RAS 10974

Attachment 10

NUCLEAR REGULATORY COMMISSION

10 CFR Parts 2, 19, 20, 21, 30, 40, 51, 61, 70, 73 and 170

Licensing Requirements for Land Disposal of Radioactive Waste

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is issuing regulations that set out licensing procedures, performance objectives and technical requirements for the licensing of facilities for the land disposal of low-level radioactive waste. The regulation is necessary to provide comprehensive national criteria applicable to the land disposal of radioactive waste. This action is taken in response to the needs and requests of the public, Congress, industry, the states, the Commission, and other Federal agencies for codified regulations to govern the disposal of low-level radioactive waste.

DATES: 10 CFR 20.311 of Part 20 effective date is December 27, 1983; 10 CFR Part 61 and all other changes effective January 26, 1983.

ADDRESSES: Documents referred to in this regulation may be examined at the Commission's Public Document Room, 1717 H Street NW., Washington, DC. Copies of NUREG's may be obtained by writing the Superintendent of Documents, U.S. Government Printing Office, CIB, SSOS, UCP, Washington, DC 20401 or the NRC/GPO Sales Program, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Copies of Branch Technical Positions may be obtained from the Low Level Waste Licensing Branch, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

FOR FURTHER INFORMATION CONTACT: Paul H. Lohaus, Low-Level Waste Licensing Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301)427-4500.

SUPPLEMENTARY INFORMATION:

Introduction

The NRC is amending its regulations to provide specific requirements for licensing the land disposal of low level radioactive wastes containing source, special nuclear, or byproduct material. The amendments provide licensing procedures, performance objectives, and technical criteria for licensing facilities for the land disposal of radioactive waste. Specifically, the regulations establish performance objectives for land disposal of waste; technical requirements for the siting, design, operations, and closure activities for a near-surface disposal facility; technical requirements concerning the waste form that waste generators must meet for the land disposal of waste; classification of waste; institutional requirements; and administrative and procedural requirements for licensing a disposal facility. Amendments to other parts are established to govern the certification and use of shipping manifests to track waste shipments and clarify, but not substantially modify, the requirements of existing regulations. Provisions for consultation and participation in license reviews by State governments and Indian tribes are also included. Specific requirements for licensing facilities for the disposal of radioactive wastes other than high level waste by alternative land disposal methods will be proposed in subsequent rulemakings. Disposal of radioactive wastes by an individual licensee will continue to be governed by 10 CFR Part 20.

Background

On October 25, 1978, the Commission published an Advance Notice of Proposed Rulemaking (43 FR 49811) regarding the development of specific regulations for the disposal of low-level radioactive wastes (LLW). The development of these regulations was in response to needs and requests expressed by the public, the Congress, industry, the States, the Commission, and other Federal agencies for codification of regulations for the disposal of LLW. The respondents to the advance notice strongly supported the Commission's development of specific criteria and standards for the disposal of low-level waste. The comments received by the Commission on the advance notice were used by the Commission in scoping the form and content of the draft Environmental Impact Statement (EIS) (NUREG-0782) and the regulation.

On February 28, 1980, the Commission also published a Notice of Availability of a preliminary draft regulation, dated November 5, 1979, announcing availability of the draft for public review and comment (45 FR 13104). This was done to help ensure wide distribution and early public review and comment on the development of the rule. Copies of this draft regulation were distributed to all of the States.

During the summer and fall of 1980, the Commission also sponsored four regional workshops to provide an opportunity for open dialogue among representatives of the States, public interest groups, industry, and others on the issues to be addressed in the Part 61 rulemaking. These workshops were particularly useful in formulating our positions on the more judgmental aspects of the rule and underlying assumptions (such as the length of time we should assume that active governmental controls could reasonably be relied on).

Proposed 10 CFR Part 61 and conforming amendments were published on July 24, 1981 (46 FR 38081). The original comment period was due to expire October 22, 1981, but was extended to January 14, 1982 to coincide with the 90-day comment period for the supporting draft EIS (NUREG-0782). The availability of the draft EIS was announced on October 22, 1981 (46 FR 51776). The proposed rule was sent to all Commission licensees and copies were provided to Agreement State officials to distribute to their licensees.

Public comments were received on both the rule and draft EIS and may be examined at the Commission's Public Document Room (PDR) located at 1717 H Street NW., Washington, D.C. Comments on the rule are available at the PDR Docket No. PR-2 *et al.* (46 FR 38081). Comments on the draft EIS are available at the PDR referencing Docket No. PR-61 (46 FR 51776).

A total of 42 persons commented on the draft EIS. These commenters represented a variety of interests. Comments were received from 21 States, 8 industry/utilities, 8 Federal agencies/laboratories, 3 individuals and 2 broker/disposal firms. The comments generally raised or echoed the same issues raised concerning the rule except that some questions on the methodologies and presentation of results were raised. A detailed analysis of the comments on the draft EIS will be included as an appendix to the final EIS (NUREG-0945) which is being prepared[1]

Overview of Comments on 10 CFR Part 61

A total of 107 different persons submitted comments on the proposed 10 CFR Part 61. The commenters represented a variety in interests. Comments were received from: 19 industrial groups, 17 state groups, 15 individuals, 13 utilities, 9 federal agencies or laboratories, 6 universities, 4 medical groups, 4 engineering firms, 4 public interest groups, 4 professional organizations, 3 broker/disposal firms, 2

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OFFICE OF THE SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

U.S. NUCLEAR REGULATORY COMMISSION

In the Matter of Louisiana Energy Services, L.P.

Docket No. 70-3103-ML Official Exhibit No. NRS/ 2085

OFFERED by: Applicant/Licensee Intervenor NIRS/PC

NRC Staff Other ~~Makhijani/AH~~

IDENTIFIED on 10/25/05 Witness/Panel Makhijani

Action Taken: ADMITTED REJECTED WITHDRAWN

Reporter/Clerk Bethany Engel

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legal groups, 2 surety groups, and 5 others. Commenters offered from one to over 20 comments each. The topics addressed a wide range of issues and all parts of the rule.

The general response was quite favorable. Almost half (47) expressed explicit support of the rule or overall approach. Many of these commenters expressed some concern about one or a few specific provisions and most offered suggestions for improvements. Many expressed the view that the rule provides a needed and adequate framework for establishing additional low-level waste disposal capacity. The importance, reasonableness, and clarity of the rule were noted. Support was expressed by almost every sector.

Only 15 commenters expressed any outright opposition to the rule or some significant portion of the rule. Most were individuals. No state group or current disposal site operator expressed opposition. The opposition expressed appeared to stem from objections to nuclear power and use of radioactive materials, opposition to shallow land burial as a disposal method in general and for TRU wastes in particular, opposition to perceived increase in costs to waste generators, the regulatory burden of the licensing process, and the technical requirements in Subpart D of the proposed rule. Several of the commenters that expressed opposition offered suggestions for improving the rule, however.

Most of the remaining commenters (45) offered constructive comments without taking a general position on the rule, or offered support with reservations about one or more aspects of the rule.

All concerns expressed by all commenters are discussed in detail in a staff analysis of comments which is available in the PDR. Because the volume of comments and analysis in detail occupy several hundred pages, the following discussion summarizes and responds to all comments of major and generic significance. For example, comments on Part 61 standard provisions that are common to all Commission regulations are not discussed in this summary, but are covered in the document available in the PDR.

Summary of Comments for Proposed Part 61

Subpart A: General Provisions. A variety of comments were received that related to the scope of the rule. Two clarifying changes were made to make it clearer that uranium and thorium tailings as defined in Section 11e(2) of the Atomic Energy Act of 1954, as amended, are not subject to the requirements of Part 61, but are disposed of according to requirements in 10 CFR Part 40. In addition, clarifying changes were made to state that the requirements of Part 61 do not apply to persons who are licensed by an Agreement State pursuant to authority relinquished to that State by the Commission in accordance with Section 274 of the Atomic Energy Act of 1954, as amended.

Some commenters felt that provisions should be made for an individual to dispose of his or her own waste. Private waste disposal may be licensed under current provisions of 10 CFR Part 20. The Commission feels that these provisions are adequate and that no change to Part 61 to accommodate private disposal is warranted.

At least two State commenters asked about Agreement State requirements being compatible with Part 61. The Commission is preparing guidance for States that will consider Section 61.2, Definitions; Subpart C, Performance Objectives; Subpart D, Technical Requirements for Land Disposal Facilities; those portions of Subpart B that are necessary to implement the provisions of Subparts C and D; Section 20.311, Transfer for disposal and manifests; and that portion of Subpart E requiring closure funding arrangements as a matter of compatibility for the Agreement States. Guidance will identify those aspects where uniformity in desirable and those aspects where States would have flexibility in establishing their own requirements.

It was suggested that construction of a disposal facility should be permitted to begin before a license is issued. The Commission believes that to do so would have a detrimental effect on the decisionmaking process and therefore no change is being made to this provision.

In the proposed rule, near surface disposal was defined in § 61.2 and discussed in § 61.7 as disposal in the upper 15–20 meters of the earth's surface. Based on comments received, the wording could be misinterpreted to mean that disposal was allowed only between 15 and 20 meters or that deeper disposal was prohibited. The wording was clarified to make it consistent with the waste classification requirements. (Class A and B wastes have no minimum depth requirement and Class C wastes have a 5 meter depth requirement when relying on depth alone.) Disposal at a depth greater than 5 meters would also be acceptable.

Subpart B: Licenses. Comments received on Subpart B covered a wide range of issues. Many were concerned with clarification and intent. There were, however, several issues that were more substantive and addressed by a large group of commenters.

Several commenters were concerned that the language in several places required the applicant to demonstrate in the application that certain objectives were met. Their concerns were over what would constitute a demonstration and the impossibility of meeting an objective with complete certainty as implied by the language in the rule. The Commission agrees with these commenters and changes have been made in appropriate places to indicate that what the Commission wants is information or analyses that will provide reasonable assurance that the objective or requirement will be met. Other minor changes were made for purposes of clarification.

An advisory statement in § 61.13 that the ground water pathway was generally the most significant for near surface disposal, in terms of releases of radioactivity, was deleted. This section requires an analysis of all potential pathways and two commentators objected to singling out ground water.

Several commenters expressed concern over the length of time that the licensing process might take and suggested limits be established in the regulations. The Commission does not believe that this is practicable, considering the uncertainties in predicting the quality of future applications, the availability of staff resources at critical times, and the potential for hearings. The licensing process must be in accordance with the Commission's mission to protect public health and safety but the Commission does agree that the licensing process must be carried out in the minimum amount of time consistent with this mission. Some changes in the procedural aspects of the rule are being made with this in mind (see comments, Subpart F). The Commission staff is developing technical positions to assist applicants in preparing their applications and is developing performance assessment capabilities that will enable the staff to perform timely reviews.

Nine commenters addressed the language in § 61.25 that prevents the licensee from making any changes in the facility or procedures described in the application except as provided for in specific license conditions. The commenters felt that this was unnecessarily restrictive, in that there may be aspects of the facility or procedures that were described in the application, but which are not important to public health and safety and the

licensee should be free to change them. The Commission agrees, since it was not intended that all changes be subject to Commission review or approval, only those important to public health and safety. Section 61.25 is changed accordingly.

Over a dozen commenters raised objections to the requirement that the license be renewed on the usual five-year interval with a concomitant public notice on the opportunity to request a public hearing. The dominant reason for these objections is the burden that is perceived if public hearings were held every five years at the time of license renewal. The Commission believes that a periodic reassessment by the licensee and the Commission staff is necessary. This reassessment should factor in the past operating experiences of the disposal facility, the results of monitoring data, changing economic conditions that might affect financial assurances, advances in technology, etc. While there are alternatives to license renewal in order to ensure these periodic reappraisals, the Commission has found through its experience that periodic license renewal is the most effective method. As for the public notice of the renewal and the notice of opportunity to request a public hearing, the Commission agrees that this is not necessary and it has been deleted. Deleting this requirement will not have an adverse effect on the public's interest and rights. According to revised § 61.25, any changes to the license conditions from a license renewal process would be subject to notice and opportunity to request hearings if the conditions were in the highest category specified in that section (paragraph 61.25(a)(1)).

Two commenters suggested not subjecting the licensee to an opportunity for hearings at the time of site closure. The Commission believes that this is an important and worthwhile time to provide for public participation. No changes were made.

While none of the commenters took exception with the need for a period of post-closure observation and maintenance by the licensee, a number did object to the open-endedness of the requirements that this period be for "a minimum of five years." This provision has been changed to state that the period will normally be five years, but that shorter or longer periods may be approved by the Commission in connection with the approval of the site closure plan for a specific site.

Several commenters, including Chem-Nuclear Systems, Inc., and U.S. Ecology, the operators of the existing disposal facilities, were concerned about possible delays in transfer of the license to the site owner at the end of the post-closure observation period. They foresee the possibility of more stringent requirements being imposed at this time, thereby delaying the transfer with an adverse effect on the ability of the licensee to effect proper closure due to changes beyond the financial requirements initially established. The Commission recognizes this possibility, but it is beyond the Commission's authority to control or regulate the site owner and force the transfer to take place. Any requirements for transfer that are outside the public health and safety considerations prescribed by Part 61 became a matter of contract or agreement between the site owner and the site operator. With the Low Level Radioactive Waste Policy Act laying the responsibility for disposal of low level waste on the States, it is obvious that the States will play an increasingly important role. State authorities, who in all likelihood will be the site owners, should become active participants in the disposal activities from the earliest stages of development through site closure and stabilization so that at the time of site transfer to them for institutional control, there are no unforeseen obstacles to the orderly and timely transfer. Part 61 provides for this participation in the licensing process, and as landlord, there are other avenues of participation.

Subpart C: Performance Objectives. A dozen commenters addressed the approach taken in Part 61 to establish performance objectives supplemented by some minimum technical requirements. All commenters except three supported the approach of addressing disposal from an overall systems standpoint, i.e., establishing overall performance objectives and minimum technical requirements and leaving considerable flexibility on how an applicant or licensee would design and operate a site. Of the three who disagreed, one felt that the concern for public health and safety is so great that the rule should be based on prescriptive requirements; one felt that there should be no technical requirements in the rule, only performance objectives; and the third felt that the rule is restrictive by establishing both performance objectives and technical requirements. On balance, the comments were judged to be supportive of the mix of objectives and requirements and no changes have been made in this regard.

One commenter challenged the performance objectives in Part 61 as being premature in advance of relevant EPA standards and beyond the agency's authority to the extent that they are not already embodied in 10 CFR Part 20 and that they are unduly stringent and unsupported. With respect to this comment, EPA, under its ambient environmental standards setting authority assigned by Reorganization Plan No. 3 of 1970 has the authority to prepare a standard that will set limits for releases of radioactivity to the general environment from disposal facilities. Presently there is no such EPA standard. In the absence of such a standard, the Commission examined a range of limits which bound that expected for the EPA standard and selected a proposed performance objective that establishes a release limit for the site boundary, a regulatory action within the limits of NRC authority. In a rulemaking action, the Commission is not solely limited to existing standards in Part 20 and the Commission does not intend to withdraw any portion of the rule that may be related to the performance objectives.

With regard to the specific performance objective for releases to the environment, the Environmental Protection Agency commented that the establishment of an individual exposure limit at the site boundary for releases as proposed in § 61.41 is appropriate. They stated that the range of 1 to 25 mrem/yr analyzed by the Commission was a reasonable range that should encompass any standard which EPA might derive for low level waste disposal facilities. Based on the Commission's analysis, NRC does not anticipate any need to change the technical requirements of Part 61 to meet a future EPA standard. In their comments, EPA stated their opinion that it was inappropriate to apply the EPA drinking water standard as proposed in § 61.41. Accordingly, this part of the performance objective has been deleted. However, this does not diminish the Commission's concern over protecting sources of drinking water. The Commission will assess the potential impact on drinking water supplies as part of its licensing review.

Reaction to the proposed performance objective to protect potential inadvertent intruders was mixed. There were some who felt the proposed 500 mrem whole body dose to the intruder was too high, some felt that it was the right value for a standard, and others felt that higher values were in order. Those that felt that the standard should be higher suggested values of 5 rem or 25 rem (the Department of Energy) to correspond to limits for occupational exposure or one-time exposures to workers from potential accidents. A number of commenters, in their comments about considering the

probability that intrusion will occur, expressed concern about weighting too heavily the protection against inadvertent intrusion in determining disposal requirements for waste. Based on these comments, the Commission believes that the primary concern of those who feel that the intruder protection objective is too restrictive is the effect that this has on the concentrations of certain nuclides that are acceptable for disposal in a near surface facility and the need to meet additional requirements such as stability for some wastes. With this in mind, and in response to other comments, the Commission has reevaluated the calculations that establish the waste classification concentration limits to eliminate unnecessarily conservative assumptions with the result that the analysis is more realistic and the limits for several important isotopes have been raised. With this action, the Commission believes that most of the concerns of those who encouraged higher exposure limits or less emphasis on protection of intruders will have been met.

With respect to those who suggested that lower limits would be appropriate, there were no compelling arguments or technical demonstrations presented that persuaded the Commission to lower the dose limit for intruders.

The EPA recommended that the 500 mrem dose limit be deleted from the performance objective, since the licensee would not be able to monitor or demostrate compliance with a specific dose limit that applies to an event that might occur hundreds of years from now. They did recommend use of the 500 mrem whole body dose limit coupled with ALARA as the basis for determining the concentration limits in Table 1 of Part 61. The 500 mrem dose limit has been deleted from the performance objective but retained as the basis of the waste classification limits.

Comments were offered that more emphasis should be placed on requirements, such as the use of durable monuments to warn potential intruders. This concept is incorporated in the regulation.

Acts of terrorism and sabotage were identified as possible intrusion problems and suggestions were made for protecting against such acts. The Commission does not feel that the likelihood of such events or the magnitude of the effects of such acts are sufficient to warrant requirements in this regard.

EPA asked for a clarification of the intent of the performance objective in § 61.43 as it pertains to effluents from the site. This performance objective states that operations at the land disposal facility must be conducted in compliance with the standards for radiation protection set out in Part 20. Part 20 contains standards for concentrations of radioisotopes in air and water released from a licensed facility. Section 61.41 sets forth limits on concentrations of radioisotopes released from a land disposal facility which are lower than those in Part 20. It is the Commission's intent that the provisions of Part 20 will apply to all aspects of radiation protection during operation except for releases of radioactivity from the site which will be governed by the more stringent requirements of § 61.41. The rule has been modified to clarify this point.

Commenters pointed out a need to be clearer in the rule on how the principle of maintaining radiation exposures to a level that is as low as reasonably achievable (ALARA) will be handled. The Commission intends that the ALARA principle apply to the performance objectives for long-term environmental release and protection of individuals during site operations. It cannot apply to the intruder performance objective, since Part 61 sets out the requirements for protection and intrusion which is beyond the disposal facility licensee's control. Appropriate changes have been made in §§ 61.41 and 61.43 to reflect the ALARA principle.

Subpart D: § 61.50, Disposal Site Suitability for Near-Surface Disposal. Approximately two dozen commenters offered comments on various aspects of § 61.50, addressing disposal site suitability requirements. These comments address eight subject areas which are discussed below.

Eight comments were received on the requirement that the disposal site shall be capable of being characterized, modeled, analyzed, and monitored. The comments were directed to the perceived vagueness of the requirement, i.e., what does it mean to be capable of being characterized, modeled, analyzed, and monitored? Some commenters offered suggested rewording or examples. The Commission has issued a staff technical position (NUREG-0902) that provides interpretation and explanation of the meaning and intent of this requirement. In the technical position, it is explained that the site characteristics must be such that limited site characterization can adequately define the site characteristics spatially across the disposal site and that site characteristics should vary with a sufficiently narrow range so that the input to modeling is representative of the hydrogeologic units and the assumptions underlying the modeling are valid. Further, natural processes affecting the disposal site should be occurring at a consistent and definable rate such that the modeling of the site will represent both present and anticipatable site conditions after closure. Finally, site characteristics must be such that a reasonable number of monitoring points can adequately describe the extent to which radionuclides have migrated from the waste disposal units. In addition, the Commission's staff is developing an in-house modeling capability and will share that capability through pre-qualification of prospective computer codes. The Commission believes that a concise statement in the rule along with guidance on these subjects provided by technical position papers and Regulatory Guides is appropriate.

Several aspects related to ground water were addressed in the comments. Three commenters (Ontario Hydro, the Department of Interior, and the Department of Energy) endorsed the provision in § 61.50(a)(7) that permits disposal below the water table where diffusion dominated the ground water flow system.

The Department of Interior recommended using the term, "molecular diffusion" and both they and Ontario Hydro suggested specifying a limit for soil hydraulic conductivity of less than 10^{-6} cm/sec, as appropriate. There were several commenters who disagreed with this provision and recommended total containment or some minimum depth to the water table.

The Commission envisions a site that would satisfy the exception in section 61.50(a)(7) as one with an inactive flow system so that the water which would contact the wastes would move on the order of less than one foot per year. Given the low hydraulic conductivity and effective porosity of the soils, very little water would actually contact the waste or flow from the disposal units. The travel time will result in sufficient reduction of concentration of the small amounts released and fine-grained soils will typically provide significant attenuation for most radionuclides. No change has been made to this provision of the rule.

Several commenters suggested requirements on retardation properties for soils, both impervious and porous. One suggested a leachate collection and treatment system for the impervious soils. The Commission does not consider it appropriate to set forth specific values for characteristics which promote attenuation of radionuclides. Whereas attenuation is advantageous for some radionuclides, others such as H-3, C-14,

and I-129 may not be significantly attenuated. The Commission believes that reliance should be placed on siting requirements which will keep water away from wastes, result in low volumes of contaminated water being released, and provide a long travel time for decay. The Commission takes exception to any design which relies on a leachate collection and treatment system to reduce migration. Such a design is expected to result in a requirement for continued active site maintenance, therefore violating the performance objective in § 61.44.

Several comments recommended that the natural resources considered under § 61.50(a)(4) specifically include ground water and aquifers underlying the site, and that the resources of significance were not limited to "economic" significance. Another suggested that the resources be "known" resources so that the applicant would not have to engage in an extensive exploration program to assure that there were no significant natural resources. The Commission considers ground water and aquifers to be natural resources in the context of this requirement. The Commission also agrees that it should not be necessary to conduct extensive exploration studies to prove that no resources exist. Several changes have been made in the sections relating to ground water to reflect these comments.

Commenters raised four questions on the siting requirements related to surface water drainage. These can be summarized as (1) definition of certain terms such as *upstream drainage areas, coastal high-hazard area* and *wetland*, (2) the adequacy of the exclusion of waste disposal based on the 100-year floodplain; (3) whether engineering drainage modifications can be made in order to meet the requirements; and (4) the vagueness of some terms.

With respect to the terms "coastal high-hazard area" and "wetland," these are defined in Executive Order 11988 (42 FR 26951, May 25, 1977), *Floodplain Management Guidelines* which is noted in the rule. The term "upstream drainage area" can be defined in conventional hydrologic terms as all the land surface which drains, either by channel flow or sheetwash, across the disposal facility.

The 100-year floodplain is that land which would be inundated by a flood having a 1 in 100 chance of occurring in any particular year. The Commission feels the major hazard due to flooding is associated with the period of site operations when disposal units are open. Because of other provisions of the rule, the disposal units will be open a comparatively short time. Once closed, the covers and site drainage system will provide protection against the effects of flooding. The Commission considers 300 or 500-year floodplains to be unnecessarily restrictive; and questions whether an adequate data base or standard methods of determining such floodplains exist.

The question on engineering modifications will be addressed more fully in staff technical positions related to site suitability, selection and characterization and to site design and operations. Engineering features may be used to improve site drainage and protect against flooding during operations.

With respect to the vagueness, or non-prescriptive, nature of the requirements, the Commission considers the siting requirements as site screening tools which will be met in most cases and which, if not met fully, would require a site-specific evaluation to determine whether an exemption is warranted. The Commission finds this preferable to treating more prescriptive siting requirements as exclusionary.

Minor changes of a clarifying nature have been made to the requirements related to flooding.

Several commenters suggested that radioactive waste disposal facilities could be colocated with hazardous waste disposal facilities. The Commission does not object to this as long as the facilities are separated from one another and the wastes are not commingled. The provisions of § 61.50 pertaining to nearby facilities not adversely impacting the ability of the site to meet the performance objectives or significantly masking the environmental monitoring program would have to be met.

Several commenters raised the question of relevance of seismic or volcanic hazards to low level waste disposal, given the orders of magnitude difference between the time frames for those geologic phenomena and the hazard of the low-level wastes. Concern was also expressed that certain areas, such as California, would have all potential sites eliminated by the requirement to avoid seismic areas.

The requirement, as written, provides the Commission a mechanism for site specific evaluation of such factors as recurrence intervals, probabilities, liquefaction potential, and ground accelerations to compare against a long-term (500-year) radiological hazard and the disposal requirements of Part 61. This minimum technical requirement would not arbitrarily eliminate potential sites so much as it would provide a site screening test which will be met in most cases and will mandate a thorough evaluation of site performance in areas of known tectonic hazards.

Several persons commented on the reliability of long term projections of population growth. The Commission recognizes such projections have a degree of uncertainty. Part of the staff review of any projection focuses on this uncertainty and how it has been handled by the applicant. Previous experience with commercial low-level disposal sites illustrate that suitable sites can reasonably be found in areas of low population density and minimal population growth potential.

Two commenters suggested a siting requirement based on accessibility to major transportation routes. This issue becomes a consideration in site selection and the evaluation of alternatives required under NEPA and is not necessary in the rule.

Individual comments were received suggesting siting requirements related to mechanical and physical properties of soils to make them suitable for compaction and supporting construction equipment, and requirements to avoid areas of high natural radioactivity. Changes to the rule were not deemed necessary. The mechanical and physical characteristics of soils are factors to be addressed in the site design and operations in order to meet stabilization requirements and objectives. With respect to areas of high natural radioactivity, these areas would be excluded if they could be shown to violate the ability to carry out a monitoring program. Otherwise, the Commission sees no valid reason for excluding these areas.

Several commenters raised the general question of the length of time the various siting or design requirements have to be satisfied. Others requested that the design basis natural events or phenomena be identified and that the length of time for consideration associated with these be stated.

The siting, design, and waste form requirements relate to both stability of the disposal site and control of releases within acceptable limits. Reliance must be placed for a longer time on the site since the waste form and design features will decrease in effectiveness over time. Therefore, each of the siting requirements should be considered applicable over the indefinite future and should be evaluated for at least a 500-year time frame. A 500-year time frame for design basis natural events or phenomena should also be applied.

Subpart D: § 61.51, Disposal Site Design for Land Disposal. Five commenters objected to the absoluteness of the requirements in

§ 61.51 relative to preventing infiltration and eliminating the contact of water with waste. Comments were also expressed requesting preferential consideration be given to progressive slope design for burial and concern was expressed that the rule does not provide specific guidance for engineered features. Commenters also expressed concern that site areas used for disposal of Class A waste will require more maintenance

The requirements referred to are expressed as design objectives. Given that these are design objectives, the actual achievement will be to minimize, rather than absolutely prevent or eliminate. The achievement level should be as near the design objectives as is practicable. The wording of these paragraphs has been changed to reflect this. With respect to progressive slope design for burial, the regulation does not specify the type of disposal unit. The site designer should give particular attention to the design of that portion of the facility used for the disposal of Class A wastes so that the inherently unstable Class A wastes will not interfere with the long-term stability of the site.

Four commenters recommended that warning signs or permanent identification monuments be employed as a deterrent to inadvertent intrusion Several suggested a design lifetime of 500 years for such markers.

Although there are few "signs" in the traditional sense that have design lives approaching 500 years, the Commission would consider such things as granite monuments near the survey marker control points as an appropriate adjunct to the physical intruder barriers employed in the disposal of the waste. A change to the rule has been made to require such monuments at the time the license is terminated.

Subpart D: § 61.52. Land Disposal Facility Operation and Disposal Site Closure. There were several issues related to facility operation and site closure identified by about thirty commenters. A half dozen commenters raised questions with respect to the requirement that Class A waste be segregated from other classes of waste. Questions also addressed the need for segregation during transportation, the meaning and intent of the term "interaction," and the need for segregation in arid sites.

The intent of the rule is not to prohibit waste from more than one class from being shipped on the same transport vehicle. Consistent with appropriate transportation regulations, the Commission has no objection to commingling different classes of waste in transport.

In identifying the need to clarify the term "interaction," the commenters noted that it was vague and unenforceable, could include migration, and could be physical or chemical interaction.

The intent of the rule is to protect Class B and C wastes. Class A wastes could interact with other wastes directly through the release of absorbed liquids, solvents, or other mobile components that might be present in Class A waste. Indirect interaction could result from degradation of Class A waste and its lack of stability. Consolidation of Class A wastes would provide a less stable support which could contribute to failure of the disposal unit cover leading to increased precipitation infiltration and surface water intrusion. The degree to which these interactions could occur depends to a large extent on site specific characteristics and the Commission does not believe that it is appropriate to set a prescriptive requirement in this area in the rule. The wording of this requirement has been changed to define the purpose for the segregation and minimization of interaction between the segregated wastes. The rule also permits Class A waste that meets the stability requirements to be placed with Class B and C wastes.

The State of Washington regulates the disposal site located in an arid region near Richland, Washington. The State noted that without the likelihood of ground water or surface water being factors at arid sites, segregation of Class A wastes seems to be unnecessary. They also noted that commingling Class A and B wastes would dilute the Class B wastes and have potential benefit.

The State's observations may have merit for arid sites but are difficult to adopt in a rule that must address sites located in all parts of the country. The Commission anticipated the need to consider alternative disposal requirements and included § 61.54, "Alternative requirements for design and operations" to provide for consideration of such alternatives.

A number of commenters noted that factors other than waste form play a role in assuring the stability of the site. In the area of site operations, these factors are identified as the way in which waste is emplaced and the filling of voids in between waste packages after emplacement. Several pointed out the stability problems (slumping, etc.) that could still be associated with disposal units containing the segregated and unstable Class A waste. A number of commenters objected to the requirement that wastes must be emplaced in an orderly manner because of perceived increased exposures. The requirement that was proposed in paragraph (4) of § 61.52(a) was intended to assure that the placement of packages into a disposal unit did not destroy the integrity of the package in order to minimize the possibility of releases of contamination, and also to minimize the void spaces between packages so that this would not be a contributor to site instability. It has been a common practice at waste disposal facilities to dump some wastes over the edge of a disposal trench with the packages falling and tumbling to the trench bottom where they ended up a random arrangement. This practice jeopardizes package integrity and does not permit access to voids between packages so that they could be backfilled. The assumption by the commenters that orderly emplacement necessitates increased handling by site operators with resultant higher radiation exposures is not necessarily the case. Lifting and stacking devices are currently in use for low level waste disposal that permit remote lifting and emplacement in the disposal trench without increased occupational exposure. The resulting emplacement meets the intent of protection of packaging integrity and access to void spaces. Since the term "orderly" was subject to misinterpretation, the requirement has been rewritten to remove the term and to specify the objectives of emplacement.

Six commenters addressed the requirement for maintaining a buffer zone of at least 100 feet. These comments generally supported the concept and purposes of a buffer zone but questioned whether the specified 100 feet was sufficient. The Department of the Interior suggested that the buffer zone should be three dimensional to include some distance below the disposal site.

In response to these comments, the Commission has restated the requirement in terms of the objective to carry out monitoring activities and take mitigative measures if needed, and has made the buffer zone three dimensional.

Several persons commented on the need to conduct ancillary activities at the disposal facility such as storage, waste treatment, truck terminals, etc. Concern was expressed over the language in § 61.51(a)(7) that would seem to preclude such activities. Others felt that provisions should be made in Part 61 for the description and licensing of such activities.

The provision of § 61.51 that caused the concern was that the disposal site shall be used exclusively for the disposal of radioactive wastes. The

intent of this provision was to prevent the disposal of wastes such as toxic or hazardous chemicals which do not contain radioactive material at the facility. It was not intended, as could easily be inferred from the way the requirement was worded, that disposal is the only activity that could take place. Corrective word changes have been made to clarify this. The purpose of Part 61 is to specify the regulatory requirements for the disposal of radioactive waste. Existing requirements in Parts 30, 40, 70, *et al.*, would govern the licensing of other activities involving licensed radioactive materials, such as waste treatment or storage.

Several comments questioned the meaning of the term "a few percent above background" as applied to the requirement that limits radiation levels at the surface of the disposal unit cover. Some suggested values from as low as 1 percent of background to as high as 1 mrem/hour (about 5,000 percent of background). One commenter suggested that the radiation limit should not be confined to gamma radiation, but should be expressed as a dose rate to include other types of radiation.

The rules in Part 20 contain provisions for permissible levels of radiation in unrestricted areas in § 20.105. The Commission considers these to be appropriate for application at the time that the disposal facility license is transferred to the site owner for the period of institutional control. Although access to the site will be controlled to prevent inadvertent intrusion and the site could be viewed as a restricted area, the Commission believes it is not proper to consider those who do have access, such as caretakers and site maintenance personnel, as radiation workers who could receive much higher occupational exposures. Therefore, § 61.52(a)(6) has been changed to reflect the Part 20 unrestricted limits.

A number of other individual comments and suggestions were considered and were addressed in the detailed analysis of comments. Some clarifying changes were made to the rule as a result.

Subpart D: § 61.53. Environmental Monitoring. Only nine commenters addressed the provisions for environmental monitoring. One commenter observed that analyses of release pathways should be conducted so that they may be validated by data acquired from subsequent monitoring, a point with which the Commission agrees. Two comments addressed the 12-month preoperational monitoring requirement: one thought it too long, the other too short. While a one-year period of site specific data may not provide the range of fluctuations in data expected over a longer period, the site specific data can be augmented by reconnaissance level data or regional data that can be correlated with the site-specific data. These activities should be started early enough in the site development process that they do not interfere with a timely submittal of an application. Additional data may be obtained as the licensing process continues which can be used to update the application.

It was noted that the environmental monitoring requirements are not detailed or specific and at least one commenter suggested that highly detailed prescriptive requirements be set forth. Because of the wide variety of site-specific conditions, and a desire to avoid overly prescriptive requirements in Part 61, the Commission does not feel that this suggestion is practicable. A Branch Technical Position on Monitoring is being prepared and will provide additional guidance.

It was pointed out that one important purpose of a monitoring system is to provide early warning of migration of radionuclides from the disposal site before they leave the site boundary. The Commission agrees, and has made a clarifying change to that effect.

The Department of Interior recommended that "geochemistry" be added to the site characteristics to be studied. This has been done.

Subpart D: § 61.55. Waste Classification. Over half of the commenters on Part 61 offered comments on one aspect or another of the waste classification provisions. Nearly 20 different issues were identified and addressed in the staff's detailed analysis of comments. In general, there was support for the concept of identifying wastes that were generally acceptable for near-surface disposal and further dividing this general category into more specific classes. Most of the comments were related to understanding how these categories were established and the basis for them; support for further identifying a class of waste that would not be of any regulatory concern because of its low radioactivity, i.e., a "de minimis" level; what should the upper limits be particularly for certain radioisotopes such as the transuranic elements; what provisions will be made for disposal of waste that exceed the limits for near-surface disposal; and how does a waste generator show compliance with the waste classification requirements. There were a large number of comments requesting clarification and restructuring of the requirements to make them more understandable, as well as a number of miscellaneous comments.

With respect to those comments that the numbers used to define waste classification were not adequately explained or supported in Part 61, it should be noted that most such comments were submitted before the supporting Draft Environmental Impact Statement (DEIS) for Part 61 became generally available. Since a considerable part of the DEIS is devoted to the derivation of the waste classification numbers, the Commission does not feel that the basis needs to be repeated in detail in the rule. The Commission is preparing an analysis of the comments received on the DEIS and these comments will be factored into the final EIS to make the basis for waste classification values more understandable. Other commenters on the numerical values suggested the use of values reported in an earlier NRC contractor document, NUREG/CR-1005. The present waste classification scheme proposed in Part 61 drew on this and other earlier work; however, the earlier approaches to waste classification did not consider the effects of stability or waste form.

Table 1 Proposed values for several radionuclides that were the same value regardless of the class of waste. This has lead to some confusion and misunderstanding. In the disposal of wastes, precautions are taken to provide protection against intrusion for the first several hundred years. These precautions include institutional controls, waste form requirements, and intruder barriers. There are certain radionuclides common to waste that are of such a long half-life that they will be present several hundred years from now in essentially the same concentration as when they were originally disposed. Therefore, the rule limits the initial concentrations of these radionuclides to values that will be acceptable after several hundred years when the intrusion protection measures are not considered to be effective.

Over one fourth of all commenters endorsed the concept of setting levels for wastes below which there is no regulatory concern, the so-called "de minimis" level. Some of the commenters supporting the de minimis concept made direct reference to the Commission's position that exempting particular waste streams from compliance with the Part 61 regulations was preferable to setting generic levels for all isotopes. Several disagreed with this position, although at least one of these commenters remarked that as there is not yet a consensus on a

generic de minimis level, any level chosen would be premature. A number of other commenters suggested that a de minimis classification be added to the Part 61 regulations, perhaps as an additional column in Table 1.

Several commenters suggested that NRC permit case-by-case review of requests for specific application of the de minimis concept during the period criteria are being developed. Others suggested specific values for specific waste streams or radioisotopes.

The fundamental concern of practicially all commenters was not as much whether a generic or a case-by-case approach be taken, but rather that action to develop de minimis standard should be taken as soon as possible.

The Commission agrees with the importance of setting timely standards for disposal of certain wastes by less restrictive means. The Commission agrees with the commenters that establishment of such de minimis levels would reduce costs of disposal for many licensees and would also conserve space in disposal facilities which are otherwise designed for wastes having much higher activities. The Commission also believes that establishment of de minimis levels is important in enhancing overall stability of a disposal facility, and therefore in reducing potential long-term site maintenance and corresponding costs, since de minimis levels would reduce the volume of Class A waste. This would also tend to reduce ground water migration impacts, since subsidence and water infiltration would be reduced.

Regarding the issue of setting de minimis levels on a generic or on a case-by-case basis, the Commission still believes that the current policy of examining waste streams on a case-by-case basis will result in the quickest and best results. It is recognized that setting generic limits may be a desirable goal, and the Commission Plans to work this goal over the next few years. Meanwhile, the Commission believes that the process of examining a few specific waste streams will facilitate the development of generic requirements and is accelerating its efforts on setting standards for disposal of wastes by less restrictive means. In this regard, the Commission staff is willing to accept petitions for rulemaking from licensees, licensee organizations, or others for declaring certain waste streams to be of no regulatory concern. Such petitions should provide at least the following information:

- A description of the process by which the waste is generated;
- A description of the waste generated, including chemical characteristics;
- The radionuclide content of the waste, including principal as well as trace contaminants;
- A description of the potential change in the radionuclide content as a function of process variations;
- A description of the process control and quality control programs by which the licensee would ensure compliance.

Waste streams common to a number of licensees and in which the radionuclide content is well known and relatively nonvarient are generally preferred. Individual licensees may also continue to request amendments for alternative disposal methods for the licensee's own waste pursuant to § 20.302.

Of all the values proposed in Table 1, the limits for contamination by alpha emitting transuranic elements received the most attention and comments. There were a number of issues raised related to the allowable concentration, ranging from its validity to the impacts of meeting the limit. By far the most comments were related to the magnitude of the limit. Of the 23 commenters on the transuranic issue, four thought the 10 nCi/gm limit should be retained or lowered, while the remaining 19 suggested that the limit be raised. Those who suggested that the limit be raised presented a number of supporting arguments. Many, if not most, of the commenters suggested that the limit could be safely raised to 100 nCi/gm. One argument given is the advantage of enforceability of the higher limit. With current measurement techniques, it is argued that it is very difficult if not impossible to certify that waste contains less than 10 nCi/gm, but much less difficult to certify that it is less than 100 nCi/gm. Others pointed out that a 100 nCi/gm limit would encourage volume reduction through incineration and other means while conversely, the 10 nCi/gm limit would discourage volume reduction, contrary to the Commission's policy on volume reduction. The commenters cited a number of reports, documents, and ongoing activities as providing justification for their contentions, including a proposed revision to the Department of Energy Manual Chapter 0511. Some commenters felt that the Commission's calculations were excessively conservative. The most common comment in this regard was that the analysis did not consider dilution by other wastes, and if that dilution were considered, the allowable concentration could be increased by an order of magnitude or more.

The commenters that supported the 10 nCi/gm limit or did not want it raised generally made statements of endorsement for the value because of prior use or because of the view that wastes exceeding this limit should not be buried at commercial low-level waste disposal sites. Concern in this regard was also expressed over the provision in § 61.58 that the Commission could, on a case-by-case basis, grant exemptions to the waste classification requirement, thereby permitting disposal of higher concentrations of transuranic radionuclides.

In response to these comments, the Commission has reevaluated the analyses for disposal of waste containing transuranic nuclides, in an attempt to temper unnecessarily conservative assumptions, such as not considering the dilution by other wastes that decay to essentially inert levels with time, so that more realistic estimates of consequences will result. As a result, disposal limits for Class C waste have been raised to 100 nCi/gm for long lived alpha emitting transuranic nuclides. For Class A wastes, the limit remains at 10 nCi/gm. The details and results of these analyses are presented in the Final Environmental Statement supporting Part 61.

Several commenters wanted to know what to do with waste containing Radium-226, a radioisotope which is not currently listed. It appears that there are two types of radium wastes to be considered: (1) small concentrated sources of radium such as radiation sources or luminescent dials, and (2) wastes which contain small amounts of radium incidental to other radioisotopes, such as radium contained in wastes from uranium separation processes. The former is not subject to regulation by the Commission, since radium is a naturally-occurring isotope and is not included in the provisions of the Atomic Energy Act of 1954, as amended. The Environmental Protection Agency has a program for collection of radium sources. This program may be phased out in the next few years. Such sources are expected to be transferred to the Department of Energy for storage and disposal. As for radium incidental to other types of waste, the Commission has made provisions for disposal of small quantities of uranium tailings as Class A waste. For purposes of this provision, a small quantity is defined as 10,000 kilograms containing not more than 5 millicuries of radium-226. This concentration is typical of uranium mill tailings (0.5 nanocuries per gram). The quantity of radium-226 is that contained in 150 pounds of natural uranium at

equilibrium with its daughter products. 10 CFR Part 40 permits any person to possess and use under general license 150 pounds of source material per year. Permitting the disposal of such a quantity in a near-future disposal facility is judged to be acceptable. For larger amounts, specific approval would be required.

Several commenters expressed concern with a footnote in Table 1 and § 61.55(d) which indicate that greater concentrations than Class C limits may be determined to be acceptable for near-surface disposal under certain conditions. Commenters were either opposed to permitting any higher concentrations or asked for clarification of what the requirements would be for higher concentrations.

The Commission established the Class C limits using the performance objectives as criteria to ensure safe disposal of waste considering the degree of protection provided by "normal" near-surface disposal. To ensure that the performance objectives are met, disposal of higher concentrations of isotopes than those listed in Table 1 would have to be by disposal technologies having greater confinement capacity or protection than "normal" near-surface disposal. Such improved disposal technologies could, depending on the particular radioisotopes, involve better waste forms or packaging, or disposal by methods having additional barriers against intrusion (e.g., burial at depths greater than 5 meters). The Commission believes that some flexibility should be permitted, provided the performance objectives are met, and therefore will evaluate exceptions on a case-by-case basis. In the meantime, the Commission is beginning studies to establish criteria for the disposal of wastes that are not normally suited for near-surface disposal. These would be the subject of future rulemaking.

Over one dozen commenters, nearly all of which were nuclear utilities or industry groups, expressed concern with how one determines compliance with the waste classification requirements. Most were concerned that the regulations would require them to routinely measure for every isotope in Table 1 within each package of waste. Many examples were given of the difficulty that this would present, citing heterogeneous waste mixtures, difficult to measure radioisotopes, increased costs, radiation exposures to personnel, etc. A number of suggestions were offered related to means of classifying the waste by its source, measuring key isotopes to infer quantities of more difficult-to-measure isotopes, and establishing different limits for every disposal site.

The Commission expects licensees to carry out individual programs to assure proper classification of waste. However, the Commission does not feel that detailed measurements routinely made on all waste packages are necessary or desirable. The Commission staff is developing guidance to licensees on a number of alternative methods by which compliance can be shown. At present, the Commission staff has identified four basic programs which may be used either individually or in combination by licensees. They are: materials accountability; classification by source; gross radioactivity measurements; and direct measurement of individual radionuclides including scaling some radionuclides based upon measurement of others. These methods are discussed in the Branch Technical Position on Waste Classification being prepared.

Several commenters also raised the issue of averaging concentrations to comply with the concentration limits. One expressed concern about the potential for concentrated or "hot spots" of transuranic nuclides permitted under the proposed provision to allow concentrations to be averaged over the volume of the package. Since the trace transuranic nuclides in most shipments will be homogeneously distributed and incidental to the total activity, averaging over the packages is physically representative of the majority of wastes. Reprocessing or other future changes in waste streams which might change the transuranic character of the waste can be addressed in subsequent rule changes. Other commenters were concerned about potential ground water restricted inventory limits on radionuclides which are present in wastes in very low concentrations. Assay of individual packages for these nuclides is difficult as discussed in the preceding paragraph. Averaging the concentration of radionuclides such as Tc-99 or I-129 over the waste shipment or control on a total site inventory basis was suggested to minimize conservative over-reporting. Such over-reporting could exhaust site inventory limits and lead to inefficient use of the site. The Commission agrees. This issue will also be addressed in the Branch Technical Position on Waste Classification which will be available in early 1983. The concentration averaging language in the final rule was changed to provide additional flexibility for the specific guidance being developed in the Branch Technical Position.

In a related issue, a few commenters remarked on the difficulty of inspection and enforcement to ensure compliance with the Part 61 requirements, citing past history of waste shippers not complying with the present DOT and NRC shipping requirements.

The Commission has recognized the importance of increasing inspection and enforcement activities in the processing, packaging, and transportation of waste. A number of programs have been initiated to improve compliance. At the present time, enforcement comes largely on the basis of provisions in the existing regulations (e.g., 10 CFR Parts 30, 40, and 70) that no licensee may transfer licensed material to another person unless that person is properly licensed to receive it. Requirements on waste form, concentrations, etc., are a part of the disposal site licensee's license. The Commission believes that issuing regulations to which all waste generators and disposal site operators would be subject will give the Commission a stronger basis for inspection and enforcement. Adoption of uniform requirements by Agreement States will greatly bolster the effectiveness of a national system of inspection and enforcement.

There were several commenters who argued that the waste classification scheme tends to discourage volume reduction, since this increases concentrations of radioisotopes and may result in a change in classification, or at the extreme, make the waste unacceptable for near-surface disposal. As long as the resulting concentrations of radioisotopes are within the limits set by Part 61, the Commission does not feel that waste classification necessarily discourages volume reduction. While a higher classification of waste might result in more stringent requirements on waste form and disposal methods, there are economic considerations that need to be considered by the waste generator. The cost of processing, shipping, and disposal of a small volume of higher classification waste needs to be compared with the transportation and disposal of a larger volume of a lower classification waste. There is no reason to believe that the balance will always be against volume reduction. For wastes with concentrations that would place them not generally acceptable for near-surface disposal if they were volume reduced, the provisions for specific Commission approval of the disposal of such wastes provides a potential alternative for licensees considering volume reduction.

Several commenters were concerned with materials which may be present in low-level radioactive waste which may be chemically toxic or hazardous. Some

suggested that the Commission's waste classification system incorporate a "total hazard" approach that would consider both the radiological and chemical hazard of wastes. At least one comment did not favor the total hazard approach because of the very complex classification system that the commenter perceived would result.

The Commission has stated publicly on several occasions that if it were technically feasible to classify waste by total hazard, then it would make eminently good sense to do so. We do not now know of any scheme for such classification however, the Department of Energy intends to support research into the development of a classification system for hazardous waste that might be compatible with Part 61. In the meantime, the Commission will study the chemical toxicity of low-level waste, with special emphasis on identifying any licensees who generate hazardous wastes subject to requirements of the Environmental Protection Agency. We will look then at what could be done, perhaps through processing, to minimize the hazard.

Furthermore, the Commission believes that the technical provisions of Part 61 generally meet or exceed those expected in the Environmental Protection Agency's rules for the disposal of hazardous wastes. Although it is not the Commission's intent to allow disposal of hazardous wastes in a radioactive waste disposal facility, as is noted in the regulation, the Commission recognizes that such wastes may be present in low-level radioactive wastes. It is the Commission's view that disposal of these combined wastes in accordance with the requirements of Part 61 will adequately protect the public health and safety. Such hazardous wastes are expected to be such a small percentage of the total volume that dilution by other wastes would greatly minimize any risks. The Commission intends to work closely with the Environmental Protection Agency to assure continued compatibility. Further, EPA in its response to a resolution of the Conference of Radiation Control Program Directors indicated their willingness to work with other Federal agencies to address this problem.

Several commenters raised questions on the basis or criteria for setting site inventory limits for certain radionuclides, as was indicated in Table 1 of the proposed rule. Some correctly noted that such inventory limits would be site specific. The Commission established concentration limits for radionuclides based on a number of considerations, including protection of a potential intruder, operational safety, and long-term site stability. In addition to concentration limits, the Commission desires the ability to limit maximum site inventories for some isotopes that are of concern from a ground water point of view. Isotopes which are both mobile and long-lived are iodine-129, technetium-99, and carbon-14. Tritium is of concern due to its extreme mobility and its presence in waste in large quantities. Establishment of inventory limits through site-specific license conditions for such radionuclides will help ensure that the performance objectives for ground water migration are not exceeded. The Commission does not plan, as was suggested by a few commenters, to establish site inventory limits for every isotope to protect against potential intrusion. Inadvertent intruder exposures are mainly controlled by the concentration of a particular isotope, and to a lesser degree by the site inventory.

Several commenters raised specific points about the cost and regulatory burden of the waste classification requirements. Much of the concern was related to the issue of costs for determining compliance with the concentration limits, as discussed earlier. The basis of the concentrations, in particular the 10 nanocurie per gram limit for transuranic nuclides was of concern and is discussed elsewhere. One commenter expressed the view that the classification requirements would raise the cost of disposal because of perceived increased cost for disposal of Class A waste and the cost of quality control activities.

While some costs will be associated with these concerns, when they are weighed against the longer term costs and institutional burdens that may result if the requirements are not adopted, the Commission judges the short-term costs to be warranted.

The State of Nevada, who regulates the Beatty site, expressed the view that the rule will increase the burden and expenses of the regulatory agencies. Two reasons cited related to monitoring the adequacy of site maintenance funds and inspection of waste generator packaging and classification activities.

Monitoring the adequacy of funding is already a part of the program for regulating disposal sites and is only peripherally related to waste classification in that stability is not assumed for Class A wastes. This is not different from the existing situation at disposal facilities where a large percentage of waste is not in a stable form. Thus, this does not appear to be a significant increase in regulatory burden. Inspection of waste generators for compliance with waste classification is more the responsibility of the Commission or the Agreement State regulating the generator. Existing regulatory responsibilities include inspection of the packaging and shipment of radioactive waste. The incremental burden of reviewing a licensee's program for classifying these wastes should be small.

In addition to the above issues, a large number of commenters offered individual comments on a variety of points of clarification, format, definition, and completeness of the provisions for waste classification. While not summarized here, they are addressed in the detailed analysis of comments by the Commission staff, and to the extent practicable, these comments were reflected in the revision of § 61.55.

As a result of these comments, § 61.55 has been revised to present the classification values in two tables rather than one. Those radio-nuclides with long half-lives, along with some shorter-lived precursors of long-lived nuclides, are now listed separately in a new Table 1. The presence of these long-lived radionuclides will dominate the classification of the waste. If waste contains less than one tenth the concentration of such a nuclide listed in Table 1, it is Class A waste; greater than that, it is judged to be Class C waste provided the concentration does not exceed the value shown in Table 1. Shorter-lived radionuclides are listed with a range of concentrations in Table 2. Depending on the concentration, wastes containing only these shorter-lived nuclides will be judged to be Class A, B, or C. If waste contains nuclides listed in both tables, the mixture must be considered in determining the waste class. If Table 1 nuclides are present in concentrations less than one tenth the Table 1 limits, the class is determined by the Table 2 nuclide concentration. If Table 1 nuclides exceed one tenth of the Table 1 limits the waste is Class C regardless of the Table 2 concentrations.

The phrase "theoretical maximum specific activity" has been eliminated and replaced with a notation of "no limit." A footnote to Table 2 explains that while there is no theoretical limit for concentrations of certain nuclides in Class B and C wastes, practical considerations such as radiation and heat generation will determine the limits.

Several radionuclides have been removed from the originally proposed table. Cesium-135 was removed because it is present in wastes in very small concentrations and classification will be

determined by the presence of Cs-137 and because Cs-135 is a pure beta emitter which is very difficult to measure. Similarly, the radionuclides Ni-59 and Nb-94 have been removed except as they may be contained in activated metals. As examined in the draft environmental impact statement of Part 61, these nuclides are present in reactor wastes (other than activated metals) in such small concentrations as to be insignificant. Uranium has been removed as a radionuclide that must be considered for waste classification. The Commission's analysis shows that the types of uranium-bearing wastes being disposed of do not present a sufficient hazard to warrant limitation on the concentration of this naturally occurring material. Both depleted and enriched uranium do not contain daughter products in any quantity because of the relatively short time since the uranium was refined from ore, compared to the half lives of the uranium isotopes. The daughter products are disposed of primarily as uranium mill tailings.

Primarily for these reasons, the uranium limits were dropped.

For a number of radionuclides, the maximum allowable concentrations in Class C waste have been increased by a factor of ten. This came in response to a number of comments received on the proposed rule and the draft environmental impact statement that pointed out where unnecessarily conservative assumptions had been incorporated into the calculations for intruder protection. These comments pointed out that waste disposed beneath five meters of cover would be difficult to contact even at 500 years and that such waste would be diluted by the other wastes whose radioactivity had decayed to extremely low levels. Additionally, the average concentrations tend to be only a fraction of the maximum permissible. At the present time, these are recognized by the Commission as conservative assumptions and the Commission has found that an order of magnitude increase in Class C limits is warranted. This order of magnitude increase has not changed the established framework of factors such as relying on up to 100 years of institutional control and a 500 mrem whole body limit for intruders.

The radionuclide, curium-242, was added to the nuclides in Table 1. While Cm-242 is a relatively short-lived nuclide (163 days) it decays to plutonium-238, a transuranic nuclide with a half life of nearly 90 years. The concentration of 20,000 nanocuries per gram for Cm-242 will result in a concentration of 100 nanocuries per gram of Pu-238.

To the extent practicable, the numerous footnotes originally found in the proposed Table 1 were eliminated and have been incorporated, where appropriate, into the textual part of the section on waste classification.

In response to a number of comments, a statement is made that permits the concentrations of nuclides in waste to be determined by means other than direct measurement. These methods may include such things as material accountability, where records of receipts, shipments, and inventories can confirm that waste concentrations could not exceed permissible concentrations. Other indirect methods might include "inferential" measurements where a ratio is established between nuclides in a mixture and the concentrations of the difficult-to-measure nuclide is inferred based on measurement of some easier-to-measure nuclide. Whatever the indirect method used, there should be reasonable assurance that the values determined could be correlated with actual measurements. For example, in the case of inferential measurements, the ratio on which the value is determined should be based on previous actual measurements. In the other example above, the receipts, shipments, and inventories should be based on measured value.

Subpart D: § 61.56. Waste Characteristics. A large number of comments were received addressing both the minimum and the stability requirements for waste form characteristics in § 61.56. The following summarizes the comments on the minimum requirements.

One commenter objected to the use of absorbent material to immobilize liquids contained in Class A waste, stating that using absorbent materials was an obsolete technique. The State of South Carolina recommended that this requirement apply only to institutionally generated aqueous or biological waste forms. Since various absorbents have been shown to be effective with liquids, such as organic solvents, oils, etc., the Commission sees no reason to restrict the use of absorbent material to aqueous or biological waste. The Commission does not see any reason to restrict the use of absorbents to institutional generators.

Eighteen commenters stated that the requirement (proposed in Table 1, § 61.55) to obtain specific approval to dispose of wastes containing greater than 0.1 percent chelating agents was too restrictive, and stated that utilities might decide against performing decontamination operations which could reduce occupational exposures. Several commenters requested the basis for the 0.1 percent limit. One commenter recommended that no chelating agents be permitted.

Since chelating agents have been shown to increase the migration of certain radionuclides at certain sites, the Commission desired to evaluate the disposal of large quantities of wastes containing high concentrations of chelating agents on a case-by-case basis. This approach was used when the Commission staff reviewed the disposal of wastes that would be generated in the decontamination operations at the Dresden Unit 1 Station. Because the disposal of wastes containing chelating agents is dependent on the characteristics of the disposal facility and on the properties of the waste form, the Commission has modified the chelating agent disposal requirements to reflect this. The Commission has placed on the disposal site license applicant the responsibility for describing the conditions for disposal of waste containing chelating agents. If approved by the Commission, site specific requirements will be placed on the disposal facility licensee. At this time the waste generator will be required only to identify such wastes in the information contained on the shipping manifest.

At the request of comments, definitions have been added for the terms, "hazardous," "pyrophoric," and "explosive."

Of five comments received on the prohibition against packaging waste in cardboard or fiberboard boxes, four felt the prohibition is unnecessary. One commenter supported the provision. After reviewing the comments, including the reasons presented, the Commission still believes that such a prohibition is needed. The experience cited by the Department of Energy, of successfully using cardboard containers for waste packages at their sites, does not include extensive handling and transportation that commercially generated wastes might encounter. The existing prohibition against cardboard and fiberboard containers at existing disposal facilities came about as a result of unfavorable experience in receiving, handling, and disposing of wastes in such containers. No change has been made in this requirement.

Ten commenters addressed the requirements relating to waste in a gaseous form. Several noted an inconsistency between the provisions in §§ 61.56(a)(5) that prohibits wastes capable of generating toxic gases, and

61.56(a)(7) that permits up to 100 curies of activity in waste in a gaseous form. Several requested the basis for the 100 curie limit. A recommendation was made that gases should be processed into liquid or solid forms, and another felt that gases should be limited to several microcuries. The Department of Energy recommended that krypton 85 immobilized by zeolite encapsulation or ion implantation into metal be permitted with concentrations up to five million curies per cubic meter.

The intent of § 61.56(a)(5) is to prohibit the disposal of wastes that are chemically reactive under ambient conditions and produce toxic gaseous reaction products. This section is not intended to prohibit the disposal of properly packaged gases such as H-3 or Kr-85 which occasionally require disposal. This section has been reworded to clarify the intent. The 100 curie limit derives from the existing limits at commercial disposal facilities. The Commission has studies underway to determine whether higher limits would be appropriate. Such limits, if justified, would be proposed in a future rulemaking. In lieu of a requirement that gases be converted to a liquid or a solid, the Commission is evaluating the significant generators of tritium wastes and investigating improved package designs for tritium wastes which would be capable of retaining the contents until they had decayed to innocuous levels. The requirements of Part 61 do not contemplate the disposal of millions of curies of Kr-85 as suggested by the Department of Energy. The Commission is not prepared to set disposal requirements for this waste at this time, and since this waste is not liable to be generated by Commission licensees in the near future, the Commission believes there is ample time to assess the still emerging technology for krypton fixation and establish suitable disposal requirements through future technical guidance or rulemaking action.

Some commenters felt that the requirement in § 61.56(a)(1) that waste packages presented for disposal must comply with NRC and DOT transportation regulations implied that outer packaging such as shipping casks must also be disposed. This was not the Commission's intent. Since proper packaging for transportation purposes is specified in regulations elsewhere, the Commission feels that it is not necessary to restate them in Part 61, particularly in view of the confusion created. This requirement has been deleted.

As discussed earlier, the Commission is concerned with the possible hazards presented by non-radiological components of the radioactive waste. This was recognized in the requirement proposed that wastes containing biological, pathogenic, or infectious material must be treated to reduce the potential hazard to the maximum extent practicable. The Commission believes it is prudent to add hazardous properties to this requirement and has done so.

A variety of comments were received on the proposed requirements in § 61.56(b) that pertain to the stability of Class B and C wastes. These are discussed below for the various aspects of the requirement.

Nine commenters commented on the statement that the requirements were intended to provide stability for at least 150 years. Three thought that the 150 years was overly restrictive and two recommended 100 years to correspond to the institutional control period. Others observed that some nuclides would not decay to low levels during the 150 years, that Class A waste should also be stable because of the presence of Cs-137 and Sr-90, that steel drums could not be expected to last this long, and that high integrity containers have not been tested for 150 years.

The Commission has reviewed the 150 year stability requirement with respect to the scenarios used to calculate the waste classification values. The property of stability contributes to meeting successfully several of the performance objectives set forth in Part 61. A waste that is stable for a long period helps assure the long term stability of the site, eliminating the need for active maintenance after the site is closed. This stability helps to assure against water infiltration due to failure of the disposal unit covers and, with the improved leaching properties implicit in a stable waste form, minimizes the potential for radionuclide migration in groundwater. Stability also plays an important role in protecting an inadvertent intruder, since the stable waste form is recognizable for a long period of time and minimizes any effects from dispersion of the waste upon intrusion.

The 150 year period was initially chosen to approximate the active life of a near-surface disposal facility, along with the periods of post-closure observation and institutional controls. At the end of this period, the intrusion scenario is based on the intruder readily recognizing any uncovered waste as something out of the ordinary with the result that no further attempts at construction or agriculture would be attempted. When other aspects of the performance objectives are considered, however, a longer design life is called for. The waste should continue to maintain its gross physical properties and maintain a measure of its identity for several hundred years more to provide site stability and to keep the Class B and C waste recognizable and unsuited to the construction and agriculture scenarios postulated. Consistent with its desire to avoid prescriptive requirements where possible, the 150 year specification has been removed. It is the Commission's belief, however, that to the extent that it is practicable, waste forms or containers should be designed to maintain gross physical properties and identity over 300 years, approximately the time required for Class B waste to decay to innocuous levels. This is reflected in Commission staff technical positions.

Fourteen commenters indicated that the proposed requirement that a stable waste form maintain its physical dimensions within five percent was overly restrictive and impossible to achieve due to the impracticality of filling containers to 95 percent capacity. Commenters also noted that asphalt and polymeric solidification agents would be incapable of meeting this requirement because of their viscoelastic creep properties. Commenters also observed that the limit could entail added expenses.

Upon review of the proposed requirement, the Commission has concluded that there is not sufficient basis at this time to support a numerical limit for deformation of stable waste. The five percent value has been removed from this requirement. Reliance will be placed on the requirements that void spaces within packages must be minimized, that wastes must be emplaced in a manner that permits void spaces between containers to be filled, and that these spaces must be filled.

With respect to void spaces in waste containers being reduced to the extent practicable, six comments were received. Several requested specific criteria on how this would be met and if filler materials were needed. Two felt that economics would drive waste generators to package the maximum volume of waste into a container and that this requirement in the rule is unnecessary.

Due to the highly variable nature of wastes, the Commission believes that it is not possible or desirable to include specific criteria for minimizing voids. To the extent that void spaces can contribute to eventual instability of the waste, they should be eliminated or reduced as much as possible. This might be done in some cases by filling void

spaces with other wastes or inert materials.

Eleven commenters objected to the specific requirement that the stability of waste be maintained under a compressive load of 50 pounds per square inch (psi). Most felt that the specific requirement should be deleted and replaced by a more general requirement to reflect actual disposal site conditions and operations.

In response to these comments, the 50 psi specification has been removed from the rule. The specification was based on conservatively assuming maximum burial depths up to 45 feet and waste or overburden densitity of 150 lb/ft.^{3}. Testing performed on acceptable solidified waste specimens indicate that 50 psi compressive strength should be easily obtained. The Commission believes that while this is achievable, some latitute should be allowed for the design of waste forms and containers to reflect site conditions where burial depths may be less.

Since § 61.56(b) permits the stability of waste to be achieved by placing the waste in a suitable container for disposal, a number of comments addressed the properties such a container should exhibit and the uses to which it should be put. It was suggested that the Commission reexamine design criteria for a high integrity container for highly dispersible forms, and one suggested that such container should be used for both high and low concentration wastes. A major supplier of waste solidification technology questioned whether the use of a container reflected the best available technology and the concepts of ALARA.

Three commenters, two of whom are suppliers of waste solidification technology and services, felt that ion exchange resins should all be solidified and that disposal of ion exchange media by dewatering is not within the concepts of ALARA and use of the best available technology.

The Commission staff is preparing a technical position on waste form criteria, including design criteria for a high integrity container. Draft copies have been made available to interested parties for their review and comment. In short, the technical position states that the container must provide as much assurance of stability for as long as required for a stable waste form or product. It should be designed, to the extent that it is practicable, to contain waste and maintain gross physical properties and identity over 300 years, under the conditions of disposal. The Commission believes that the use of containers to achieve stability is consistent with the concept of ALARA and the use of the best available technology. Occupational exposures in using high integrity containers are expected to be similar to or less than waste solidification, either with mobile or installed systems.

Several commenters addressed the proposed limitation of free standing liquid which would require that such liquids be reduced to as low a level as is reasonably achievable, but in no case to exceed 1 percent. Further, the proposed rule stated that the liquid should be noncorrosive. There were no requests to increase the value. However, one waste solidification service supplier recommended a limit of zero, while the State of South Carolina recommended implementing the limits in the license for the Barnwell disposal facility, i.e., 0.5 percent for solidified wastes, 1 percent for waste in high integrity containers. Several commenters asked for a definition of the term "noncorrosive."

The Commission has reexamined the proposed limit on free standing liquid and judged that solidified wastes and wastes in high integrity containers should be addressed separately. The Commission has concluded that existing waste solidification technology can produce a waste form that is essentially free of free standing liquid. In order to compensate for potential condensation of water vapor sealed in containers, the Commission believes that a limit of 0.5 percent by volume is appropriate for solidified wastes. For dewatered products, such as ion exchange resins, that are in a container designed to ensure stability, it is very difficult to ensure that such products would meet a 0.5 percent requirement following transport to a burial site. Therefore, for dewatered products, 1 percent should be allowed to account for settling during the transport period. The non-corrosive properties of the liquids will be defined and discussed in a staff technical position, rather than in the regulation. To provide a degree of consistency between Class A wastes and the Class B and C wastes, the limitations on liquids in Class A wastes have been modified. Liquid waste must be packaged with sufficient absorbent material to absorb twice the volume of the liquid. Solid wastes with incidental liquids must meet the 1 percent free standing liquid requirement.

Two commenters pointed out what they perceived as inconsistencies between Part 61 and other Commission rules or guides. One of the guides referenced is the Effluent Treatment Systems Branch Technical Position 11-3. This document was revised in July 1981 and is consistent with Part 61 requirements. The Commission fails to see inconsistency between Part 61 and its supporting EIS, with Apperdix I of Part 50, or guidelines for storage of waste, as claimed by the commenters.

Subpart D: § 61.57. Labeling. Several commenters offered suggestions or raised questions on the requirement that waste packages be labeled to show the classification of the contents. The commenters suggested color coding, different wording, consistency with DOT labeling, minimum standards, and asked for clarification of responsibilities.

The requirement for labeling is to provide the disposal facility operator with information as to whether the contents are Class A, B, or C wastes so that he will be able to dispose of them in the proper manner. The Commission does not feel that a Federal standard for such labeling is warranted, only that it be clear and legible. Individual facility operators may have operating procedures that could be enhanced by label location, size, color, etc. Since the label is to benefit the operator, it is more appropriate for him to set specifications through contractual arrangement. A suggestion to simplify the nomenclature on the labels was adopted and a minor change was made in § 61.57.

Waste classification labeling is in addition to labels required by DOT for transportation purposes. There is a similarity in nomenclature between the Class A and B wastes and the Type A and B packages used by DOT. DOT requires that packages be labeled as to whether they are Type A or B, therefore, there could be some confusion if the packages are labeled to indicate the waste classification. However, DOT has a variety of numerical and alphabetical designations and it is difficult to avoid some similarity in designation.

Subpart D: § 61.59. Institutional Requirements. There were few comments on the requirement for State or Federal ownership of the disposal site. Those commenting expressed general support. One commenter suggested that the State should have an option to turn ownership and responsibility for long-term custody over to the Federal government. Such an option is not available under current law. In related comments, two commenters expressed concern over the State's responsibility and liability after accepting the disposal site for custodial care. Since the State does become responsible for the site, the State must be involved and aware of the operations and conditions at the site during its operation. This could be done through some independent oversight as landlord, or through participation with NRC in the

review of the initial application as provided in Subpart F of Part 61.

About twenty commenters addressed the appropriateness of the 100 year limit on institutional controls and its effect on wastes acceptable for disposal under the conditions prescribed by Part 61. All commenters expressed support in one way or another for defining a time frame for institutional control related either to the hazard duration of the waste or assurance of continued government stability or concern. It was generally agreed that waste that was potentially hazardous after the end of the assured institutional controls should be disposed of by methods providing greater controls and assurances against potential exposure. These comments are judged to support the provisions of Part 61 that combine institutional controls with waste form, site characteristics, and site design and operations to provide assurances that potential exposures will be with acceptable limits. Class A waste that is potentially accessible and unrecognizable is no longer hazardous after 100 years. Special provisions for waste being in a stable form and in some cases buried deep assure against potentially unacceptable exposures or releases for up to 500 years.

There were a number of suggestions that the period of institutional control should be raised from 100 to 300 years. There appear to be two basic reasons for these suggestions. One reason is that institutions such as a state or the Federal government can reasonably be expected to survive for much longer than 100 years. A second reason is that the 100 year restriction on institutional care affects the waste concentrations acceptable for disposal as Class A waste with resultant higher costs to the waste generator. With respect to the first reason, the Commission feels that it is not a question of how long the government can survive, but how long should they be expected to provide custodial care. Based on work done by EPA, public comments on a preliminary draft of Part 61 and an advanced notice of proposed rulemaking, and four regional workshops, a clear consensus was developed which supported the 100 year limit. The Commission has not seen any compelling reasons to change its view on the 100 year limit.

Some commenters expressed the view that the government landowner should have flexibility in controlling site access during the institutional control period and that productive uses of the land which would not affect site integrity should be permitted. The Commission agrees and words to that effect have been added to the Concepts section. 61.7.

Subpart E: Financial Assurances. Approximately two dozen commenters responded to the proposed financial assurance requirements for closure and post-closure care. In general, the commenters expressed support for the rule's establishment of financial assurances for closure and for long term care of a LLW disposal site. Commenters mentioned that the existing history of LLW disposal sites revealed a strong need to require licensees to demonstrate evidence of financial responsibility so that the public health and safety were protected and also so that potential liabilities do not rest with state taxpayers.

Several commenters felt that the financial requirements should provide more detail. The Commission agrees and has prepared a draft Branch Technical Position on Funding Arrangements for Closure and for Long-Term Care of a LLW Disposal Site that provides definitive guidance for evaluating all financial assurances, including surety bonds.

One of the major points raised by a variety of commenters was that the proposed regulation failed to address financial responsibility for unanticipated contingencies at a LLW disposal site. One group expressed concern that the regulations set the stage for a "tax-payer funded bail-out" of poorly-run disposal sites. They felt the industry should bear these costs, and that the regulations should be written to make this explicit. Another commenter noted that the experience of the State of Kentucky with Maxey Flats emphasized the importance of making contingency funds available in the event that serious problems occur. They felt this issue should be addressed in the rulemaking. One State further noted that the rule failed to mention who would be financially responsible if problems occur at the site that cost more than were budgeted on an assumption of normal operation. These questions cover such a variety of different scenarios (i.e., Acts of God, licensee negligence, etc.) that it is not possible to specifically respond to all of the potential contingencies. However, a general response to the overall issue of responsibility for contingencies at a low-level waste disposal site is possible. These comments cover two different time periods—the post-closure period, when the original licensee is still responsible at the site, and the institutional control period, when the license has been transferred to the landowner of the site for a period of up to one hundred years. In the case of the post-closure care period, the licensee would be responsible for all activities at the site found necessary by the Commission to protect the public health and safety. Financial responsibility for activities during the institutional control period are a matter to be worked out between the site owner (i.e., the State or Federal Government) and the licensee in their lease or other legally binding arrangement. It is possible that if the site owner were a state, they would work out an arrangement whereby the site operator would collect a surcharge from waste generators for the institutional control period. The rights and responsibilities of the State and the licensee would be determined at such a time.

With regard to contingencies, one commenter also asked who would assume responsibility for a site and its accompanying waste when it was closed prematurely by the NRC, due to rule violation. Responsibility for a site closed prematurely by the NRC would depend on the situation. Additionally, closure would be a last resort of the Commission, since the agency has other authorities, such as civil penalties, to require licensee compliance. In the event it would become necessary to close the site for health and safety reasons, the rule provides that the licensee continues to be responsible until the license is terminated. In the event that the licensee's financial condition deteriorated so that he was unable to maintain the site to protect the public health and safety, then the Commission would probably require the site owner (either the State or Federal government) to assume responsibility at the site.

Regardless of who assumed responsibility for a prematurely closed site, the rules require that a licensee have available at all times during the site life, sufficient financial guarantees to ensure that sufficient funds are available for site closure and decommissioning. These funds would be available for properly maintaining the site if the original licensee were unable to do so.

Several commenters considered that the rule should resolve the issue of financial responsibility for contingencies by requiring liability insurance or specific language that licensees would be required to indemnify property owners in case of off-site migration. Although not proposed in the original rule, the staff evaluation of these public comments indicates there is a need for licensees to provide financial responsibility for liability coverage for

off-site bodily injury and property damage. The Commission thinks the public health and safety and the environment would be protected from unanticipated contingencies by such coverage, as well as assisting the States in establishing disposal sites. Four existing LLW disposal facilities currently carry this type of liability coverage, and several other State and Federal agencies, including EPA have imposed similar requirements for hazardous and radio-active waste facilities in order to protect the public health and safety and the environment. However, at the present time, the Commission's only statutory framework for establishing such a requirement is Section 170 of the Atomic Energy Act, also known as the "Price-Anderson" Act. This type of coverage is designed to cover "catastrophic events" primarily for nuclear reactor licensees, and the Commission feels this coverage would be in excess of the risk at a low-level waste facility. Therefore, the Commission has not established a third party liability requirement in this regulation. The Commission will strongly encourage licensees to continue to carry third party liability insurance coverage through the conventional insurance market.

A variety of comments were received concerning the short term financial assurances required for closure and decomissioning. Several commenters supported the rule's use of a variety of different options for closure, noting that flexibility was crucial if the proposed rule was to function in a reasonable manner.

Other commenters expressed support for the rule's provision requiring that the amount of surety liability change with changes in cost estimates. One commenter also was concerned that the financial surety arrangements increase in value over time to compensate for the effects of inflation. The rule allows the Commission to periodically assess the amount of funds collected for both closure and post-closure care of the site and if necessary, the Commission could require the financial assurances to be increased to account for inflation, unforeseen problems, and unanticipated costs.

Commenters expressed support for the variety of alternatives allowed to demonstrate short term financial responsibility. However, several commenters mentioned that no commercial market exists to provide surety bonds of the type mentioned in the rule. In developing the rule, the Commission is aware that surety bonds of the type proposed in the rule may be unavailable at this time. However, the Commission included this alternative in the rule in the event that this type of coverage becomes available in the insurance market at a later time.

Commenters were also divided about whether the Commission should allow self-insurance as a financial assurance for closure. Several commenters felt that self-insurance would not satisfy the surety requirements, and they recommended that licensees should be required to place specific funds in escrow to cover costs of decontamination, closure and stabilization. Another commenter suggested that self-insurance be based on an annual submittal of financial reports, i.e., a financial test.

The Commission rejected the use of stand alone "self-insurance" based on the Commission's lack of confidence in this method to provide adequate assurances. Further, state officials have informally expressed the need to have tangible funds available from the licensee for site closure, so the State as landowner would not be left financially responsible. While not specifically allowing its use on a generic basis in the rule, the Commission will evaluate the use of financial tests proposed by licensees on a case-by-case basis.

Commenters also expressed support for the need to have a long-term care fund established at the time a license is issued. Some commenters wanted the rule to explicitly require the licensee to set aside funds for long-term care. However, the Commission currently lacks the authority to require a licensee to establish a fund to provide for long-term care of the site after the license is terminated. Instead, the Commission can only require a licensee to provide evidence of entering into a lease or other binding arrangement with the site owner indicating that the two parties have established financial responsibility for long-term care between themselves. With regard to the lack of authority, one person suggested that the Commission ask Congress for authority to require financial assurances for licensees for the active institutional control period. The NRC has raised this issue with Congress both in testimony and in a letter commenting on waste legislation.

Subpart F: Participation by State Governments and Indian Tribes. Many of the comments on Subpart F were concerned with interpretations and clarifications. These have been answered in the detailed analysis of comments. Two noteworthy changes were made. In § 61.71, a change was made to ensure that the Director shall make Commission staff available for discussion with the State or tribal governing body. At the request of the Department of the Interior, a statement was added to § 2.101 to indicate that the Commission will inform the U.S. Bureau of Indian Affairs when tribes have been notified of the filing of an application.

The Commission has been examining ways by which the licensing process can be shortened in time. One way is to conduct activities in parallel where possible, rather than sequentially. One such area is in the submittal and evaluation of proposals by States and Indian tribes for participation in the NRC license review, as provided by Subpart F. As proposed, § 61.72 would provide up to 120 days after an application was docketed for a State or tribe to submit a proposal for participation. The time from initial submittal of the application until it has been docketed is estimated to be 60 days or more. Thus, there is a potential delay of 180 days between the time NRC would receive a proposal and could begin the serious consideration of the proposal. Until resolution were reached on the role a State or tribes would play in the review, the NRC's review of the application could be significantly hampered.

The Low Level Radioactive Waste Policy Act of 1980 clearly states that it is a State's responsibility to provide for the disposal of low level waste. The Act also provides for the formation of interstate compacts for this purpose, subject to Congressional approval. Thus, any application for a disposal facility license will have had State or compact participation and backing for a significant period of time before submittal. During this time, the Commission believes that the State will have had ample opportunity to determine what role it wants to play in the review of the application. This also holds true for other States that are parties to an interstate compact. Therefore, § 61.72 is being changed to require that a proposal from the State in which the facility is proposed, or from any State involved in a compact with the State, must be submitted within 45 days after the application has been tendered. However, the Commission notes that a more prompt submittal by the State would help reduce delays.

Although it is to be hoped that the States will inform Indian tribes of plans for disposal facilities and provide them with sufficient information to permit them to make a proposal at an early time, there is no way of ensuring this. Therefore, Indian tribes and States not covered above will be given 120 days from the tendering of an application to

submit their proposal. It is anticipated that the participation of Indian tribes and non-compact States will not impact the schedule of the licensing process as much and this additional time can be accommodated.

The Commission believes that there should be sufficient information in the tendered application on which to base a proposal and that it is not necessary to wait until the acceptance review is completed and the docketing procedure carried out.

By making these changes, review of proposals can be carried out earlier and in parallel with the other reviews. It is expected that this could reduce the licensing time by up to six months.

It shoud be noted that participation by States and Indian tribes pursuant to Subpart F of Part 61 is not through an adjudicatory hearing. If an adjudicatory hearing is requested, then 10 CFR Part 2 applies.

A provision was added to § 61.25 to ensure that State, local, and Indian officials were notified of the opportunity for a hearing for certain types of amendments to the disposal facility license.

Subpart G: Records, Reports, Tests, and Inspections. Several commenters made suggestions on records and reports and the need for resident inspectors. Comments were also offered encouraging state involvement in records review and inspections. Two suggestions, relative to reporting any release of radioactivity and a requirement for maintaining duplicate sets of records were rejected as being impracticable. The Commission, however, would encourage protection of records so that they would not be vulnerable to loss because of fire flood, or other occurrence. The other suggestions did not require modification of the regulations in order to accomplish what was suggested.

10 CFR Part 2: Rules of Practice. No major issues were raised by the several comments on the proposed amendments to Part 2.

10 CFR Part 20: § 20.311 Transfer for Disposal and Manifests. Because any licensee might make a waste shipment and thus be subject to the proposed manifest system requirements, the Commission mailed copies of the proposed rules to each of the Commission's approximately 9,000 licensees. In addition, some 12,000 copies were furnished to the Agreement States for distribution to their licensees. Out of this large group came a total of 29 letters commenting on the manifest system. These comments were wide ranging, with the majority of questions or suggestions being raised by only one commenter. Only a handful of issues drew more than one comment, with four being the largest number of comments on any issue. As a result of these comments, several changes were made to the proposed requirements to clarify some aspects.

To deal with the situation where a waste collector picks up waste directly from the generator, provisions are made for delivering the manifest to the collector at that time. The waste collector will not be required to attach copies of all waste generator manifests to his, as long as the collector's manifest has the information for each package that is required by § 20.311(b). The person transferring wastes will be required to maintain a signed copy of the manifest or equivalent documentation such as a computer generated printout from the transferee containing the same information and binding acknowledgement as the record required by Parts 30, 40 and 70 governing transfer of licensed material. This was done to provide inspectable records at the waste generator's facility which demonstrate compliance with the manifest requirements.

Changes were made in the requirements dealing with quality assurance. The term quality "assurance" has been changed to quality "control" and management's role has been modified to require evaluation of audits rather than the conduct of such audits.

Of note is that only one commenter, a midwest utility, addressed the question of the burden that the manifest would represent to small entities. When the manifest requirements were proposed, the Commission judged that they would not have significant economic impact on small entities. Pursuant to the Regulatory Flexibility Act, the Commission solicited comments on this matter.

General Comments

Seventeen commenters expressed concern with the use of absolute terms in the rule such as "eliminate" and "prevent." One was concerned about the lack of absoluteness of "reasonable assurance."

As discussed elsewhere, most of the places where such terms were used were in the context of design objectives. Since total achievement of such absolute objectives is unlikely, modifications have been made to the requirements to require minimization or prevention to the extent practicable.

Twelve commenters made suggestions on the kinds of additional regulatory guidance they felt was needed. The Commission agrees with the need for regulatory guidance and has a program underway to provide such guidance, first in the form of staff technical positions, then as Regulatory Guides. Most of the topics addressed by the commenters are already under development. Consideration is being given to the development of guidance on other topics suggested by the commenters.

One commenter suggested exempting wastes in storage prior to the effective date of the regulation from the packaging and labeling requirements. This comment touches on a subject with broader implications, the phasing in of the Part 61 requirements, consistent with the ability of licensees, Agreement States, and applicants to make necessary changes to assure compliance.

The following sections and subparts will be considered a matter of compatibility for the Agreement States when the rule is adopted: Section 61.2, Definitions; Subpart C, Performance Objectives; Subpart D, Technical Requirements for Land Disposal Facilities; those portions of Subpart B that are necessary to implement the provisions of Subparts C and D; that portion of Subpart E requiring closure funding arrangements; and Section 20.311, Transfer for disposal and manifests. Meetings were held with Agreement State representatives and agreement was reached on a method for uniform implementation of the manifest requirements, waste classification, waste form, and the effective date of Section 20.311 which was set at 365 days after publication in the Federal Register.

Since all other provisions of the proposed rules would pertain only to applicants for new Commission-licensed disposal facilities, there are no reasons to delay the effective date of these requirements. The Commission is working with the Agreement States to develop model regulations to be adopted by the Agreement States in accordance with their agreements to maintain compatible state regulations.

Applicability of the requirements in Part 61 to Commission disposal facility licenses in effect on the effective date of the rule will be determined on a case-by-case basis and implemented through terms and conditions of the license or by orders issued by the Commission.

There were a variety of comments related to commenters questions about the development of new sites, concerns over nuclear facilities becoming *de facto* disposal sites, the need for an environmental impact statement, and an extension of the comment period for Part 61 to correspond with that of the environmental impact statement. These comments are addressed in the detailed

analysis of comments and had no effect on the rule. The comment period was, in fact, extended from October 22, 1981 to January 14, 1982 to correspond with that for the EIS.

About one third of all commenters offered editorial suggestions that were aimed at improving clarity, correcting grammatical errors, and noting typographical errors. These were very helpful in preparing the final version of the rule.

Employee Protection

A new 10 CFR 61.9 has been added concerning job protection for employees who provide information to the Commission. The new section is included in this final rulemaking to carry out the Commission's intent that all state licensees will have similar responsibilities under its employee protection regulations. See the Federal Register notice (47 FR 30452) dated July 14, 1982 for the basis for this action.

New 10 CFR 61.9 emphasizes to employers—that is, licensees, applicants, and their contractors and subcontractors—that termination or other acts of job discrimination against employees who engage in activities furthering the purposes of the Atomic Energy Act and the Energy Reorganization Act is prohibited. In addition, new 10 CFR 61.9 makes the employee aware that if discrimination of this nature is believed to have occurred, a remedy is available through the Wage and Hour Division of the Department of Labor. To ensure that employees of licensees and applicants are aware of these amendments, these organizations are required to post their premises with explanatory material related to the prohibition of discrimination and availability of a remedy in the event of discrimination.

Paperwork Reduction Act

As required by the Paperwork Reduction Act, Pub. L. 96-511, the recordkeeping and reporting requirements in the proposed amendments to 10 CFR 20 incorporated in the 10 CFR 61 rulemaking were submitted to the Office of Management and Budget and were approved. The proposed amendments to 10 CFR Part 20 were not significantly altered as a result of public comments so that approval remains valid. The application, reporting, and recordkeeping requirements contained in 10 CFR 61 apply only to land disposal facility operators and affect fewer than 10 persons and, therefore, are not subject to OMB clearance.

Regulatory Flexibility Act

Based upon the information available and on the public comments received on the proposed rule, and in accordance with the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission hereby certifies that this rulemaking will not, if promulgated, have a significant economic impact upon a substantial number of small entities.

The Regulatory Flexibility Act (Pub. L. 96-343) was signed into law in September 1980. The Act's principal objective is to make certain that Federal agencies try, where possible, to fit regulatory requirements to the scale of the affected activity. Significant economic impacts on a substantial number of small entities is a major concern. Part 61 and accompanying rule changes will potentially impact a significant number of persons licensed by the Commission and the Agreement States. The following discussion addresses the factors in the analyses required by the Act and the public comments received. The draft and final EIS's for Part 61 provide additional background information and analysis of the impacts of this rulemaking action.

Section 604 of the Regulatory Flexibility Act requires that the need for the regulatory action be clearly established. The need for standards to govern the disposal of low-level radioactive wastes and new regulations to implement these standards was discussed in detail in the draft EIS. The majority of the public comments supported the rule and thus affirmed the need for the rule and the regulatory framework it establishes.

Section 609 of the Regulatory Flexibility Act requires that small entities have an opportunity to participate in the rulemaking when the rule will have a significant economic impact on a substantial number. Since the Commission's initial certification of no significant impact was a qualified one, special efforts to reach small entities were made. For example, the proposed rule was distributed to all Commission licensees (9,000) and made available to Agreement States (12,000 licensees) with a cover letter highlighting the points that might impact them. Comments were solicited from groups such as the Health Physics Society, a national organization of professionals concerned with radiation safety, many of whose members will have to prepare manifests and coordinate compliance with the rule. The Health Physics Society publicized the rule in its newsletters to members. Of some 107 different commenters responding, none specifically addressed the Regulatory Flexibility Act or the summary analysis. One utility (which is not a small entity) did make a general qualitative reference to burdens on small entities. Twelve commenters representing a variety of sectors (not just small entities) addressed the potential burden of the manifest system.

Section 604 of the Regulatory Flexibility Act further requires a summary of the issues and a statement of any changes made in the proposed rule as a result of the comments. Two commenters were concerned about the burden of specifying chemical form. Four commenters objected to shipper responsibility for tracking shipments. Three commenters including one broker considered the system to be a paperwork burden and two, a general burden. Three supported the system and one indicated no problems in complying. Two objected to forwarding a copy of the manifest and one was concerned about the implications of generator certifications.

The proposed rule included relief language "as completely as practicable" for specifying chemical form. Small entities generate a significant percent of wastes and data on these wastes is needed, so no further relief was provided. Objections to shipper tracking and forwarding manifests stemmed primarily from the need to clarify intent of the rule on waste broker or collector role and responsibility. The transfer of papers and tracking responsibility is more clearly addressed in the final rule. The recommendation for simplifying the paperwork for brokers was adopted. These issues and concerns are addressed in more detail in the staff analysis of comments in the final EIS.

The comments on waste classification were discussed in the preceding summary and resulted in extensive revision of this portion of the rule to simplify and clarify the requirements. The detailed staff analysis in the final EIS provides further discussion of the issues raised.

Federal rules that overlap the proposed rule are primarily those of the Department of Transportation (DOT). The Commission and DOT have an established working relationship implemented through a formal Memorandum of Understanding. The rule itself acknowledges the need to comply with DOT rules, and the Commission currently inspects licensees for compliance with DOT requirements. The manifest required by this rulemaking is consistent with DOT shipping paper requirements, and the same document may be used by licensees to meet requirements of both

agencies. Neither NRC nor DOT require a specific form and both allow such dual use. The waste form and packaging requirements are in addition to and compatible with DOT rules. In addition, the manifest terminology and requirements were compared to those in the proposed Uniform Hazardous Waste Manifest, the joint EPA/DOT proposed form published March 4, 1982 [47 FR 9336]. A few minor procedural and terminology changes were made to conform to this proposed form. Licensees may use the Uniform Hazardous Waste Manifest, once it is implemented, as both a DOT shipping paper and a NRC manifest for radioactive wastes by using additional spaces to describe wastes and adding information to the back. These changes were made based on consultation with EPA and DOT staff and will help to reduce the burden on all licensees.

The following comment was received from EPA on possible duplicative requirements:

> NRC solicited comments on possible duplicative requirements for effluent releases and broker activities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). This "Superfund" law exempts from notification "any release of source, special nuclear, or byproduct material . . . in compliance with a legally enforceable license, permit, regulations, or order issued pursuant to the Atomic Energy Act of 1954" (CERCLA Section 101(10)(K)). Radioactive releases from nuclear waste disposal facilities which are not in compliance with an NRC license, permit, regulation, or order fall within the reporting requirements of CERCLA. Furthermore, as part of the notification regulations under CERCLA, EPA is planning to develop a notification scheme for releases of radioactive materials not licensed under the Atomic Energy Act of 1954 or the Uranium Mill Tailings Radiation Control Act of 1978. EPA wishes to minimize duplicative reporting requirements for releases reported to other agencies. EPA intends to work with NRC to minimize duplicative reporting requirements to the extent possible.

The EPA also addressed the potential for duplicative costs to the two agencies for wastes that are a mixture of hazardous chemicals and radioactive materials. Close coordination and a memorandum of understanding were suggested. EPA has regulatory responsibility for the disposal of hazardous wastes under the Resource Conservation and Recovery Act (RCRA). NRC agrees that the two regulatory programs need to be coordinated, and will take action in that regard.

The Regulatory Flexibility Act also requires discussion of alternatives to the proposed action. The recordkeeping and reporting requirements impose such a minor incremental burden that no exemption was considered. Initial estimates were that about 2,000 of the Commission's 9,000 licensees are waste generators who might make waste shipments. Waste generators must provide more complete information on the manifest than is currently required to meet DOT shipping paper requirements and must report on investigations of missing shipments. The additional information required in the manifest includes the identities of solidification agents; presence of any chelating agents; whether the waste is Class A, B, or C; and the total quantity of H-3, C-14, Tc-99, and I-129. The annual public burden for all licensees should be no more than about 4,500 staff hours for the preparation of the manifest instead of just preparation of DOT shipping papers and 1,000 hours for investigating and reporting on late or missing shipments. Reactor licensees, who are not small entitites, ship at least half the waste now shipped to disposal sites. The remainder is shipped by hospitals, universities, industrial firms, etc., who may or may not be small entities. Thus, less than half this burden should fall on small entities based on relative volumes of wastes shipped. The waste classification and characteristics portion of the rule does provide relief for most wastes produced by the small entities, i.e., Class A wastes. Where radiological hazard permits, segregated disposal has been provided as an option to complying with more restrictive waste acceptance requirements for Class B and C wastes.

The incremental burdens were initially judged small. Based on further staff evaluations and public comments on the rule, this initial judgment was correct and the rule will not have a significant economic impact. The rulemaking will not affect economic factors such as employment, business viability, or ability of affected entities to compete. The improvements in waste disposal practices and the contribution of those improvements to establishing new disposal capacity are judged to significantly outweigh the small economic impact on small entities.

List of Subjects in 10 CFR Part 61

Low-level waste, Nuclear materials, Penalty, Waste treatment and disposal.

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and section 553 of title 5 of the United States Code, the following new 10 CFR Part 61 and the following amendments to 10 CFR Parts 2, 19, 20, 21, 30, 40, 51, 70, 73, and 170 to Chapter 1 of Title 10, of the Code of Federal Regulations are published as a document subject to codification.

A new Part 61 is added to 10 CFR to read as follows:

PART 61—LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

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Authority: Secs. 53, 57, 62, 63, 65, 81, 161, 182, 183, 68 Stat. 930, 932, 933, 935, 948, 953, 954, as amended (42 U.S.C. 2073, 2077, 2092, 2093, 2095, 2111, 2201, 2232, 2233); Secs. 202, 206, 88 Stat. 1244, 1246, (42 U.S.C. 5842, 5846); Secs. 10 and 14, Pub. L. 95-601, 92 Stat. 2951 (42 U.S.C. 2021a and 5851).

For the purposes of Sec. 223, 68 Stat. 958, as amended, (42 U.S.C. 2273): Tables 1 and 2, §§61.3, 61.24, 61.25, 61.27(a), 61.41 through 61.43, 61.52, 61.53, 61.55, 61.56, and 61.61 through 61.63 issued under Sec. 161b, 68 Stat. 948 as amended (42 U.S.C. 2201(b)); §§ 61.10 through 61.16, 61.24, and 61.80 issued under Sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

Subpart A—General Provisions

§ 61.1 Purpose and scope.

(a) The regulations in this part establish, for land disposal of radioactive waste, the procedures, criteria, and terms and conditions upon which the Commission issues licenses for the disposal of radioactive wastes *containing* byproduct, source and special nuclear material received from other persons. Disposal of waste by an individual licensee is set forth in Part 20 of this chapter. Applicability of the requirements in this Part to Commission licenses for waste disposal facilities in effect on the effective date of this rule will be determined on a case-by-case basis and implemented through terms and conditions of the license or by orders issued by the Commission.

(b) Except as provided in Part 150 of this chapter, which addresses assumption of certain regulatory authority by Agreement States, and § 61.6 "Exemptions," the regulations in this part apply to all persons in the United States. The regulations in this part do not apply to (1) disposal of high-level waste as provided for in Part 60 of this chapter; (2) disposal of uranium or thorium tailings or wastes (byproduct material as defined in § 40.4(a-1)) as provided for in Part 40 of this chapter in quantities greater than 10,000 kilograms and containing more than five (5) millicuries of radium-226; or (3) disposal of licensed material as provided for in Part 20 of this chapter.

§ 61.2 Definitions.

As used in this part:

"Active maintenance" means any significant remedial activity needed during the period of institutional control to maintain a reasonable assurance that the performance objectives in §§ 61.41 and 61.42 are met. Such active maintenance includes ongoing activities such as the pumping and treatment of water from a disposal unit or one-time measures such as replacement of a disposal unit cover. Active maintenance does not include custodial activities such as repair of fencing, repair or replacement of monitoring equipment, revegetation, minor additions to soil cover, minor repair of disposal unit covers, and general disposal site upkeep such as mowing grass.

"Buffer zone" is a portion of the disposal site that is controlled by the licensee and that lies under the disposal units and between the disposal units and the boundary of the site.

"Chelating agent" means amine polycarboxylic acids (e.g., EDTA, DTPA), hydroxy-carboxylic acids, and ploycarboxylic acids (e.g., citric acid, carbolic acid, and glucinic acid).

"Commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the environment of a land disposal facility. The term does not mean disposal site exploration, necessary roads for disposal site exploration, borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the disposal site or the protection of environmental values.

"Commission" means the Nuclear Regulatory Commission or its duly authorized representatives.

"Custodial Agency" means an agency of the government designated to act on behalf of the government owner of the disposal site.

"Director" means the Director, Office of Nuclear Material Safety and Safeguards, U. S. Nuclear Regulatory Commission.

"Disposal" means the isolation of radioactive wastes from the biosphere inhabited by man and containing his food chains by emplacement in a land disposal facility.

"Disposal site" means that portion of a land disposal facility which is used for disposal of waste. It consists of disposal units and a buffer zone.

"Disposal unit" means a discrete portion of the disposal site into which waste is placed for disposal. For near surface disposal the unit is usually a trench.

"Engineered barrier" means a man-made structure or device that is intended to improve the land disposal facility's ability to meet the performance objectives in Subpart C.

"Explosive material" means any chemical compound, mixture, or device, which produces a substantial instantaneous release of gas and heat spontaneously or by contact with sparks or flame.

"Government agency" means any executive department, commission, independent establishment, or corporation, wholly or partly owned by the United States of America which is an instrumentality of the United States; or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the government.

"Hazardous waste" means those wastes designated as hazardous by Environmental Protection Agency regulations in 40 CFR Part 261.

"Hydrogeologic unit" means any soil or rock unit or zone which by virtue of its porosity or permeability, or lack thereof, has a distinct influence on the storage or movement of groundwater.

"Inadvertent intruder" means a person who might occupy the disposal site after closure and engage in normal activities, such as agriculture, dwelling construction, or other pursuits in which the person might be unknowingly exposed to radiation from the waste.

"Indian Tribe" means an Indian tribe as defined in the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450).

"Intruder barrier" means a sufficient depth of cover over the waste that inhibits contact with waste and helps to ensure that radiation exposures to an inadvertent intruder will meet the performance objectives set forth in this part, or engineered structures that provides equivalent protection to the inadvertent intruder.

"Land disposal facility" means the land, buildings, and equipment which is intended to be used for the disposal of radioactive wastes into the subsurface of the land. For purposes of this chapter, a geologic repository as defined in Part 60 is not considered a land disposal facility.

"License" means a license issued under the regulations in Part 61 of this chapter. "Licensee" means the holder of such a license.

"Monitoring" means observing and making measurements to provide data to evaluate the performance and characteristics of the disposal site.

"Near-surface disposal facility" means a land disposal facility in which radioactive waste is disposed of in or within the upper 30 meters of the earth's surface.

"Person" means (1) any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, government agency other than the Commission or the Department of Energy, (except that the Department of Energy is considered a person within the meaning of the regulations in this part to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the Commission pursuant to section 202 of the Energy Reorganization Act of 1974 (88 Stat. 1244)), any State or any political subdivision of or any political entity within a State, any foreign government or nation or any political subdivision of any such government or nation, or other entity; and (2) any legal successor, representative, agent, or agency of the foregoing.

"Pyrophoric liquid" means any liquid that ignites spontaneously in dry or moist air at or below 130°F (54.5°C). A pyrophoric solid is any solid material, other than one classed as an explosive, which under normal conditions is liable to cause fires through friction, retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious transportation, handling, or disposal hazard. Included are spontaneously combustible and water-reactive materials.

"Site closure and stablization" means those actions that are taken upon completion of operations that prepare the disposal site for custodial care and that assure that the disposal site will remain stable and will not need ongoing active maintenance.

"State" means any State, Territory, or possession of the United States, Puerto Rico, and the District of Columbia.

"Stability" means structural stabillity.

"Surveillance" means observation of the disposal site for purposes of visual detection of need for maintenance, custodial care, evidence of intrusion, and compliance with other license and regulatory requirements.

"Tribal Governing Body" means a Tribal organization as defined in the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450).

"Waste" means those low-level radioactive wastes containing source, special nuclear, or byproduct material that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Waste Policy Act, that is radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste).

§ 61.3 License required.

(a) No person may receive, possess, and dispose of radioactive waste containing source, special nuclear, or byproduct material at a land disposal facility unless authorized by a license issued by the Commission pursuant to this part, or unless exemption has been granted by the Commission under § 61.6 of this part.

(b) Each person shall file an application with the Commission and obtain a license as provided in this part before commencing construction of a land disposal facility. Failure to comply with this requirement may be grounds for denial of a license.

§ 61.4 Communications.

Except where otherwise specified, all communications and reports concerning the regulations in this part and applications filed under them should be addressed to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 1717 H Street NW., Washington, D.C. or 7915 Eastern Avenue, Silver Spring, Maryland.

§ 61.5 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be considered binding upon the Commission.

§ 61.6 Exemptions.

The Commission may, upon application by any interested person, or upon its own initiative, grant any exemption from the requirements of the regulations in this part as it determines is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest.

§ 61.7 Concepts.

(a) *The Disposal Facility.* (1) Part 61 is intended to apply to land disposal of radioactive waste and not to other methods such as sea or extraterrestrial disposal. Part 61 contains procedural requirements and performance objectives applicable to any method of land disposal. It contains specific technical requirements for near-surface disposal of radioactive waste which involves disposal in the uppermost portion of the earth, approximately 30 meters. Burial deeper than 30 meters may also be satisfactory. Technical requirements for alternative methods will be added in the future.

(2) Near-surface disposal of radioactive waste takes place at a near-surface disposal facility, which includes all of the land and buildings necessary to carry out the disposal. The disposal site is that portion of the facility which waste is used for disposal of waste and consists of disposal units and a buffer zone. A disposal unit is a discrete portion of the disposal site into which waste is placed for disposal. For near-surface disposal, the disposal unit is usually a trench. A buffer zone is a portion of the disposal site that is controlled by the licensee and that lies under the site and between the boundary of the disposal site and any disposal unit. It provides controlled space to establish monitoring locations which are intended to provide an early warning of radionuclide movement, and to take mitigative measures if needed. In choosing a disposal site, site characteristics should be considered in terms of the indefinite future and evaluated for at least a 500 year time frame.

(b) *Waste Classification and Near-Surface Disposal.* (1) Disposal of radioactive waste in near-surface disposal facilities has the following safety objectives: protection of the general population from releases of radioactivity, protection of individuals from inadvertent intrusion, and protection of individuals during operations. A fourth objective is to ensure stability of the site after closure.

(2) A cornerstone of the system is stability—stability of the waste and the disposal site so that once emplaced and covered, the access of water to the waste can be minimized. Migration of radionuclides is thus minimized, long-term active maintenance can be avoided, and potential exposures to intruders reduced. While stability is a

desirable characteristic for all waste much radioactive waste does not contain sufficient amounts of radionuclides to be of great concern from these standpoints; this waste, however, tends to be unstable, such as ordinary trash type wastes. If mixed with the higher activity waste, their deterioration could lead to failure of the system and permit water to penetrate the disposal unit and cause problems with the higher activity waste. Therefore, in order to avoid placing requirements for a stable waste form on relatively innocuous waste, these wastes have been classed as Class A waste. The Class A waste will be disposed of in separate disposal units at the disposal site. However, Class A waste that is stable may be mixed with other classes of waste. Those higher activity wastes that should be stable for proper disposal are classed as Class B and C waste. To the extent that it is practicable, Class B and C waste forms or containers should be designed to be stable, i.e., maintain gross physical properties and identity, over 300 years. For certain radionuclides prone to migration, a maximum disposal site inventory based on the characteristics of the disposal site may be established to limit potential exposure.

(3) It is possible but unlikely that persons might occupy the site in the future and engage in normal pursuits without knowing that they were receiving radiation exposure. These persons are referred to as inadvertent intruders. Protection of such intruders can involve two principal controls: institutional control over the site after operations by the site owner to ensure that no such occupation or improper use of the site occurs; or, designating which waste could present an unacceptable risk to an intruder, and disposing of this waste in a manner that provides some form of intruder barrier that is intended to prevent contact with the waste. This regulation incorporates both types of protective controls.

(4) Institutional control of access to the site is required for up to 100 years. This permits the disposal of Class A and Class B waste without special provisions for intrusion protection, since these classes of waste contain types and quantities of radioisotopes that will decay during the 100-year period and will present an acceptable hazard to an intruder. The government landowner administering the active institutional control program has flexibility in controlling site access which may include allowing productive uses of the land provided the integrity and long-term performance of the site are not affected.

(5) Waste that will not decay to levels which present an acceptable hazard to an intruder within 100 years is designated as Class C waste. This waste is disposed of at a greater depth than the other classes of waste so that subsequent surface activities by an intruder will not disturb the waste. Where site conditions prevent deeper disposal, intruder barriers such as concrete covers may be used. The effective life of these intruder barriers should be 500 years. A maximum concentration of radionuclides is specified for all wastes so that at the end of the 500 year period, remaining radioactivity will be at a level that does not pose an unacceptable hazard to an intruder or public health and safety. Waste with concentrations above these limits is generally unacceptable for near-surface disposal. There may be some instances where waste with concentrations greater than permitted for Class C would be acceptable for near-surface disposal with special processing or design. These will be evaluated on a case-by-case basis. Class C waste must also be stable.

(c) *The Licensing Process.* (1) During the preoperational phase, the potential applicant goes through a process of disposal site selection by selecting a region of interest, examining a number of possible disposal sites within the area of interest and narrowing the choice to the proposed site. Through a detailed investigation of the disposal site characteristics the potential applicant obtains data on which to base an analysis of the disposal site's suitability. Along with these data and analyses, the applicant submits other more general information to the Commission in the form of an application for a license for land disposal. The Commission's review of the application is in accordance with administrative procedures established by rule and may involve participation by affected State governments or Indian tribes. While the proposed disposal site must be owned by a State or the Federal government before the Commission will issue a license, it may be privately owned during the preoperational phase if suitable arrangements have been made with a State or the Federal government to take ownership in fee of the land before the license is issued.

(2) During the operational phase, the licensee carries out disposal activities in accordance with the requirements of this regulation and any conditions on the license. Periodically, the authority to conduct the above ground operations and dispose of waste will be subject to a license renewal, at which time the operating history will be reviewed and a decision made to permit or deny continued operation. When disposal operations are to cease, the licensee applies for an amendment to his license to permit site closure. After final review of the licensee's site closure and stabilization plan, the Commission may approve the final activities necessary to prepare the disposal site so that ongoing active maintenance of the site is not required during the period of institutional control.

(3) During the period when the final site closure and stabilization activities are being carried out, the licensee is in a disposal site closure phase. Following that, for a period of 5 years, the licensee must remain at the disposal site for a period of post-closure observation and maintenance to assure that the disposal site is stable and ready for institutional control. The Commission may approve shorter or require longer periods if conditions warrant. At the end of this period, the licensee applies for a license transfer to the disposal site owner.

(4) After a finding of satisfactory disposal site closure, the Commission will transfer the license to the State or Federal government that owns the disposal site. If the Department of Energy is the Federal agency administering the land on behalf of the Federal government the license will be terminated because the Commission lacks regulatory authority over the Department for this activity. Under the conditions of the transferred license, the owner will carry out a program of monitoring to assure continued satisfactory disposal site performance, physical surveillance to restrict access to the site and carry out minor custodial activities. During this period, productive uses of the land might be permitted if those uses do not affect the stability of the site and its ability to meet the performance objectives. At the end of the prescribed period of institutional control, the license will be terminated by the Commission.

§ 61.8 Reporting, recordkeeping, and application requirements: OMB approval not required.

The information collection requirements contained in this part affect fewer than ten persons. Therefore, under section 3506(c)(5) of the Paperwork Reduction Act of 1980 (Pub. L. 96-511), OMB clearance is not required for these information collection requirements.

§ 61.9 Employee protection.

(a) Discrimination by a Commission licensee, an applicant for a Commission licensee, or a contractor or subcontractor of a Commission licensee or applicant against an employee for engaging in certain protected activities is prohibited. Discrimination includes discharge and other actions that relate to compensation, terms, conditions, and privileges of employment. The protected activities are established in Section 210 of the Energy Reorganization Act of 1974, as amended, and in general are related to the administration or enforcement of a requirement imposed under the Atomic Energy Act or the Energy Reorganization Act.

(1) The protected activities include but are not limited to—(i) Providing the Commission information about possible violations of requirements imposed under either of the above statutes;

(ii) Requesting the Commission to institute action against his or her employer for the administration or enforcement of these requirements; or

(iii) Testifying in any Commission proceeding.

(2) These activities are protected even if no formal proceeding is actually initiated as a result of the employee assistance or participation.

(3) This section has no application to any employee alleging discrimination prohibited by this section who, acting without direction from his or her employer (or the employer's agent), deliberately causes a violation of any requirement of the Energy Reorganization Act of 1974, as amended, or the Atomic Energy Act of 1954, as amended.

(b) Any employee who believes that he or she has been discharged or otherwise discriminated against by any person for engaging in the protected activities specified in paragraph (a)(1) of this section may seek a remedy for the discharge or discrimination through an administrative proceeding in the Department of Labor. The administrative proceeding must be initiated within 30 days after an alleged violation occurs by filing a complaint alleging the violation with the Department of Labor, Employment Standards Administration, Wage and Hour Division. The Department of Labor may order reinstatement, back pay, and compensatory damages.

(c) A violation of paragraph (a) of this section by a Commission licensee, an applicant for a Commission licensee, or a contractor or subcontractor of a Commission licensee or applicant may be grounds for—

(1) Denial, revocation, or suspension of the license.

(2) Imposition of a civil penalty on the licensee or applicant.

(3) Other enforcement action.

(d) Actions taken by an employer, or others, which adversely affect an employee may be predicated upon nondiscriminatory grounds. The prohibition applies when the adverse action occurs because the employee has engaged in protected activities. An employee's engagement in protected activities does not automatically render him or her immune from discharge or discipline for legitimate reasons or from adverse action dictated by non-prohibited considerations.

(e) Each licensee and each applicant shall post Form NRC-3, "Notice to Employees," on its premises. Posting must be at locations sufficient to permit employees protected by this section to observe a copy on the way to or from their place of work. Premises must be posted not later than 30 days after an application is docketed and remain posted while the application is pending before the Commission, during the term of the license, and for 30 days following license termination.

Note.—Copies of Form NRC-3 may be obtained by writing to the Regional Administrator of the appropriate U.S. Nuclear Regulatory Commission Regional Office listed in Appendix D, Part 20 of this chapter or the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Subpart B—Licenses

§ 61.10 Content of application.

An application to receive from others, possess and dispose of wastes containing or contaminated with source, byproduct or special nuclear material by land disposal must consist of general information, specific technical information, institutional information, and financial information as set forth in §§ 61.11 through 61.16. An environmental report prepared in accordance with Part 51 of this chapter must accompany the application.

§ 61.11 General information.

The general information must include each of the following:

(a) Identity of the applicant including:

(1) The full name, address, telephone number and description of the business or occupation of the applicant;

(2) If the applicant is a partnership, the name, and address of each partner and the principal location where the partnership does business;

(3) If the applicant is a corporation or an unincorporated association, (i) the state where it is incorporated or organized and the principal location where it does business, and (ii) the names and addresses of its directors and principal officers; and

(4) If the applicant is acting as an agent or representative of another person in filing the application, all information required under this paragraph must be supplied with respect to the other person.

(b) Qualifications of the applicant:

(1) The organizational structure of the applicant, both offsite and onsite, including a description of lines of authority and assignments of responsibilities, whether in the form of administrative directives, contract provisions, or otherwise;

(2) The technical qualifications, including training and experience, of the applicant and members of the applicant's staff to engage in the proposed activities. Minimum training and experience requirements for personnel filling key positions described in Paragraph 61.11(b)(1) must be provided;

(3) A description of the applicant's personnel training program; and

(4) The plan to maintain an adequate complement of trained personnel to carry out waste receipt, handling, and disposal operations in a safe manner.

(c) A description of:

(1) The location of the proposed disposal site;

(2) The general character of the proposed activities;

(3) The types and quantities of radioactive waste to be received, possessed, and disposed of;

(4) Plans for use of the land disposal facility for purposes other than disposal of radioactive wastes; and

(5) The proposed facilities and equipment.

(d) Proposed schedules for construction, receipt of waste, and first emplacement of waste at the proposed land disposal facility.

§ 61.12 Specific technical information.

The specific technical information must include the following information needed for demonstration that the performance objectives of Subpart C of this part and the applicable technical requirements of Subpart D of this part will be met:

(a) A description of the natural and demographic disposal site characteristics as determined by disposal site selection and characterization activities. The description must include geologic, geotechnical, hydrologic, meteorologic, climatologic, and biotic features of the disposal site and vicinity.

(b) A description of the design features of the land disposal facility and

the disposal units. For near-surface disposal, the description must include those design features related to infiltration of water; integrity of covers for disposal units; structural stability of backfill, wastes, and covers; contact of wastes with standing water; disposal site drainage; disposal site closure and stabilization; elimination to the extent practicable of long-term disposal site maintenance; inadvertent intrusion; occupational exposures; disposal site monitoring; and adequacy of the size of the buffer zone for monitoring and potential mitigative measures.

(c) A description of the principal design criteria and their relationship to the performance objectives.

(d) A description of the design basis natural events or phenomena and their relationship to the principal design criteria.

(e) A description of codes and standards which the applicant has applied to the design and which will apply to construction of the land disposal facilities.

(f) A description of the construction and operation of the land disposal facility. The description must include as a minimum the methods of construction of disposal units; waste emplacement; the procedures for and areas of waste segregation; types of intruder barriers; onsite traffic and drainage systems; survey control program; methods and areas of waste storage; and methods to control surface water and groundwater access to the wastes. The description must also include a description of the methods to be employed in the handling and disposal of wastes containing chelating agents or other non-radiological substances that might affect meeting the performance objectives in Subpart C of this part.

(g) A description of the disposal site closure plan, including those design features which are intended to facilitate disposal site closure and to eliminate the need for ongoing active maintenance.

(h) An identification of the known natural resources at the disposal site, the exploitation of which could result in inadvertent intrusion into the low-level wastes after removal of active institutional control.

(i) A description of the kind, amount, classification and specifications of the radioactive material proposed to be received, possessed, and disposed of at the land disposal facility.

(j) A description of the quality control program for the determination of natural disposal site characteristics and for quality control during the design, construction, operation and closure of the land disposal facility and the receipt, handling, and emplacement of waste. Audits and managerial controls must be included.

(k) A description of the radiation safety program for control and monitoring of radioactive effluents to ensure compliance with the performance objective in § 61.41 of this part and occupational radiation exposure to ensure compliance with the requirements of Part 20 of this chapter and to control contamination of personnel, vehicles, equipment, buildings, and the disposal site. Both routine operations and accidents must be addressed. The program description must include procedures, instrumentation, facilities, and equipment.

(l) A description of the environmental monitoring program to provide data to evaluate potential health and environmental impacts and the plan for taking corrective measures if migration of radionuclides is indicated.

(m) A description of the administrative procedures that the applicant will apply to control activities at the land disposal facility.

§ 61.13 Technical analyses.

The specific technical information must also include the following analyses needed to demonstrate that the performance objectives of Subpart C of this part will be met:

(a) Pathways analyzed in demonstrating protection of the general population from releases of radioactivity must include air, soil, groundwater, surface water, plant uptake, and exhumation by burrowing animals. The analyses must clearly identify and differentiate between the roles performed by the natural disposal site characteristics and design features in isolating and segregating the wastes. The analyses must clearly demonstrate that there is reasonable assurance that the exposure to humans from the release of radioactivity will not exceed the limits set forth in § 61.41.

(b) Analyses of the protection of individuals from inadvertent intrusion must include demonstration that there is reasonable assurance the waste classification and segregation requirements will be met and that adequate barriers to inadvertent intrusion will be provided.

(c) Analyses of the protection of individuals during operations must include assessments of expected exposures due to routine operations and likely accidents during handling, storage, and disposal of waste. The analyses must provide reasonable assurance that exposures will be controlled to meet the requirements of Part 20 of this chapter.

(d) Analyses of the long-term stability of the disposal site and the need for ongoing active maintenance after closure must be based upon analyses of active natural processes such as erosion, mass wasting, slope failure, settlement of wastes and backfill, infiltration through covers over disposal areas and adjacent soils, and surface drainage of the disposal site. The analyses must provide reasonable assurance that there will not be a need for ongoing active maintenance of the disposal site following closure.

§ 61.14 Institutional information.

The institutional information must include:

(a) A certification by the Federal or State government which owns the disposal site that the Federal or State government is prepared to accept transfer of the license when the provisions of § 61.30 are met, and will assume responsibility for custodial care after site closure and postclosure observation and maintenance.

(b) Where the proposed disposal site is on land not owned by the Federal or a State government, the applicant must submit evidence that arrangements have been made for assumption of ownership in fee by the Federal or a State government before the Commission issues a license.

§ 61.15 Financial information.

The financial information must be sufficient to demonstrate that the financial qualifications of the applicant are adequate to carry out the activities for which the license is sought and meet other financial assurance requirements as specified in Subpart E of this part.

§ 61.16 Other information.

Depending upon the nature of the wastes to be disposed of, and the design and proposed operation of the land disposal facility, additional information may be requested by the Commission including the following:

(a) Physical security measures, if appropriate. Any application to receive and possess special nuclear material in quantities subject to the requirements of Part 73 of this chapter shall demonstrate how the physical security requirements of Part 73 will be met. In determining whether receipt and possession will be subject to the requirements of Part 73, the applicant shall not consider the quantity of special nuclear material that has been disposed of.

(b) Safety information concerning criticality, if appropriate.

(1) Any application to receive and possess special nuclear material in quantities that would be subject to the requirements of § 70.24, "Criticality accident requirements" of Part 70 of this chapter shall demonstrate how the requirements of that section will be met, unless the applicant requests an exemption pursuant to § 70.24(d). In determining whether receipt and possession would be subject to the requirements of § 70.24, the applicant shall not consider the quantity of special nuclear material that has been disposed of.

(2) Any application to receive and possess special nuclear material shall describe proposed procedures for avoiding accidental criticality, which address both storage of special nuclear material prior to disposal and waste emplacement for disposal.

§ 61.20 Filing and distribution of application.

(a) An application for a license under this part, and any amendments thereto, shall be filed with the Director, must be signed by the applicant or the applicant's authorized representative under oath, and must consist of 1 signed original and 2 copies.

(b) Another 85 copies of the application and environmental report must be retained by the applicant for distribution in accordance with written instructions from the Director or designee.

(c) *Fees.* Application, amendment, and inspection fees applicable to a license covering the receipt and disposal of radioactive wastes in a land disposal facility are required by Part 170 of this chapter.

§ 61.21 Elimination of repetition.

In its application or environmental report, the applicant may incorporate by reference information contained in previous applications, statements, or reports filed with the Commission if these references are clear and specific.

§61.22 Updating of application and environmental report.

(a) The application and environmental report must be as complete as possible in the light of information that is available at the time of submittal.

(b) The applicant shall supplement its application or environmental report in a timely manner, as necessary, to permit the Commission to review, prior to issuance of a license, any changes in the activities proposed to be carried out or new information regarding the proposed activities.

§ 61.23 Standards for issuance of a license.

A license for the receipt, possession, and disposal of waste containing or contaminated with source, special nuclear, or byproduct material will be issued by the Commission upon finding that the issuance of the license will not be inimical to the common defense and security and will not constitute an unreasonable risk to the health and safety of the public, and:

(a) The applicant is qualified by reason of training and experience to carry out the disposal operations requested in a manner that protects health and minimizes danger to life or property.

(b) The applicant's proposed disposal site, disposal design, land disposal facility operations (including equipment, facilities, and procedures), disposal site closure, and postclosure institutional control are adequate to protect the public health and safety in that they provide reasonable assurance that the general population will be protected from releases of radioactivity as specified in the performance objective in § 61.41, Protection of the general population from releases of radioactivity.

(c) The applicant's proposed disposal site, disposal site design, land disposal facility operations (including equipment, facilities, and procedures), disposal site closure, and postclosure institutional control are adequate to protect the public health and safety in that they will provide reasonable assurance that individual inadvertent intruders are protected in accordance with the performance objective in § 61.42, Protection of individuals from inadvertent intrusion.

(d) The applicant's proposed land disposal facility operations, including equipment, facilities, and procedures, are adequate to protect the public health and safety in that they will provide reasonable assurance that the standards for radiation protection set out in Part 20 of this chapter will be met.

(e) The applicant's proposed disposal site, disposal site design, land disposal facility operations, disposal site closure, and postclosure institutional control are adequate to protect the public health and safety in that they will provide reasonable assurance that long-term stability of the disposed waste and the disposal site will be achieved and will eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure.

(f) The applicant's demonstration provides reasonable assurance that the applicable technical requirements of Subpart D of this part will be met.

(g) The applicant's proposal for institutional control provides reasonable assurance that institutional control will be provided for the length of time found necessary to ensure the findings in paragraphs (b)–(e) of this section and that the institutional control meets the requirements of § 61.59, Institutional requirements.

(h) The information on financial assurances meets the requirements of Subpart E of this part.

(i) The applicant's physical security information provides reasonable assurance that the requirements of Part 73 of this chapter will be met, insofar as they are applicable to special nuclear material to be possessed before disposal under the license.

(j) The applicant's criticality safety procedures are adequate to protect the public health and safety and provide reasonable assurance that the requirements of § 70.24, Criticality accident requirements, of Part 70 of this chapter will be met, insofar as they are applicable to special nuclear material to be possessed before disposal under the license.

(k) Any additional information submitted as requested by the Commission pursuant to § 61.16, Other information, is adequate.

(l) The requirements of Part 51 of this chapter have been met.

§ 61.24 Conditions of licenses.

(a) A license issued under this part, or any right thereunder, may be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, only if the Commission finds, after securing full information, that the transfer is in accordance with the provisions of the Atomic Energy Act and gives its consent in writing in the form of a license amendment.

(b) The licensee shall submit written statements under oath upon request of the Commission, at any time before termination of the license, to enable the Commission to determine whether or not the license should be modified, suspended, or revoked.

(c) The license will be transferred to the site owner only on the full implementation of the final closure plan as approved by the Commission, including postclosure observation and maintenance.

(d) The licensee shall be subject to the provisions of the Atomic Energy Act now or hereafter in effect, and to all rules, regulations, and orders of the Commission. The terms and conditions of the license are subject to amendment,

revision, or modification, by reason of amendments to, or by reason of rules, regulations, and orders issued in accordance with the terms of the Atomic Energy Act.

(e) Any license may be revoked, suspended or modified in whole or in part for any material false statement in the application or any statement of fact required under Section 182 of the Act, or because of conditions revealed by any application or statement of fact or any report, record, or inspection or other means which would warrant the Commission to refuse to grant a license to the original application, or for failure to operate the facility in accordance with the terms of the license, or for any violation of, or failure to observe any of the terms and conditions of the Act, or any rule, regulation, license or order of the Commission.

(f) Each person licensed by the Commission pursuant to the regulations in this part shall confine possession and use of materials to the locations and purposes authorized in the license.

(g) No radioactive waste may be disposed of until the Commission has inspected the land disposal facility and has found it to be in conformance with the description, design, and construction described in the application for a license.

(h) The Commission may incorporate in any license at the time of issuance, or thereafter, by appropriate rule, regulation or order, additional requirements and conditions with respect to the licensee's receipt, possession, and disposal of source, special nuclear or byproduct material as it deems appropriate or necessary in order to:

(1) Promote the common defense and security;

(2) Protect health or to minimize danger to life or property;

(3) Require reports and the keeping of records, and to provide for inspections of activities under the license that may be necessary or appropriate to effectuate the purposes of the Act and regulations thereunder.

(i) Any licensee who receives and possesses special nuclear material under this part in quantities that would be subject to the requirements of § 70.24 of Part 70 of this chapter shall comply with the requirements of that section. The licensee shall not consider the quantity of special nuclear material that has been disposed of.

(j) The authority to dispose of wastes expires on the date stated in the license except as provided in § 61.27(a) of this part.

§ 61.25 Changes.

(a) Except as provided for in specific license conditions, the licensee shall not make changes in the land disposal facility or procedures described in the license application. The license will include conditions restricting subsequent changes to the facility and the procedures authorized which are important to public health and safety. These license restrictions will fall into three categories of descending importance to public health and safety as follows: (1) those features and precedures which may not be changed without (i) 60 days prior notice to the Commission, (ii) 30 days notice of opportunity for a prior hearing, and (iii) prior Commission approval; (2) those features and procedures which may not be changed without (i) 60 days prior notice to the Commisson, and (ii) prior Commission approval; and (3) those features and procedures which may not be changed without 60 days prior notice to the Commission. Features and procedures falling in paragraph (a)(3) of this section may not be changed without prior Commission approval if the Commission, after having received the required notice, so orders.

(b) Amendments authorizing site closure, license transfer, or license termination shall be included in paragraph (a)(1) of this section.

(c) The Commission shall provide a copy of the notice for opportunity for hearings provided in paragraph (a)(1) of this section to State and local officials or tribal governing bodies specified in § 2.104(e) of Part 2 of this chapter.

§ 61.26 Amendment of license.

(a) An application for amendment of a license must be filed in accordance with § 61.20 and shall fully describe the changes desired.

(b) In determining whether an amendment to a license will be approved, the Commission will apply the criteria set forth in § 61.23.

§ 61.27 Application for renewal or closure.

(a) Any expiration date on a license applies only to the above ground activities and to the authority to dispose of waste. Failure to renew the license shall not relieve the licensee of responsibility for carrying out site closure, postclosure observation and transfer of the license to the site owner. An application for renewal or an application for closure under § 61.28 must be filed at least 30 days prior to license expiration.

(b) Applications for renewal of a license must be filed in accordance with §§ 61.10 through 61.16 and § 61.20. Applications for closure must be filed in accordance with §§ 61.20 and 61.28. Information contained in previous applications, statements or reports filed with the Commission under the license may be incorporated by reference if the references are clear and specific.

(c) In any case in which a licensee has timely filed an application for renewal of a license, the license for continued receipt and disposal of licensed materials does not expire until the Commission has taken final action on the application for renewal.

(d) In determining whether a license will be renewed, the Commission will apply the criteria set forth in § 61.23.

§ 61.28 Contents of application for closure.

(a) Prior to final closure of the disposal site, or as otherwise directed by the Commission, the applicant shall submit an application to amend the license for closure. This closure application must include a final revision and specific details of the disposal site closure plan included as part of the license application submitted under § 61.12(g) that includes each of the following:

(1) Any additional geologic, hydrologic, or other disposal site data pertinent to the long-term containment of emplaced radioactive wastes obtained during the operational period.

(2) The results of tests, experiments, or other analyses relating to backfill of excavated areas, closure and sealing, waste migration and interaction with emplacement media, or any other tests, experiments, or analysis pertinent to the long-term containment of emplaced waste within the disposal site.

(3) Any proposed revision of plans for:

(i) Decontamination and/or dismantlement of surface facilities;

(ii) Backfilling of excavated areas; or

(iii) Stabilization of the disposal site for post-closure care.

(4) Any significant new information regarding the environmental impact of closure activities and long-term performance of the disposal site.

(b) Upon review and consideration of an application to amend the license for closure submitted in accordance with paragraph (a) of this section, the Commission shall issue an amendment authorizing closure if there is reasonable assurance that the long-term performance objectives of Subpart C of this part will be met.

§ 61.29 Post-closure observation and maintenance.

Following completion of closure authorized in § 61.28, the licensee shall observe, monitor, and carry out

necessary maintenance and repairs at the disposal site until the license is transferred by the Commission in accordance with § 61.30. Responsibility for the disposal site must be maintained by the licensee for 5 years. A shorter or longer time period for post-closure observation and maintenance may be established and approved as part of the site closure plan, based on site-specific conditions.

§ 61.30 Transfer of license.

(a) Following closure and the period of post-closure observation and maintenance, the licensee may apply for an amendment to transfer the license to the disposal site owner. The license shall be transferred when the Commission finds:

(1) That the closure of the disposal site has been made in conformance with the licensee's disposal site closure plan, as amended and approved as part of the license;

(2) That reasonable assurance has been provided by the licensee that the performance objectives of Subpart C of this part are met;

(3) That any funds and necessary records for care will be transferred to the disposal site owner;

(4) That the post-closure monitoring program is operational for implementation by the disposal site owner; and

(5) That the Federal or State government agency which will assume responsibility for institutional control of the disposal site is prepared to assume responsibility and ensure that the institutional requirements found necessary under § 61.23(g) will be met.

(b) [Reserved]

§ 61.31 Termination of license.

(a) Following any period of institutional control needed to meet the requirements found necessary under § 61.23, the licensee may apply for an amendment to terminate the license.

(b) This application must be filed, and will be reviewed, in accordance with the provision of § 61.20 and of this section.

(c) A license is terminated only when the Commission finds:

(1) That the institutional control requirements found necessary under § 61.23(g) have been met; and

(2) That any additional requirements resulting from new information developed during the institutional control period have been met, and that permanent monuments or markers warning against intrusion have been installed.

Subpart C—Performance Objectives

§ 61.40 General requirement.

Land disposal facilities must be sited, designed, operated, closed, and controlled after closure so that reasonable assurance exists that exposures to humans are within the limits established in the performance objectives in §§ 61.41 through 61.44.

§ 61.41 Protection of the general population from releases of radioactivity.

Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public. Reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.

§ 61.42 Protection of individuals from inadvertent intrusion.

Design, operation, and closure of the land disposal facility must ensure protection of any individual inadvertently intruding into the disposal site and occupying the site or contacting the waste at any time after active institutional controls over the disposal site are removed.

§ 61.43 Protection of individuals during operations.

Operations at the land disposal facility must be conducted in compliance with the standards for radiation protection set out in Part 20 of this chapter, except for releases of radioactivity in effluents from the land disposal facility, which shall be governed by § 61.41 of this part. Every reasonable effort shall be made to maintain radiation exposures as low as is reasonably achievable.

§ 61.44 Stability of the disposal site after closure.

The disposal facility must be sited, designed, used, operated, and closed to achieve long-term stability of the disposal site and to eliminate to the extent practicable the need for ongoing active maintenance of the disposal site following closure so that only surveillance, monitoring, or minor custodial care are required.

Subpart D—Technical Requirements for Land Disposal Facilities

§ 61.50 Disposal site suitability requirements for land disposal.

(a) Disposal site suitability for near-surface disposal.

(1) The purpose of this section is to specify the minimum characteristics a disposal site must have to be acceptable for use as a near-surface disposal facility. The primary emphasis in disposal site suitability is given to isolation of wastes, a matter having long-term impacts, and to disposal site features that ensure that the long-term performance objectives of Subpart C of this part are met, as opposed to short-term convenience or benefits.

(2) The disposal site shall be capable of being characterized, modeled, analyzed and monitored.

(3) Within the region or state where the facility is to be located, a disposal site should be selected so that projected population growth and future developments are not likely to affect the ability of the disposal facility to meet the performance objectives of Subpart C of this part.

(4) Areas must be avoided having known natural resources which, if exploited, would result in failure to meet the performance objectives of Subpart C of this part.

(5) The disposal site must be generally well drained and free of areas of flooding or frequent ponding. Waste disposal shall not take place in a 100-year flood plain, coastal high-hazard area or wetland, as defined in Executive Order 11988, "Floodplain Management Guidelines."

(6) Upstream drainage areas must be minimized to decrease the amount of runoff which could erode or inundate waste disposal units.

(7) The disposal site must provide sufficient depth to the water table that ground water intrusion, perennial or otherwise, into the waste will not occur. The Commission will consider an exception to this requirement to allow disposal below the water table if it can be conclusively shown that disposal site characteristics will result in molecular diffusion being the predominant means of radionuclide movement and the rate of movement will result in the performance objectives of Subpart C of this part being met. In no case will waste disposal be permitted in the zone of fluctuation of the water table.

(8) The hydrogeologic unit used for disposal shall not discharge ground water to the surface within the disposal site.

(9) Areas must be avoided where tectonic processes such as faulting, folding, seismic activity, or vulcanism may occur with such frequency and extent to significantly affect the ability of the disposal site to meet the performance objectives of Subpart C of this part, or may preclude defensible modeling and prediction of long-term impacts.

(10) Areas must be avoided where surface geologic processes such as mass wasting, erosion, slumping, landsliding, or weathering occur with such frequency and extent to significantly affect the ability of the disposal site to meet the performance objectives of Subpart C of this part, or may preclude defensible modeling and prediction of long-term impacts.

(11) The disposal site must not be located where nearby facilities or activities could adversely impact the ability of the site to meet the performance objectives of Subpart C of this part or significantly mask the environmental monitoring program.

(b) Disposal site suitability requirements for land disposal other than near-surface (reserved).

§ 61.51 Disposal site design for land disposal.

(a) Disposal site design for near-surface disposal.

(1) Site design features must be directed toward long-term isolation and avoidance of the need for continuing active maintenance after site closure.

(2) The disposal site design and operation must be compatible with the disposal site closure and stabilization plan and lead to disposal site closure that provides reasonable assurance that the performance objectives of Subpart C of this part will be met.

(3) The disposal site must be designed to complement and improve, where appropriate, the ability of the disposal site's natural characteristics to assure that the performance objectives of Subpart C of this part will be met.

(4) Covers must be designed to minimize to the extent practicable water infiltration, to direct percolating or surface water away from the disposed waste, and to resist degradation by surface geologic processes and biotic activity.

(5) Surface features must direct surface water drainage away from disposal units at velocities and gradients which will not result in erosion that will require ongoing active maintenance in the future.

(6) The disposal site must be designed to minimize to the extent practicable the contact of water with waste during storage, the contact of standing water with waste during disposal, and the contact of percolating or standing water with wastes after disposal.

(b) Disposal site design for other than near-surface disposal (reserved).

§ 61.52 Land disposal facility operation and disposal site closure.

(a) Near-surface disposal facility operation and disposal site closure.

(1) Wastes designated as Class A pursuant to § 61.55, must be segregated from other wastes by placing in disposal units which are sufficiently separated from disposal units for the other waste classes so that any interaction between Class A wastes and other wastes will not result in the failure to meet the performance objectives in Subpart C of this Part. This segregation is not necessary for Class A wastes if they meet the stability requirements in § 61.56(b) of this part.

(2) Wastes designated as Class C pursuant to § 61.55, must be disposed of so that the top of the waste is a minimum of 5 meters below the top surface of the cover or must be disposed of with intruder barriers that are designed to protect against an inadvertent intrusion for a least 500 years.

(3) All wastes shall be disposed of in accordance with the requirements of paragraphs (a)(4) through (11) of this section.

(4) Wastes must be emplaced in a manner that maintains the package integrity during emplacement, minimizes the void spaces between packages, and permits the void spaces to be filled.

(5) Void spaces between waste packages must be filled with earth or other material to reduce future subsidence within the fill.

(6) Waste must be placed and covered in a manner that limits the radiation dose rate at the surface of the cover to levels that at a minimum will permit the licensee to comply with all provisions of § 20.105 of this chapter at the time the license is transferred pursuant to § 61.30 of this part.

(7) The boundaries and locations of each disposal unit (e.g., trenches) must be accurately located and mapped by means of a land survey. Near-surface disposal units must be marked in such a way that the boundaries of each unit can be easily defined. Three permanent survey marker control points, referenced to United States Geological Survey (USGS) or National Geodetic Survey (NGS) survey control stations, must be established n the site to facilitate surveys. The USGS or NGS control stations must provide horizontal and vertical controls as checked against USGSD or NGS record files.

(8) A buffer zone of land must be maintained between any buried waste and the disposal site boundary and beneath the disposed waste. The buffer zone shall be of adequate dimensions to carry out environmental monitoring activities specified in § 61.53(d) of this part and take mitigative measures if needed.

(9) Closure and stabilization measures as set forth in the approved site closure plan must be carried out as each disposal unit (e.g., each trench) is filled and covered.

(10) Active waste disposal operations must not have an adverse effect on completed closure and stabilization measures.

(11) Only wastes containing or contaminated with radioactive materials shall be disposed of at the disposal site.

(b) Facility operation and disposal site closure for land disposal facilities other than near-surface (reserved).

§ 61.53 Environmental monitoring.

(a) At the time a license application is submitted, the applicant shall have conducted a preoperational monitoring program to provide basic environmental data on the disposal site characteristics. The applicant shall obtain information about the ecology, meteorology, climate, hydrology, geology, geochemistry, and seismology of the disposal site. For those characteristics that are subject to seasonal variation, data must cover at least a twelve month period.

(b) The licensee must have plans for taking corrective measures if migration of radionuclides would indicate that the performance objectives of Subpart C may not be met.

(c) During the land disposal facility site construction and operation, the licensee shall maintain a monitoring program. Measurements and observations must be made and recorded to provide data to evaluate the potential health and environmental impacts during both the construction and the operation of the facility and to enable the evaluation of long-term effects and the need for mitigative measures. The monitoring system must be capable of providing early warning of releases of radionuclides from the disposal site before they leave the site boundary.

(d) After the disposal site is closed, the licensee responsible for post-operational surveillance of the disposal site shall maintain a monitoring system based on the operating history and the closure and stabilization of the disposal site. The monitoring system must be capable of providing early warning of releases of radionuclides from the

disposal site before they leave the site boundary.

§ 61.54 Alternative requirements for design and operations.

The Commission may, upon request or on its own initiative, authorize provisions other than those set forth in §§ 61.51 through 61.53 for the segregation and disposal of waste and for the design and operation of a land disposal facility on a specific basis, if it finds reasonable assurance of compliance with the performance objectives of Subpart C of this part.

§ 61.55 Waste classification.

(a) Classification of waste for near surface disposal.

(1) *Considerations.* Determination of the classification of radioactive waste involves two considerations. First, consideration must be given to the concentration of long-lived radionuclides (and their shorter-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. These precautions delay the time when long-lived radionuclides could cause exposures. In addition, the magnitude of the potential dose is limited by the concentration and availability of the radionuclide at the time of exposure. Second, consideration must be given to the concentration of shorter-lived radionuclides for which requirements on institutional controls, waste form, and disposal methods are effective.

(2) *Classes of waste.* (i) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in § 61.56(a). If Class A waste also meets the stability requirements set forth in § 61.56(b), it is not necessary to segregate the waste for disposal.

(ii) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in § 61.56.

(iii) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in § 61.56.

(iv) Waste that is not generally acceptable for near-surface disposal is waste for which waste form and disposal methods must be different, and in general more stringent, than those specified for Class C waste. In the absence of specific requirements in this part, proposals for disposal of this waste may be submitted to the Commission for approval, pursuant to § 61.58 of this part.

(3) Classification determined by long-lived radionuclides. If radioactive waste contains only radionuclides listed in Table 1, classification shall be determined as follows:

(i) If the concentration does not exceed 0.1 times the value in Table 1, the waste is Class A.

(ii) If the concentration exceeds 0.1 times the value in Table 1 but does not exceed the value in Table 1, the waste is Class C.

(iii) If the concentration exceeds the value in Table 1, the waste is not generally acceptable for near-surface disposal.

(iv) For wastes containing mixtures of radionuclides listed in Table 1, the total concentration shall be determined by the sum of fractions rule described in paragraph (a)(7) of this section.

TABLE 1

Radionuclide	Concentration curies per cubic meter
C-14	8
C-14 in activated metal	80
Ni-59 in activated metal	220
Nb-94 in activated metal	0.2
Tc-99	3
I-129	0.08
Alpha emitting transuranic nuclides with half-life greater than five years	[1] 100
Pu-241	[1] 3,500
Cm-242	[1] 20,000

[1] Units are nanocuries per gram.

(4) Classification determined by short-lived radionuclides. If radioactive waste does not contain any of the radionuclides listed in Table 1, classification shall be determined based on the concentrations shown in Table 2. However, as specified in paragraph (a)(6) of this section, if radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A.

(i) If the concentration does not exceed the value in Column 1, the waste is Class A.

(ii) If the concentration exceeds the value in Column 1, but does not exceed the value in Column 2, the waste is Class B.

(iii) If the concentration exceeds the value in Column 2, but does not exceed the value in Column 3, the waste is Class C.

(iv) If the concentration exceeds the value in Column 3, the waste is not generally acceptable for near-surface disposal.

(v) For wastes containing mixtures of the nuclides listed in Table 2, the total concentration shall be determined by the sum of fractions rule described in paragraph (a)(7) of this section.

TABLE 2

Radionuclide	Concentration, curies per cubic meter		
	Col. 1	Col. 2	Col. 3
Total of all nuclides with less than 5 year half life	700	[1]	[1]
H-3	40	[1]	[1]
Co-60	700	[1]	[1]
Ni-63	3.5	70	700
Ni-63 in activated metal	35	700	7000
Sr-90	0.04	150	7000
Cs-137	1	44	4600

[1] There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other nuclides in Table 2 determine the waste to the Class C independent of these nuclides.

(5) Classification determined by both long- and short-lived radionuclides. If radioactive waste contains a mixture of radionuclides, some of which are listed in Table 1, and some of which are listed in Table 2, classification shall be determined as follows:

(i) If the concentration of a nuclide listed in Table 1 does not exceed 0.1 times the value listed in Table 1, the class shall be that determined by the concentration of nuclides listed in Table 2.

(ii) If the concentration of a nuclide listed in Table 1 exceeds 0.1 times the value listed in Table 1 but does not exceed the value in Table 1, the waste shall be Class C, provided the concentration of nuclides listed in Table 2 does not exceed the value shown in Column 3 of Table 2.

(6) Classification of wastes with radionuclides other than those listed in Tables 1 and 2. If radioactive waste does not contain any nuclides listed in either Table 1 or 2, it is Class A.

(7) The sum of the fractions rule for mixtures of radionuclides. For determining classification for waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each nuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits must all be taken from the same column of the same table. The sum of the fractions for the column must be less than 1.0 if the waste class is to be determined by that column. Example: A waste contains Sr-90 in a

concentration of 50 Ci/m³ and Cs-137 in a concentration of 22 Ci/m³ Since the concentrations both exceed the values in Column 1, Table 2, they must be compared to Column 2 values. For Sr-90 fraction 50/150=0.33; for Cs-137 fraction, 22/44=0.5; the sum of the fractions=0.83. Since the sum is less than 1.0, the waste is Class B.

(8) *Determination of concentrations in wastes.* The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as nanocuries per gram.

§ 61.56 Waste characteristics.

(a) The following requirements are minimum requirements for all classes of waste and are intended to facilitate handling at the disposal site and provide protection of health and safety of personnel at the disposal site.

(1) Waste must not be packaged for disposal in cardboard or fiberboard boxes.

(2) Liquid waste must be solidified or packaged in sufficient absorbent material to absorb twice the volume of the liquid.

(3) Solid waste containing liquid shall contain as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume.

(4) Waste must not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.

(5) Waste must not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This does not apply to radioactive gaseous waste packaged in accordance with paragraph (a)(7) of this section.

(6) Waste must not be pyrophoric. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.

(7) Waste in a gaseous form must be packaged at a pressure that does not exceed 1.5 atmospheres at 20°C. Total activity must not exceed 100 curies per container.

(8) Waste containing hazardous, biological, pathogenic, or infectious material must be treated to reduce to the maximum extent practicable the potential hazard from the non-radiological materials.

(b) The requirements in this section are intended to provide stability of the waste. Stability is intended to ensure that the waste does not structurally degrade and affect overall stability of the site through slumping, collapse, or other failure of the disposal unit and thereby lead to water infiltration. Stability is also a factor in limiting exposure to an inadvertent intruder, since it provides a recognizable and nondispersible waste.

(1) Waste must have structural stability. A structurally stable waste form will generally maintain its physical dimensions and its form, under the expected disposal conditions such as weight of overburden and compaction equipment, the presence of moisture, and microbial activity, and internal factors such as radiation effects and chemical changes. Structural stability can be provided by the waste form itself, processing the waste to a stable form, or placing the waste in a disposal container or structure that provides stability after disposal.

(2) Notwithstanding the provisions in §§ 61.56(a) (2) and (3), liquid wastes, or wastes containing liquid, must be converted into a form that contains as little free standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of the waste for waste processed to a stable form.

(3) Void spaces within the waste and between the waste and its package must be reduced to the extent practicable.

§ 61.57 Labeling.

Each package of waste must be clearly labeled to identify whether it is Class A waste, Class B waste, or class C waste in accordance with § 61.55.

§ 61.58 Alternative requirements for waste classification and characteristics.

The Commission may, upon request or on its own initiative, authorize other provisions for the classification and characteristics of waste on a specific basis, if, after evaluation, of the specific characteristics of the waste, disposal site, and method of disposal, it finds reasonable assurance of compliance with the performance objectives in Subpart C of this part.

§ 61.59 Institutional requirements.

(a) *Land ownership.* Disposal of radioactive waste received from other persons may be permitted only on land owned in fee by the Federal or a State government.

(b) *Institutional control.* The land owner or custodial agency shall carry out an institutional control program to physically control access to the disposal site following transfer of control of the disposal site from the disposal site operator. The institutional control program must also include, but not be limited to, carrying out an environmental monitoring program at the disposal site, periodic surveillance, minor custodial care, and other requirements as determined by the Commission; and administration of funds to cover the costs for these activities. The period of institutional controls will be determined by the Commission, but institutional controls may not be relied upon for more than 100 years following transfer of control of the disposal site to the owner.

Subpart E—Financial Assurances

§ 61.61 Applicant qualifications and assurances.

Each applicant shall show that it either possesses the necessary funds or has reasonable assurance of obtaining the necessary funds, or by a combination of the two, to cover the estimated costs of conducting all licensed activities over the planned operating life of the project, including costs of construction and disposal.

§ 61.62 Funding for disposal site closure and stabilization.

(a) The applicant shall provide assurance that sufficient funds will be available to carry out disposal site closure and stabilization, including: (1) Decontamination or dismantlement of land disposal facility structures; and (2) closure and stabilization of the disposal site so that following transfer of the disposal site to the site owner, the need for ongoing active maintenance is eliminated to the extent practicable and only minor custodial care, surveillance, and monitoring are required. These assurances shall be based on Commission-approved cost estimates reflecting the Commission-approved plan for disposal site closure and stabilization. The applicant's cost estimates must take into account total capital costs that would be incurred if an independent contractor were hired to perform the closure and stabilization work.

(b) In order to avoid unnecessary duplication and expense, the Commission will accept financial sureties that have been consolidated with earmarked financial or surety arrangements established to meet

requirements of other Federal or State agencies and/or local governing bodies for such decontamination, closure and stabilization. The Commission will accept this arrangement only if they are considered adequate to satisfy these requirements and that the portion of the surety which covers the closure of the disposal site is clearly identified and committed for use in accomplishing these activities.

(c) The licensee's surety mechanism will be annually reviewed by the Commission to assure that sufficient funds are available for completion of the closure plan, assuming that the work has to be performed by an independent contractor.

(d) The amount of surety liability should change in accordance with the predicted cost of future closure and stabilization. Factors affecting closure and stabilization cost estimates include: inflation; increases in the amount of disturbed land; changes in engineering plans; closure and stabilization that has already been accomplished and any other conditions affecting costs. This will yield a surety that is at least sufficient at all times to cover the costs of closure of the disposal units that are expected to be used before the next license renewal.

(e) The term of the surety mechanism must be open ended unless it can be demonstrated that another arrangement would provide an equivalent level of assurance. This assurance could be provided with a surety mechanism which is written for a specified period of time (e.g., five years) yet which must be automatically renewed unless the party who issues the surety notifies the Commission and the beneficiary (the site owner) and the principal (the licensee) not less than 90 days prior to the renewal date of its intention not to renew. In such a situation the licensee must submit a replacement surety within 30 days after notification of cancellation. If the licensee fails to provide a replacement surety acceptable to the Commission, the site owner may collect on the original surety.

(f) Proof of forfeiture must not be necessary to collect the surety so that in the event that the licensee could not provide an acceptable replacement surety within the required time, the surety shall be automatically collected prior to its expiration. The conditions described above would have to be clearly stated on any surety instrument which is not open-ended, and must be agreed to by all parties. Liability under the surety mechanism must remain in effect until the closure and stabilization program has been completed and approved by the Commission and the license has been transferred to the site owner.

(g) Financial surety arrangements generally acceptable to the Commission include: surety bonds, cash deposits, certificates of deposits, deposits of government securities, escrow accounts, irrevocable letters or lines of credit, trust funds, and combinations of the above or such other types of arrangements as may be approved by the Commission. However, self-insurance, or any arrangement which essentially constitutes pledging the assets of the licensee, will not satisfy the surety requirement for private sector applicants since this provides no additional assurance other than that which already exists through license requirements.

§ 61.63 Financial assurances for institutional controls.

(a) Prior to the issuance of the license, the applicant shall provide for Commission review and approval a copy of a binding arrangement, such as a lease, between the applicant and the disposal site owner that ensures that sufficient funds will be available to cover the costs of monitoring and any required maintenance during the institutional control period. The binding arrangement will be reviewed periodically by the Commission to ensure that changes in inflation, technology and disposal facility operations are reflected in the arrangements.

(b) Subsequent changes to the binding arrangement specified in paragraph (a) of this section relevant to institutional control shall be submitted to the Commission for approval.

Subpart F—Participation by State Governments and Indian Tribes

§ 61.70 Scope.

This subpart describes mechanisms through which the Commission will implement a formal request from a State or tribal government to participate in the review of a license application for a land disposal facility. Nothing in this subpart may be construed to bar the State or tribal governing body from participating in subsequent Commission proceedings concerning the license application as provided under Federal law and regulations.

§ 61.71 State and Tribal government consultation.

Upon request of a State or tribal governing body, the Director shall make available Commission staff to discuss with representatives of the State or tribal governing body information submitted by the applicant, applicable Commission regulations, licensing procedures, potential schedules, and the type and scope of State activities in the license review permitted by law. In addition, staff shall be made available to consult and cooperate with the State or tribal governing body in developing proposals for participation in the license review.

§ 61.72 Filing of proposals for State and Tribal participation.

(a) A State or tribal governing body whose interest is affected by a near-surface disposal facility at the proposed site may submit to the Director a proposal for participation in the review of a license application. Proposals must be submitted within the following time periods:

(1) For the State in which the disposal facility will be located, or any State that is member of an interstate compact that includes the State in which the disposal facility is located, no later than 45 days following publication in the Federal Register of the notice of tendering of an application submitted under § 61.20.

(2) For any other State, or for a tribal governing body, no later than 120 days following publication in the Federal Register of the notice of tendering of an application submitted under § 61.20.

(b) Proposals for participation in the licensing process must be made in writing and must be signed by the Governor of the State or the official otherwise provided for by State or tribal law.

(c) At a minimum, proposals must contain each of the following items of information:

(1) A general description of how the State or tribe wishes to participate in the licensing process specifically identifying those issues it wishes to review.

(2) A description of material and information which the State or tribe plans to submit to the Commission for consideration in the licensing process. A tentative schedule referencing steps in the review and calendar dates for planned submittals should be included.

(3) A description of any work that the State or tribe proposes to perform for the Commission in support of the licensing process.

(4) A description of State or tribal plans to facilitate local government and citizen participation.

(5) A preliminary estimate of the types and extent of impacts which the State expects, should a disposal facility be located as proposed.

(6) If desired, any requests for educational or information services (seminars, public meetings) or other

actions from the Commission such as establishment of additional Public Document Rooms or exchange of State personnel under the Intergovernmental Personnel Act.

§ 61.73 Commission approval of proposals.

(a) Upon receipt of a proposal submitted in accordance with § 61.72, the Director shall arrange for a meeting between the representatives of the State or tribal governing body and the Commission staff to discuss the proposal and to ensure full and effective participation by the State or tribe in the Commission's license review.

(b) If requested by a State or tribal governing body, the Director may approve all or any part of a proposal if the Director determines that:

(1) The proposed activities are within the scope of Commission statutory responsibility and the type and magnitude of impacts which the State or tribe may bear are sufficient to justify their participation; and

(2) The proposed activities will contribute productively to the licensing review.

(c) The decision of the Director will be transmitted in writing to the governor or the designated official of the tribal governing body.

(d) Participation by a State or Indian tribe shall not affect their rights to participate in an adjudicatory hearing as provided by Part 2 of this chapter.

Subpart G—Records, Reports, Tests, and Inspections

§ 61.80 Maintenance of records, reports, and transfers.

(a) Each licensee shall maintain any records and make any reports in connection with the licensed activities as may be required by the conditions of the license or by the rules, regulations, and orders of the Commission.

(b) Records which are required by the regulations in this part or by license conditions must be maintained for a period specified by the appropriate regulations in this chapter or by license condition. If a retention period is not otherwise specified, these records must be maintained and transferred to the officials specified in paragraph (e) of this section as a condition of license termination unless the Commission otherwise authorizes their disposition.

(c) Records which must be maintained pursuant to this part may be the original or a reproduced copy or microfilm if this reproduced copy or microfilm is capable of producing copy that is clear and legible at the end of the required retention period.

(d) If there is a conflict between the Commission's regulations in this part, license condition, or other written Commission approval or authorization pertaining to the retention period for the same type of record, the longest retention period specified takes precedence.

(e) Notwithstanding paragraphs (a) through (d) of this section, copies of records of the location and the quantity of radioactive wastes contained in the disposal site must be transferred upon license termination to the chief executive of the nearest municipality, the chief executive of the county in which the facility is located, the county zoning board or land development and planning agency, the State governor and other State, local and Federal governmental agencies as designated by the Commission at the time of license termination.

(f) Following receipt and acceptance of a shipment of radioactive waste, the licensee shall record the date of disposal of the waste, the location in the disposal site, the condition of the waste packages as received, any discrepancies between materials listed on the manifest and those received, and any evidence of leaking or damaged packages or radiation or contamination levels in excess of limits specified in Department of Transportation and Commission regulations. The licensee shall briefly describe any repackaging operations of any of the waste packages included in the shipment, plus any other information required by the Commission as a license condition.

(g) Each licensee shall comply with the safeguards reporting requirements of §§ 30.55, 40.64, 70.53 and 70.54 of this chapter if the quantities or activities of materials received or transferred exceed the limits of these sections. Inventory reports required by these sections are not required for materials after disposal.

(h) Each licensee authorized to dispose of radioactive waste received from other persons shall file a copy of its financial report or a certified financial statement annually with the Commission in order to update the information base for determining financial qualifications.

(i)(1) Each licensee authorized to dispose of waste materials received from other persons, pursuant to this part, shall submit annual reports to the appropriate Commission regional office shown in Appendix D of Part 20 of this chapter, with copies to the Director of the Office of Inspection and Enforcement and the Director of the Division of Waste Management, USNRC, Washington, D.C., 20555. Reports shall be submitted by the end of the first calendar quarter of each year for the preceding year; (2) The reports shall include (i) specification of the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in airborne effluents during the preceding year, (ii) the results of the environmental monitoring program, (iii) a summary of licensee disposal unit survey and maintenance activities, (iv) a summary, by waste class, of activities and quantities of radionuclides disposed of, (v) any instances in which observed site characteristics were significantly different from those described in the application for a license; and (vi) any other information the Commission may require. If the quantities of radioactive materials released during the reporting period, monitoring results, or maintenance performed are significantlly different from those expected in the materials previously reviewed as part of the licensing action, the report must cover this specifically.

(j) Each licensee shall report in accordance with the requirements of § 70.52 of this chapter.

(k) Any transfer of byproduct, source, and special nuclear materials by the licensee is subject to the requirements in §§ 30.41, 40.51, and 70.42 of this chapter. Byproduct, source and special nuclear material means materials as defined in these parts, respectively.

§ 61.81 Tests at land disposal facilities.

(a) Each licensee shall perform, or permit the Commission to perform, any tests as the Commission deems appropriate or necessary for the administration of the regulations in this part, including tests of:

(1) Radioactive wastes and facilities used for the receipt, storage, treatment, handling and disposal of radioactive wastes.

(2) Radiation detection and monitoring instruments; and

(3) Other equipment and devices used in connection with the receipt, possession, handling, treatment, storage, or disposal of radioactive waste.

(b) [Reserved]

§ 61.82 Commission inspections of land disposal facilities.

(a) Each licensee shall afford to the Commission at all reasonable times opportunity to inspect radioactive waste not yet disposed of, and the premises, equipment, operations, and facilities in which radioactive wastes are received, possessed, handled, treated, stored, or disposed of.

(b) Each licensee shall make available to the Commission for inspection, upon

reasonable notice, records kept by it pursuant to the regulations in this chapter. Authorized representatives of the Commission may copy and take away copies of, for the Commission's use, any record required to be kept pursuant to this part.

§ 61.83 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Atomic Energy Act of 1954, as amended, or any regulation or order issued thereunder. A court order may be obtained for the payment of a civil penalty imposed pursuant to section 234 of the Act for violation of section 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Act, or section 206 of the Energy Reorganization Act of 1974, or any rule.

The following amendments are also made to existing parts of the regulations in this chapter.

PART 2—RULES OF PRACTICE

2. In § 2.101, paragraph (a)(2), (b), and (d) are revised and a new (g) is added to read as follows:

§ 2.101 Filing of application.

(a) * * *

(2) Each application for a license for a facility or for receipt of waste radioactive material from other persons for the purpose of commercial disposal by the waste disposal licensee will be assigned a docket number. However, to allow a determination as to whether an application for a construction permit or operating license for a production or utilization facility is complete and acceptable for docketing, it will be initially treated as a tendered application after it is received and a copy of the tendered application will be available for public inspection in the Commission's Public Document Room, 1717 H Street NW., Washington, D.C. Generally, that determination will be made within a period of thirty (30) days. However, in selected construction permit applications, the Commission may decide to determine acceptability on the basis of the technical adequacy of the application as well as its completeness. In such cases, the Commission, pursuant to § 2.104(a), will direct that the notice of hearing be issued as soon as practicable after the application has been tendered, and the determination of acceptability will generally be made within a period of sixty (60) days. For docketing and other requirements for applications pursuant to Part 61 of this chapter, see paragraph (g) of this section.

* * * * *

(b) After the application has been docketed each applicant for a license for receipt of waste radioactive material from other persons for the purpose of commercial disposal by the waste disposal licensee except applicants under Part 61 of this chapter, who must comply with paragraph (g) of this section, shall serve a copy of the application and environmental report, as appropriate, on the chief executive of the municipality in which the activity is to be conducted or, if the activity is not to be conducted within a municipality on the chief executive of the county, and serve a notice of availability of the application or environmental report on the chief executives of the municipalities or counties which have been identified in the application or environmental report as the location of all or part of the alternative sites, containing the following information: Docket number of the application; a brief description of the proposed site and facility; the location of the site and facility as primarily proposed and alternatively listed; the name, address, and telephone number of the applicant's representative who may be contacted for further information; notification that a draft environmental impact statement will be issued by the Commission and will be made available upon request to the Commission; and notification that if a request is received from the appropriate chief executive, the applicant will transmit a copy of the application and environmental report, and any changes to such documents which affect the alternative site location, to the executive who makes the request. In complying with the requirements of this paragraph (b) the applicant should not make public distribution of those parts of the application subject to § 2.790(d). The applicant shall submit to the Director of Nuclear Material Safety and Safeguards an affidavit that service of the notice of availability of the application or environmental report has been completed along with a list of names and addresses of those executives upon whom the notice was served.

* * * * *

(d) The Director of Nuclear Reactor Regulation or Director of Nuclear Material Safety and Safeguards, as appropriate, will give notice of the docketing of the public health and safety, common defense and security, and environmental parts of an application for a license for a facility or for receipt of waste radioactive material from other persons for the purpose of commercial disposal by the waste disposal licensee, except that for applications pursuant to Part 61 of this chapter paragraph (g) of this section applies, to the Governor or other appropriate official of the State in which the facility is to be located or the activity is to be conducted and will cause to be published in the Federal Register a notice of docketing of the application which states the purpose of the application and specifies the location at which the proposed activity would be conducted.

* * * * *

(g) Each application for a license to receive radioactive waste from other persons for disposal under Part 61 of this chapter and the accompanying environmental report shall be processed in accordance with the provisions of this paragraph.

(1) To allow a determination as to whether the application or environmental report is complete and acceptable for docketing, it will be initially treated as a tendered document and a copy will be available for public inspection in the Commission's Public Document Room 1717 H Street NW., Washington, D.C. One original and two copies shall be filed to enable this determination to be made.

(i) Upon receipt of a tendered application, the Commission will publish in the Federal Register notice of the filed application and will notify the governors, legislatures and other appropriate State, county, and municipal officials and tribal governing bodies of the States and areas containing or potentially affected by the activities at the proposed site and the alternative sites. The Commission will inform these officials that the Commission staff will be available for consultation pursuant to § 61.71 of this chapter. The Federal Register notice will note the opportunity for interested persons to submit views and comments on the tendered application for consideration by the Commission and applicant. The Commission will also notify the U.S. Bureau of Indian Affairs when tribal governing bodies are notified.

(ii) The Commission will also post a public notice in a newspaper or newspapers of general circulation in the affected States and areas summarizing information contained in the applicant's tendered application and noting the opportunity to submit views and comments.

(iii) When the Director of Nuclear Material Safety and Safeguards determines that the tendered document is complete and acceptable for docketing, a docket number will be assigned and the applicant will be notified of the determination. If it is determined that all or any part of the