factors as the hydrogeology of the facility and the nature and quantity of the wastes stored or treated in the tank system. Therefore, today's proposed secondary-containment requirements for hazardous waste tanks adopt the complete-containment approach presented in the January 12, 1981, Preamble, but with significant exceptions to address some important concerns identified by several of those who commented.

The proposed requirements are intended to offer flexibility to existing tank systems because the Agency believes that it may not be technically or economically feasible to retrofit some of these systems with full secondary containment, short of total replacement of the system. Thus, although the proposal requires new tank systems to have full secondary-containment systems, it also provides an alternative for existing tank systems: the ground-water monitoring alternative discussed in EPA's strategy (see Section IV.D.) that allows the use of a ground-water monitoring program in conjunction with partial secondary containment (for above-ground portions of tank systems), semi-annual leak tests (for underground tank systems), and thorough periodic assessments of aboveground and inground tank systems.

To allow for flexibility in implementing the containment requirements on a case-by-case basis, the proposal permits waivers of both the full secondary-containment requirements and the ground-water monitoring alternative if an owner or operator can demonstrate that any hazardous waste or hazardous constituent will be prevented from migrating into ground water or surface water "at any future time." EPA is considering and seeking public comment on the alternative of demonstrating that migration will not occur "during the active life of the unit and the post-closure care period." These waivers do not, however, alter the proposed design, installation, and operating requirements for tank systems (the primary containment system), which must always be met. In addition, the Agency solicits comment on the merits of using a risk-based approach to granting a waiver from the secondary containment requirement, as outlined in Section IV.C. of this preamble.

b. *Problems with Retrofitting Existing Above-, In-, and Underground Tank Systems.* Full secondary containment for tank systems is viewed as a barrier designed, installed, and operated so that any release of hazardous waste from the system will be promptly detected, collected, and removed, thereby preventing hazardous waste from reaching the soil, ground water, or surface water outside the barrier. Because most existing hazardous waste tank systems are not protected by full secondary containment, a key issue is the feasibility of retrofitting these existing systems. In order to evaluate this issue, it is useful to classify the existing hazardous waste tank universe into three broad categories: aboveground, inground, and underground. Figures 1–13 provide typical examples of each of these categories, including some of the types of partial or full secondary containment that may be provided for them.

At existing aboveground tanks that are cradled or otherwise elevated above the ground's surface, the Agency believes that it is technically and economically feasible to place a barrier such as concrete under the tank and to install curbing or diking around the storage area to contain the movement of released waste. In contrast, if a secondary-containment barrier must be placed under a tank system that is in contact with the ground's surface, it would, in many cases, be necessary to disassemble, lift, and unearth the tank system, which could result in destruction of the tank. To solve these problems, the Agency considered several technical control measures as an alternative to full secondary containment.

For existing aboveground tanks that are in direct contact with the ground's surface or sitting on a foundation and cannot practicably be provided with full secondary containment under the bottom of the tank, the Agency evaluated the use of partial containment consisting of a base and diking around the perimeter of the tank but not under its bottom. (See Figure 1.) EPA believes that such partial containment would prevent many of the most frequent type of releases (e.g., overtopping, malfunctioning equipment, operators' errors) from entering the environment. Although in certain limited situations (e.g., tanks on concrete pads) leakage from the bottom could be detected by visual inspection of the tank's exterior and the surrounding area, the Agency does not believe that most leaks from the bottoms of such tanks can be detected in this manner. As discussed previously, the Agency is concerned with releases from those portions of tank systems that corrode as a result of contact with the surrounding soil and that cannot be observed. Partial containment of an aboveground tank does not prevent or contain releases from the bottom of a tank that is in contact with the ground's surface.

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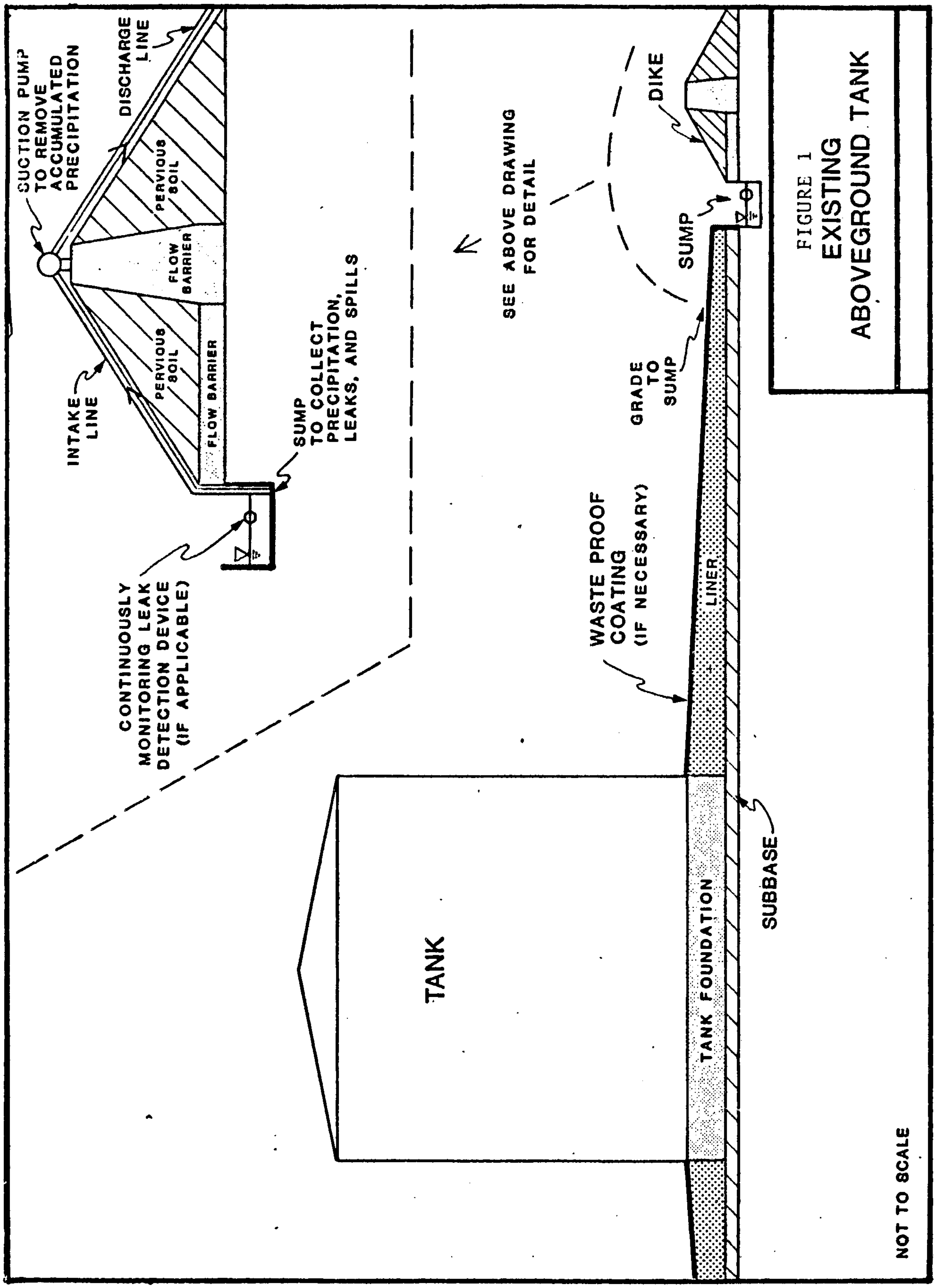

FIGURE 1
EXISTING ABOVEGROUND TANK

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The Agency also assessed the feasibility of using such measures as ground-water monitoring, inventory controls, leak tests, and corrosion-protection measures at partially contained aboveground tank systems as a means of achieving environmental protection equivalent to full secondary containment. (See Section IV.B. for a detailed discussion of the additional protective measures available and their relative strengths and limitations.) EPA believes that inventory monitoring and leak testing cannot be relied upon for detecting leakage from the bottom of aboveground tanks. It concludes that ground-water monitoring and periodic assessments are the most feasible means of detecting invisible leaks from the bottoms of those existing aboveground tanks that can only be retrofitted with partial secondary containment. (A possible future alternative may be some type of continuous unsaturated zone monitoring, as discussed in Section IV.B. but EPA has rejected this alternative because of the lack of data establishing its reliability at this time.) Corrosion-protection measures required by this proposal would also provide added protection for tank bottoms where full secondary containment is not used.

The Agency realizes that retrofitting a containment barrier to surround the portion of existing inground tanks that do not have a full secondary-containment barrier around or underneath them would usually require replacing the tank, especially since approximately 70 percent of such tanks are constructed of concrete (see Figure 2). The Agency has evaluated the use of partial containment consisting of a base and diking around the perimeter of the tank but not containing that portion of the tank in the ground. EPA has determined that this approach could be valuable in preventing releases from overtopping, and malfunctioning equipment, but is concerned with the high probability that inground concrete tanks will crack over time and allow leakage and the present inability to detect releases within a reasonable period. As discussed in Section IV.B., inventory controls and leak testing are not viable options for inground tanks. The Agency has concluded that existing inground hazardous waste tank systems that do not have full secondary containment must implement the ground-water monitoring alternative previously discussed. For inground metal tanks, corrosion control measures must also be retrofitted; for example, cathodic protection can provide added protection for that portion of the shell in the ground.

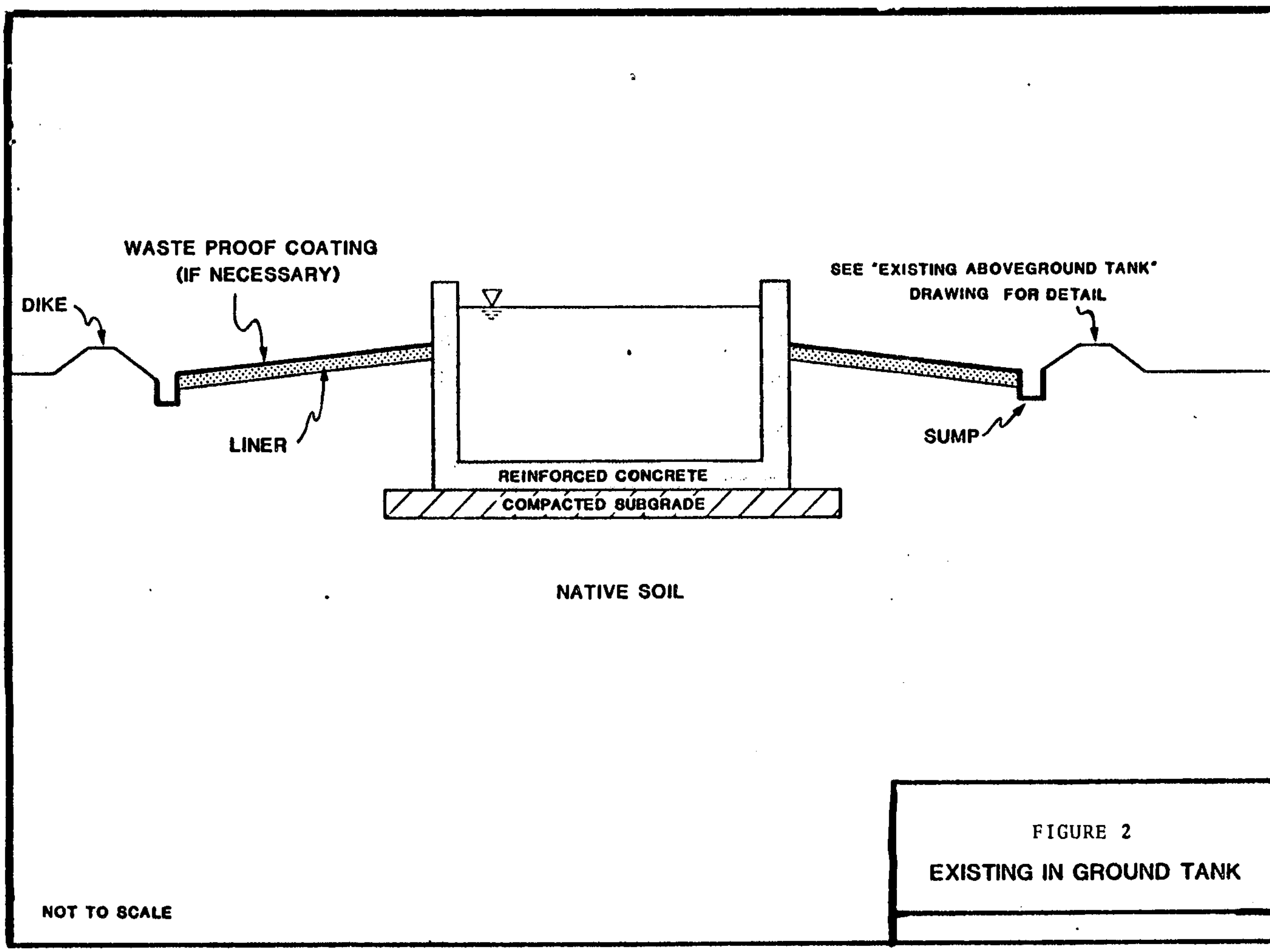

FIGURE 2
EXISTING IN GROUND TANK

As an alternative to ground-water monitoring, the Agency is evaluating the feasibility of internal liners on existing inground tanks. Consistent with existing secondary-containment requirements for other types of facilities (e.g., landfills and surface impoundments), leak detection between the liner and the shell of the tank would be included. In this approach to secondary containment for existing inground tanks, the liner becomes the primary containment device while the original tank walls and bottom compose the secondary containment. EPA does not know if this approach is technically feasible and seeks comment on its equivalency to the more common types of secondary containment that are technically feasible and practical: an external liner surrounding the tank, a tank within a vault, or double-walled tanks.

For exisiting underground tanks without a barrier between the tank and the surrounding soils, the Agency does not believe it is practicable to provide full containment around the tank without digging it up and lifting it out to install the containment system. Neither does the Agency believe that partial containment addresses releases from underground tanks because of their location below the ground's surface. The primary concerns with existing underground tank systems are: the causal relationship between corrosion of metal tanks and the surrounding soils, the "invisibility" of resulting releases into the ground, and the present inability to detect releases quickly. As discussed in Section IV.B., tank-testing methods are available primarily for use with underground tank systems. The Agency believes that periodic testing can be valuable in detecting releases from existing underground tanks without secondary containment. EPA is concerned, however, that this approach alone will not detect significant releases that could develop over the period of time between tests. Also, as discussed in Section IV.B, the Agency is reluctant to rely on inventory monitoring to identify releases of hazardous waste from tank systems. The retrofitting of corrosion-protection measures (e.g., cathodic protection) is feasible and may be one useful method for mitigating or preventing releases from many metal underground tank systems. The Agency has concluded that a ground-water monitoring program plays an important role in assuring that releases from existing underground tanks without full secondary containment are adequately controlled to protect human health and the environment.

Problems with retrofitting existing ancillary equipment (e.g., pipes, pumps, valves, flanges) that is without full secondary containment depend on whether the equipment is: above or below the ground's surface, and associated with above-, in-, or underground tanks. The Agency believes that the partial containment of above- and inground tanks may often be utilized to provide the necessary secondary containment for nearby ancillary equipment. The Agency has concluded that it is necessary to provide full secondary containment for aboveground equipment (e.g., at valves, flanges, and pumps) since the risk of release from breakage of malfunction is significant. All ancillary equipment that is in the ground must be either provided with full secondary containment *or* leak tested and provided with ground-water monitoring.

The Agency believes there are leak-testing methods that can be used effectively on a periodic basis to assure the integrity of underground piping (see Section IV.B.). EPA is concerned that metal equipment will corrode in the ground and that releases from underground equipment are invisible. The Agency believes, however, that retrofitting corrosion protection for underground metal piping is feasible. Because significant leaks can be released undetected from underground equipment in a relatively short period of time, the Agency has concluded that a ground-water monitoring and leak testing program must be provided for underground equipment that does not have full secondary containment. If the ancillary equipment is part of an existing inground or underground tank without full secondary containment, then the ground-water monitoring program required for the tank should also be designed to cover the ancillary equipment.

c. *General Requirements for Secondary-Containment Systems.* As discussed previously, EPA is today proposing in § 264.193 to incorporate into the RCRA permitting standards specific design, installation, and operating requirements that are intended to implement full secondary containment for hazardous waste tank systems. Proposed § 264.193(a) provides the general performance standards that must be achieved by such systems. Proposed § 264.193(b) provides general requirements that the Agency believes must be met to assure that any technical approach to full secondary containment chosen by an owner or operator successfully protects human health and the environment.

The first two general design standards (§§ 264.193(b) (1) and (2)) relate to the wastes stored and physical forces. The first requires that containment systems be constructed of or lined with materials that are compatible with the type of waste(s) to be handled in the tank system (e.g., a concrete vault may need to be lined to prevent attack from sulfides or decomposition by acidic wastes). The second requires that the secondary-containment system be designed and installed so that climatic conditions resulting from stresses from installation and pressure gradients that could result in settlement, compression, or uplift are prevented. Special precautions would be necessary, for example, when a secondary-containment system is located in a fluctuating water table (owing to seasonal or tidal variations). In this case, the design engineer must compensate for the external hydrological forces exerted on the system. In addition, the base or foundation on which the containment system rests must be of sound construction.

The design standard proposed in § 264.193(b)(3) requires that secondary containment for a tank system incorporate a device or method capable of detecting promptly the presence of released hazardous liquid in the seondary-containment system ("leak detection"). It is EPA's intent that this leak detection capability be able to detect the presence of liquids within 24 hours of a release. Once a release is detected, the owner or operator must take measures to respond to the release. These required measures are provided in § 264.196 and are described in V.E.7. of this Preamble. To ensure that the integrity of the secondary-containment system is maintained, such leak detection should also be capable of detecting the entrance of liquids that are external to the tank and within the containment area. This design standard would be achieved if the flow of ground water into the system could be detected, thus indicating a failure of the secondary-containment system. One such method of leak detection is a containment-detection system designed with a sump that has an access point enabling periodic inspection for the presence of liquids. (See Figures 1 and 2 for an example of this technical approach.)

To meet the proposed § 264.193(b)(4) standard, the base of the secondary-containment system must be sloped or otherwise designed and operated so that liquids entering that system will be able to drain to a location from which removal is facilitated. In many cases, this could simply be a sump from which the liquid is pumped as soon as it is detected in the containment system. (See Figures 3 and 4.) If this liquid is thought or known to have resulted from a leak in the tank system, action should be taken to minimize the quantity of the release by cutting off the flow of waste to the tank and possibly even emptying the tank's contents into another storage device (tank or container). Liquids that do get into the secondary-containment system should be removed within 24 hours in order to minimize the risk of the waste's being released into the environment and to avoid endangering human health (from fumes, explosions, etc.).

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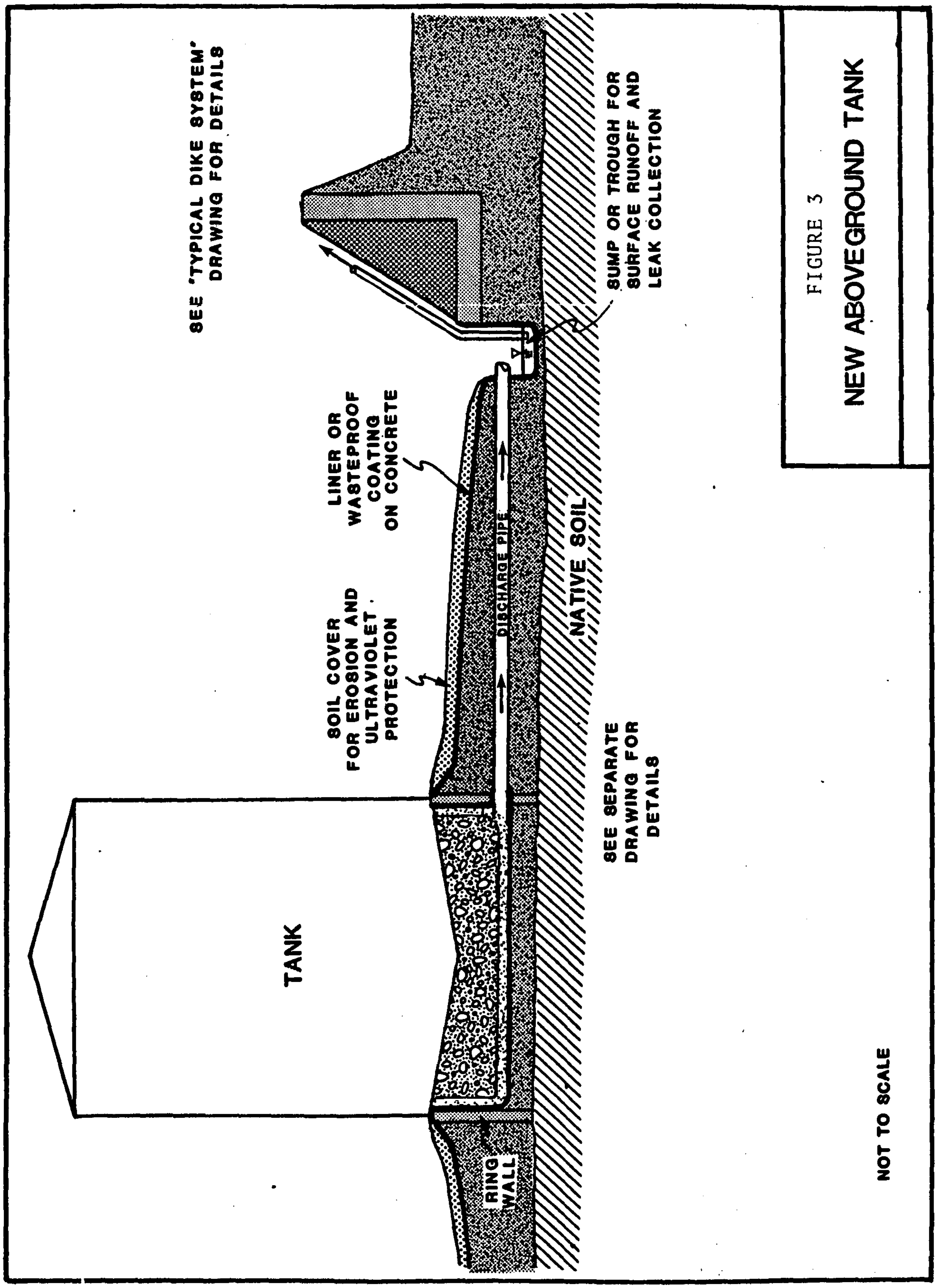

FIGURE 3

NEW ABOVEGROUND TANK

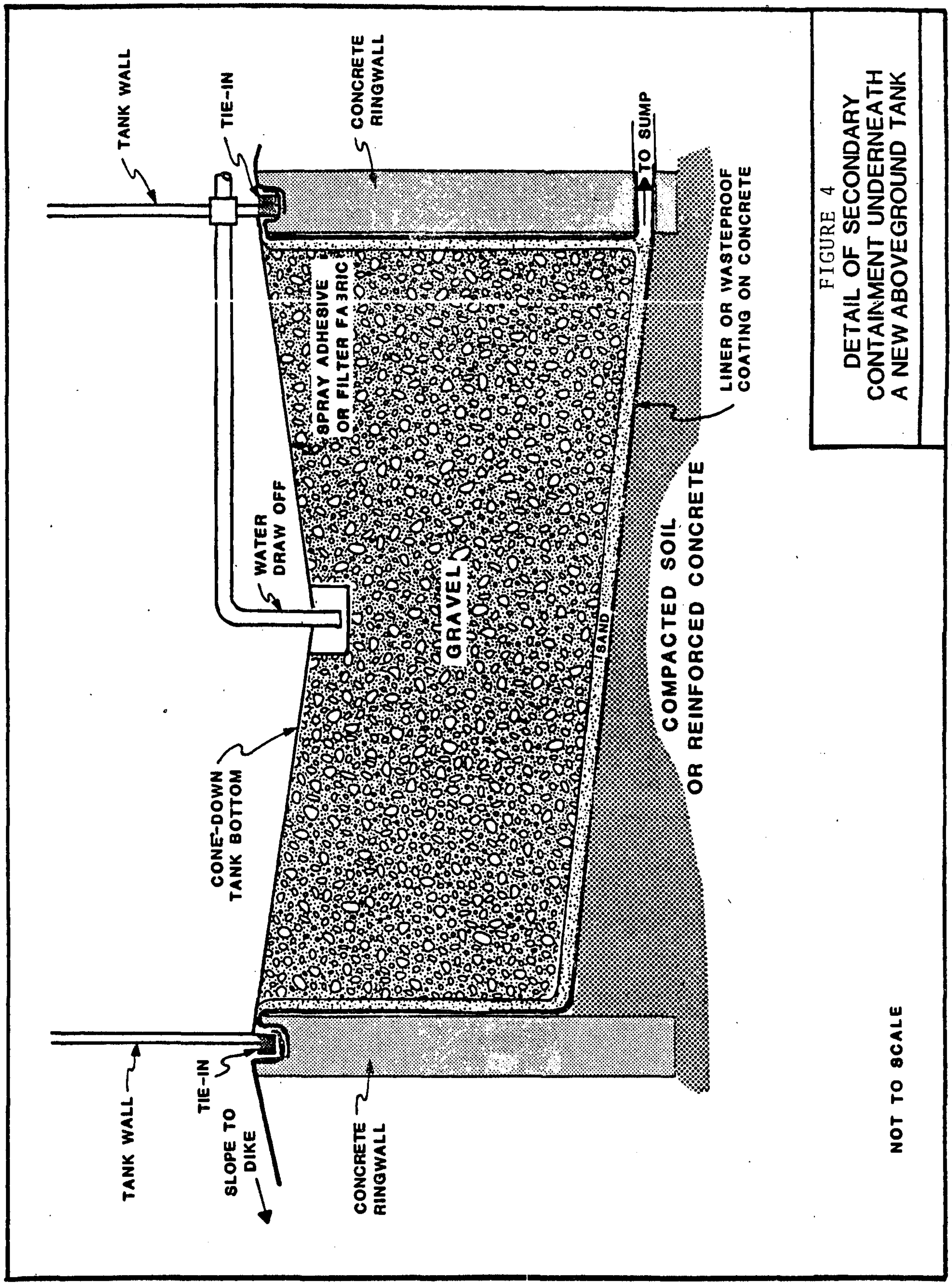

FIGURE 4
DETAIL OF SECONDARY CONTAINMENT UNDERNEATH A NEW ABOVEGROUND TANK

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In order to provide complete containment should a tank rupture, § 264.193(b)(5) requires that the secondary-containment system be designed and/or operated to hold 110 percent of the design capacity of the largest tank within the containment area. In addition, under § 264.193(b)(6), the containment system must have sufficient capacity, above and beyond 110 percent of the largest tank's capacity, to collect precipitation runon and infiltration that may enter the containment system. To compute the quantities of precipitation that may enter the containment system, the Agency believes that the 25-year, 24-hour rain storm should be used. If the design capacity required in § 264.193(b)(5) and the possible runon, infiltration, and precipitation, calculated in § 264.193(b)(6) together exceed the containment system's design capacity, then the system must be redesigned to accommodate this volume.

d. *Specific Secondary-Containment Requirements for Tanks.* Proposed § 264.193(b) provides several standards specific to each of the three types of secondary containment available for tanks: liners external to the tank system, vaults, and double walls. These special standards and the basis for the Agency's concerns regarding the three options for containment are discussed below. It is important to note that the Agency does not at this time intend to endorse any particular type of containment over another. If properly designed, installed, and operated, each of the methods is expected to provide protection of human health and the environment.

External liners may be used to contain aboveground, inground, and underground tanks. (See Figures 5 and 6 for examples of this technical approach.) Liners may be constructed of a variety of materials, including bentonite, asphalt, concrete, or synthetic membranes. The choice of materials depends on such factors as the site's location, the wastes handled, and climate. Diking or curbing around aboveground portions of tanks might be constructed of asphalt or concrete, depending on site-specific factors. (See Figure 7.) Owners and operators who use an external liner to provide secondary containment must ensure that the liner provides a complete envelope that will prevent both lateral and vertical migration of waste out of the containment system and will be free of craks or gaps. Care must also be taken to ensure that a leak-proof connection between the tank and piping containment systems is provided (see Figure 8). Compatibility between the liner and the wastes to be handled must be assured so that the integrity of the liner is maintained.

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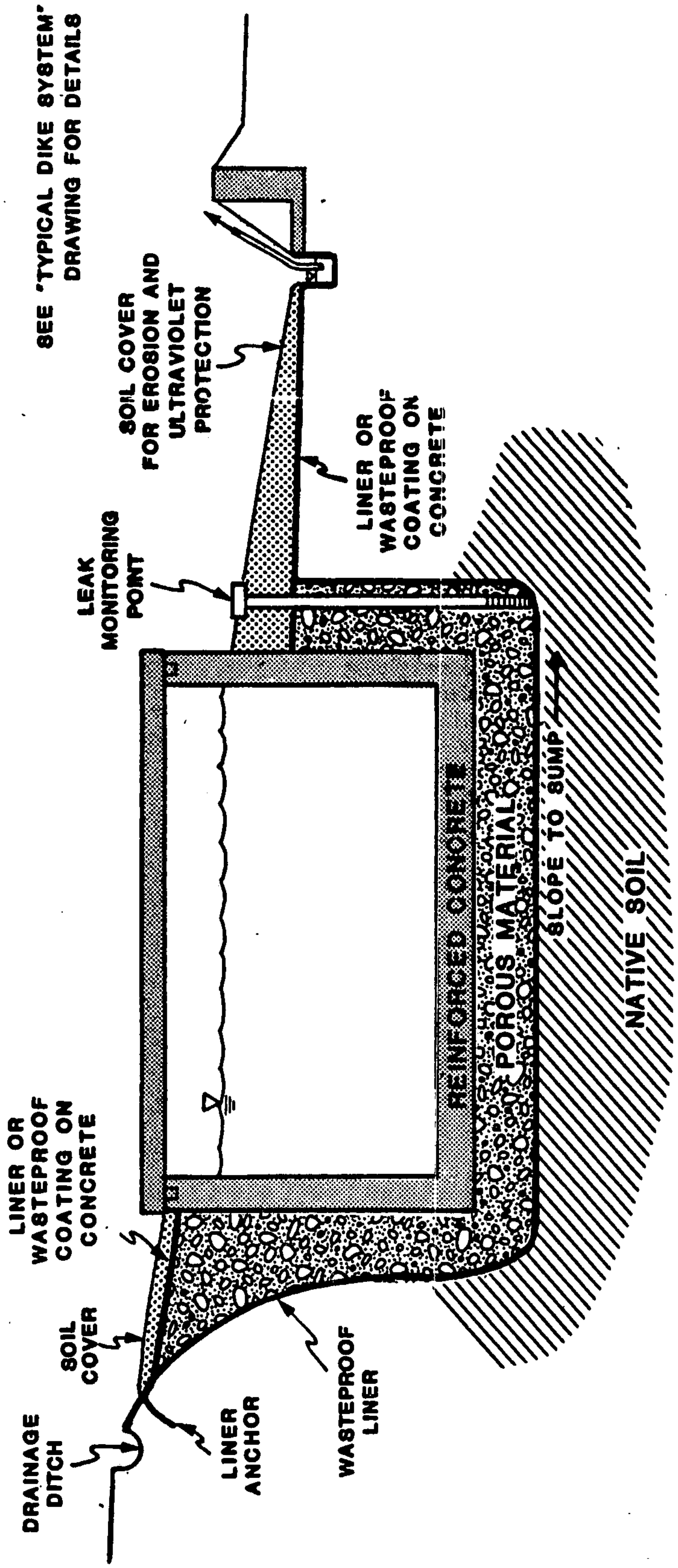

FIGURE 5

NEW INGROUND TANK

NOT TO SCALE

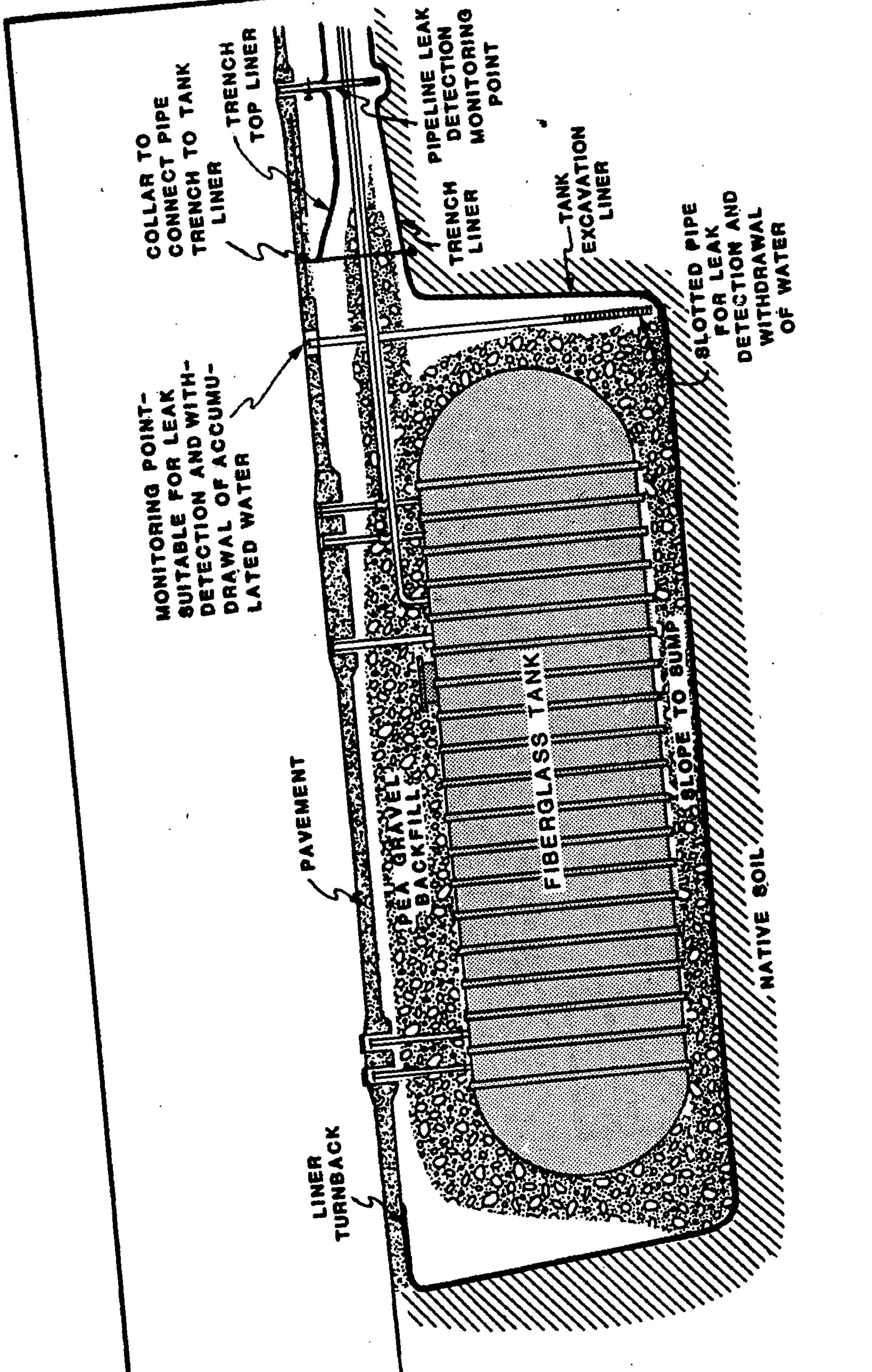

FIGURE 6
SYNTHETIC MEMBRANE LINER

NOTES:
1. NOT TO SCALE.
2. TANK EXCAVATION LINER AND TRENCH LINER CONSIST OF CHEMICALLY COMPATIBLE SYNTHETIC MEMBRANES.

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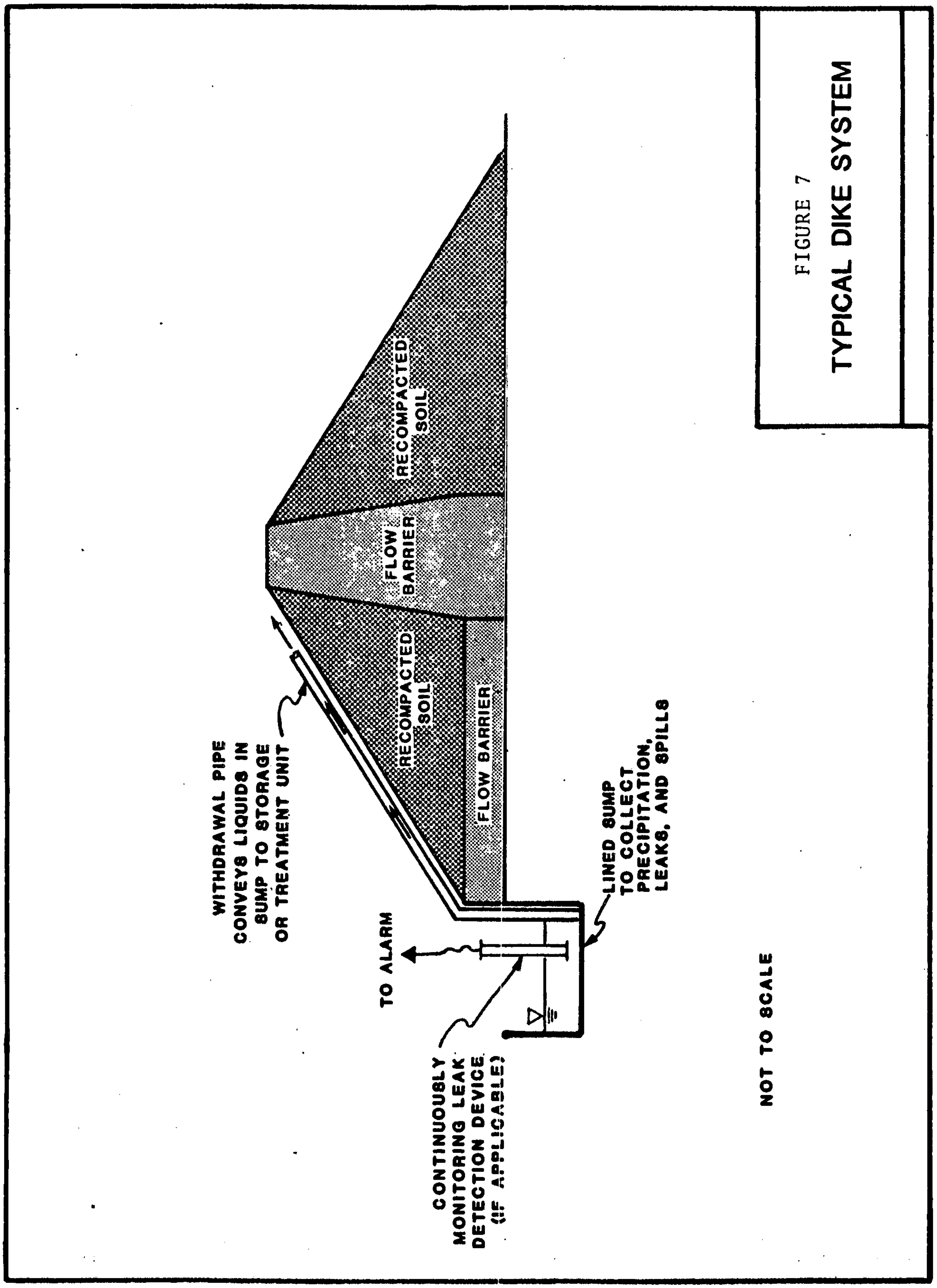

FIGURE 7
TYPICAL DIKE SYSTEM

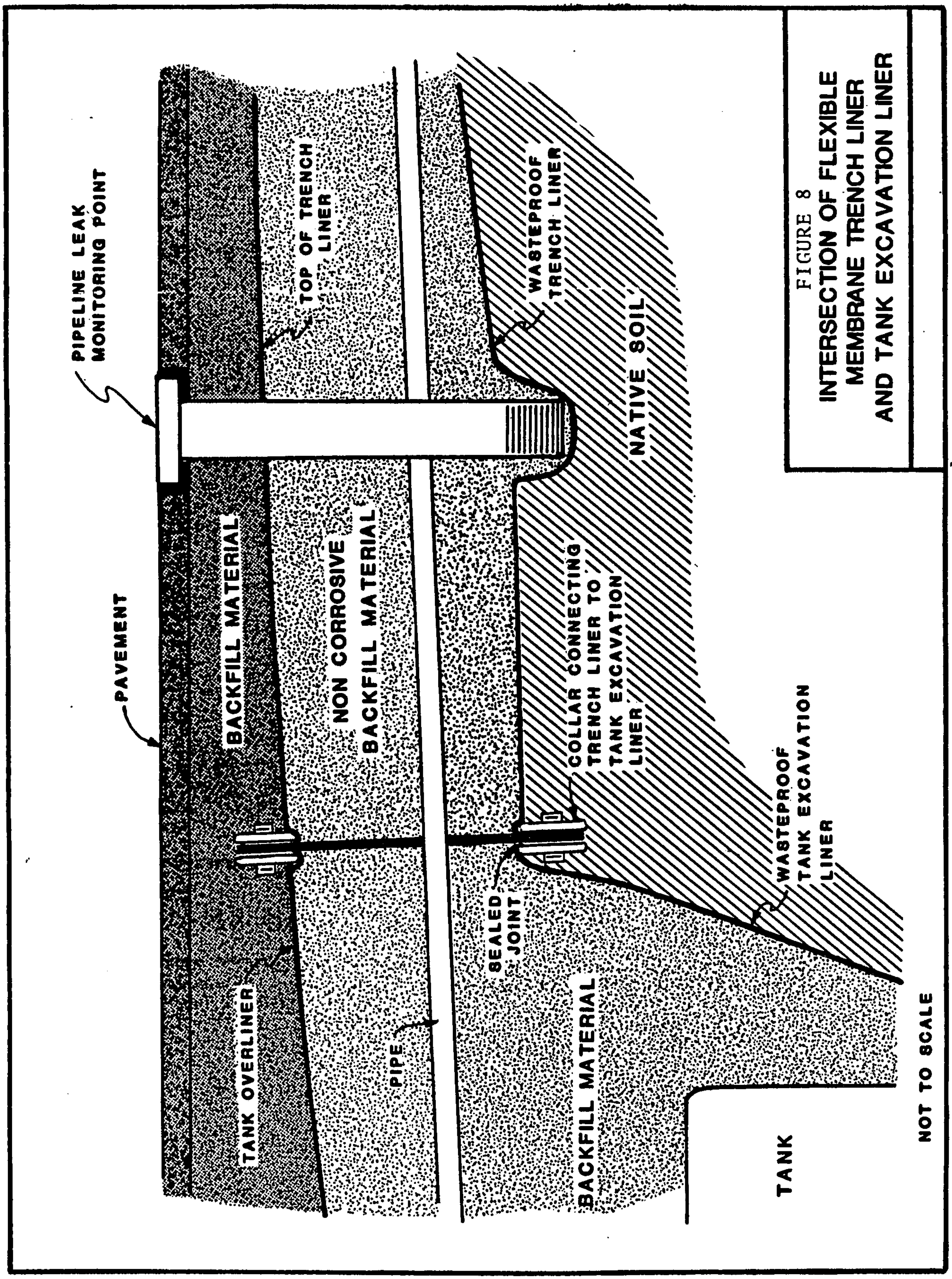

FIGURE 8
INTERSECTION OF FLEXIBLE MEMBRANE TRENCH LINER AND TANK EXCAVATION LINER

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Another approach to achieving secondary containment is to construct a vault around the tank. The proposed § 264.193(d)(2) standards require that a vault system be constructed so that it is liquid-tight, that is, it provides a continuous structure with leakproof joints. In addition, any water stops must be chemically compatible with the wastes being stored or treated.

One of the most common construction materials for vaults is concrete. (See Figure 9.) A major concern with concrete is that cracking is inevitable. EPA believes that since concrete is porous and susceptible to cracking, the interior surface of vaults constructed of concrete must be lined with an epoxy or similar material that is compatible with the waste being stored. Such an interior coating provides the added advantage of preventing the absorption of waste by the concrete. EPA also requires that the external surface of vault containment structures be waterproofed to prevent water from being absorbed by the concrete and thus entering the secondary-containment area.

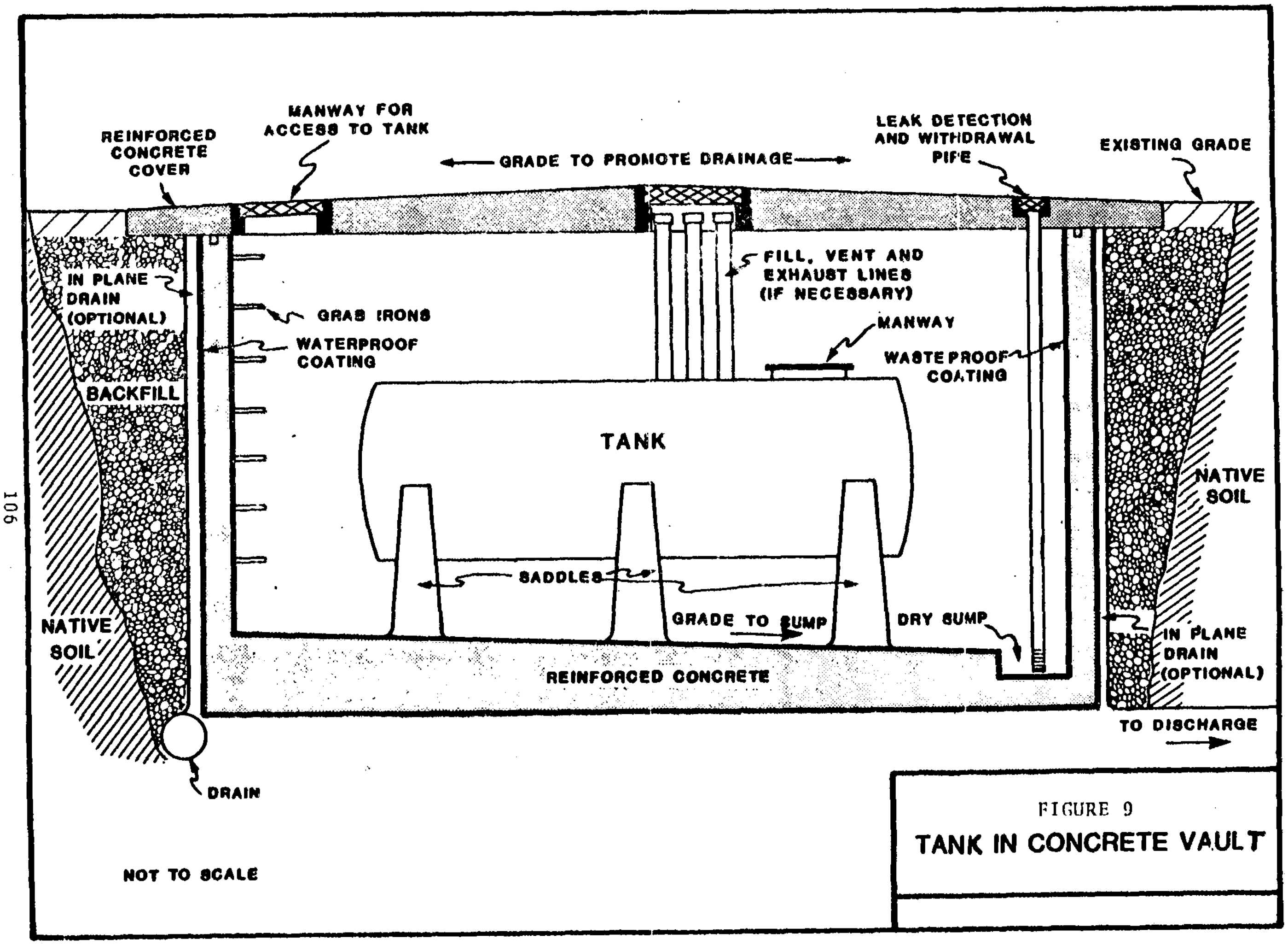

FIGURE 9

TANK IN CONCRETE VAULT

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One of the main problems EPA must address with regard to vaults is assessing risk of fire or explosion, which may cause a conflict with fire codes. Proposed § 264.193(d)(2)(iii) requires tanks storing ignitable waste that are placed in secondary-containment vaults to be backfilled. The reason for this requirement is that fire safety officials believe that an unfilled vault poses a potential risk of explosion if a leak of ignitable waste from the tank vaporizes and mixes with the air in the vault to form an explosive mixture.

Backfilling the tank in the vault eliminates this concern. This practice does, however, make it impossible to perform a visual inspection of the tank's exterior and the vault's interior surfaces; it also increases the cost of taking remedial actions on the tank or vault should a release occur in the system. EPA will continue to work closely with the National Fire Protection Association (NFPA) on this issue so that vaults will become acceptable from the viewpoints of environmental protection and fire safety. The Agency invites comment on this issue.

Double-walled tanks offer yet another approach to providing secondary containment for tanks. (See Figure 10.) Double walls offer such advantages as easy installation and ease of cleanup if primary containment fails. Industries in several European countries have used double-walled tanks for as many as 15 years or more. Although such tanks are not currently manufactured extensively in the United States, a growing number of U.S. tank manufacturers consider them standard items. The Steel Tank Institute (STI) has recently developed guidelines for the design, construction, and installation of steel double-walled tanks. Since the fiberglass tank industry does not have a comparable national association, a similar industry-wide guideline has not been developed for fiberglass double-walled tanks although they are being marketed by several companies.

The standards in proposed § 264.193(d)(3) require that double-walled secondary containment be a self-contained unit (i.e., complete containment of the tank) with built-in leak-detection monitoring. Liquid-, vacuum-, or pressure-type detection systems can be used. Corrosion protection must be provided for metal double-walled tanks in contact with the ground's surface.

e. *Specific Secondary-Containment Requirements for Ancillary Equipment.* As discussed previously in this Preamble, 50 percent or more of releases from tank systems can be attributed to failure of a component of the ancillary equipment. Thus, the Agency has concluded that releases from this equipment must be adequately controlled. After considering the applicability of the protective measures discussed in Section IV.B., EPA concluded that releases from ancillary equipment are inevitable and only secondary containment can completey prevent such releases. For this reason, the proposed standards in § 264.193(e) require secondary containment for such ancillary equipment as pipes, pumps, and valves. The general secondary-containment standards in § 264.193(b) apply to ancillary equipment as well as to tanks.

Containment of releases from some ancillary equipment may already be provided by virtue of its location within the secondary-containment system of storage or treatment tanks. The Agency believes that secondary containment for pumps and valves is most cost-effective if it is integrated in the tank's secondary-containment system. The Agency recognizes that this will not always be the case, and so a separate containment system specifically designed for ancillary equipment may have to be provided. For equipment such as pumps and valves, a sump or similar device may be used to collect leaks (see Figure 11).

Releases from pipes can be contained by trenches or double-walled piping. (See Figures 12 and 13.) The Agency believes that acceptable trenches can be constructed of concrete or lined with a synthetic membrane. Either open-topped or covered trenches are acceptable, depending on whether the piping is above- or under-ground, but uncovered trenches would necessitate the management of incidental precipitation, as would any secondary containment system (see § 264.193(b)), if located outdoors. Another potentail problem with trenches is fire safety: a release that becomes "pooled" in the trench may be subject to ignition. This issue is similar to the fire safety concerns associated with tank vaults; thus, EPA is discussing both of these topics with NFPA. Comment on the relationship of fire safety to secondary containment for piping is invited.

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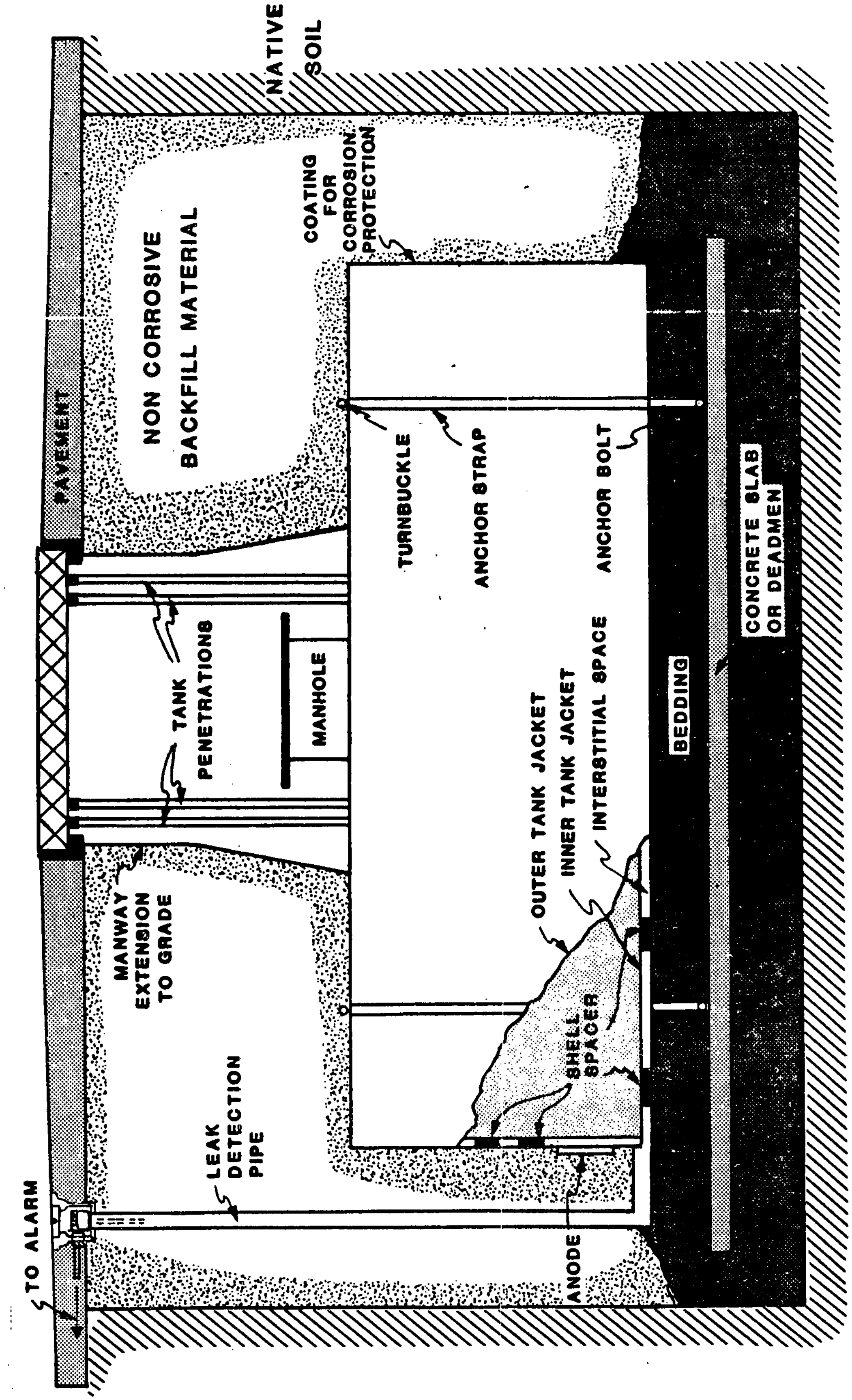
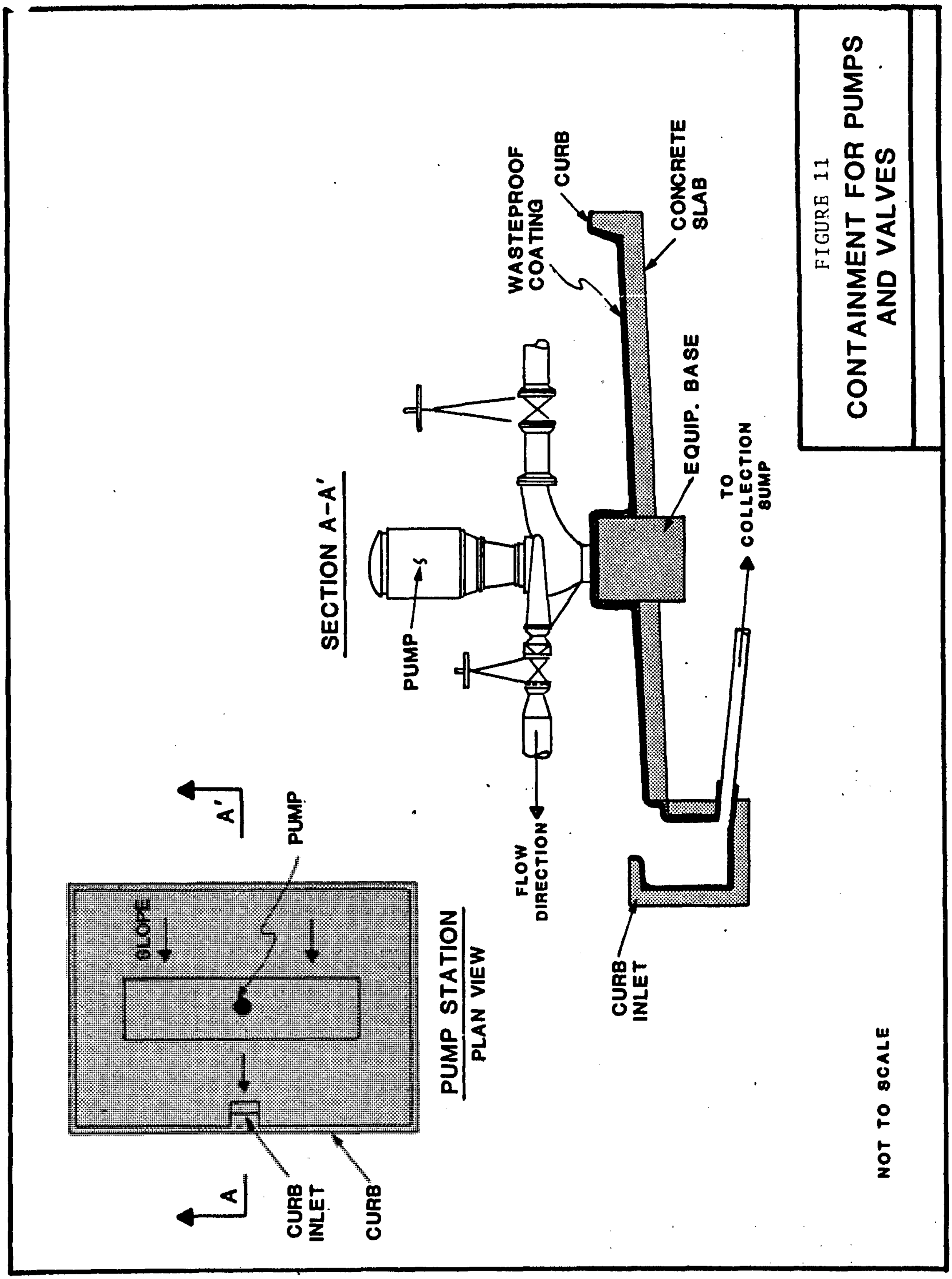


FIGURE 10

DOUBLE WALLED STEEL TANK

NOTES:

1. NOT TO SCALE.
2. TURNBUCKLES, ANCHOR STRAPS, ANCHOR BOLTS, AND CONCRETE SLAB ARE NEEDED IN WATER CONDITIONS.


SECTION A–A'
WASTEPROOF COATING
CURB
CONCRETE SLAB
EQUIP. BASE
TO COLLECTION SUMP
PUMP
FLOW DIRECTION
CURB INLET
A'
A
PUMP
SLOPE
PUMP STATION
PLAN VIEW
CURB INLET
CURB
NOT TO SCALE
FIGURE 11
CONTAINMENT FOR PUMPS AND VALVES

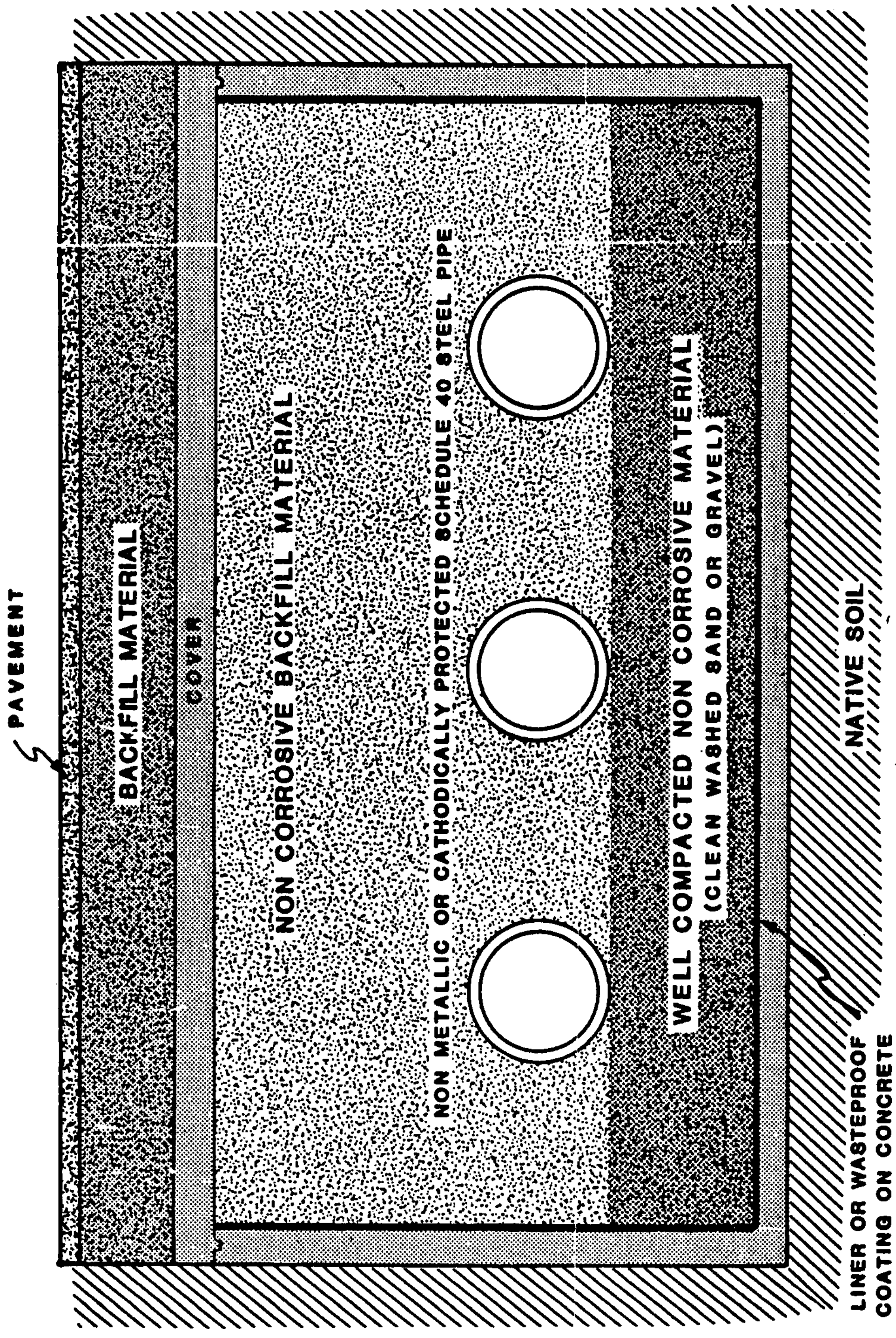


FIGURE 12
UNDERGROUND LINED TRENCH FOR PIPING

NOTES:
1. LEAK DETECTION SHOULD BE INCORPORATED INTO THE DESIGN.
2. NOT TO SCALE.

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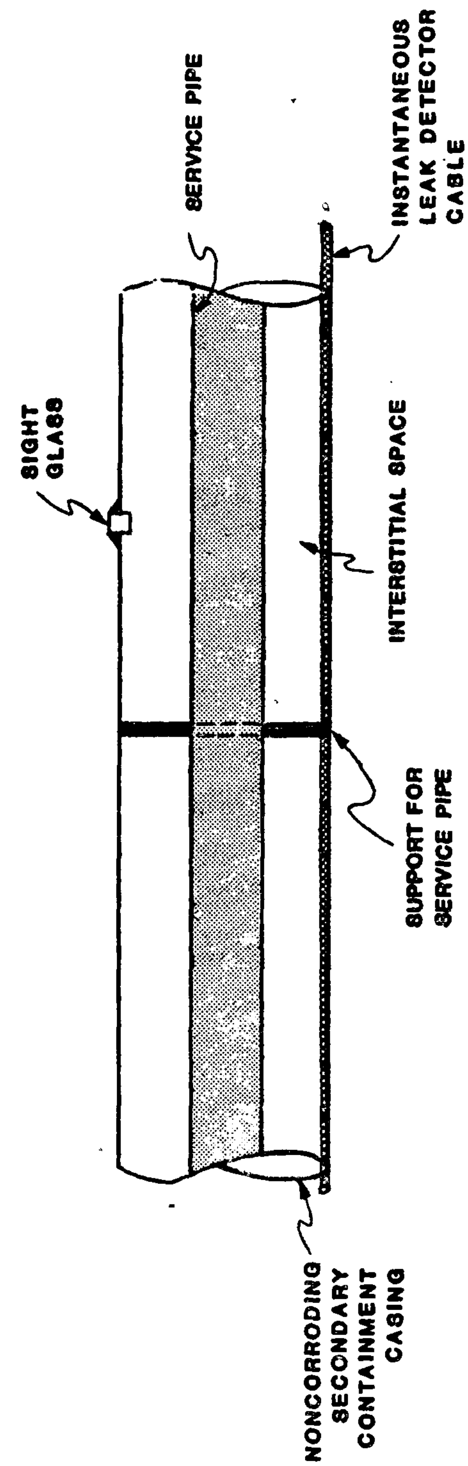

FIGURE 13
DOUBLE WALLED PIPE SYSTEM PROFILE

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Another method of secondary containment is double-walled piping—a pipe within a pipe. (See Figure 13.) The interstitial space between the walls is part of the system and is included in the leak monitoring, which is identical to that discussed above for trenches. Double-walled piping, although initially expensive, has a number of advantages. First, it is equally applicable aboveground and underground. Second, there is no need for the management of precipitation. Third, if there is a release from the primary piping, the cleanup is relatively simple and inexpensive.

Proposed § 264.193(e) requires a leak-detection device for ancillary equipment.

In combined tank-ancillary equipment containment systems, owners or operators may want to consider designing leak-detection devices or methods that would, for example, differentiate between releases from the tank vs. the piping. This is not, however, required in the proposed regulations. EPA also suggests that, to limit the area over which secondary containment may be necessary to protect against releases from failures of pump-fed piping (valves bursting, flanges breaking, etc.), protection against spray-out (for which several devices are commercially available) should be used. Again, this is not required in the proposed regulations.

Leak detection may be provided either by integrating the secondary containment for the tank with that for the piping and using one leak detection system for the entire system or by installing sensors along the length of the separately contained pipe. For a number of reasons, EPA believes sensors (or similar methods) may be prefered, particularly for covered or underground piping. Reliance on the tank's monitoring device would not necessarily identify which part of the tank or piping is leaking. On the other hand, monitoring devices along the entire length of the piping enable the owner or operator to detect even relatively small leaks anywhere in the piping system and also provide a check of the integrity of the secondary containment (i.e., ingress of water into the containment area). Furthermore, it is beneficial to know where the leak is occurring so that remedial action can be taken quickly and efficiently.

EPA requests comment on the types of leak-monitoring devices that currently exist and the degree to which such devices or methods are presently being used.

f. *Alternative of Ground-Water Monitoring.* Proposed § 264.193(f) allows owners or operators of existing tank systems, except for those used to store or treat Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027, the option of providing a ground-water monitoring program in accordance with § 264.193(g) in lieu of full secondary containment, which was discussed in Sections IV.D and V.C. The option is intended for facilities where it is technically impractical and costly to retrofit full secondary containment under those portions of existing tanks, piping, and ancillary equipment that are already on or below the ground's surface.

To exercise the option, however, an owner or operator must also provide a partial secondary-containment system for all the aboveground portions of the tank system.

g. *Ground-Water Monitoring Requirements.* Proposed § 264.193(g) provides the specific ground-water monitoring standards that apply to owners and operators of tank systems that do not have full secondary containment. As previously discussed in Section V.C., as an alternative to applying all of the Subpart F requirements, EPA incorporated into Subpart J only those specific provisions of Subpart F that would provide detection monitoring for tank systems. Once the detection of a statistically significant increase in parameters or constituents is found, appropriate measures to confirm the leak and to implement corrective action at the facility as necessary to protect human health and the environment are required.

h. *Leak-Testing.* Proposed § 264.193(h) requires that all undergound tank systems that do not have full secondary containment to be leak tested at least semi-annually. This provision, as previously discussed in Sections IV.D. and V.C., plays an important role in ensuring that the ground-water monitoring alternative provides protection equivalent to full secondary containment. EPA believes that semi-annual leak testing will in many cases enable a release to be detected prior to its detection via ground-water monitoring. As such, ground water may be prevented from becoming contaminated and corrective action costs may be minimized. EPA is specifying the same criteria for testing as was discussed in Sections V.E.2.d. and V.F. for assessing tank system integrity.

i. *Waiver from Secondary Containment.* Proposed § 264.193(i) provides a waiver from all or part of the secondary-containment requirements. Such a waiver may be granted if the owner or operator can demonstrate to EPA that the location of the tank system and the facility's design and operating practices prevent hazardous waste from ever reaching ground or surface waters. As previously mentioned in Section V.4.a., EPA considered the option of allowing a demonstration that migration will not occur "during the active life of the unit and the post-closure period." This waiver will not, however, be made available to storers/treaters of the EPA Hazardous Waste Nos. F020, F021, F023, F026, and F027 for which full secondary containment must always be provided. EPA requests comment on the feasibility of this waiver.

5. General Operating Requirements (§ 264.194)

The proposed § 264.194 requirements are essentially the same as the existing general operating requirements. Proposed § 264.194(a) revises the existing requirements of § 264.192(a) by substituting a more general performance standard that must be achieved under the permit. Under the proposed standard, the owner or operator is still required to ensure that the wastes being managed are compatible and that measures are taken to protect the tank system against accelerated corrosion, erosion, and abrasion.

Under proposed § 264.194(b), spills and overflows from tank systems must be prevented. This requirement encompasses the need to use appropriate controls and practices to prevent spills during transfer operations (e.g., filling or emptying of a tank). For example, if a hose is used to empty a tank's contents into a truck, the hose is regarded as part of the tank system and therefore subject to these requirements. The Agency is concerned with releases that occur during these operations, especially at facilities that do not have secondary containment. The use of check valves, dry disconnect couplings, and so forth will prevent most spills of this type.

6. Inspections (§ 264.195)

The revised inspection requirements in proposed § 264.195 are, with a few exceptions, similar to the existing standards. Those requirements in § 264.195 (b) and (c) are unchanged. Under proposed § 264.195(a), the present requirement for daily inspection of overfill controls has been eliminated, but the owner or operator must develop a schedule and procedure for carrying out such inspections, as appropriate. Because of the technical differences and variety of overfill controls that might be present at a facility, EPA believes that more flexibility is needed in establishing inspections for these controls; this approach will allow the owner or operator more flexibility in establishing the frequency and protocol of inspections, taking into account site-specific factors.

In § 264.195(d), the Agency proposes to add requirements to inspect cathodic-protection systems, if present. As discussed previously, the Agency is proposing several new requirements to assure corrosion protection of metal tank systems that are in contact with the ground. Although cathodic protection is effective in mitigating corrosion of a metal tank system, once it is installed, it must be adequately maintained. If corrosion-protection measures are not maintained, corrosion rates for systems that have such protection can exceed the rates for completely unprotected systems. The proposal requires that impressed current systems must be inspected monthly for such problems as anode deterioration, rectifier malfunction, power interruption, and rectifier output and that the anode output of a sacrificial anode system must be checked at least semiannually. It also requires that the tank system to soil potential measurement be conducted at least annually to ensure a minimum voltage of −0.85 volts. This measurement is typically conducted by taking voltage measurements between the tank or piping surface and a saturated copper/copper sulfate reference electrode located on the soil as close as possible to the storage system. Reference should be made to the NACE Standard Recommended Practice, RP–02–85—"Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems" for details on performing this measurement. EPA recommends that manufacturers' recommendations for inspection of cathodic-protection equipment be followed to ensure that the cathodic-protection system is properly maintained and that corrosion is not taking place.

Proposed § 264.195(e) retains the existing requirements for periodic inspections, but, in keeping with other changes being proposed today, a schedule and procedure must be developed for assessing the condition of the entire tank system. Although EPA is today proposing requirements for secondary containment, this does not mean that the tank system's primary containment should be neglected. The owner or operator must, of course, properly maintain the integrity of the tank system to preclude catastrophic failures that could endanger human health or the environment. Thus, the proposed standards for periodic inspections of § 264.195(e) require scheduled investigations of the complete tank system to check for leaks, cracks, corrosion, and erosion that may lead to releases. Such inspections should include the bottoms and roofs of tanks, piping joints, and so on. The frequency of this assessment can be determined individually for each tank system. It is appropriate in many cases to coordinate this comprehensive inspection with the schedule by which the tank system is normally taken out of service for routine preventive maintenance. Of course, this requirement would apply only to tanks that can be inspected and would not apply to underground tanks that cannot be entered for inspection. Underground tanks that do not have full secondary containment, however, must be tested semi-annually under § 264.193(h).

Inspection for shell thickness has been deleted since the Agency is also proposing to delete the existing requirement for minimum shell thickness. The practices described in the API publication, *Guide for Inspection of Refinery Equipment* (4th ed., 1981), Chapter XIII, "Atmospheric and Low Pressure Storage Tanks," may be used as guidelines for assessing the overall condition of the tank system.

7. Response to and Disposition of Leaking or Unfit-for-Use Tank Systems (§ 264.196)

Proposed § 264.196 establishes procedures to be used in responding to spills and leaks, including the timing and procedures for the removal of leaked or spilled waste. This requirement also covers removal of waste from secondary-containment systems, where applicable, and measures that will be taken to minimize any release (e.g., emptying a tank to below the level of the leak) when discovered. These requirements must be part of the contingency plan required under Subpart D of Part 264 and must be made available upon request. At a minimum, these procedures must include measures for containment of releases, measures for removal of releases from the tank and containment systems, procedures for conducting assessments of the risks due to a release and the remedial actions necessary to mitigate the severity of a release, and procedures for placing repaired or replacement tank systems into service.

8. Closure and Post-closure Care (§ 264.197).

The proposed requirements in § 264.197(a) oblige each facility owner or operator to close the entire tank system, not just the tank, as is required under the existing standard. This means that both the tank and ancillary equipment must be removed or decontaminated at closure. If a secondary-containment system is used, it, too, must be properly closed by assuring that all hazardous wastes are decontaminated or removed. Finally, the owner or operator is required to decontaminate or remove any contaminated soil. Such soil must be managed as hazardous waste unless it is a solid waste that does not exhibit any of the characteristics of hazardous waste or it has been excluded under §§ 260.20 and 260.22. The proposed standard is intended to prevent releases from closed tank systems and to eliminate contamination from the surrounding soil so that human health or the environment is not endangered subsequent to closure of the system.

Proposed § 264.197(b) states that if an owner or operator is unable to remove or decontaminate all contaminated soils at closure, then the post-closure landfill requirements of final capping and ground-water monitoring set forth in § 264.310 are applicable at the site. This post-closure care requirement is being proposed because there is the potential that a release from any tank system without full secondary containment could be left unmanaged at closure.

The Agency believes that an impermeable cap over the contaminated area will reduce the possibility of the waste in the soil from migrating into the ground water. In addition, continuation of the ground-water monitoring program will ensure that human health and the environment are not adversely impacted during the post-closure care period, if the contamination moves offsite.

Under proposed § 264.197(c), owners or operators of tank systems without secondary containment are required to prepare a contingent post-closure plan that will ensure that any potential post-closure care responsibilities are identified in the RCRA permit. The plan would be used only if all contaminated residues and soils (if any) cannot be removed at closure.

EPA believes that contingent post-closure plans should be required at tank facilities without secondary containment because, if such a system has had undetected leaks or spills in the past, it is possible that the material cannot be practicably removed from the soil without incurring unreasonable costs. Implementation of contingent post-closure plans will ensure that future threats to public health and the environment from these past releases at closed facilities are minimized, monitored, and controlled as necessary.

A facility that receives a waiver from the secondary-containment requirements under § 264.193(i) need not prepare a contingent post-closure plan. This is because EPA would previously have examined the facility's design, operation, and location and determined that hazardous waste constituents will not migrate into ground water or surface water at any future time. Facilities with secondary-containment systems are likewise not required to prepare contingent post-closure plans because these systems should prevent releases into the environment. Under § 264.197(b), however, if a contained system has released hazardous waste and it all cannot be removed or be decontaminated at closure, then the facility must also meet the post-closure requirements of proposed § 264.197(b).

To implement fully the proposed requirements in § 264.197, EPA is also proposing a conforming change to the applicability section of § 264.110. This change makes tank systems subject to the general post-closure requirements of §§ 264.117–264.120.

9. Special Requirements for Ignitable or Reactive Wastes (§ 264.198)

The requirements in § 264.198 are the same as the existing standards with only one minor change: the owner or operator must ensure that the required precautions for tanks are taken throughout the entire tank system (i.e., tank and ancillary equipment). Since EPA is retaining the existing requirements, public comment is invited only on the applicability of these standards to the overall tank system as opposed to solely the storage or treatment tank.

10. Special Requirements for Incompatible Wastes (§ 264.199)

The requirements in § 264.199 are the same as the existing standards with only one minor change: the owner or operator must ensure that the required precautions for tanks are taken throughout the entire tank system (i.e., tank and ancillary equipment). Since EPA is retaining the existing requirements, public comment is invited only on the applicability of these standards to the overall tank system as opposed to solely the storage or treatment tank.

F. Interim Status Tank Systems (Part 265, Subpart J)

It was originally intended that the existing interim status standards apply at hazardous waste tank facilities for a relatively short time prior to the issuance of RCRA permits. It is expected, however, that many will not be permitted for several years. On the basis of the information discussed previously in this Preamble, EPA has concluded that a significant number of existing hazardous waste storage or treatment tank systems may be releasing hazardous wastes into the environment. The Agency is concerned that, under the existing interim status standards, these tanks will continue to release hazardous wastes into the environment undetected for an undetermined period of time.

As discussed previously, the Agency has also concluded that the existing Part 264 permitting standards are inadequate and do not prevent most of the releases or spills from tanks that are inevitable over time. The Part 265 requirements are even less stringent than the permitting standards. EPA is today proposing to amend the Part 265, Subpart J, as well as the Part 264, Subpart J, tank regulations. In most instances, the proposed amendments to the interim status tank standards correlate with the changes proposed for the permitting requirements.

As in Part 264, the existing interim status requirements are being revised to address tank systems (i.e., tank and ancillary equipment), not just tanks. The same regulatory strategy of containment with either full secondary containment or the groundwater monitoring option is being implemented. Evaluation of the tank system by a qualified registered professional engineer, corrosion protection, and leak testing of underground tanks are some of the regulatory options being proposed in a manner consistent with what is being proposed under Part 264. Because many of these facilities will eventually be permitted, the Agency has carefully considered the proposed interim status requirements to assure that these facilities follow similar management practices to those that will be required under RCRA tank permits.

The following discussion describes these requirements and the Agency's rationale for making the changes. To the extent possible, the previous discussions in today's Preamble that support similar requirements in Part 264 are cited but not repeated in this section.

1. Assessment and Certification of Tank System's Integrity (§ 265.191)

The Agency proposes to address the concern that a significant number of existing hazardous waste storage or treatment tank systems may be leaking and to locate such tank systems as soon as possible. Accordingly, § 265.191 proposes that within six months of the effective date of these regulations, all tank systems without full secondary containment be assessed and certified as able to store or treat hazardous waste in a manner that protects human health and the environment. The Agency believes that the required assessment under interim status should at least address all the concerns listed in proposed § 265.191. These assessments can then be used to meet both the interim status and permitting requirements (if the assessment is performed within one year of submitting the Part B application to EPA). The owner or operator would be responsible for the assessment, which would consist of a leak test of all underground tanks and piping and a qualified registered professional engineer's assessment and certification that the aboveground and inground tank systems are not leaking and are able to continue to be used for the storage/treatment of hazardous waste. EPA considers the guidelines in the API publication, *Guide for Inspection of Refinery Equipment*, Chapter XIII, "Atmospheric and Low Pressure Storage Tanks," to be appropriate for the assessment of most aboveground steel tanks.

Since corrosion is the primary cause for failure of metal tank systems, EPA believes that it is necessary for corrosion-protection measures to be instituted immediately, even prior to a tank system's being permitted. Thus, proposed § 265.191(b) requires that an evaluation of the potential for corrosion of metal tank systems be conducted by a corrosion expert within 1 year after these proposed regulations become effective. This evaluation should, of course, be performed only for those tank systems that are not presently leaking and that will continue to be used for the purpose of storing or treating hazardous waste.

The leak testing being proposed in § 265.191(a) for the underground components of tank systems without secondary containment would be similar to that commonly performed for gasoline storage tanks. A discussion of this technique was given in Section IV.B.2. The testing must be accurate enough to detect leaks to the .05 gallons per hour level, meeting the recommended NFPA standards for leak-testing sensitivity, and the results must be certified by the qualified personnel performing the test.

As discussed previously in Section IV.B.2., existing leak-testing technology has certain limitations. For example, current technology cannot reliably detect leaks of less than 0.05 gallon per hour. The Agency believes, nevertheless, that these required assessments and leak tests will be of crucial importance in identifying currently leaking tanks. Depending on the particular leak test employed, underground piping and the tank itself may be tested simultaneously. If simultaneous testing is not done, a separate test must be conducted to determine the integrity of the piping.

Leak testing as described here applies only to underground tanks and piping. Thus, alternative methods must be used to assess the integrity of aboveground and inground tank systems. In many cases this could involve an intensive internal inspection using ultrasonic or similar equipment to detect the locations, if any, of existing or impending failures in the tank system.

Proposed § 265.191(a) requires that assessment and leak testing be conducted within 6 months of the effective date of the regulation. Under § 265.191(b) owners or operators have 1 year in which to conduct the evaluation of corrosion potential. The Agency believes that these requirements provide the regulated community with sufficient time to implement the assessment and conduct the tests to determine if tank systems are leaking.

EPA beleives that the proposed requirements will result in the identification of many, if not all, of the existing tank systems that are believed to be contaminating the environment.

2. Response to and Disposition of Leaking or Unfit-for-Use Tank Systems (§ 265.192)

EPA is today proposing several requirements under § 265.192 for tank systems that are found to be leaking or are otherwise unfit for storage or treatment of hazardous waste. These proposed requirements are intended to: stop any leak that is identified at a nonpermitted tank facility; require immediate containment of surface spills and remedial action for any release resulting from the identified leak(s); and remove from service either temporarily or permanently any tank system that is leaking or is unfit for service. Replacement tank systems must have full secondary containment.

Once a tank system is found to be leaking under the requirements of § 265.191, the owner or operator must take steps to minimize, contain, and clean up the release in accordance with proposed § 265.192(a). The Agency has decided that the first step in minimizing a potential release is to require that no hazardous waste be added to tank systems that are identified as leaking until the integrity of the primary containment system is restored (§ 265.192(a)(1)). Proposed § 265.192(a)(2) requires that the system must be sufficiently emptied to remove the threat of further release. Such emptying also facilitates any needed inspections and repairs. Under § 265.192(a)(3) the owner or operator must take immediate action to contain any visible contamination resulting from releases. This may, for example, entail the containment or removal of visibly contaminated soils.

Under the existing RCRA interim status standards, owners or operators are not required to report leaks to EPA; they are required to inspect tanks and containment structures for leaks on a regular basis and to make repairs as necessary. (See § 265.15(c) and § 265.194.) Under proposed § 265.192(a)(4), however, the Regional Administrator must be notified within 24 hours after confirmation of an actual leak. With respect to invisible leaks from underground portions of the tank system, the Agency intends this provisions to require that the notification takes place within 24 hours of the completion of a test or assessment that confirms the existence of a leak, such as the assessement required in § 265.191, if the assessement shows the tank system to be leaking. This notification should specify the way the leak was detected, the substance leaked or suspected of having leaked, the cause of the leak (if known), and the estimated extent of the leak.

Today's proposed RCRA notification requirement is not intended to include reports of minor leaks such as minor drips that are quickly detected and stopped. Any leak of hazardous substance that exceeds the "reportable quantity" established under sections 103 (a) and (b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), however, would not be considered a minor leak and must be reported to the Regional Administrator and to the National Response Center under CERCLA section 103(a).

If the assessment of the tank system required in proposed § 265.191 reveals a leak in the tank, this leak must be reported, and the steps proposed in § 265.192 must be followed. If a leak test of an underground tank and/or piping fails the standard in § 265.191(a), this leak must also be reported under the proposed provision. In addition, *all* leaks would have to be fully repaired before the system could be certified as fit for use in accordance with proposed § 265.191(c). Again, all leaks of a reportable quantity under CERCLA section 103(a) must be reported to the National Response Center as well as to the Regional Administrator under the new RCRA requirements discussed above.

Within 30 days of discovering a leak that must be reported under proposed § 265.192(a)(4), the owner or operator must determine under proposed § 265.194(a)(5) the extent of the release. This determination may be based, for example, on soil borings, sample soil excavations, or ground-water samples.

New RCRA section 3008(h), added by the 1984 Hazardous and Solid Waste Amendments, provides EPA authority to issue corrective action orders or such other measures as deemed necessary to protect human health and the environment from releases of hazardous waste from any facility authorized to operate under section 3005(e) of RCRA Subtitle C. Accordingly, a note has been added to the proposed rule explaining that the Regional Administrator may, on the basis of information received that there is or has been a release, issue an order under RCRA section 3008(h) requiring corrective action or such other response as is deemed necessary to protect human health or the environment.

Owners or operators must repair or close leaking or unfit tank systems in accordance with proposed § 265.192(b). Systems that are taken permanently out of service must meet the closure and post-closure care requirements of § 265.197. Repaired tanks must be recertified as conforming to the standards in proposed § 265.191 (a) and (b). This recertification must be submitted to EPA at least 7 days before a tank system is returned to service; this amount of time will enable EPA to conduct an inspection of the repaired system if the Agency believes it is necessary. (EPA recommends that the owner or operator consult API Publication 1631 for guidelines on the repairability of steel tank systems before a decision on repair is made.) Replaced tank systems are regarded as maintaining interim status but, because a replacement tank system would not encounter the problems presented by retrofitting full secondary containment that are present for existing facilities, § 265.192(b)(3) requires that all replacement tank systems have full secondary containment.

3. Secondary Containment (§ 265.193)

EPA is proposing to make secondary containment a requirement for non-permitted tank facilities under interim status. The additions to the Part 265 requirements are identical to the secondary-containment requirements proposed for Part 264, with a few exceptions. Below is a summary of these standards. (See Section V.E.4. for a more complete discussion of the proposed secondary-containment requirements.)

Under § 264.193 (b) and (c), the Aency is proposing to require general design and operating standards for all containment systems, as in § 264.193 (a) and (b). The specific secondary-containment requirements being proposed in Part 264 for the various categories of tanks are not, however, being proposed for tanks under interim status because the Agency believes that these standards can be most effectively implemented through a permit. The limited contact between the Agency and facilities under interim status may not provide either EPA or the owner/operator with sufficient opportunity and information with which to judge compliance with detailed design standards.

On the other hand, because the Part 265 standards are self-implementing, an argument can be made that specific Part 265 secondary containment standards are desirable and necessary so that the owner or operator can best achieve the level of protection intended by EPA. EPA invites public comment on whether the detailed requirements for secondary containment systems set forth in § 264.193(d) should be incorporated into the secondary containment requirements of § 265.193.

As in Part 264, existing facilities under interim status will be allowed to meet either the full secondary containment requirements or the ground-water monitoring option. Thus, in lieu of full secondary containment, the following alternatives are being proposed under § 265.193(e): (1) For *above- and in-ground tanks* where it is not practical to retrofit in order to contain releases from the tank—partial containment measures around the perimeter of the tank, consisting of a base and diking in conjuction with a ground-water monitoring program; (2) for *underground tanks*—a ground-water monitoring program supplemented with semiannual leak testing. (See "General Operating Requirements," below, for the leak-testing standards.) EPA is proposing that interim status tank systems be provided with a ground-water monitoring program that meets the Part 265—Subpart F requirements. Owners or operators of existing tank systems who choose the option of full secondary containment must install such a system within 1 year of the effective date of these amendments. The secondary-containment system must be designed, installed, and operated in compliance with the proposed performance requirements in § 265.193 (b) and (c). The system must detect and contain leaks and must be emptied when such leaks occur. Ancillary equipment must also be provided with either full secondary containment under § 265.193(d) or the ground-water monitoring option under § 265.193(e).

Also, as in Part 264, the owner or operator can obtain a waiver from all or part of the foregoing containment requirements (unless storing or treating the EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27 or unless the tank system is a replacement tank system subject to the requirements of § 265.192(b)(3), if it can be demonstrated that there will never be potential for migration of hazardous waste into ground or surface water. EPA requests comment on the alternative that the demonstration be made that no migration of hazardous waste will occur "during the operating life of the unit or during the post-closure period."

As discussed above, EPA believes there are several benefits to be derived from proposing, where possible, identical approaches for secondary containment under Parts 265 and 264. Owners or operators should also consider all of the more detailed requirements under Part 264 (including, for example, design requirements for tank systems before installing secondary containment). Each of these facilities will later need to be permitted, and, to the extent the requirements are the same, there will be reductions in permitting time and resources and elimination of the need for reconstruction or other costly modifications.

Because there may be little if any opportunity for the owner or operator to work out the details for his secondary-containment system with EPA during interim status, the Agency is developing a guidance manual to assure that the methods for attaining such equivalence are understood.

4. General Operating Requirements (§ 265.194)

All of the existing Part 265 general operating standards have been retained but, in addition, some new standards are being proposed in concert with other changes that are being proposed in Parts 265 and 264.

Proposed § 265.194(b) modifies the existing requirement to make clear that the present freeboard standards must be met unless a secondary containment structure or a stand-by tank is provided. Because all aboveground and inground tank systems must have at least partial secondary containment within 1 year of the effective date of the final amendments, this standard will apply until such secondary containment is provided.

Under proposed § 265.194(d), underground tanks and piping are required to be leak tested every six months if full secondary containment is not provided (i.e., if the ground-water monitoring option is followed). This is the same requirement that is being proposed for such tanks under proposed § 264.193(g). The Agency believes that this requirement is particularly important for the underground components of tank systems because they cannot be observed during the routine daily inspections that are already required. These leak tests will ensure that releases from these systems are identified and corrected. In many cases, the leak test will alert the owner or operator to a release prior to it being detected by ground-water monitoring. These tests and required follow-up actions (if any are needed) must be conducted in accordance with the requirements in §§ 265.191(a) and 265.192, which were discussed previously in this Preamble. After the initial assessments, records of leak tests conducted in accordance with proposed § 265.191 must be kept at the facility. If, however, a test shows a leak exists, the owner or operator must notify the Agency within 24 hours of obtaining the results of the leak test, and he must comply with the other requirements of proposed §265.192.

EPA considered requiring a periodic assessment for interim status aboveground and inground tank systems. A number of factors, however, convinced the Agency that such a requirement is not necessary. First, each of these tank systems must be evaluated within six months of final promulgation of today's proposed rules. Second, for those tank systems for which a Part B is submitted more than a year subsequent to this evaluation, another evaluation is required at time of submittal of the Part B application. Third, due to the cost and laborious nature of performing internal tank inspections (as discussed in Section V.E.2.a.) and the variety of factors influencing the selection of appropriate assessment schedules for various types of tank systems, the Agency is reluctant to specify a uniform frequency for these inspections that would be applicable to all interim status tank systems. Because there is limited interaction with EPA during interim status, there would be no opportunity to negotiate a schedule for such assessments on a case-by-case basis.

Public comment is invited on the appropriateness of EPA's decision not to require periodic comprehensive inspections of aboveground and inground tank systems during interim status.

Proposed § 265.194(f) requires that all metal tank systems found to be susceptible to external corrosion as a result of the evaluation required in § 265.191(b) be provided with corrosion protection that will ensure the integrity of the tank system for its intended life. Publications developed by the National Association of Corrosion Engineers (NACE) and API may be used for guidance on corrosion protection for tank systems.

5. Waste Analysis and Trial Tests (§ 265.195)

The § 265.195 is the same as existing § 265.193.

This section is not being revised but is presented only to clarify for the reader the overall structure of these proposed tank system standards. EPA is not reproposing this section and as such is not requesting or accepting public comment on this section.

6. Inspections (§ 265.196)

Except for minor revisions reflecting changes that are being made in some of the other interim status standards, the proposed inspection requirements are the same as the existing standards. For example, proposed § 265.196(b) adds the requirement that leak-detection equipment, which is being proposed as part of the secondary-containment requirements, be inspected daily.

Proposed § 265.196(c) revises the existing standard to make clear that only the aboveground portions of the tank system must be inspected daily to detect corrosion or leaking.

Under proposed § 265.196(d) the existing standard has been revised to focus the inspection on releases around the area of the secondary-containment system as well as the tank. This change reflects the incorporation of secondary-containment requirements being proposed today for interim status tank facilities.

As proposed in § 265.192(a)(4), the owner or operator must notify the Regional Administrator within 24 hours after confirmation of a leak. The owner or operator must also notify the National Response Center of the release of any reportable quantity of a hazardous waste pursuant to Sections (103(a) of CERCLA.

7. Closure and Post-Closure Care (§ 265.197)

The existing closure standard for tanks has been revised and expanded under proposed § 265.197. The requirements are the same as those proposed in § 264.196. (See Section V.E.8. for a detailed discussion of the Agency's rationale for these changes.)

8. Special Requirements for Ignitable or Reactive Wastes (§ 265.198)

The requirements in § 265.198 are essentially the same as those under the existing standards with the exception of those changes that are also proposed in § 264.198. (See Section V.E.9. for a discussion of these changes.) Since EPA is retaining the existing requirements, public comment is invited only on the applicability of these standards to the overall tank system as opposed to solely the storage or treatment tank.

9. Special Requirements for Incompatible Wastes (§ 265.199)

The existing requirements for incompatible waste in § 265.199) are essentially the same as those under the existing standards with the exception of these changes that are also proposed in § 264.199. (See Section V.E.10. for a discussion of these changes). Since EPA is retaining the existing requirements, public comment is invited only on the applicability of these standards to the overall tank system as opposed to solely the storage or treatment tank.

G. Permitting Requirements

1. Specific Part B Information Requirements for Tanks (§ 270.16)

In order to receive a RCRA permit for a hazardous waste treatment, storage, or disposal facility, owners or operators must submit sufficient information in Parts A and B of a two-part permit application to demonstrate that the facility's methods of compliance are technically appropriate in relation to the Part 264 standards. Today's proposal does not change the requirements for the contents of Part A of the application, which are in § 270.13. The contents of Part B of the application are specified in §§ 270.14–270.21. Today's proposal revises the specific Part B information requirements for tanks (§ 270.16), but does not change the general information requirements (§ 270.14).

The existing requirements for Part B of the RCRA permit application for hazardous waste treatment or storage tanks were promulgated, along with the Part 264 technical standards, on January 12, 1981. (See the Preamble to that rulemaking for a general discussion of the Part B application requirements [46 FR 2841–2842].) The Part B requirements were subsequently recodified under Part 270 on April 1, 1983 (48 FR 14238). Today's proposal completely revises the specific Part B information requirements that apply to tanks (§ 270.16) and tailors them to today's proposed technical standards for tanks in Part 264, Subpart J.

EPA has proposed only those application information requirements that it believes are needed to evaluate the facility's compliance with the appropriate standards.

2. Changes During Interim Status (§ 270.72)

In order to enable owners or operators to comply with the containment requirements in § 265.193, interim status facilities will need to retrofit their tank systems. Currently, any changes during interim status are limited to the requirements in § 270.72 to: (a) new hazardous wastes not previously identified in the Part A application; (b) increases in the design capacity of processes; (c) changes in or the addition of processes; (d) changes in the ownership or operational control of the facility. Under § 270.72(e), changes cannot be made to an interim status facility that amount to reconstruction of the facility. Reconstruction occurs when the capital investment in the changes to the facility exceeds fifty percent of the capital costs of a comparable new facility.

If the proposed requirement for secondary containment systems at interim status facilities results in a capital expenditure that exceeds fifty percent of the capital cost of an entirely new facility, such changes would violate the reconstruction prohibition of § 270.72(e).

Accordingly, the Agency believes that the existing requirements of § 270.72(e) need to be amended to exclude the changes required by this proposal from the changes referred to in § 270.72(e).

Therefore, § 270.72(e) is being amended to exclude changes made solely for the purpose of complying with the secondary containment requirements of § 265.193. In this way, owners or operators will be able to comply with either the full secondary or partial secondary containment requirements of § 265.193 without violating the reconstruction prohibition.

VI. Relationship to the Current RCRA Hazardous Waste Program

A. Small Quantity Generators

Under the existing hazardous waste regulations, generators of less than 1000 kg per month of non-acutely hazardous wastes are conditionally exempted by 40 CFR 261.5 from most of the requirements of Subtitle C. The 1984 amendments, however, added a new provision to RCRA, section 3001(d), designed to modify this regulatory exemption for small quantity generators. New section 3001(d) directs EPA to promulgate standards no later than March 31, 1986, applicable to generators of between 100 and 1000 kg per month of hazardous waste ("100–1000 kg/mo generators").

At a minimum, section 3001(d) standards must require that all treatment, storage, or disposal of hazardous wastes generated by 100–1000 kg/mo generators occur at facilities with interim status or a permit. However, the standards must allow generators of 100–1000 kg/mo to store hazardous waste for up to 180 days without the need for interim status or a RCRA permit (or 270 days if they store no more than a total of 6000 kg of waste and the waste is shipped or hauled over 200 miles for offsite storage, treatment, or disposal). In addition, the standards for 100–1000 kg/mo must generally require that a copy of the Uniform Hazardous Waste Manifest accompany all offsite shipments.

If EPA fails to promulgate standards under section 3001(d) by March 31, 1986, section 3001(d)(8) imposes a statutory "hammer," which, among other things, would impose the minimum requirements described above.

The potential impact and applications of the proposed regulation on small quantity generators has not been fully evaluated. Therefore, the universe of generators potentially impacted and the estimates of the effects of this rule may be subject to change. The following discussion explains the requirements of RCRA section 3001(d) and its potential impact on small quantity generators who store or treat hazardous waste in tanks. The Agency will decide whether to apply the Subpart J requirements to small quantity generators during the proposal of that rule.

1. Proposed Standards for 100–1000 kg/mo Generators

EPA is now developing proposed regulations to satisfy the requirements of new section 3001(d). It is likely that EPA will propose subjecting 100–1000 kg/mo generators to most of the Part 262 requirements applicable to generators of larger quantities of hazardous waste. Specifically, it is likely that small quantity generators will be required to meet the applicable § 262.34 (less than 90-day accumulator) requirements. However, the 1984 RCRA Amendments (section 3001(d)) provide that the period of on-site storage allowed without a permit or interim status can be extended for 100–1000 kg/mo generators to 180 days (or 270 days if the waste does not exceed 6000 kg and is to be shipped over 200 miles). Accordingly, if the requirements for tanks being proposed today become final, and EPA also finalizes the small quantity generator proposal as discussed above, the tank regulations being proposed today would also apply to 100–1000 kg/mo generators. Those 100–1000 kg/mo generators storing for up to 180 (or 270 days) would, therefore, be governed by the Subpart J requirements for tanks referenced in proposed § 262.34, including the requirement for secondary containment. These generators would not have the option of ground-water monitoring in lieu of secondary containment. Generators of 100–1000 kg/mo storing wastes in tanks for greater than 180 (or 270) days would be subject to Parts 264 and 265, as well as the requirement to obtain a RCRA permit.

The Agency estimates that these requirements could impose an additional annual compliance cost of $37 million for all small quantity generators storing hazardous waste in tanks.

EPA is considering modifying the proposed standards applicable to 100–1000 kg/mo generators who store hazardous waste in tanks for less than 180 (or 270) days to provide that such generators satisfy all requirements set forth in § 262.34 *except* for the proposed § 262.34 requirement for full secondary containment. This limited exemption from secondary containment requirements would be available under conditions that restrict both the amount of waste stored and the duration of waste stored. Further, the exemption could be withdrawn at the discretion of the Regional Administrator in situations that are known to pose an unacceptable risk to human health and the environment.

2. Section 3001(d)(8) Hammer Provision

In the event that EPA fails to promulgate standards for small quantity generators by March 31, 1986, section 3001(d)(8) imposes certain statutory "hammer" provisions. Among those requirements is an allowance for on-site storage by generators of 100–1000 kg/mo for up to 180 (or 270) days without the requirement for a permit. This hammer provision does not impose substantive management requirements, such as those contained in § 262.34 on such on-site storage. However, 100–1000 kg/mo generators who store for *more* than 180 (or 270) days will be required to obtain a permit or qualify for interim status. Since EPA's current regulations impose substantive requirements on all facilities having interim status or a permit, a 100–1000 kg/mo generator storing for more than 180 (or 270) days will be subject to Subpart J of Part 265 during interim status and Subpart J of Part 264 under its permit.

The Agency estimates that if the hammer provisions become effective, those 100–1000 kg/mo generators storing wastes in tanks for longer than 180 (or 270) days would incur additional annual costs of $17.6 million.

3. Request for Comments

The Agency will be seeking comment on small quantity generator standards when those standards are proposed this summer. Nevertheless, the tank rules being proposed today may have a substantial impact on 100–1000 kg/mo generators if the tank rules become final. For this reason, EPA solicits comment on options for regulating the storage of hazardous waste in tanks by small quantity generators and the impact of this proposed rule upon such generators. By requesting comments in this proposal, as well as in the small quantity generator proposal, EPA hopes to provide the regulated community an opportunity to focus their comments on the impacts that today's proposed tank rule will have if it were to apply to 100–1000 kg/mo generators.

B. State Authority

1. Applicability of Rules in Authorized States

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

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

Under newly enacted section 3006(g) of RCRA, 42 U.S.C. 6926(g), new requirements and prohibitions imposed by the HSWA take effect in nonauthorized States. EPA is directed to carry out those requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so. While States must still adopt HSWA-related provisions as State law to retain final authorization, the HSWA applies in authorized States in the interim.

2. Effect on State Authorizations

Because many of the requirements that are being proposed today to revise the existing standards for management of hazardous waste in tank systems are imposed pursuant to the Hazardous and Solid Waste Amendments of 1984, they would be applicable in all States. Included in this category are: Requirements for underground tanks not enterable for inspection, leak detection including secondary containment for new tank systems, and response measures (i.e., requirements in §§ 264.196 and 265.192). Thus, EPA will implement these standards in nonauthorized States and in authorized States until they revise their programs to adopt these rules and the revision is approved by EPA.

A State may apply to receive either interim or final authorization under section 3006(g)(2) or 3006(b), respectively, on the basis of requirements that are substantially equivalent or equivalent to EPA's. The procedures and schedule for State adoption of these regulations is described in 40 CFR 271.21. See 49 FR 21678 (May 22, 1984). Similar procedures should be followed for section 3006(g)(2).

Applying § 271.21(e)(2), States that have final authorization must revise their programs within a year of promulgation of EPA's regulations if only regulatory changes are necessary, or within two years of promulgation if statutory changes are necessary. These deadlines can be extended in exceptional cases (40 CFR 271.21(e)(3)).

States that submit official applications for final authorization less than 12 months after promulgation of EPA's regulations may be approved without including standards equivalent to those promulgated. However, once authorized, a State must revise its program to include standards substantially equivalent or equivalent to EPA's within the time period discussed above.

Today's announcement also proposes standards that will not be in effect in authorized States since the requirements are not being imposed pursuant to the Hazardous and Solid Waste Amendments of 1984. Included in this category are those standards being proposed for existing tank systems that are enterable for inspection and that have been subject to State requirements considered no less stringent than the federal requirements of Part 264, Subpart J. Also included are tanks subject to the 90-day accumulation provisions of 40 CFR 262.34. Thus, these requirements will be applicable only in those States that do not have interim or final authorization. In authorized States, the requirements will not be applicable until the State revises its program to adopt equivalent requirements under State law.

40 CFR 271.21(e)(2) requires that States that have final authorization must revise their programs to include equivalent standards within a year of promulgation of these standards if only regulatory changes are necessary, or within two years of promulgation if statutory changes are necessary. These deadlines can be exended in exceptional cases (40 CFR 271.21(e)(3)). Once EPA approves the revision, the State requirements become Subtitle C RCRA requirements.

States that submit official applications for final authorization less than 12 months after promulgation of these standards may be approved without including equivalent standards. However, once authorized, a State must revise its program to include equivalent standards within the time period discussed above. The process and schedule for revision of State programs is described in amendments to 40 CFR 271.21 published on May 22, 1984. (See 49 FR 21678.)

C. Storage and Treatment of Dioxin-Containing Wastes in Tanks

On January 14, 1985 (50 FR 1978), EPA promulgated an amendment to Part 261 of the RCRA hazardous waste regulations that listed wastes containing certain chlorinated dioxins (CDDs), dibenzofurans (CDFs), and phenols and their phenoxy derivatives as hazardous wastes. Final amendments to Part 264 were also promulgated that specified certain management standards for the storage and treatment of these wastes in aboveground, inground, and underground tanks that can be entered for inspection. Thus, existing § 264.200 requires secondary containment of spills or leaks of dioxin-containing wastes from tanks in accordance with these performance standards. Under existing § 264.194(c)(2), such facilities must also have procedures in their contingency plan for responding to spills or leaks from the tank into the containment system.

Today's proposal would delete these special requirements for permitting dioxin tanks and substitute the proposed standards that would be applicable to all RCRA tanks, with two exceptions. First, the proposal will not allow new or existing tanks storing or treating dioxin-containing wastes the option of utilizing the ground-water monitoring alternative instead of secondary-containment. (See proposed §§ 265.193(e) and 264.193(f).) Second, tanks storing or treating these wastes will not be allowed to seek a waiver of secondary-containment requirements as proposed under §§ 265.193(f) and 264.193(i). As discussed in the Preamble to the amendments to Part 264, it is well documented that these extremely toxic wastes present a substantial hazard to human health and the environment. In addition, EPA's experience shows that these wastes are particularly difficult and expensive to clean up. This requirement for containment of dioxin wastes is the same as the existing requirements in § 264.200.

The existing standard in § 264.194(c)(2) that requires procedures in the contingency plan for responding to spills or leaks of dioxin-containing wastes from the tank into the containment system becomes applicable for all tanks in proposed § 264.195(f).

Today's proposal includes several requirements that may be more stringent than the existing special permitting requirements for dioxin. For example, today's proposed standards for corrosion protection and leak tests are not required under the existing special standards. If EPA issues RCRA permits to tanks storing dioxin-containing wastes under the existing permitting requirements, the Agency intends to consider these concerns. New RCRA section 3005(c)(3), added to RCRA by the 1984 Hazardous and Solid Waste Amendments, provides the Agency (or any authorized State) authority to require any terms or conditions in permits beyond those mandated by current regulations if such terms or conditions are deemed necessary to protect human health and the environment. This amendment gives the Agency the authority to incorporate new requirements in permits when EPA intends to add such requirements to the regulations but has not yet issued a final regulatory amendment. See S. Rep. 98-284, 98th Cong., 1st Sess. (October 28, 1983).

D. Class Permitting for Storage in Tanks

On July 20, 1984, EPA proposed a standard permit application and reduced requirements for a class of facilities (see 49 FR 29524–29550) consisting of generators whose only activity subject to RCRA permitting is the storage of hazardous wastes generated onsite in aboveground tanks or containers for more than 90 days. Today's proposed amendments will have no impact on most of these facilities because they store hazardous waste in containers only, but will impact approximately 210 facilities that have at least one tank onsite.

IF today's proposed revisions to the RCRA tank standards become final, the standard permit application form as it applies to tanks would have to be modified to reflect these revisions were it to be applied to tanks. Changes to the application requirements (Parts 270) will be made in proposed form at the time that this proposal becomes final and will be tailored to the final changes to the Part 264, Subpart J, standards being proposed today.

VII. Relationship to Other EPA Programs

A. Regulation of Leaking Underground Storage Tanks ("Lust" Program)

Under new Subtitle I of the amended Resource Conservation and Recovery Act that became law on November 8, 1984, the Agency has been charged to study, report on, develop, and implement a program to regulate underground storage tanks that contain "regulated substances" other than hazardous waste. The Agency estimates that there may be over 3 million such tanks containing petroleum and chemical products that will eventually be covered under this program.

Prior to the passage of this new statute, the Agency had begun a nationwide survey of approximately 1,050 underground tank facilities storing motor fuels. This survey, including leak testing of approximately 500 tanks, will be completed by November 1985 at which time the Agency expects to report its findings.

To avoid any confusion that might arise among the public, including the regulated community, the Agency believes it is important to emphasize that today's proposed standards for hazardous waste tank systems do not apply to this new and broader Congressional initiative to control underground storage tanks containing "regulated substances." Today's proposed revisions should not be interpreted as indicating the Agency's intended regulatory strategy (which is still being planned) for managing the storage of regulated substances or as establishing precedents for underground tanks regulated under Subtitle I of RCRA. In fact, the requirements proposed today, as they apply to underground hazardous waste storage tanks, may be significantly different in many ways from the standards that will be developed in the future for underground tanks storing regulated substances.

A number of factors underly the Agency's belief that two different regulatory approaches are necessary, and will continue to cause them to be developed separately from each other.

First, there are differences in the statutory language of Subtitles C and I. Although regulations under Subtitle I, like Subtitle C, must be "necessary to protect human health and the environment," section 9003(b) of Subtitle I specifies that EPA may distinguish between types, sizes, and ages of tanks taking into account a number of factors including, for example, current industry practices and national consensus codes. The legislative history of this provision suggests that Congress intended that EPA build upon existing industry practices in developing its regulations, taking into special account the needs of small businesses.

Another difference between Subtitles C and I is that Subtitle C requires implementation of a permit system while Subtitle I does not. Requirements that can be implemented through interaction between EPA and the tank owner or operator, therefore, would not be implementable under Subtitle I in the absence of a permit system.

Other differences stem from the differences in the nature of tanks and the size of the tank universe regulated under Subtitles C and I. With respect to differences in the number of tanks subject to each Subtitle, the proposed Subtitle C tank regulations affect a total universe of approximately 15,000 tanks. Subtitle I, on the other hand, may affect as many as 3 million tanks or more. A major consideration in developing Subtitle I regulations, therefore, will be ability of owners and operators to implement the requirements without EPA oversight and EPA ability to enforce the requirements.

Finally, with respect to difference in the nature of the tanks governed by Subtitles C and I, management practices for product tanks may differ from those hazardous waste tanks, thus making certain protective measures more feasible at one than the other.

For example, as described in Section IV.B., inventory monitoring of hazardous waste tank sytems has several drawbacks. Such monitoring is, however, already a widespread practice throughout the retail gasoline service industry, and, therefore, these drawbacks may not apply for tanks containing petroleum products. For the reason, the Agency is carefully considering whether it is feasible and effective to require inventory monitoring as a management tool for leak detection at least at existing underground tank facilities storing petroleum-based products. Likewise, the effectiveness of inventory monitoring for other regulated substance storage tanks will also be evaluated.

B. EPA's Ground-Water Protection Strategy

In August 1984, EPA published "A Ground Water Protection Strategy" (a copy of which is included in today's rulemaking docket), which was developed at the direction of the Administrator. The strategy's main goals are to: strengthen State ground-water protection programs; cope with currently unaddressed problems related to ground-water contamination; create a policy framework for guiding EPA programs; and strengthen EPA's organization for ground-water management. One of the important conclusions of this report is that States, with local governments, have the principal role in ground-water protection and management. An important role for EPA in this area is to provide national environmental leadership and to develop a general program framework for ground-water protection. The strategy provides general guidelines by which to establish consistency in EPA's ground-water protection programs. These guidelines are based on recognition that protection should be afforded to a ground-water resource in order to allow the highest beneficial use for which it could presently or potentially be used.

The strategy establishes that the protection of particularly sensitive and valuable ground water (Class I) is of critical importance. EPA intends to use its authorities to the greatest extent possible to provide the protection that these unique and highly important resources require. Class II is described as that ground water currently used or potentially available for drinking water or for other beneificial uses (e.g., irrigation). Under this strategy, this class will receive a level of protection consistent with gound water standards under EPA's existing statutes. Class III ground water is described as that which is saline or otherwise contaminated beyond levels that would allow for drinking or other beneficial purposes and is not hydraulically connected to Class I or II ground waters or to surface waters in a way that would allow contaminants to migrate to these waters and potentially cause adverse effects on human health or the environment. The strategy provides that this ground water may, in some instances, receive less protection. For example, hazardous waste facilities located over Class III areas could be required to meet the same technical standards as facilities over the other classes. If, however, contamination resulting from human activity occurs in Class III ground waters, the extent of cleanup required would be evaluated on a case-by-case basis. Should contamination pose no risk to human health and the environment (if the ground water is not usable or controls prevent its use), then, under RCRA, cleanup requirements could be reduced or eliminated.

To implement the strategy, EPA will consider a series of changes to existing RCRA regulations and may develop new regulations or guidelines that support the Agency's goal of providing consistent levels of ground-water protection throughout its programs. Today's proposed hazardous waste tank regulations constitute one area where the existing RCRA regulations may need to be altered to be consistent with the new ground-water protection strategy. For example, the strategy calls for EPA to ban the siting of new land disposal facilities above Class I ground water and to clean up contamination in all cases to background or drinking water standards. Conversely, the strategy also allows, on a case-by-case basis, a reduction or elimination of requirements for cleanup over Class III ground water. Specific regulatory language is not being proposed today because the detailed definitions, criteria, and guidelines necessary to implement the strategy are still being developed by EPA. The Agency requests comment on these and other alternatives for developing tank regulations that implement the ground-water strategy.

Several alternatives that may be appropriate for hazardous waste storage or treatment tanks include: a ban of new underground tanks from being located over Class I ground water; special management of existing tanks situated over Class I ground water (e.g., retrofitting all existing tanks to include secondary containment); elimination of any cleanup variances (ACLs) over Class I water; determination of the degree of protection, if any, needed at tank systems over Class III ground water, i.e., possibily eliminating secondary containment or modifying ground-water monitoring and leak testing requirements and liberal cleanup variances for tanks located over Class III ground water.

C. Reportable Quantities under CERCLA

Sections 103 (a) and (b) of CERCLA (or "Superfund") require persons in charge of vessels or facilities to notify the National Response Center immediately when there is a release of hazardous substances in quantities that are equal to or greater than the reportable quantity (RQ) for that substance. All RCRA hazardous wastes listed under RCRA are designated as hazardous substances and assigned RQs under 40 CFR 302.4. Solid wastes exhibiting characteristics identified in Subpart C of Part 261 are also hazardous substances under CERCLA. As a result, RQ releases of all hazardous wastes from RCRA tanks must be reported pursuant to section 103 of CERCLA, unless they are a federally permitted release, as defined under section 101(10) of that Act.

The major purpose of this notification program is to alert government officials of releases of hazardous substances that may require rapid response to protect public health and welfare and the environment. Under Section 104 of CERCLA, the Federal Government may respond whenever there is such a release or a substantial threat of release into the environment. Thus, the RQ is essentially a trigger for notifying the government so that the need for response can be evaluated and any necessary response can be undertaken promptly. While experience shows that the government does not undertake a field response to all reported releases, reporting will enable the government to make the appropriate response deteremination. Failure to report such releases may result in penalties under section 103(b).

In the preamble to an earlier proposed rule, "Notification Requirements; Reportable Quantity Adjustments," the Agency determined that releases from hazardous waste management facilities with final RCRA permits were considered federally permitted releases for purposes of CERCLA. (See 48 FR 23556, May 25, 1983.) It was also determined, however, that this exemption does not apply to facilities in interim status pursuant to section 3005(e) of RCRA. Today's proposed revisions to the RCRA tank rules do not change that earlier decision. Thus, any releases from tank facilities in interim status must be reported to the NRC.

As discussed in Section V of this Preamble, EPA is today proposing requirements concerning response to and disposition of leaking or unfit-for-use tank systems discovered during interim status. (See proposed § 265.192.) These provisions require, among other things, that the EPA Regional Administrator be notified within 24 hours after a leak is discovered under the assessment required in proposed § 265.191. EPA may choose to respond quickly to such notices to ensure that other RCRA requirements in § 265.192(a) are being met (i.e., the tank system is being expeditiously removed from service to stem the flow of any further releases, and steps are being taken to contain any surface leakage). Meeting these initial requirements under RCRA will not, however, relieve the owner or operator of the notification requirements or any future liabilities or responsibilities under CERCLA.

VIII. Economic Analysis.

The Agency undertook an analysis of the proposed hazardous waste tank regulation amendments to determine the extent of the associated costs and economic impacts on the regulated community. These analyses also provided the Agency with the necessary information for determining whether the proposed revisions will constitute a major rule under Executive Order 12291, or have significant small business impacts on a substantial number of small businesses as the Agency is required to consider under the Regulatory Flexibility Act.

The following discussion summarizes the methodology and the results of the analyses supporting these findings. Further detail of the cost and economic analyses for the proposed tank regulations can be found in the docket reports, *Cost Analysis of Proposed RCRA Regulations for Hazardous Waste Tank Facilities* and *Economic Impact Analysis of Proposed RCRA Regulations for Hazardous Waste Tank Facilities.*

A. Cost and Economic Impact Methodology

The analysis found in these reports is based on the cost estimates for facilities sampled in the Office of Solid Waste's Regulatory Impact Analysis (OSW RIA) survey. The data from the tank and generator questionnaires indicte that the proposed tank regulations could affect facilities in a variety of two digit SIC's. The most prominant SICs are chemicals and allied products; petroleum and coal products; fabricated metals; and electric and electronic equipment.

EPA estimated incremental compliance costs for Parts 262, 264 and 265 for each sample facility. The primary focus of the proposed revisions is the requirements for secondary containment. EPA estimated these facility costs from cost functions developed for tanks based on material of construction and the size of the tank. For purposes of estimating total national costs, EPA assumed a number of existing tanks are leaking on the basis of tank type, age, and size.

For accumulation tanks, the Agency estimated the cost of retrofitting all accumulation tanks with full secondary containment. For storage or treatment tanks assumed to be leaking, EPA estimated the cost of replacing the tank including full secondary containment. For storage or treatment tanks not assumed to be leaking, EPA estimated the least expensive option of either retrofitting full secondary containment *or* partial secondary containment/leak testing and ground-water monitoring.

For the Parts 265 and 264 revisions, EPA also included the cost of requiring an assessment of the integrity of the tank system and corrosion protection for steel tanks. Part 264 permitting standards require a more detailed tank integrity assessment. However, the difference in cost between 265 and 264 standards are minimal. In order to estimate the economic impacts associated with the proposed regulatory costs, the Agency collected financial data for each facility in the survey population. The analysis of publicly available financial information estimated the ability of affected facilities, firms, and industries to bear the increased costs of the proposed regulations.

The Agency first estimated net income of each firm in the OSW RIA database. To determine whether compliance costs for a facility may be significant, EPA investigated whether the ratio of annualized compliance costs to total annual cash flow is greater than 20 percent. If so, a firm is identified as having financial difficulties in complying with the potential regulations.

For firms identified as such, EPA examined each facility's financial profile to determine whether the facility has financial difficulty exclusive of the proposed compliance costs or has assets that could be redirected in order to finance compliance with the proposed requirements. From this analysis, EPA determined the extent of impacts on facilities for the Nation.

In order to determine whether a substantial number of small businesses would be significantly affected by the proposed regulations, EPA compared average compliance costs for small business to model small business annual net income levels. This analysis allowed the Agency to determine at what level compliance costs would be greater than 20 percent of a small business annual net income.

From this result EPA could estimate the percentage of small businesses that would incur financial difficulty in complying with the proposed regulations. As suggested in the Regulatory Flexibility Act guidelines, if less than 20 percent of the small businesses that must comply with the regulations incur financial hardship as a result, then EPA does not consider the proposed regulations to result in significant small business impacts.

B. Cost and Economic Impacts

EPA estimated total national compliance costs in four categories. The first category of compliance costs are initial costs. Initial costs are those which are incurred in the first year, but are not depreciable capital costs. An example of an initial cost is the tank integrity assessment requirement. The second category of compliance costs are the capital costs. Tank facilities may incur these costs in the first year or they may occur periodically over the life of the tank. Capital costs are depreciable costs. An example of a capital cost is the secondary containment requirement for tanks.

Third, EPA estimated operating and maintenance (O&M) compliance costs. O&M costs are incurred by tank facilities periodically during the year. These compliance costs would include periodic inspections of monitoring equipment. Finally, EPA estimated annualized costs. Annualized costs represent the initial and capital costs on a yearly basis over the life of the tank plus the O&M costs on an annual basis.

The Agency estimated the total initial costs of regulatory Parts 265 and 264 to be approximately $18 million, total capital costs are about $163 million, and the total O&M costs are about $3 million. EPA estimates the total initial costs of the regulatory Part 262 amendments to be about $5.5 million and the capital costs to be about $49.5 million if we assume all accumulation tanks are aboveground. If all accumulation tanks are assumed to be underground, the Part 262 total initial costs are about $17 million and the capital costs are about $150.5 million. The Part 262 total O&M costs are estimated to be about $2 million.

For the purpose of estimating the impacts of these proposed rule revisions, costs are annualized based on an average 12.9 percent real rate of return for a period of 20 years. The Agency estimated the annualized cost of regulatory Parts 265 and 264 amendments to be about $29 million for approximately 1,700 storage and treatment facilities in the United States. For the 2,100 accumulation tank facilities, EPA estimated the annualized cost of the Part 262 amendment to be between $9.6 million and $25.5 million. Thus, the estimated total national annualized cost of the regulatory proposal is between $38.6 and $54.6 million.

Tables I and II display the incremental costs new tank facilities will face under the proposed tank permitting standards. These costs represent installing new tanks that comply with the full secondary containment requirement. As the tables indicate, there is a wide variation in the incremental cost of the secondary containment requirement, depending upon the type and number of tanks.

The results of our financial analysis on the sample facilities indicate that EPA does not expect any plant closure as a result of the amendments to Parts 262, 264, and 265. For example, EPA estimates that about 88 percent of the storage and treatment tank facilities and between 76 percent and 82 percent of the accumulation tank facilities will incur annualized compliance costs less than one percent of their firm's net income.

TABLE I.—INSTALLED COSTS FOR NEW CARBON STEEL ABOVEGROUND TANKS WITH FULL SECONDARY CONTAINMENT

[Dollars in thousands]

Number of tanks	Size of tanks (gallon)	Tank systems without full secondary containment			Tank systems with full [1] secondary containment			Incremental cost of full secondary containment		
		Initial	O&M	Annualized	Initial	O&M	Annualized	Initial	O&M	Annualized
1	3,000	$9	$0	$1.3	$13	$0.25	$2.1	$4	$0.25	$0.8
1	10,000	14	0	2.0	24	.25	3.6	10	.25	1.8
1	125,000	149	0	21.1	190	.25	27.1	41	.25	8.0

TABLE I.—INSTALLED COSTS FOR NEW CARBON STEEL ABOVEGROUND TANKS WITH FULL SECONDARY CONTAINMENT—Continued

[Dollars in thousands]

Number of tanks	Size of tanks (gallon)	Tank systems without full secondary containment			Tank systems with full [1] secondary containment			Incremental cost of full secondary containment		
		Initial	O&M	Annualized	Initial	O&M	Annualized	Initial	O&M	Annualized
4	10,000	59	0	8.3	87	.25	12.6	28	.25	4.3

[1] Full secondary containment costs include a lined concrete basin underneath and surrounding the tank(s) with diking around the perimeter and leak monitoring. There is 35 feet of underground piping that is double-walled, corrosion resistant steel with interstitial monitoring. There is 15 feet of above-ground piping that is in the tank secondary containment area

TABLE II.—INSTALLED COSTS FOR NEW CARBON STEEL ABOVEGROUND TANKS WITH FULL SECONDARY CONTAINMENT

[Dollars in thousands]

No of tanks	Size of tanks (gallon)	Tank systems without full secondary containment			Tank systems with full [1] secondary containment			Incremental cost of full secondary containment		
		Initial	O&M	Annualized	Initial	O&M	Annualized	Initial	O&M	Annualized
1	3,000	$10	$0	$1.4	$23	$0.25	$3.5	$13	$0.25	$2.1
1	10,000	19	0	2.7	39	.25	5.8	20	.25	3.1
1	20,000	30	0	4.2	57	.25	8.1	27	.25	4.1
3	10,000	48	0	6.8	100	.25	14.4	52	.25	7.6

[1] Full secondary containment costs include double-walled tanks and 50 feet of double-walled, corrosion resistant underground steel piping and interstitial monitoring.

The majority of the remaining facilities will either incur compliance costs less than 20 percent of net income or have assets that can be redirected to cover compliance costs. Thus, EPA does not anticipate significant financial impacts for the Nation. As there are no significant financial impacts for individual facilities, the Agency expects no overall price, wage, or employment shifts in industries with facilities using hazardous waste tanks.

Finally, the small business analysis indicates that the proposed hazardous waste tank amendments will not result in a substantial number of small businesses incurring significant impacts. Our analysis indicates that between 17 and 19 percent of the small businesses subject to the regulations will be significantly affected. The Regulatory Flexibility Guidelines suggest that if less than 20 percent of the relevant small businesses are significantly affected, then a Regulatory Flexibility Analysis is unnecessary. Therefore, although EPA intends to improve the small business analysis as the data improves, the Agency will not undertake a Regulatory Flexibility Analysis.

IX. Review of Supporting Documents and Request for Public Comments

EPA invites public comments on all aspects of these proposed regulations, including all issued raised in the Preamble. In preparing this proposal, the Agency has used several sources of data (the major sources are listed below). They have been placed in the rulemaking docket, which may be inspected by the public in Room S-212(c), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C., from 9:00 am to 4:00 pm, Monday through Friday, excluding holidays. Copies of several of these documents are also available for public inspection and review in the libraries of EPA's Regional Offices.

Although the Agency used the background documents supporting the existing RCRA tank regulations, it based today's proposal primarily on information that has been gathered since promulgation of the RCRA tank permitting standards on January 12, 1981. Among the sources EPA has used are: in-house and contractors' studies; written communications from EPA Regional permitting officials; and public comments on the January 12, 1981 regulations and Preamble. All these items are available for viewing in the public docket at EPA Headquarters. In addition, copies of the major studies are available in the libraries of EPA's Regional Offices. Comments are solicited in regard to these sources of informtion, especially their relevance to today's proposed rulemaking. The Agency requests that these comments be submitted to the RCRA Docket Clerk (Docket No. 3004, Revised Tank Standards, Office of Solid Waste, WH-562, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460) on or before September 24, 1985.

A brief discussion concerning these sources of information follows.

1. *Assessment of the Technical, Environmental, and Management Aspects of Storage and Treatment of hazardous Waste in Above-ground and Inground Tanks* by SCS Engineers (August 1984). The objectives of this EPA-sponsored study were to define current practices for hazardous waste storage in aboveground and inground tanks; evaluate these practices in relation to data on spills and damages and best engineering judgment; estimate the relative probability and magnitude of releases from aboveground tanks; and examine alternatives for prevention and/or mitigation of releases. Shell thickness and secondary containment were among the alternatives assessed. An analysis included evaluation of approximately 2,000 releases reported to the mutually exclusive SPCC amd PIRS data systems.

2. *Assessment of the Technical, Environmental, and Safety Aspects of Storage of Hazardous Waste in Underground Tanks* by SCS Engineers (February 1984). The objectives of this study were to define current practices for hazardous waste storage in underground tanks; evaluate these practices in relation to data on spills and damages and best engineering judgment; estimate the relative probability and magnitude of releases from underground tanks; and examine appropriate alternatives for prevention and/or mitigation of releases.

3. *Seismic Location Standard: The Physical Effects of Seismic Events on Hazardous Waste Facilities* and *The Risks Associated with Earthquake Damage at Hazardous Waste Facilities* by Livermore Associated Research Group, Inc. (LARG), (December 1982). This report assessed the impact of seismic events on hazardous waste management facilities, including tanks. Tanks were reported to be a major contributor to the risk of release of hazardous waste due to seismic activity.

4. *A Brief In-House Statistical Summary of an 1981 National Survey Data Re: Hazardous Waste Tanks.* This statistical summary, which is based on EPA-sponsored national survey data, presents significant characteristics of a sampling of actual hazardous waste

tank facilities (e.g., age of tank, design capacity, material of construction).

5. *National Survey of Hazardous Waste Generators and Treatment, Storage, and Disposal Facilities Regulated under RCRA in 1981* by Westat Inc. (April 1984). This report summarizes the methodology and findings of an extensive national survey of hazardous waste generators and treatment, storage, and disposal facilities regulated under Subtitle C of RCRA.

6. *Cost of Analysis of Proposed RCRA Regulations for Hazardous Waste Tank Facilities* by ICF, Inc. (February 1985). The purpose of this study was to develop regulatory cost functions for facilities with hazardous waste tanks. These cost functions are based on tanks at model facilities developed by EPA from the OSW tank survey (see No. 4 above). The cost functions are used to estimate regulatory costs for the actual facilities in the survey sample. The facility costs are extrapolated to national costs and are used to determine expected economic impacts resulting from the regulations.

7. *Economic Impact Analysis of Proposed RCRA Regulations for Hazardous Waste Tank Facilities* by ICF, Inc. (January 1985). The purpose of this study was to estimate the financial effects of the requirements on the regulated community. The study also analyzes the expected impacts on small businesses to determine whether a regulatory flexibility analysis is necessary. Finally, the report examines economic impacts in terms of changes in prices, number of employees, and output.

8. *A Brief Compilation of Hazardous Waste Tank Damage Cases Impacting or Threatening Community Drinking Water Well Systems* (May 7, 1984). This brief in-house survey of some of the Agency's data bases provides a brief illustration of some of the known or suspected causes of releases from tanks that may be impacting or threatening community drinking water well systems at various sites throughout the United States.

9. *EPA Permit-writer Memos on the Subject of Minimum Shell Thickness.* Memos from many of the EPA Regional Offices and Headquarters offices that are involved in the permitting of hazardous waste storage facilities were obtained on the topic of minimum shell thickness.

As the memos show, the EPA Regions are generally unanimous in their opinion concerning the minimum shell thickness requirements: they are difficult to implement; they have placed an unnecessary burden on many owners and operators of tank facilities, especially those with secondary containment; and they have only a limited effect in controlling releases from tanks.

10. *Public Comments on the January 12, 1981, RCRA Tank Permit Standards.* All the public comments received on the tank regulations promulgated in 1981 and a summary of them are included in the docket at EPA Headquarters. These comments were considered by EPA in developing today's proposal.

X. Schedule for Public Hearings

The Agency will hold three public hearings on today's proposal. They are scheduled to convene at three different locations and at the dates indicated below:

1. *August 9, 1985*—Washington, D.C.
   Department of Health and Human Services, North Auditorium, 330 Independence Avenue SW., Washington, D.C. 20201
2. *August 13, 1985*—Chicago, Illinois
   The Westin Hotel O'Hare, 6100 River Road, Rosemont, Illinois 60018
3. *August 15, 1985*—San Francisco, California
   San Francisco Hilton & Towers, Pacific Room, 330 O'Farrell Street, San Francisco, California 94102

The hearings will begin at 9:30 a.m., with registration at 9:00 a.m. The hearings will end at 4:30 p.m., unless concluded earlier. Anyone wishing to make a statement at the hearing should notify, in writing, Ms. Geraldine Wyer, Public Participation Officer, Office of Solid Waste [WH-562], U.S. Environmental Protection Agency, 401 M Street SW., Washington, D.C. 20460.

Oral and written statements may be submitted at the public hearing. Persons who wish to make oral presentations must restrict them to 15 minutes and are encouraged to have written copies of their complete comments for inclusion in the official record.

XI. Compliance With Executive Order 12291

Sections 2 and 3 of Executive Order 12291 (46 FR 13193, February 9, 1981) require that a regulatory agency determine whether a new regulation will be "major" and, if so, that a Regulatory Impact Analysis be conducted. A major rule is defined as one that is likely to result in: (1) An annual effect on the economy of $100 million or more; (2) a major increase in costs or prices for consumers, individual industries, Federal, State, and local government agencies, or geographic regions; or (3) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Today's proposal of revised standards for RCRA tank facilities will have none of the above effects. Because the proposed amendments do not meet the definition of a major regulation, the Agency is not conducting a Regulatory Impact Analysis at this time. However, EPA will perform a risk analysis to support the final rule. EPA has prepared background information supporting this determination; this documentation is in the Economic Impact Analysis Report, which may be examined at the RCRA Public Docket Office.

These proposed amendments have been submitted to the Office of Management and Budget (OMB) for review pursuant to Section 6 of the Executive Order.

XII. Paperwork Reduction Act

Pursuant to Section 3504(h) of the Paperwork Reduction Act of 1980, the reporting and recordkeeping provisions of today's proposed rule have been submitted for OMB approval. Comments on these requirements should be submitted to the Office of Information and Regulatory Affairs, OMB, 726 Jackson Place NW., Washington, D.C. 20503, marked: Attention—Desk Officer for EPA. Should EPA promulgate a final rule, the Agency will respond to comments by OMB or the public regarding the information collection provisions of the rule.

XIII. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 *et. seq.*), whenever an agency is required to publish a general notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the impact of the rule on small entities (i.e., small business, small organizations, and small governmental jurisdictions.) No regulatory flexibility analysis is required, however, if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities.

EPA has conducted some analysis of the impacts on small businesses, which is included in the Economic Impact Analysis Report (EIAR). However, the forthcoming small quantity generator rule may require facilities generating between 100–1000 kg/mo to comply with the requirements specified in today's proposal. The EIAR does not include the potential impact on small businesses of the small quantity generator rule. The EIAR is available for public viewing in the docket for today's proposal.

On the basis of the analysis conducted thus far, EPA has determined that the proposed rule, if promulgated, will not have a significant economic impact on a substantial number of small entities.

List of Subjects

40 CFR Part 260

Administrative practice and procedure, Confidential business information, Hazardous materials, Waste treatment and disposal.

40 CFR Part 262

Hazardous materials, Waste treatment and disposal, recycling.

40 CFR Part 264

Hazardous materials, Packaging and containers, Reporting and recordkeeping requirements, Security measures, Surety bonds, Waste treatment and disposal.

40 CFR Part 265

Hazardous materials, Packaging and containers, Reporting and recordkeeping requirements, Security measures, Surety bonds, Waste treatment and disposal, Water supply.

40 CFR Part 270

Administrative practice and procedure, Confidential business information, Hazardous materials transportation, Hazardous waste, Reporting and recordkeeping requirements, Water pollution control, Water supply.

Dated: June 14, 1985.

Lee M. Thomas,

Administrator.

For the reasons set out in the Preamble, it is proposed to amend 40 CFR Chapter I as set forth below:

PART 260—HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL

40 CFR Part 260 is amended as follows:

1. The authority citation for Part 260 is revised to read as follows:

Authority: Secs. 1006, 2002(a), 3001 through 3007, 3010, 3014, 3015, 3017, 3018, and 3019 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), 6921 through 6927, 6930, 6934, 6935, 6937, 6938, and 6939).

2. It is proposed to amend § 260.10 by adding the following terms and definitions in alphabetical order:

§ 260.10 Definitions.

* * * * *

"Above-ground tank" (AGT) means a device meeting the definition of "tank" in § 260.10 and that is situated in such a way that the base of the tank is at or above the plane of ground level.

* * * * *

"Ancillary equipment" means any device used to distribute, meter, or control the flow of hazardous waste to or from the storage or treatment tank(s), including but not limited to such devices as piping, fittings, flanges, gaskets, valves, and pumps.

* * * * *

"Corrosion expert" refers to a person who, by reason of his knowledge of the physical sciences and the principles of engineering and mathematics, acquired by a professional education and related practical experiences, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. Such person may be a registered professional engineer or may be a person certified as being qualified by the National Association of Corrosion Engineers if such licensing or certification includes suitable experience in corrosion control on buried or submerged metal piping systems and metal tanks.

* * * * *

"Existing tank system" means a tank system that is used for the storage or treatment of hazardous waste and that is in operation, or for which installation has commenced, on or prior to (put in effective date of these regulations). Installation will be considered to have commenced if the owner or operator has obtained all Federal, State, and local approvals or permits necessary to begin physical construction of the site or installation of the tank system and either (1) a continuous onsite physical construction or installation program has begun, or (2) the owner or operator has entered into contractual obligations—which cannot be canceled or modified without substantial loss—for physical construction of the site or installation of the tank system to be completed within a reasonable time.

* * * * *

"Inground tank" (IGT) means a device meeting the definition of "tank" in § 260.10 that is situated to any degree within the ground, i.e., below the plane of ground level, but is neither completely buried nor situated so that the tank bottom is above the plane of ground level.

* * * * *

"Leak-detection system" means a system for providing the capability to detect within 24 hours the failure of either the primary- or secondary-containment structure or the presence of liquid in the secondary-containment structure. Such a system may consist of operational controls (i.e., inspections) or a device designed to detect leaks.

* * * * *

"New tank system" means a tank system for which installation has commenced after (put in the effective date of these regulations). (See definition of existing tank system for the determination of when installation has commenced.)

* * * * *

"Tank system" means any storage or treatment tank and the ancillary equipment associated with that tank. It does not include the secondary containment system associated with the tank system.

* * * * *

"Underground tank" (UGT) means a device meeting the definition of "tank" in § 260.10 whose entire surface area is wholly submerged within the ground (i.e., totally below the surface of and covered by the ground), or is otherwise covered with a material so that expeditous inspection of the tank's exterior surface area is precluded.

* * * * *

PART 262—STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE

40 CFR Part 262 is amended as follows:

3. The authority citation for Part 262 is revised to read as follows:

Authority: Secs. 1006, 2002, 3001, 3002, 3003, 3004, 3005, and 3017 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6906, 6912, 6922, 6923, 6924, 6925, and 6937).

4. It is proposed to amend § 262.34 by revising paragraph (a)(1), adding a new paragraph (a)(2) and redesignating paragraphs (a)(2) through (a)(4) as paragraphs (a)(3) through (a)(5) as follows:

§ 262.34 Accumulation time.

(a) A generator may accumulate hazardous waste onsite for 90 days or less without a permit or without having interim status provided that:

(1) The waste is placed in containers and the generator complies with Subpart I of 40 CFR Part 265, or the waste is placed in tanks and the generator complies with §§ 265.192(a)(1)–(4), 265.194(a)–(c), 265.196, 265.197 (a) and (b), 265.198 and 265.199 of Subpart J of 40 CFR Part 265;

(2) Tanks that are used to accumulate hazardous waste are provided with secondary containment equivalent to that prescribed in § 265.193(b)-(c) within 1 year of the effective date of those sections;

(3) The date upon which each period of accumulation begins is clearly marked and visible for inspection on each container;

(4) While being accumulated onsite, each container and tank is labeled or marked clearly with the words, "Hazardous Waste;" and

(5) The generator complies with the requirements of owners or operators in Subparts C and D of 40 CFR Part 265, and with § 265.16.

* * * * *

PART 264—STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

40 CFR Part 264 is amended as follows:

5. The Authority citation for Part 264 is revised to read as follows:

Authority: Secs. 1006, 2002, 3004, and 3005 of the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), 6924, and 6925).

6. It is proposed to amend the Table of Contents and heading of Part 264, Subpart J—Tanks by revising it to read:

* * * * *

Subpart J—Tank Systems

Sec.

* * * * *

§ 264.15 [Amended]

7. It is proposed to amend § 264.15 General inspection requirements in paragraph (b)(4) by removing the reference to "§ 264.194" and adding "§ 264.195".

§ 264.73 [Amended]

8. It is proposed to amend § 264.73 Operating record requirements in paragraph (b)(6) by adding a reference to "§ 264.192".

9. It is proposed to amend § 264.110 in Subpart G—Closure and Post-closure by adding a new paragraph (b)(3):

§ 264.110 Applicability.

* * * * *

(b) * * *

(3) Tank systems to the extent that these sections are made applicable to such facilities in § 264.197.

* * * * *

10. It is proposed to amend § 264.140 in Subpart H—Financial Requirements by adding a new paragraph (b)(3):

§ 264.140 Applicability.

* * * * *

(b) * * *

(3) Tank systems to the extent that these Sections are made applicable to such facilities in § 264.197.

* * * * *

11. It is proposed to amend the Subpart J— Tank Systems requirements by revising the Subpart as follows:

Subpart J—Tank Systems

§ 264.190. Applicability.

The requirements of this Subpart apply to owners and operators of facilities that use tank systems for storing and/or treating hazardous waste except as otherwise provided in § 264.1 of this Part.

§ 264.191 Design of tank systems.

Owners or operators of tank systems must obtain and submit to the Regional Administrator a written assessment by a qualified registered professional engineer of the system's structural integrity and acceptabilty for the storing and treating of hazardous waste. This assessment, which will be used by the Regional Administrator to judge the acceptabilty of the tank system design, must include, at a minimum, the following information:

(a) For new tank systems:

(1) Design standard(s) according to which the tank is constructed;

(2) Design standard(s) according to which the ancillary equipment is constructed; and

(3) Hazard characteristics of the waste(s) to be handled.

(b) For existing, used, and reused tanks systems:

(1) Design standard(s), if available, according to which the tank(s) and piping system components were constructed;

(2) Description of the tank system (e.g., size, age, material of construction);

(3) Hazard characteristics of the waste(s) that have been and will be handled;

(4) Estimated remaining life of the tank system; and

(5) Results of a leak test that is capable of detecting a leak equal to or greater than 0.05 gallons per hour (for underground tank systems) or an internal inspection (for above- and inground tank systems) performed within the past year.

(c) For all metal tank systems in which all or part of the tank system is or will be in contact with the soil, a determination by a corrosion expert of: (1) Factors affecting the potential for corrosion, including but not limited to:

(i) Soil moisture content;

(ii) Soil pH;

(iii) Soil sulfides level;

(iv) Soil resistivity;

(v) Structure to soil potential;

(vi) Influence of nearby underground metal structures (e.g., piping);

(vii) Existence of stray electric current;

(viii) Existing corrosion-protection measures (i.e., coatings, cathodic protection).

and (2) the type and degree of corrosion protection needed to ensure the integrity of the tank system for its intended life, consisting of one or more of the following:

(i) Corrosion-resistant materials of construction such as special alloys, fiberglass reinforced plastic, etc.;

(ii) Corrosion-resistant coating (such as epoxy, fiberglass, etc.)

(iii) Cathodic protection (i.e., impressed current or sacrificial anodes); or

(iv) Electrical isolation devices such as insulating joints, flanges, etc.

Note.—The practices described in the National Association of Corrosion Engineers (NACE) standard, "Recommended Practice (RP-02-85)—Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems," and the American Petroleum Institute (API) Publication 1632, *Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems,* may be used as guidelines in providing corrosion protection for tank systems.

(d) For underground tank system components that are likely to be affected by vehicular traffic, a determination of design or operational measures that will protect the tank system against potential damage; and

(e) Design considerations to ensure that:

(1) Tank foundations will maintain the load of a full tank; and

(2) Tank systems will be anchored to prevent flotation and/or dislodgment where the tank system is placed in a saturated zone, or is located within a

seismic fault zone subject to the standards of § 264.18(a).

§ 264.192 Installation of new tank systems.

(a) The owner or operator must ensure that proper handling procedures are adhered to in order to prevent damage to the tank system during installation. Prior to covering, enclosing, or placing a new tank system in use, a qualified installation inspector or a qualified professional registered engineer who is trained in the proper installation of tank systems must inspect the system for the presence of any of the following items:

(1) Weld breaks;

(2) Punctures;

(3) Scrapes of protective coatings;

(4) Cracks;

(5) Corrosion;

(6) Other structural damage or inadequate construction/installation.

All discrepancies must be remedied before the system is placed in service.

(b) Backfill material must be a noncorrosive, porous substance. Tanks that are placed underground must be carefully backfilled so that the backfill is placed completely around the tank and compacted to ensure that the tank is fully and uniformly supported.

(c) All tanks and ancillary equipment must be tested for tightness prior to being covered, enclosed, or placed in use. All leaks must be remedied before the system is placed in service.

(d) Piping systems must be supported and protected against physical damage and excessive stress owing to settlement, vibration, expansion, or contraction.

Note.—The piping system installation procedures described in API Publication 1615 (November 1979), *Installation of Underground Petroleum Storage Systems*, or ANSI Standard B31.3, "Petroleum Refinery Piping," and ANSI Standard B31.4 "Liquid Petroleum Transportation Piping System," may be used as guidelines for proper installation of piping systems.

(e) The owner or operator must provide the type and degree of corrosion protection determined by the Regional Administrator to be necessary to ensure the integrity of the tank system for its intended life, based on the information provided under § 264.191(c). A corrosion expert must supervise the installation of any cathodic protection system.

(f) Written statements by those persons required to supervise the installation of tank systems in accordance with the requirements of paragraphs (a)–(e) of this section which attest that the tank system was properly installed, must be kept on file at the facility. These written statements must also include a certification as required in § 270.11(d)

§ 264.193 Secondary containment.

(a) Except as allowed under paragraphs (f), (g), (h), and (i) of this section, a tank system must be designed, installed, and operated with a secondary containment system that:

(1) Prevents any migration of wastes or accumulated precipitation out of the tank system to the soil ground water or to surface water at any time during the use of the tank system;

(2) Detects and collects any releases of waste and accumulated precipation until the collected material can be removed;

(3) Removes or permits the removal of spilled or leaked waste and accumulated precipitation in as timely a manner as is necessary to prevent releases from the secondary containment system.

(b) To meet the requirements in paragraph (a) of this section all secondary-containment systems must be at a minimum:

(1) Constructed of or lined with materials that are compatible with the waste(s) to be placed in the tank system and must have sufficient strength and thickness to prevent failure owing to pressure gradients (including static head and external hydrological forces), physical contact with the waste to which it is exposed, climatic conditions, the stress of installation, and the stress of daily operation (including stresses from nearby vehicular traffic);

(2) Placed on a foundation or base capable of providing support to the secondary containment system and resistance to pressure gradients above and below the system and capable of preventing failure owing to settlement, compression, or uplift;

(3) Provided with a leak-detection system that is designed or operated so that it will detect the presence of any release of hazaradous waste or accumulated liquid in the secondary containment system within 24 hours of entry of the liquid into the system;

(4) Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation;

(5) Designed or operated to contain 110 percent of the design capacity of the largest tank within its boundary;

(6) Designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity in addition to that required in paragraph (b)(5) of this section to contain run-on or infiltration. Such additional capacity must be sufficient to contain precipitation from a 25 year, 24 hour rain storm.

Notes.—If the collected material is a hazardous waste under Part 261 of this Chapter, it is subject to management as a hazaradous waste in accordance with all applicable requirements of Parts 262 through 265 of this chapter. If the collected material is discharged through a point source to waters of the United States, it is subject to the requirements of sections 307 and 402 of the Clean Water Act, as amended.

(c) Secondary containment for aboveground, inground, and underground tanks must include one or more of the following devices:

(1) A liner (external to the tank);

(2) A vault;

(3) A double-walled tank; or

(4) An equivalent device as approved by the Regional Administrator.

(d) In addition to the requirements of paragraphs (a), (b), and (c) of this section, liners, vaults, and double-walled tank systems must satisfy the following requirements:

(1) External liner systems must be:

(i) Free of cracks or gaps; and

(ii) Installed to cover all surrounding earth likely to come into contact with the waste if released from the tank(s) (i.e., capable of preventing lateral as well as vertical migration of the waste).

(2) Vault systems (concrete) must be:

(i) Constructed as an continuous structure with chemical resistant water stops in place at all joints (if any);

(ii) Provided with an interior coating that is compatible with the stored waste for the purpose of preventing migration of waste through the concrete and also an exterior moisture barrier to prevent migration of moisture into the vault; and

(iii) Provided with a noncorrosive porous fill material around the tank if the waste being stored meets the definition of ignitable waste under § 261.21 of this chapter.

(3) Double-walled tanks must be:

(i) Designed as a integral structure (i.e., an inner tank with an outer shell) so that any release from the inner tank is contained by the outer shell;

(ii) Protected, if constructed of metal, from both corrosion of the primary tank interior and of the external surface of the outer shell; and

(iii) Provided with a built-in leak monitor.

Note.—The provisions outlined in the Steel Storage Tank Institute's (STI) "Standard for Dual Wall Underground Steel Storage Tanks" may be used as guidelines for the design of underground steel double-walled tanks.

(e) Ancillary equipment associated with tanks must be provided with secondary containment (e.g., trench, double-walled piping) that meet the requirements of (a) and (b) of this section.

(f) As an alternative to complying with the full secondary containment requirements of paragraphs (a), (b), (c), (d), and (e) of this section, the owner or operator of an existing tank system, except for those used to store or treat EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27, may implement a ground-water monitoring program in accordance with the requirements of paragraph (g) of this Section. Owners or operators who choose to implement a ground-water monitoring program in lieu of complying with the secondary-containment requirements of § 264.193(a)–(e) must also install partial secondary containment for any above ground portion of the tank system consisting of a leak-proof base and diking that meet the requirements of § 264.193 (a), (b), and (d)(1).

(g) The ground-water monitoring requirements of this section apply to owners and operators of tank systems that do not have full secondary containment in accordance with paragraphs (a)–(e) of this section. Owners and operators subject to this section must comply with the following requirements:

(1) The owner or operator must install a ground-water monitoring system at a compliance point to be specified in the permit by the Regional Administrator.

(i) The compliance point is a vertical surface located at the hydraulically downgradient limit of the waste management area that extends down into the uppermost aquifer underlying the tank system.

(ii) The waste management area is the limit projected in the horizontal plane of the area covered by the tank system. The waste management area includes any horizontal space taken up by the tank or any ancillary equipment connected to the tank.

(iii) If the facility contains more than one tank system, the waste management area is described by an imaginary line circumscribing the several tank systems.

(2) The owner or operator must monitor for indicator parameters (e.g., specific conductance, total organic carbon, or total organic hologen), waste constituents, or reaction products that provide a reliable indication of the presence of hazardous constituents in ground water. The Regional Administrator will specify the indicators or constituents to be monitored in the facility permit, after considering the following factors:

(i) The types, quantities, and concentrations of constituents in wastes contained in the tank system;

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

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

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

(3) The ground-water monitoring system required by this section must comply with the following requirements:

(i) The ground-water monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield ground-water samples from the uppermost aquifer that:

(A) Represent the quality of background water that has not been affected by leakage from a tank system; and

(B) Represent the quality of ground water passing through the compliance point.

(ii) If a facility contains more than one tank system, separate ground-water monitoring systems are not required for each tank system provided that provisions for sampling the ground-water in the upper-most aquifer will enable detection and measurement at the compliance point of monitoring parameters or constituents from the tank systems that have entered the environment.

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

(iv) The ground-water monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide a reliable indication of ground-water quality below the waste management area and that accurately measure monitoring parameters or constituents in ground-water samples. At a minimum, the program must include procedures and techniques for:

(A) Samples collection;

(B) Sample preservation and shipment;

(C) Analytical procedures; and

(D) Chain of custody control.

(v) The ground-water monitoring program must include a determination of the ground-water surface elevation each time ground water is sampled.

(4) The owner or operator must establish a background value for each of the monitoring parameters or constituents specified in the permit pursuant to paragraph (g)(2) of this section. The permit will specify the background values for each parameter or specify the procedures to be used to calculate the background values. The owner or operator must comply with the following requirements in developing the data base used to determine background values:

(i) Background ground-water quality for a monitoring parameter or constituent must be based on data from quarterly sampling of wells upgradient from the waste management area for one year.

(ii) Background quality may be based on sampling of wells that are not upgradient from the waste management area where hydrogeological conditions do not allow the owner or operator to determine what wells are upgradient; or sampling at other wells will provide an indication of background ground-water quality that is as representative or more representative than that provided by the upgradient wells.

(iii) In developing the data base used to determine a background value for each parameter or constituent, the owner or operator must take a minimum of four samples from the entire system used to determine background ground-water quality each time the system is sampled.

(5) The owner or operator must determine ground-water quality at each monitoring well at the compliance point at least semi-annually during the active life of the tank system (including any closure and post-closure care period required under § 264.196). The owner or operator must express the ground-water quality at each monitoring well in a form necessary for the determination of statistically significant increases.

(6) The owner or operator must determine whether there is a statistically significant increase over background values for any parameter or constituent specified in the permit pursuant to paragraph (g)(2) of this section each time he determines ground-water quality at the compliance point under paragraph (g)(5) of this section.

(i) In determining whether a statistically significant increase has occurred, the owner or operator must compare the ground-water quality at each monitoring well at the compliance point for each parameter or constituent to the background value for that parameter or constituent, according to the statistical procedure specified in the permit under paragraph (g)(7) of this section.

(ii) The owner or operator must determine whether there has been a statistically significant increase at each monitoring well at the compliance point within a reasonable time period after completion of sampling. The Regional Administrator will specify that time period in the facility permit, after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of ground-water samples.

(7) The owner or operator must use the following statistical procedure in determining whether background values or concentration limits have been exceeded:

(i) If the background value has a sample coefficient of variation less than 1.00:

(A) The owner or operator must take at least four portions from a sample at each well at the compliance point and determine whether the difference between the mean of the constituent at each well (using all portions taken) and the background value for the constituent is significant at the 0.05 level using the Cochran's Approximation to the Behrens-Fisher Student's t-test as described in Appendix IV of this part. If the test indicates that the difference is significant, the owner or operator must repeat the same procedure (with at least the same number of portions as used in the first test) with a fresh sample from the monitoring well. If this second round of analyses indicates that the difference is significant, the owner or operator must conclude that a statistically significant change has occurred; or

(B) The owner or operator may use an equivalent statistical procedure for determining whether a statistical procedure for determining whether a statistically significant change has occurred. The Regional Administrator will specify such a procedure in the facility permit if he finds that the alternative procedure reasonably balances the probability of falsely identifying a non-leaking tank system and the probability of failing to identify a leaking tank system in a manner that is comparable to that of the statistical procedure described in paragraph (g)(7)(i)(A) of this section.

(ii) In all other situations, the owner or operator must use a statistical procedure providing reasonable confidence that the migration of hazardous constituents from a tank system into and through the aquifer will be indicated. The Regional Administrator will specify a statistical procedure in the facility that he finds:

(A) Is appropriate for the distribution of the data used to establish background values or concentration limits; and

(B) Provides a reasonable balance between the probability of falsely identifying a non-leaking tank system and the probability of failing to identify a leaking tank system.

(8) The owner or operator must determine the ground-water flow rate and direction in the uppermost aquifer at least annually.

(9) If the owner or operator determines, pursuant to paragraph (g)(6) of this section, that there is a statistically significant increase for parameters or constituents specified pursuant to paragraph (g)(2) of this section at any monitoring well at the compliance point, he must:

(i) Notify the Regional Administrator of this finding in writing within seven days. The notification must indicate what indicators or constituents have been detected; and

(ii) Assess the integrity of the tank system by conducting a leak test (of underground system) in accord with paragraph (h) of this section and by a thorough inspection of any aboveground or inground tank systems.

(h) All underground tank systems that do not have full secondary containment that meets the requirements of this section must be leak tested at least semi-annually in accordance with the following:

(1) A leak test of every underground tank to detect any leak equal to or greater than 0.05 gallon per hour and

(2) A leak test of all underground piping to detect any leak equal to or greater than 0.05 gallon per hour, or a pressure drop of 5 pounds per square inch per minute.

(i) Except for tanks used to store or treat EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27, the owner or operator may be exempted from all or part of the requirements of this Section if the Regional Administrator finds, as a result of a demonstration by the owner or operator, that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous waste or hazardous constituents into the ground water or surface water at any future time.

In deciding whether to grant an exemption, the Regional Administrator will consider:

(1) The nature and quantity of the wastes;

(2) The proposed alternate design and operation;

(3) The hydrogeologic setting of the facility, including the thickness of soils present between the tank system and ground water; and

(4) All other factors that would influence the quality and mobility of the hazardous constituents and the potential for them to migrate to ground water or surface water.

§ 264.194 General operating requirements.

(a) Hazardous wastes or treatment reagents must not be placed in a tank system if they could cause the tank or its ancillary equipment to rupture, leak, or corrode, or otherwise fail before the end of its intended life.

(b) The owner or operator must use appropriate controls and practices to prevent spills and overflows from tank or secondary containment systems. These include at a minimum:

(1) Spill prevention controls (e.g., check valves, dry disconnect couplings);

(2) Overfill prevention controls (e.g., automatic feed cutoff or bypass to a standby tank); and

(3) Maintenance of sufficient freeboard in uncovered tanks to prevent overtopping by wave or wind action or by precipitation.

§ 264.195 Inspections.

(a) The owner or operator of a tank system must develop a schedule and procedure for inspecting overfill controls, where present (e.g., level-sensing devices, high-level alarms, waste feed cutoff and bypass systems).

(b) The owner or operator must inspect at least once each operating day:

(1) The aboveground portions of the tank system, if any, to detect corrosion or leaking of waste from fixtures, joints, and seams; and

(2) Data gathered from continuous monitoring and leak detection equipment, if any, (e.g., pressure or temperature gauges, monitoring wells, leak-detection devices) to ensure that the tank system is being operated according to its design.

(c) The owner or operator must inspect on at least a weekly basis the construction materials of, and the area immediately surrounding the externally accessible portion of the tank system and the secondary-containment system, to detect erosion or signs of leakage (e.g., wet spots, dead vegetation).

(d) The owner or operator must inspect cathodic-protection systems, if present, according to, at a minimum, the following schedule to ensure that they are properly functioning:

(1) The operation and components of impressed current systems must be inspected at least monthly for such items as: anode deterioration, rectifier

malfunction, power interruption, and rectifier output;

(2) The anode output of a sacrificial anode system must be inspected at least semiannually; and

(3) The tank system to soil potential measurement must be conducted at least annually to ensure a minimum level of −0.85 volts.

(e) A schedule and procedure must be developed for assessing the overall condition of the tank system. The schedule and procedure must be adequate to detect obvious cracks, leaks, and corrosion or erosion that may lead to cracks or leaks. The frequency of these assessments must be based on the material of construction of the tank and its ancillary equipment, the age of the system, the type of corrosion- or erosion-protection used, the rate of corrosion or erosion observed during the previous inspection, and the characteristics of the waste being stored or treated.

Note.—The practices described in the API Publication *Guide for Inspection of Refinery Equipment,* Chapter XIII, "Atmospheric and Low-Pressure Storage Tanks," 4th edition, 1981, may be used as guidelines for assessing the overall condition of the tank system.

§ 264.196 Response to and disposition of leaking or unfit-for-use tank systems.

(a) As part of the contingency plan required under Subpart D of Part 264, the owner or operator must specify procedures for responding to spills or leakage from tanks, including procedures for expeditious removal of leaked or spilled waste. These procedures must be available for review by EPA upon request and must include:

(1) Measures for containing any visible contamination resulting from a release from the tank system that has occurred or is occurring;

(2) Measures for immediate removal of waste from the tank and containment system;

(3) Procedures for conducting assessments of the risk to human health and the environment owning to a release from a tank system and the remedial actions necessary to mitigate the severity of a release;

(4) Steps for obtaining, prior to returning repaired or replaced tank systems or secondary-containment systems to service, a certification by a qualified registered professional engineer that the system is capable of handling hazardous waste for the intended useful life of the tank system without permitting its release into the environment. This certification must be submitted in writing to the Regional Administrator at least seven (7) days prior to the system being returned to service.

(b) The owner or operator must promptly, in accordance with the procedures set forth in the contingency plan, remedy any malfunction, deterioration, leak, spill, or crack.

§ 264.197 Closure and post-closure care.

(a) At closure of a tank system, the owner or operator must remove or decontaminate all residues, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment contaminated with waste and manage them as hazardous waste unless § 261.3(d) of this chapter applies.

(b) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, soils, structures, and equipment as required in paragraph (a) of this section, the owner or operator finds that not all contaminated soils can be practicably removed or decontaminated, he must close the tank system and perform post closure care in accordance with the closure and post-closure care requirements that apply to landfills (§ 264.310).

(c) The closure plan for the tank system under § 264.12 must include details for complying with paragraph (a) of this section.

(d) The owner or operator of a tank system that does not comply with the full secondary containment requirements of § 264.193(a)-(d), must: (i) Include in the closure plan for the tank system under § 264.112 both a plan for complying with paragraph (a) of this section and a contingent plan for complying with paragraph (b) of this section in case not all contaminated soil can be practicably removed at closure; and (ii) prepare a contingent post-closure plan under § 264.118 for complying with paragraph (b) of this section in case not all contaminated soil can be practicably removed at closure.

(e) The cost estimates for closure and post-closure care must be calculated in accordance with the requirements under §§ 264.142 and 264.144, respectively.

§ 264.198 Special requirements for ignitable or reactive wastes.

(a) Ignitable or reactive waste must not be placed in a tank system, unless:

(1) The waste is treated, rendered, or mixed before or immediately after placement in the tank system so that the resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste under §§ 261.21 or 261.23 of this Chapter, and § 264.17(b) is complied with: or

(2) The waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react; or

(3) The tank system is used solely for emergencies.

(b) The owner or operator of a facility where ignitable or reactive waste is stored or treated in a tank system must comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon as required in Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code" (1977 or 1981), (incorporated by reference, see § 260.11).

§ 264.199 Special requirements for incompatible wastes.

(a) Incompatible wastes, or incompatible wastes and materials, must not be placed in the same tank system, unless § 264.17(b) is complied with.

(b) Hazardous waste must not be placed in an unwashed tank that previously held an incompatible waste or material, unless § 264.17(b) is complied with.

* * * * *

PART 265—INTERIM STATUS STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

40 CFR Part 265 is amended as follows:

12. The Authority citation for Part 265 is revised to read as follows:

Authority: Secs. 1006, 2002(a), 3004, 3005, and 3015 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), 6924, 6925, and 6935).

13. It is proposed to amend the Table of Contents and the heading of Part 265, Subpart J—Tanks by revising it to read:

* * * * *

Subpart J—Tank Systems

Sec.

* * * * *

§ 265.13 [Amended].

14. It is proposed to amend § 265.13 General waste analysis requirements in paragraph (b)(6) by removing the reference to "265.193" and adding "265.195".

§ 265.15 [Amended]

15. It is proposed to amend § 265.15 General inspection requirements in paragraph (b)(4) by removing the reference to "265.194" and adding "265.196".

§ 265.73 [Amended]

16. It is proposed to amend § 265.73 Operating record requirements in paragraph (b)(3) by removing the reference to "265.193" and adding "265.195," and in paragraph (b)(6) by adding a reference to "265.194".

17. It is proposed to amend § 265.110 in Subpart G—Closure and post-closure by revising paragraph (b) to read:

§ 265.110 Applicability.

* * * * *

(b) Sections 265.117–265.120 (which concern post-closure) apply to the owners and operators of:

(1) All hazardous waste disposal facilities; and

(2) Tank systems to the extent that these sections are made applicable to such facilities in § 265.197.

* * * * *

18. It is proposed to amend § 265.140 in Subpart H—Financial requirements by revising paragraph (b) to read:

§ 265.140 Applicability.

* * * * *

(b) The requirements of §§ 265.144 and 265.145 and 265.146 apply only to owners and operators of:

(1) Disposal facilities; and

(2) Tank systems to the extent that these Sections are made applicable to such facilities in § 265.197.

* * * * *

19. It is proposed to amend the Subpart J—Tank Systems requirements by revising the Subpart as follows:

Subpart J—Tank Systems

§ 265.190 Applicability.

The regulations in this subpart apply to owners or operators of facilities that use tanks to treat or store hazardous waste, except as otherwise provided in § 265.1 of this part.

§ 265.191 Assessment and certification of tank system's integrity.

(a) For each tank system that does not have full secondary containment meeting the requirements of 265.193(b)–(d), the owner or operator must submit an assessment of the tank system to the Regional Administrator within 6 months of the effective date of these revisions to the regulations. Such assessment must include:

(1) A leak test of every underground tank to detect any leak equal to or greater than 0.05 gallon per hour;

(2) A leak test of all underground piping to detect a leak equal to or greater than 0.05 gallon per hour, or a pressure drop of 5 pounds per square inch per minute;

(3) For tank systems, other than underground tanks and underground piping that do not have full secondary containment meeting the requirements of § 265.193(b)–(d), an assessment of each tank system by a qualified registered professional engineer. This assessment must address cracks, leaks, corrosion, or erosion.

Note.—The practices described in the API Publication, *Guide for Inspection of Refinery Equipment*, Chapter XIII, "Atmospheric and Low-Pressure Storage Tanks," 4th edition, 1981, may be used as guidelines in conducting the assessment of a tank system.

(b) For those metal tank systems at which all or part of the tank system is in contact with the soil, the owner or operator must, within 1 year of the effective date of these revisions to the regulations, have a corrosion expert conduct a determination of factors affecting the potential for corrosion, including but not limited to:

(1) Soil moisture content;

(2) Soil pH;

(3) Soil sulfides level;

(4) Soil resistivity;

(5) Structure to soil potential;

(6) Influence of nearby underground metal structures (e.g., piping);

(7) Existence of stray electric current; and

(8) Existing corrosion-protection measures (i.e., coatings, cathodic protection).

§ 265.192 Response to and disposition of leaking or unfit-for-use tank systems.

(a) A tank system found to be leaking must be immediately removed from service and its owner or operator must satisfy the following requirements:

(1) The flow or addition of hazardous waste into the tank system must be immediately stopped;

(2) The remaining hazardous waste in the tank system or its secondary containment (if any) must be removed as quickly as possible and no later than 24 hours after detection of the leak so that no further release of hazardous waste is permitted to occur and inspection or repair of the tank system can be performed;

(3) Necessary steps must be immediately taken to contain any visible contamination resulting from a release from the tank system that has occurred or is occurring;

(4) The Regional Administrator must be notified within 24 hours after confirmation of the leak; and

(5) An estimation of the extent of release of hazardous waste or constituents of hazardous waste to the environment must be performed and reported to the Regional Administrator within 30 days of detection of a release.

Note.—The Regional Administrator may, on the basis of any information received that there is or has been releases of hazardous waste into the environment, issue an order under RCRA section 3008(h) requiring corrective action or such other response as deemed necessary to protect human health or the environment.

Note.—See § 265.15(c) for the requirements necessary to remedy a failure. Also, sections 103 (a) and (b) of CERCLA require the owner or operator to notify the National Response Center at (800) 424–8802 of the release of any "reportable quantity."

(b) Tank systems taken out of service in accordance with (a) of this Section or that are judged to present a hazard for continued use as hazardous waste storage or treatment units as a result of the assessment of § 265.191(a)(3) must be:

(1) Closed in accordance with the requirements of § 265.197, or

(2) *Repaired.* Repaired tank systems, prior to being returned to service for the management of hazardous waste, must be certified by a qualified registered professional engineer to be capable of storing or treating hazardous waste for the intended life of the tank system without permitting its release into the environment. This certification must be based upon assessments performed in accordance with §§ 265.191 (a) and (b) and must be submitted in writing to the Regional Administrator at least 7 days prior to the tank system's being returned to service, or

(3) *Replaced.* If an interim status tank system is replaced with another tank system, the replacement system is regarded as having interim status. Such tank systems must have full secondary containment in accordance with the requirements of §§ 265.193 (b) and (c) and must be certified by a qualified registered professional engineer to be capable of storing or treating hazardous waste for the intended life of the tank

system without permitting its release into the environment. This certification must be based upon an assessment performed in accordance with §§ 265.191 (a) and (b) and must be submitted to the Regional Administrator at least 7 days prior to bringing the tank system into use.

§ 265.193 Secondary containment.

(a) In order to minimize the release of hazardous waste or constituents of hazardous waste to the environment, all tanks and ancillary equipment must, within 1 year of the effective date of these revised regulations, be provided with full secondary containment that meets the requirements of paragraphs (b), (c), and (d) of this Section.

(b) Full secondary-containment systems must be:

(1) Designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil or ground water or to surface water at any time during the intended life of the tank system; and

(2) Capable of detecting and collecting any waste or leak and accumulated liquids until the collected material can be removed.

(c) To meet the requirements of paragraphs (b) and (d), secondary-containment systems must be at a minimum:

(1) Constructed of or lined with materials that are compatible with the waste(s) to be placed in the tank system and must have sufficient strength and thickness to prevent failure owing to pressure gradients (including static head and external hydrological forces), physical contact with the waste to which it is exposed, climatic conditions, the stress of installation, and the stress of daily operation (including stresses from nearby vehicular traffic);

(2) Placed on a foundation or base capable of providing support to the secondary containment system and resistance to pressure gradients above and below the system owing to settlement, compression, or uplift;

(3) Provided with a leak-detection system that is designed or operated so that it will detect the presence of any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours of entry of the liquid into the containment system;

(4) Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation. Spilled or leaked waste and accumulated precipitation must be removed from the secondary-containment system in as timely a manner as is possible but no later than 24 hours after the detection of the release.

(5) Designed or operated to contain 110 percent of the design capacity of the largest tank within its boundary.

(6) Designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity in addition to that required in paragraph (c)(5) of this section to contain run-on or infiltration. Such additional capacity must be sufficient to contain precipitation from a 25 year, 24 hour rain storm.

Note.—If the collected material is a hazardous waste under Part 261 of this chapter, it is subject to management as a hazardous waste in accordance with all applicable requirements of Parts 262 through 265 of this Chapter. If the collected material is discharged through a point source to waters of the United States, it is subject to the requirements of sections 307 and 402 of the Clean Water Act, as amended.

(d) Ancillary equipment must be provided with full secondary containment (e.g., trench, double-walled piping) that meets the requirements of paragraphs (b) and (c) of this section (except paragraph (c)(5)).

(e) As an alternative to complying with the full secondary containment requirements of paragraphs (a), (b), (c), and (d) of this section, the owner or operator or an existing tank system, except for those used to store or treat EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27 and replacement tank systems subject to the requirements of § 265.192(b)(3) may implement a groundwater monitoring program in accordance with the requirements of Subject F of this Part. Owners or operators who choose to implement a groundwater monitoring program in lieu of complying with the full secondary containment requirements of this Section must also install partial secondary containment consisting of a leak-proof base and diking that meet the requirements of §§ 264.193 (b) and (c) for any aboveground portion of the tank system.

(f) Except for tank systems used to store or treat EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27, the owner/operator may be exempted from all or part of the secondary containment requirements of this Section if the Regional Administrator finds, as a result of a demonstration by the owner or operator, that alternative design or operating practices, together with location characteristics, will prevent the migration of hazardous waste or constituents of hazardous waste into the ground water or surface water at any future time.

§ 265.194 General operating requirements.

(a) Hazardous wastes or treatment reagents must not be placed in a tank system if they could cause the tank or its inner liner to rupture, leak, corrode, or otherwise fail before the end of its intended life.

(b) Uncovered tanks must be operated to ensure at least 60 centimeters (2 feet) of freeboard, unless the tank is equipped with a secondary-containment structure (e.g., dike or trench) or a diversion structure (e.g., standby tank) with a capacity that equals or exceeds the volume of the top 60 centimeters (2 feet) of the tank.

(c) Where hazardous waste is continuously fed into a tank, the tank must be equipped with a means to stop this inflow (e.g., a waste feed cutoff system or bypass system to a standby tank).

(d) All underground tank systems that do not have full secondary containment meeting the requirements of § 265.193 (b), (c), and (d) must be leak tested at least semiannually in accordance with the requirements of § 265.191(a) (1) or (2). The owner or operator must maintain a record of the results of the leak tests at the facility.

(e) Any tank system that is found to be leaking either by the leak test required in paragraph (d) or by any other means of leak detection must meet the requirements of § 265.192.

(f) All metal tanks and associated piping that are found to be susceptible to corrosive conditions resulting from the determination in 265.191(b) must be provided with the corrosion protection needed to ensure the integrity of the tank system for its intended life, consisting of one or more of the following:

(1) Corrosion-resistant materials of construction such as special alloys, fiberglass reinforced plastic, etc.;

(2) Corrosion-resistant coating such as epoxy, fiberglass, etc.;

(3) Cathodic protection (i.e., impressed current or sacrificial anodes); or

(4) Electrical isolation devices such as insulating joints, flanges, etc.

Note.—The practices described in the NACE standard, "Recommended Practice (PR-02-85)—Control of External Corrosion on Metallic Buried, partially Buried, or Submerged Liquid Storage Systems," and API Publication 1632, *Cathodic Protection of Underground Petroleum Tanks and Piping Systems,* may be used as guidelines in providing corrosion protection for tank systems.

§ 265.195 Waste analysis and trial tests.

In addition to performing the waste analysis required by § 265.13, the owner or operator must, whenever a tank system is to be used to treat chemically or store a hazardous waste that is substantially different from waste previously treated or stored in that tank system; or treat chemically a hazardous waste with a substantially different process than any previously used in that tank system:

(a) Conduct waste analyses and trial treatment or storage tests (e.g., bench scale or pilot plant scale tests); or

(b) Obtain written, documented information on similar waste under similar operating conditions to show that this proposed treatment or storage will meet all applicable requirements of § 265.194 (a) and (b).

Note. Section 265.13 requires the waste analysis plan to include analyses needed to comply with §§ 265.198 and 265.199. Section 265.73 requires the owner or operator to place the results from each waste analysis and trial test, or the documented information, in the operating record of the facility.

§ 265.196 Inspections.

The owner or operator of a tank must conduct and document in the operating record of the facility an inspection of, where present:

(a) Discharge control equipment (e.g., waste-feed cutoff systems, bypass systems, and drainage systems), at least once each operating day, to ensure that it is in good working order;

(b) Data gathered from monitoring equipment (e.g., pressure and temperature gauges) and leak-detection equipment, at least once each operating day, to ensure that the tank system and leak-detection system are being operated according to their design;

(c) The aboveground portions of the tank system, if any, at least once each operating day, to detect corrosion or leaking of fixtures, joints, or seams; and

(d) The construction materials of, and the area immediately surrounding the externally accessible portion of the tank system and secondary-containment structures (e.g., dikes), at least weekly, to detect erosion or signs of leakage (e.g. wet spots, dead vegetation);

Note.—Section 265.15(c) requires the owner or operator to remedy any deterioration or malfunction he finds. Section 265.192 requires the owner or operator to notify the Regional Administrator within 24 hours of confirming a leak. Also, Sections 103 (a) and (b) of CERCLA require the owner or operator to notify the National Response Center at (800) 424-8802 of the release of any "reportable quantity."

(e) Cathodic protection systems to ensure that it is properly functioning according to, at a minimum, the following schedule:

(1) The operation and components of impressed current systems must be inspected at least monthly for such items as anode deterioration, rectifier malfunction, power interruption, and rectifier output;

(2) The anode output of a sacrificial anode system must be inspected at least semiannually; and

(3) The tank system to soil potential measurement must be conducted at least annually to ensure a minimum level of -0.85 volts.

§ 265.197 Closure and post-closure care.

(a) At closure of a tank system, the owner or operator must remove or decontaminate all hazardous waste residues, contaminated containment system components (liners, etc.), contaminated soil, and structures and equipment contaminated with waste, and manage them as hazardous waste unless § 261.3(d) of this chapter applies.

(b) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, soils, structures, and equipment as required in paragraph (a) of this Section, the owner or operator finds that not all contaminated soils can be practicably removed or decontaminated, he must close the tank system and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills. (§ 264.310).

(c) The closure plan for the tank system under § 265.112 must include a plan for complying with paragraph (a) of this section.

(d) The owner or operator of a tank system that does not comply with the full secondary requirements of §§ 265.193 (b) and (c) must: (i) Include in the closure plan for the tank system under § 265.112 both a plan for complying with paragraph (a) of this section and a contingent plan for complying with paragraph (b) of this section in case not all contaminated soil can be practicably removed at closure; and (ii) prepare a contingent post-closure plan under § 265.118 for complying with paragraph (b) of this section in case not all contaminated soil can practicably be removed at closure.

(e) The cost estimates for closure and post-closure care must be calculated in accordance with the requirements under §§ 265.142 and 265.144, respectively.

§ 265.198 Special requirements for ignitable or reactive wastes.

(a) Ignitable or reactive waste must not be placed in a tank system, unless:

(1) The waste is treated, rendered, or mixed before or immediately after placement in the tank system so that

(i) The resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste under §§ 261.21 or 261.23 of this Chapter, and

(ii) Section 265.17(b) is complied with; or

(2) The waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react; or

(3) The tank system is used solely for emergencies.

(b) The owner or operator of a facility where ignitable or reactive waste is stored or treated in tanks must comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon as required in: Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code" (1977 or 1981), (incorporated by references, see § 260.11).

§ 265.199 Special requirements for incompatible wastes.

(a) Incompatible wastes, or incompatible wastes and materials, must not be placed in the same tank system, unless § 265.17(b) is complied with.

(b) Hazardous waste must not be placed in an unwashed tank that previously held an incompatible waste or material, unless § 265.17(b) is complied with.

PART 270—EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

40 CFR Part 270 is amended as follows:

20. The authority citation for Part 270 is revised to read as follows:

Authority: Secs. 1006, 2002, 3005, 3007, 3019, and 7004 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912, 6925, 6927, 6939, and 6974).

§ 270.14 [Amended]

21. It is proposed to amend § 270.14(b) General information requirements in paragraph (b)(5) by removing reference to "264.194" and adding "264.195"; and in paragraph (b)(7) by adding "264.196,"

prior to ". . . specific requirements in §§" and "264.227."

22. It is proposed to amend § 270.16, Specific Part B information requirements for tanks, by revising it to read:

§ 270.16 Specific Part B information requirements for tank systems.

Except as otherwise provided in § 264.190, owners and operators of facilities that use tanks to store or treat hazardous waste must provide the following additional information:

(a) A written assessment by a registered professional engineer as to the structural integrity and suitability for handling hazardous waste of each tank system, as required under § 264.191;

(b) Dimensions and capacity of the tank;

(c) Description of feed systems, safety cutoff, bypass systems, and pressure controls (e.g., vents);

(d) A diagram of piping, instrumentation, and process flow for each tank system;

(e) A description of materials and equipment used to provide external corrosion protection, as required under § 264.191(c);

(f) For new tank systems, a detailed description of how the tank system(s) will be installed in compliance with § 264.192 (b), (c), and (d);

(g) Detailed plans and description of how the secondary-containment system for each tank system is or will be designed, constructed, and operated to meet the requirements of § 264.193 (a), (b), (c), (d), and (e);

(h) For tank systems not in compliance with the secondary-containment requirements of § 264.193 (a) (b), (c) (d), and (e) the following:

(1) All plans, reports and other information required under § 270.14(c); and

(2) Detailed plans and description of the partial secondary-containment system for aboveground portions of the tank system(s), as required under § 264.193(f);

(i) For tank systems for which an exemption from the requirements of § 264.193 is sought (as provided by § 264.193(i)), detailed plans and engineering and hydrologic reports, as appropriate, describing alternate design and operating practices that will, in conjunction with location aspects, prevent the migration of any hazardous constituents into the ground water or surface water at any future time;

(j) Description of controls and practices to prevent spills and overflows, as required under § 264.194(b); and

(k) For tank systems in which ignitable, reactive, or incompatible wastes are to be stored or treated, a description of how operating procedures and tank system and facility design will achieve compliance with the requirements of §§ 264.198 and 264.199.

§ 270.72 [Amended]

23. It is proposed to amend § 270.72(e), Changes during interim status, by adding the following sentence after the last sentence:

* * * Changes under this section do not include changes made solely for the purpose of complying with requirements of § 265.193 for tanks and ancillary equipment.

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