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Long-Term Stewardship Science and Technology Requirements

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EXECUTIVE SUMMARY

Many of the United States' hazardous and radioactively contaminated waste sites will not be sufficiently remediated to allow unrestricted land use because funding and technology limitations preclude cleanup to pristine conditions. This means that after cleanup is completed, the Department of Energy will have long-term stewardship responsibilities to monitor and safeguard more than 100 sites that still contain residual contamination. Long-term stewardship encompasses all physical and institutional controls, institutions, information, and other mechanisms required to protect human health and the environment from the hazards remaining.

The Department of Energy Long-Term Stewardship National Program is in the early stages of development, so considerable planning is still required to identify all the specific roles and responsibilities, policies, and activities needed over the next few years to support the program's mission. The Idaho National Engineering and Environmental Laboratory was tasked with leading the development of Science and Technology within the Long-Term Stewardship National Program. As part of that role, a task was undertaken to identify the existing science and technology related requirements, identify gaps and conflicts that exist, and make recommendations to the Department of Energy for future requirements related to science and technology requirements for long-term stewardship. This work is summarized in this document.

Review and identification of requirements were based on the laws and requirements of the future stewardship sites, which will be remediated under: Uranium Mill Tailings Radiation Control Act Title I and Title II; Department of Energy Decontamination and Decommissioning; Formerly Utilized Site Remedial Action Program; Nuclear Waste Policy Act of 1982; Comprehensive Environmental Response, Compensation, and Liability Act of 1982; and Resource Conservation and Recovery Act of 1976. The requirements were categorized within those site types for each of the Science and Technology Roadmap Work Group Areas: safety systems and institutional controls, monitoring and sensors, contamination containment and control, and decision making and institutional performance.

Gaps analysis was performed by developing a list of objectives for each work group area to support Long-Term Stewardship's mission of protecting human health and the environment. Requirements identified for the Roadmap Work Group Areas were matched to the objectives. If a match did not occur, a potential gap was identified. Several gaps were identified:

- A record retention schedule that will support the needs of the Long-Term Stewardship Program does not exist
- A requirement to ensure records are accessible and retrievable for stewardship activities does not exist
- Security systems to ensure the waste is not disturbed or removed are not required for all sites.

As requirements were reviewed, one conflict was identified, which it occurs between the Department of Energy's definition of institutional controls and the Environmental Protection Agency's definition of institutional controls. The Department of Energy includes signs, fences, and security systems as a part of the definition of institutional controls. The Environmental Protection Agency does not consider signs, fences, and security systems a part of institutional controls.

A list of recommendations was generated with respect to science and technology requirements to close the gaps and resolve the conflicts identified. These recommendations include:

- A record retention schedule requirement should be developed to ensure the appropriate records are retained for the specified time period. Record retention schedule should identify which records need to be retained and their length of retention.

- A requirement needs to be developed to ensure records are accessible and retrievable throughout the specified time. The requirement should also take in account the rapidly changing technology of media storage and software to read the media.

- The Department of Energy should develop a requirement to ensure the residual waste is not disturbed or removed.

- The Department of Energy should use the same terminology as the Environmental Protection Agency for institutional controls. Department of Energy should not refer or define signs, fences, and security systems as institutional controls. Call them what they are—security and safety measures, but retain their function to protect human health and the environment.

- A requirement should be developed to ensure a baseline is developed and updated throughout the specified time period to account for the changes in site characteristics, community at risk, land use plans, and applicable policies, regulations, and laws.

CONTENTS

FIGURES

TABLES

ACRONYMS

ANSI	American National Standards Institute
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
D&D	Decontamination and Decommissioning
DoD	Department of Defense
DOE	Department of Energy
EPA	Environmental Protection Agency
FUSRAP	Formerly Utilized Site Remedial Action Program
NRC	Nuclear Regulatory Commission
NWPA	Nuclear Waste Policy Act
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
UMTRCA	Uranium Mill Tailings Radiation Control Act

Long-Term Stewardship
Science and Technology Requirements

1. INTRODUCTION

Many of the United States' hazardous and radioactively contaminated waste sites will not be sufficiently remediated to allow unrestricted land use because funding and technology limitations preclude cleanup to pristine conditions. This means that after cleanup is completed, the Department of Energy (DOE) will have long-term stewardship responsibilities to monitor and safeguard more than 100 sites that still contain residual contamination. Long-term stewardship encompasses all physical and institutional controls, institutions, information, and other mechanisms required to protect human health and the environment from the hazards remaining.

The DOE Long-Term Stewardship National Program is in the early stages of development, so considerable planning is still required to identify all the specific roles and responsibilities, policies, and activities needed over the next few years to support the program's mission. The Idaho National Engineering and Environmental Laboratory was tasked with leading the development of Science and Technology within the Long-Term Stewardship National Program. As part of that role, a task was undertaken to identify the existing science and technology related requirements, identify gaps and conflicts that exist, and make recommendations to the DOE for future requirements related to science and technology requirements for long-term stewardship. This work is summarized in this document.

This science and technology requirements work directly supports another key aspect of the Long-Term Stewardship National Program—the Science and Technology Roadmap. Science and technology roadmapping is an effective way to develop a strategic plan or investment strategy for technology development for increasing protection of human health and the environment, mitigating risks, and decreasing life cycle costs. In the process of identifying technology development needs, it is important to include the requirements the technology must meet when applied in the field; failure to do so could render the technology useless. To increase the likelihood of success, this review of national requirements and policy applicable to science and technology applications in support of long-term stewardship operations was performed. As a result of the review, not only were national regulatory requirements identified, but gaps and conflicts were also identified, and a science and technology requirements recommendation was developed for the Department's consideration.

2. APPROACH

Prior to entering long-term stewardship, sites will undergo some form of remediation and closure. The primary national regulations, laws, and policies that dictate remediation and closure vary by site types. These site types entering long-term stewardship are Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I and Title II; Formerly Utilized Site Remedial Action Program (FUSRAP); DOE Decontamination and Decommissioning (D&D); Nuclear Waste Policy Act (NWPA) of 1982; Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1982; and Resource Conservation and Recovery Act (RCRA) of 1976. Review and identification of national science and technology requirements were based on site types. Although the FUSRAP is a program, not a law or policy, it was chosen as a long-term stewardship category because of the numerous FUSRAP sites scheduled to enter long-term stewardship.

The review categorized requirements within those site types for each of the Science and Technology Roadmap Work Group Areas: safety systems and institutional controls, monitoring and

150 sensors, contamination containment and control, and decision making and institutional performance. Figure 1 shows the structure of these groups. Information technology is a crosscutting subcategory applicable to all the Science and Technology Roadmap Work Group Areas.

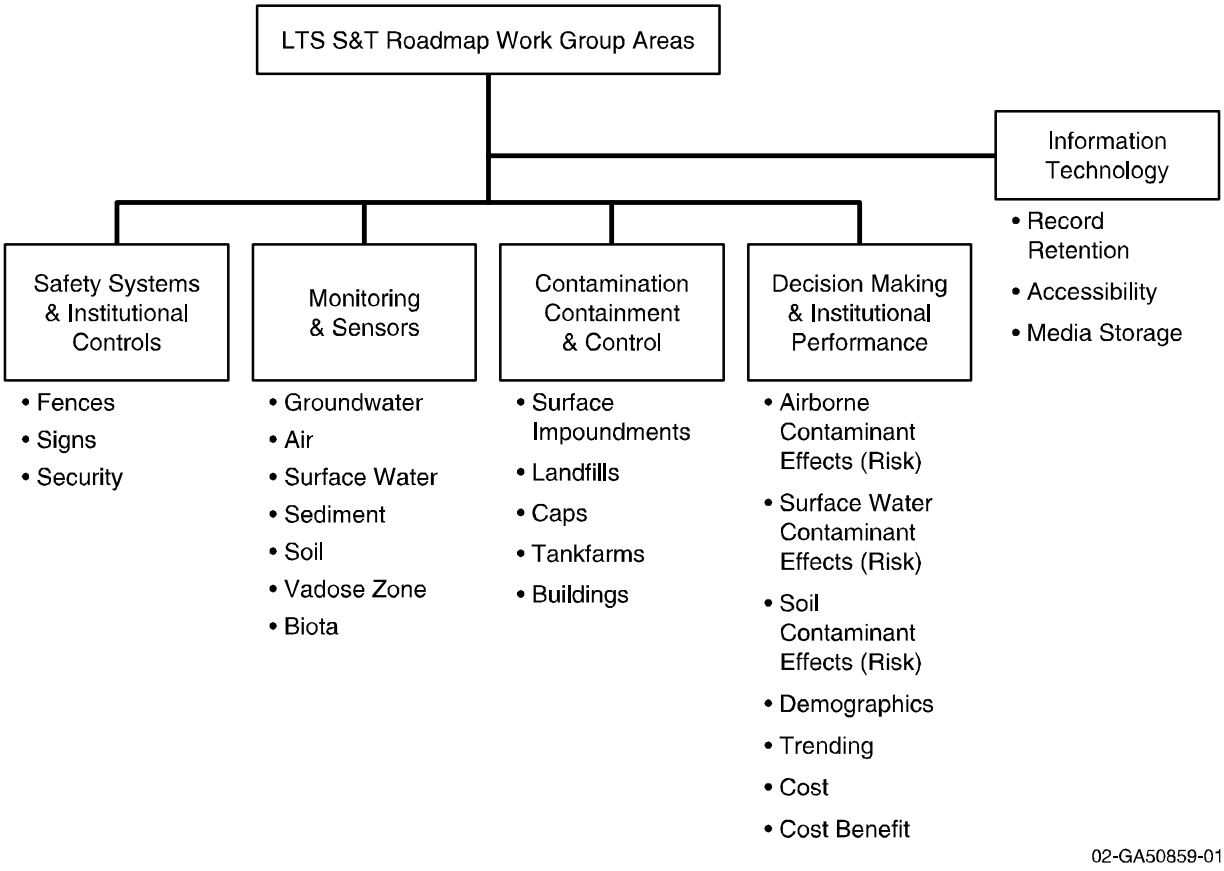

Figure 1. Subcategories within the Long-Term Stewardship Science and Technology Roadmap Work Group Areas.

The primary regulations for site types were used as a basis to narrow the requirements search. From these primary regulations, the applicable national-level science and technology requirements for these subcategories were identified for each site type. Table 1 shows the primary regulations for the site types.

Table 1. Site Type Primary Regulations.

Site Type	Primary Regulation
Uranium Mill Tailings Radiation Control Act Title I	40 CFR 192 and 10 CFR 40.27
Uranium Mill Tailings Radiation Control Act Title II	40 CFR 192 and 10 CFR 40.28
Nuclear Waste Policy Act of 1982	DOE orders
Formerly Utilized Site Remedial Action Program	CERCLA (40 CFR 300–399)
DOE Decontamination and Decommissioning	DOE orders
Comprehensive Environmental Response, Compensation, and Liability Act	CERCLA (40 CFR 300–399)
Resource Conservation and Recovery Act	RCRA (40 CFR 260–299)

3. REQUIREMENTS

Potential requirements with respect to science and technology application were reviewed from three primary sources: regulations, codes and standards, and other federal agencies. Results of the review are discussed in this section.

3.1 Regulations

As stated in Section 2, "Approach," regulations were reviewed and identified for each subcategory for each Science and Technology Work Group Area. Results of the regulation review are summarized in this section by each Science and Technology Work Group Area: Information Technology, Safety Systems and Institutional Controls, Monitoring and Sensors, Contamination Containment and Control, and Decision Making and Institutional Performance. Many of the regulations contain numerous details, which are included in Appendix A and referred to by a summary table for each Work Group Area. If the reader desires more detail of the regulation, the reader is directed to the Notes contained in Appendix A.

It should be noted that DOE orders were included in the review of regulations. Although DOE orders are not promulgated, or legally enforceable as federal laws are, such as the Code of Federal Regulations, they can be legally binding because of contractual arrangements between DOE and its contractors.

For most Work Group Areas, requirements or regulations are discussed generically by the site type (also may be referred to as regulation source). In some instances, for the purpose of clarity, discussions of regulations or requirements were not only discussed by the site type, but also further segregated by the work group subcategory.

3.1.1 Information Technology

Subcategories for information technology include record retention, accessibility, and media storage (see Table 2). Notes for Information Technology are located in Appendix A.

Table 2. Referenced Notes for information technology are located in Appendix A.

Site Type	Primary Agency (ies)	Regulations/Requirements			
		Information Technology			
		Primary	Record Retention	Accessibility	Media Storage
UMTRCA Title I	NRC, States, Tribes	40 CFR 192 10 CFR 40.27	Note AG	Note AG	Note AG
UMTRCA Title II	NRC, States, Tribes	40 CFR 192 10 CFR 40.28	Note AH	Note AH	Note AH
NWPA Section 151 (Parkersburg)	NRC	DOE orders, Note AI	Note AJ	Note AK	Note AL
D&D	DOE	DOE orders, Note AI	Note AJ	Note AK	Note AL
Other (RCRA)	EPA	RCRA	Note AM		
FUSRAP	EPA	CERCLA		Note AM	
CERCLA	EPA	CERCLA		Note AN	
CERCLA On-going Treatment	EPA	CERCLA		Note AN	
Other (PCBs - Disposal)			Note AO		
Other (Injection Wells - Closure)			Note AP		

Uranium Mill Tailings Radiation Control Act Title I and II. The primary regulations for UMTRCA Title I and II, 10 CFR 40.27 and 10 CFR 40.28, respectively, do not have specific requirements or references to information technology. However, 10 CFR 40.27 and 10 CFR 40.28 do require a description of the long-term surveillance program record keeping procedures as part of the license. Since the requirements for record keeping procedures are not explicitly provided, this implies that record keeping procedures are site-specific in accordance to the license. Thus, each site could have different records, formats, and storage and retrieval methods.

Department of Energy Decontamination and Decommissioning and Nuclear Waste Policy Act. Department of Energy D&D and NWPA sites' primary regulations are DOE orders. The applicable DOE order for information technology is DOE Order 200.1, "Information Management Program." DOE Order 200.1 has two requirements:

1. Information, information resources, and information technologies shall be managed in a manner that supports the strategic and operational plans of the Department

2. Information management activities shall be established, maintained, and managed in a manner that addresses Department policy and implements appropriate laws and regulations as specified in Attachment II, "References."

Attachment II, "References," of DOE Order 200.1 contains a list of 23 references. Each reference was reviewed for applicability to the appropriate subcategory for information technology. Of the 23 references reviewed, Reference 6 of DOE Order 200.1, 36 CFR 1200, was the most appropriate

regulation for the category of information technology and its subcategories. For record retention, 36 CFR 1228.64 requires transfer of records to the National Archives after 30 years unless the DOE Secretary certifies the records must be retained for a longer period. For environmental records, this has been done. The DOE Environmental Record Schedule, Appendix B, has requirements for record retention, which are specific to the type of record being retained.

Accessibility of records is not explicitly stated with the exception of 36 CFR 1236, "Management of Vital Records." Vital records are required to be accessible in the event of an emergency. Vital records are policies, plans, and procedures developed and implemented and the resources needed to identify, use, and protect the essential records needed to meet operational responsibilities under national security emergencies or other emergency or disaster conditions, or to protect the government's rights or those of its citizens.

Because most records for long-term stewardship will eventually be transferred to the National Archives or stored in a similar manner, 36 CFR 1200 defines how to store the record type or media and specifies the formats accepted by the National Archives. Media storage is specific to the type of media used.

Comprehensive Environmental Response, Compensation, and Liability Act. With respect to information technology, CERCLA 40 CFR 300, Subpart I requires establishment of an administrative record at facilities undergoing response actions. 40 CFR 300 is specific as to when the administrative record must be established, but does not state how long nor what documents generated after the response action is completed that must be maintained in the administrative record. CERCLA requires the administrative record be kept at or near the facility where the response action is occurring. It also must be maintained at a central location, and to ensure public access to the administrative record, it cannot be located in an area where a security clearance is required. If wastes remain onsite after response action has been completed, CERCLA requires a five-year review. Supporting documents (i.e., monitoring data collected during the five-year period) would be necessary information to be maintained to support a CERCLA five-year review.

Resource Conservation and Recovery Act. Review of RCRA did not reveal requirements for long-term stewardship information technology. However, RCRA requires a closure plan when a site is closed under RCRA. The specifics of record keeping for a RCRA site will likely be noted in the closure plan. Closure of underground storage tanks under RCRA is an exception. 40 CFR 280, Subpart G, requires records for underground storage tanks to be maintained for at least three years after completion of permanent closure or change-in-service.

3.1.2 Safety Systems and Institutional Controls

Subcategories for safety systems and institutional controls include fences, signs, and security (see Table 3). Notes for Safety Systems and Institutional Controls are located in Appendix A.

Table 3. Safety systems and institutional controls referenced Notes are located in Appendix A.

Site Type	Primary Agency (ies)	Regulations/Requirements			
		Safety Systems and Institutional Controls			
		Primary	Fences	Signs	Security
UMTRCA Title I	NRC, States, Tribes	40 CFR 192 10 CFR 40.27	Note AQ	Note AQ	Note AQ
UMTRCA Title II	NRC, States, Tribes	40 CFR 192 10 CFR 40.28	Note AQ	Note AQ	Note AQ
NWPA Section 151 (Parkersburg)	NRC	DOE orders	Note AR	Note AR	Note AR
D&D	DOE	DOE orders	Note AR	Note AR	Note AR
Other (RCRA)	EPA	RCRA	Note AS	Note AS	Note AS
FUSRAP	EPA	CERCLA	Note AT	Note AT	Note AT
CERCLA	EPA	CERCLA	Note AT	Note AT	Note AT
CERCLA On-going Treatment	EPA	CERCLA	Note AT	Note AT	Note AT
Other (Asbestos)			Note AU	Note AU	

Uranium Mill Tailings Radiation Control Act Title I and II. The primary regulations for UMTRCA Title I and II, 10 CFR 40.27 and 10 CFR 40.28, respectively, do not have requirements for fences, signs, or security. However, 10 CFR 61.42 also applies and requires the facility to ensure protection of any individual from inadvertently intruding into the disposal site and occupying the site or contacting the waste. This requirement does not specifically state to install a fence or signs, or to have a security system, but it implies the need for some type of safety system to prevent individuals from inadvertently intruding into a disposal site.

Department of Energy Decontamination and Decommissioning and Nuclear Waste Policy Act. The DOE has an order requiring protection of property. DOE Order 5632.1.C-1, "Manual for Protection and Controls of Safeguards and Security," requires protection of government-owned property from damage, destruction, or theft. In addition to protection of property, by implementing this order it protects human health and the environment by preventing inadvertent entry.

Comprehensive Environmental Response, Compensation, and Liability Act. CERCLA does not have any requirements specific to signs, fences, or security. Instead, institutional controls are considered a response action under CERCLA and are part of a remedy. Institutional controls must meet all statutory requirements and are subject to the nine evaluation criteria outlined in 40 CFR 300.430. Thus, the need for signs, fences, or security would be addressed as part of the Record of Decision.

Resource Conservation and Recovery Act. RCRA, 40 CFR 264.117 and 40 CFR 265.117, state the Regional Administrator may require the same security as required during operations of the facility if the hazardous waste remains exposed after closure or access by the public or domestic livestock may pose a hazard to human health. Sites would meet these requirements in various ways and could use fences, signs, or other methods. If the Regional Administrator requires security, then 40 CFR 264.14 or 40 CFR 265.14 (c) is implemented defining the requirements for the posting of signs.

3.1.3 Monitoring and Sensors

Subcategories for sensors and monitoring include, where applicable, groundwater, air, surface water, sediment, and soil (see Table 4). Although there are numerous requirements and guidance for monitoring of the various subcategories within the site types, specific requirements for sensors were not identified. Notes for Monitoring and Sensors are located in Appendix A.

Uranium Mill Tailings Radiation Control Act Title I and II. Generally, if monitoring is required for a UMTRCA Title I or Title II site, it will be for groundwater, air, or both. 10 CFR 40.27 and 10 CFR 40.28 require a general license to be issued for the custody of and long-term care—including monitoring, maintenance, and emergency measures—necessary to protect public health and safety. The license becomes effective when the Nuclear Regulatory Commission accepts the site Long-Term Surveillance Plan outlining the steps to be taken to ensure protection of the environment and the public. Monitoring requirements for UMTRCA Title I and Title II are very similar, but are separated in discussion to minimize the confusion of applicable references to the requirements.

Uranium Mill Tailings Radiation Control Act Title I Groundwater. Monitoring levels for groundwater are identified in 40 CFR 192, Subparts A and B. Appendix I to CFR 192 contains a list of constituents for which the groundwater background levels are determined. Once the background levels have been established, the concentration limits are set. The concentration of a listed constituent from Appendix I in the groundwater must not exceed at the point of compliance:

- The background level of that constituent in the groundwater
- For any of the constituents listed in Table 1 Subpart A of 40 CFR 192, the respective value given in that table if the background level of the constituent is below the value given in the table
- An alternate concentration limit established pursuant to 40 CFR 192, Subpart A or B.

In many cases, the monitoring levels for groundwater will be site-specific. Frequency of monitoring is not specified in the CFR. Frequency is site-specific and noted in the Long-Term Surveillance Plan.

Uranium Mill Tailings Radiation Control Act Title II Groundwater. Monitoring levels for groundwater are identified in 40 CFR 192, Subpart D, which refers to 40 CFR 264. Appendix VIII to 40 CFR 264 contains a list of constituents for which the groundwater background levels are determined. Once the background levels have been established, the concentration limits are set. The concentration of a listed constituent from Appendix VIII in the groundwater must not exceed at the point of compliance:

- The background level of that constituent in the groundwater
- For any of the constituents listed in Table 1 Subpart F of 40 CFR 264, the respective value given in that table if the background level of the constituent is below the value given in the table
- An alternate concentration limit established pursuant to 40 CFR 264, Subpart F.

In many cases, the monitoring levels for groundwater will be site-specific. Frequency of monitoring is not specified in the CFR. Frequency is site-specific and noted in the Long-Term Surveillance Plan.

Table 4. Monitoring and Sensors Notes are located in Appendix A.

Site Type	Primary Agency(ies)	Regulations/Requirements								
				Monitoring and Sensors						
		Primary	Closure Plan Required?	Groundwater	Air	Surface Water	Sediment	Soil	Vadose Zone	Biota
UMTRCA Title I	NRC, States, Tribes	40 CFR 192 10 CFR 40.27	Yes, 10 CFR 40.27(b)	Note A	Note C					
UMTRCA Title II	NRC, States, Tribes	40 CFR 192 10 CFR 40.28	Yes, 10 CFR 40.28(b)	Note B	Note D					
NWPA Section 151	NRC	DOE orders								
D&D	DOE	DOE orders	Yes, DOE Order 5400.1	Note H	Note I	Note J	Note K	Note L		Note M
Other (RCRA)	EPA	RCRA	Yes, Note G	Note N						
FUSRAP	EPA	CERCLA	ROD driven	Note O	Note P	Note Q	Note R	Site-specific, ROD	Site-specific based on ROD ARARs	Site-specific based on ROD ARARs
CERCLA	EPA	CERCLA	ROD driven	Note O	Note P	Note Q	Note R	Site-specific, ROD	Site-specific based on ROD ARARs	Site-specific based on ROD ARARs
CERCLA On-going Treatment	EPA	CERCLA	ROD driven	Note O	Note P	Note Q	Note R	Site-specific, ROD	Site-specific based on ROD ARARs	Site-specific based on ROD ARARs

Uranium Mill Tailings Radiation Control Act Type I and II Air. Air monitoring is required as a function of site closure under UMTRCA Title I. A permanent radon barrier is built prior to closure of an UMTRCA Title I impoundment. The barrier is required to be designed to release no more than 20 pCi/m^2 of radon-222 in a period of one year in accordance with 40 CFR 192. After monitoring has proven the design, which is performed prior to impoundment closure, no further monitoring of radon-222 is required.

Air monitoring is not required under UMTRCA Title II.

Department of Energy Decontamination and Decommissioning and Nuclear Waste Policy Act. Monitoring requirements for contaminants in various medium are established in DOE Order 5400.5, "Radiation Protection of the Public and the Environment." Implementation guidance for DOE Order 5400.5 is DOE/EH-1073T, "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance." DOE orders do not contain specific monitoring requirements for non-radiological contaminants. For specific monitoring requirements for non radiological contaminants, refer to the monitoring discussion for CERCLA and RCRA sites.

DOE Order 5400.5 limits the radiation exposure from routine DOE activities to the public from all pathways to 100-mrem/year effective dose equivalent. When reviewing monitoring limits as established by DOE, it is necessary to remember the 100-mrem/year effective dose equivalent radiation exposure from all pathways. It is interesting to note that for low-level disposal facilities in accordance with DOE M 435.1, the dose to representative members of the public shall not exceed 25 mrem in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air.

DOE Order 5400.1 requires a written environmental monitoring plan for each site, facility, or process that uses, generates, releases, or manages significant pollutants or hazardous material. Monitoring frequency of all mediums is site-specific and documented in the site monitoring plan.

Groundwater. If the groundwater is a drinking water pathway, then the following limits are applicable:

- Effective dose of 4 mrem/year
- Beta particles and photon emitters, 4 mrem/year
- Gross alpha particles activity, 15 pCi/L
- Radium 226 and Radium 228 (combined), 5 pCi/L.

For other radionuclides, the derived concentration guides listed in DOE Order 5400.5 would most likely be used as an assessment tool if monitoring limits have been exceeded.

Air. DOE Order 5400.5 limits the airborne emissions from all DOE sources of radionuclides to an effective dose equivalent of 10 mrem/year to the public. Equating effective dose equivalent to a monitoring value is a complex task dependent upon the radionuclide and the source. Implementation guide, DOE/EH-0173T, for DOE Order 5400.5 defines two types of sources contributing to the total radiological emissions from a DOE facility:

1. *Point source* is a single, defined point (origin) of an airborne release such as a vent or stack.

2. *Diffuse source* is an area source or several sources of radioactive contaminants released into the atmosphere (generally, all sources other than point sources). Examples of diffuse sources are ponds, contaminated areas, and structures without ventilation or with ventilation that do not result in a well-defined release point.

Most sources, if not all sources, from D&D and NWPA sites would be considered diffuse sources. Monitoring guidance or requirements for diffuse sources are not defined as well as the requirements for point sources. DOE/EH-0173T states when assessing a diffuse source, the evaluation should be accomplished by using appropriate computational models to characterize the concentrations of the radionuclides in any resulting plume; and empirical data and sound assumptions should be applied to define the source term for a diffuse source. DOE/EH-0173T does not provide concentration limits. The derived concentration guides listed in DOE Order 5400.5 would most likely be used as an assessment guide.

The derived concentration guides represent the concentrations of radioactivity in air inhaled or water ingested continuously during a year that resulted in a 100-mrem, 50-year committed effective dose equivalent. The derived concentration guide yields the maximum dose a person could receive at the location where the sample was collected, given the following two assumptions:

1. The concentration was at the derived concentration guides level continuously for the entire year

2. The person receiving the exposure was at that location for the entire year, continually inhaling the air.

DOE M 435.1 has specific requirements for radon in air at low-level waste disposal facilities. Release of radon shall be less than an average flux of 20 $pCi/m^2/s$ at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/l of air may be applied at the boundary of the facility.

Surface Water. DOE Order 5400.5 does not have release limits, but uses screening values instead. If radioactive waste streams contain radionuclide concentrations of not more than the derived concentration guides reference values at the point of discharge to a surface waterway, treatment is normally not required. If the derived concentration guides are exceeded, the best available technology is the prescribed level of treatment. Derived concentration guides (for water) are used to monitor the water to determine if a corrective action needs to occur.

Sediment. To prevent the buildup of radionuclide concentrations in sediments, liquid process waste streams containing radioactive material in the form of settleable solids may be released to natural waterways if the concentration of radioactive material in the solids present in the waste stream does not exceed 5 pCi/g above background level, of settleable solids for alpha-emitting radionuclides or 50 pCi/g above background level, of settleable solids for beta-gamma-emitting radionuclides in accordance with DOE Order 5400.5.

Soil. DOE Order 5400.5 provides guidelines and requirements for residual radioactive material primarily for soil. Application of the guidelines is specific only to FUSRAP and the Surplus Facilities Management Program to establish cleanup levels for unrestricted use. The guidelines are based on a basic radiation dose limit of 100 mrem/yr applied to a member of a critical population group. The radiation dose is defined here as the effective dose equivalent from external radiation plus committed effective dose equivalent from internal radiation. The critical population group is a relatively small, homogeneous group that is representative of those individuals in the population expected to potentially receive the largest radiation dose. It is assumed, for the purpose of deriving soil guidelines, that the critical population group

is a family that establishes residence of a site after the site has been released for use without radiological restrictions. The controlling principles for the guidelines are:

- The annual radiation dose received by a member of the critical population group from the residual radioactive material—predicted by a realistic but reasonably conservative analysis and averaged over a time interval of 50 years—should not exceed the basic dose limit of 100 mrem/yr
- Doses should be kept as low as reasonably achievable.

The generic guidelines for residual concentrations of Ra-226, Ra-228, Th-230, and Th-232 are:

- 5 pCi/g, averaged over the first 15 cm of soil below the surface
- 15 pCi/g, averaged over 15-cm thick layers of soil more than 15 cm below the surface.

Guidelines for other radionuclides are site-specific and can be derived by the process established in DOE/CH 8901, "A Manual for Implementing Residual Radioactive Material Guidelines."

Other. Monitoring of plants and animals may be necessary to ensure the public does not exceed the 100-mrem/year effective dose equivalent. DOE/EH-0173T provides guidance for when plants and animals should be monitored and is summarized in Table 5. If wild game animals, such as deer or game birds, are available locally, then these should also be considered in the pathway analysis. When evaluating pathways by which foods become contaminated, several factors need to be considered:

- Agricultural uses of the land
- Farming and gardening practices
- Soil type
- Climate
- Dietary habits
- Quantities of specific radionuclides released to air and water and their chemical physical forms.

Table 5. Basis for Sampling Terrestrial Foodstuffs.

Annual Effective Dose Equivalent	Sampling Guidance
Dose >5 mrem	Sufficient sampling and analysis should be carried out so that the foods and radionuclides contributing at least 90% of this ingestion dose have been evaluated.
1 mrem < dose <5 mrem	Sufficient sampling and analysis should be carried out to provide reasonable assurance that the doses are within this range.
0.1 mrem < dose <1	Sufficient surveillance should be done to show that the radionuclides are behaving in the environment as expected.

Comprehensive Environmental Response, Compensation, and Liability Act. Monitoring requirements for CERCLA are unique and site-specific just as the cleanup levels for CERCLA remediation. Monitoring requirements discussed in this section should be used for guidance. CERCLA applies all applicable or relevant and appropriate requirements (ARARs) where hazardous substances are left onsite. CERCLA Section 121 states the following are ARARs for the hazardous substance, pollutant, or contaminant concerned:

- Any standard, requirement, criteria, or limitation under any federal environmental law
- Any promulgated standard, requirement, criteria or limitation under a state environmental of facility siting law that is more stringent than any federal standard.

ARARs are promulgated or legal enforceable requirements. DOE orders themselves are not ARARs because they are not promulgated. DOE orders can be "to be considered." Once a "to be considered" is part of a Record of Decision, it becomes enforceable. DOE orders in final Records of Decision are enforceable under CERCLA and cannot be waived using DOE procedures for waiving orders. It is not unreasonable to assume the use of DOE orders as monitoring requirements for post cleanup under a DOE CERCLA site. If there were two monitoring levels, each one from a different requirement, the more stringent requirement would be selected as the ARAR.

Specific levels and frequency of post cleanup monitoring may be stated in the Record of Decision, but are more likely to be included in the documentation for the remedial action as a function of operation and maintenance.

Groundwater. For groundwater monitoring, the Environmental Protection Agency's National Primary Drinking Water Standards maximum contaminant level would most likely be applicable for groundwater monitoring. The phrase "most likely be applicable" is used because there could be sites where the groundwater's background quality is so poor it is not used for drinking water. Groundwater monitoring requirements for radionuclides would likely be the derived concentration guides from DOE Order 5400.5.

Air. The Environmental Protection Agency's ambient air quality standards would likely be selected as "to be considered" for air monitoring and DOE Order's 5400.5 derived concentration guides for airborne radionuclides would likely be used to define the air monitoring requirements.

Surface Water. Surface water would likely be monitored to the Environmental Protection Agency's National Primary Drinking Water Standards maximum contaminant level. For the radionuclide constituent for surface water, the derived concentration guides from DOE Order 5400.5 could be selected as "to be considered."

Sediment. DOE Order 5400.5 provides monitoring requirements for sediments. To prevent the buildup of radionuclide concentrations in sediments, liquid process waste streams containing radioactive material in the form of settleable solids may be released to natural waterways if the concentration of radioactive material in the solids present in the waste stream does not exceed 5 pCi/g above background level, of settleable solids for alpha-emitting radionuclides or 50 pCi/g above background level, of settleable solids for beta-gamma-emitting radionuclides.

Resource Conservation and Recovery Act. Under RCRA, groundwater monitoring is required for post-closure care if one of the two following conditions occur:

1. The facility contains waste residues or contaminated materials left in place at final closure
2. The facility is closed in accordance to landfill requirements.

40 CFR 265 and 40 CFR 264, Subpart F states the groundwater monitoring requirements and limits. Groundwater background levels are established by monitoring for a period of one year. For Part B facilities, maximum concentration levels are the established background levels, or Table 1 of 40 CFR 264.94, whichever is lower. For Part A facilities, maximum concentration levels are the established background levels. An exception to maximum concentration levels for both Part A and B facilities are alternate concentration limits established and approved by the Environmental Protection Agency (EPA) Regional Administrator.

Post-closure plans are required for facilities closed in accordance to landfill requirements. Frequency of monitoring is site-specific and stated in the post-closure plan. Post-closure is generally performed for 30 years; however, the Regional Administrator may shorten or lengthen the post-closure care.

3.1.4 Contamination Containment and Control

Subcategories for contamination containment and controls are engineering systems or structures designed and built to contain and control contaminants, such as surface impoundments, landfills, caps, tank farms, and buildings. Requirements discussed in this section are those requirements that must be met for post-closure care. Most sites, if not all sites, entering long-term stewardship will require post-closure care because of residual wastes. Requirements discussed in this section are those for post-closure care of systems with residual wastes. Notes (see Table 6) for Contamination Containment and Control are located in Appendix A.

Table 6. Contamination Containment and Control reference Notes are located in Appendix A.

Site Type	Primary Agency (ies)	Regulations/Requirements					
		Contamination Containment & Control					
		Primary	Surface Impoundments	Landfills	Caps	Tankfarms (Tanksystems)	Buildings
UMTRCA Title I	NRC, States, Tribes	40 CFR 192 10 CFR 40.27		Note T	Note T		
UMTRCA Title II	NRC, States, Tribes	40 CFR 192 10 CFR 40.28	Note E		Note E		
NWPA Section 151 (Parkersburg)	NRC	DOE orders		Note F			
D&D	DOE	DOE orders		Note F			
Other (RCRA)	EPA	RCRA	Note U	Note V	Note W	Note X	Note Y
FUSRAP	EPA	CERCLA	Site-specific based on ROD	Site-specific based on ROD	Site-specific based on ROD	Site-specific based on ROD	Site-specific based on ROD
CERCLA	EPA	CERCLA	Site-specific based on ROD	Site-specific based on ROD	Site-specific based on ROD	Site-specific based on ROD	Site-specific based on ROD
CERCLA On-going Treatment	EPA	CERCLA	Site-specific based on ROD	Site-specific based on ROD	Site-specific based on ROD	Site-specific based on ROD	Site-specific based on ROD

Uranium Mill Tailings Radiation Control Act Title I and II. The legal requirements for post-closure care are different for UMTRCA Title I and II. UMTRCA Title I post-closure legal requirements are vague as opposed to the more specific requirements for UMTRCA Title II. For this reason, post-closure discussion for UMTRCA Title I and II is separate.

UMTRCA Title I standards refer to a disposal site, not an impoundment or landfill. 40 CFR 192 defines a disposal site as the region within the smallest perimeter of residual radioactive material (excluding cover materials) following completion of control activities. A disposal site is not an impoundment nor is it a landfill by the EPA definitions.

UMTRCA Title I sites require as a minimum, annual site inspections to be conducted for the long-term care of the disposal site to confirm its integrity and to determine the need, if any, for maintenance or monitoring. In addition, UMTRCA Title I sites are required to describe the long-term surveillance program in the Long-Term Surveillance Plan as part of the closure license application to the Nuclear Regulatory Commission. The Long-Term Surveillance Plan is to include inspection frequency and reporting to the Nuclear Regulatory Commission, frequency and extent of groundwater monitoring if required, appropriate constituent concentration limits for groundwater, inspection personnel qualifications, inspection procedures, and record keeping and quality assurance procedures.

UMTRCA Title II sites have two types of engineering systems: (1) surface impoundments and (2) caps. A cap or final barrier is placed on the UMTRCA Title II site as part of the closure process. Discussion of cap requirements has been combined with surface impoundments. Two sets of standards for post-closure apply to landfills for UMTRCA Title II sites: requirements for (1) nonradiological hazards and (2) radiological hazards.

For nonradiological hazards, 40 CFR 264.228 applies and includes:

- Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events
- Continue to operate the leachate collection and removal system until leachate is no longer detected
- Maintain and monitor the groundwater monitoring system
- Prevent run-on and run-off from eroding or otherwise damaging the final cover
- Protect and maintain surveyed benchmarks.

The requirements for radiological hazards are not as definitive as they are for the nonradiological hazards. They are the same requirements as required for UMTRCA Title I:

- Annual site inspections to confirm the disposal site integrity and to determine the need, if any, for maintenance or monitoring
- Describe the long-term surveillance program in the Long-Term Surveillance Plan as part of the closure license application to the Nuclear Regulatory Commission.

Department of Energy Decontamination and Decommissioning and Nuclear Waste Policy Act. DOE requires a closure plan for low-level waste disposal facilities, a specific type of a landfill, as identified in DOE M 435.1-1, "Radioactive Waste Management Manual." The closure plan identifies the necessary activities required for post-closure care. Further guidance from Technical Basis and

Considerations for DOE M 435.1 discusses a period of institutional control and defines the period of institutional control when DOE maintains a custodial presence and controls the use of the land until the facility can be released. The closure plan should include the necessary activities to be performed during institutional control to ensure protection of public health and the environment, such as facility monitoring, custodial maintenance, access controls, corrective actions, passive controls and restrictions, reporting requirements, and record keeping.

Comprehensive Environmental Response, Compensation, and Liability Act. Post-closure care under CERCLA is site-specific and based on the Record of Decision. However, if waste residues or contaminated soils remain after closure, then it is very likely the engineering system would be closed under the requirements of landfills, as outlined in the RCRA discussion below.

Resource Conservation and Recovery Act. Post-closure care is required for engineering systems where waste residues or contaminated soils remain after closure and are closed under the requirements of landfills, 40 CFR 264 and 40 CFR 265. Post-closure care is performed over a period of 30 years, but can be shortened or extended at the discretion of the EPA Regional Administrator. The post-closure RCRA requirements are:

- Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events.
- Maintain and monitor the leak detection system.
- Maintain and monitor the groundwater monitoring system. Requirements for groundwater monitoring under RCRA are discussed in "Sensors and Monitoring" section for RCRA.
- Prevent run-on and run off from eroding or otherwise damaging the final cover.

Groundwater monitoring requirements can be waived if it can be demonstrated that there is a low potential for migration of hazardous waste or hazardous constituents from the facility (engineered system) via the uppermost aquifer to water supply wells or to surface water.

3.1.5 Decision Making and Institutional Performance

Risk and decision analysis subcategories include airborne contaminant effects, surface water contaminant effects, soil contaminant effects, groundwater contaminant effects, demographics, trending, cost, and cost/benefit. In most cases, risk and decision analysis is done prior to the site entering post-closure care. However, there are a few circumstances where risk and decision analysis is implemented during post-closure care. In many cases, risk and decision analysis is used to determine monitoring level requirements and is discussed in the "Sensors and Monitoring" section of this document. However, there are a few circumstances where risk and decision analysis is implemented during post-closure care. Notes (see Table 7) for Decision Making and Institutional Performance are located in Appendix A.

Table 7. Decision Making and Institutional Performance reference Notes are located in Appendix A.

Site Type	Primary Agency (ies)	Regulations/Requirements								
		Decision Making and Institutional Performance								
		Primary	Airborne Contaminant Effects (Risk)	Surface Water Contaminant Effects (Risk)	Soil Contaminant Effects (Risk)	Groundwater Contaminant Effects (Risk)	Demographics (land use & population densities)	Trending	Cost	Cost/ Benefit
UMTRCA Title I	NRC, States, Tribes	40 CFR 192 10 CFR 40.27						Note Z		
UMTRCA Title II	NRC, States, Tribes	40 CFR 192 10 CFR 40.28						Note AA		
NWPA Section 151 (Parkersburg)	NRC	DOE orders						Note AB		
D&D	DOE	DOE orders						Note AB		
Other (RCRA)	EPA	RCRA								
FUSRAP	EPA	CERCLA	Note AC	Note AC	Note AC	Note AC		Note AD	Note AE	Note AF
CERCLA	EPA	CERCLA	Note AC	Note AC	Note AC	Note AC		Note AD	Note AE	Note AF
CERCLA On-going Treatment	EPA	CERCLA	Note AC	Note AC	Note AC	Note AC		Note AD	Note AE	Note AF

Uranium Mill Tailings Radiation Control Act Title I and II. A Long-Term Surveillance Plan is required as part of an application for a closure license in accordance with 10 CFR 40.27 and 10 CFR 40.28 for UMTRCA Title I and II sites, respectively. The Long-Term Surveillance Plan includes a detailed description of the final disposal site conditions including existing groundwater characterization. The description must be detailed enough so future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs. Although the requirement does not explicitly require trending, trending analysis is implied to warrant when maintenance or repairs are necessary.

Department of Energy Decontamination and Decommissioning and Nuclear Waste Policy Act. Stewardship is considered to be a DOE activity and, therefore, DOE Order 5400.1 is applicable. DOE Order 5400.1 requires environmental surveillance to be conducted to monitor the effects of DOE activities and requires the design of the environmental surveillance to meet one or more of seven objectives. One of the seven design objectives is to characterize and define trends in the physical, chemical, and biological conditions of environmental media.

Comprehensive Environmental Response, Compensation, and Liability Act. Risk analysis is performed during the remedial investigation phase of the CERCLA process. It is unlikely that risk analysis would be performed for a site during post-closure care. However, CERCLA Section 121 requires that remedial actions, which result in any hazardous substances, pollutants, or contaminants remaining at the site, be subject to five-year reviews. The Environmental Protection Agency will determine the number of five-year reviews, and for those sites that will require stewardship into perpetuity, five-year reviews could be infinite. Sites remediated under CERCLA and entered into the Long-Term Stewardship Program are assumed to have contaminants remaining at the site and, therefore, will be required to perform five-year reviews and prepare a five-year report. (Note: Some sites entering the Long-Term Stewardship Program may have already performed their first of many five-year reviews.) The outline for a five-year review report, as suggested by Environmental Protection Agency's Comprehensive Five-Year Review Guidance, EPA 540-R-01-007, June 2001, includes a section titled Technical Assessment. The Technical Assessment objective is to evaluate whether the remedy at a site is protective of human health and the environment. Environmental Protection Agency asks three questions as part of the evaluation:

1. Is the remedy functioning as intended by the decision documents?

2. Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

3. Has any other information come to light that could call into question the protectiveness of the remedy?

Environmental Protection Agency provides further guidance to address the questions, which refers to the application of risk and decision analysis.

Airborne contaminant effects, surface water contaminant effects, soil contaminant effects, and groundwater contaminant effects are discussed in relationship to the risks they present. To answer the Question 2, "Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?" —changes in the following should be evaluated:

- Promulgated standards and To Be Considered (from the Record of Decision)

- Risk parameters (includes reference doses, cancer potency factors, and exposure pathways of concern)

- Toxicity and other contaminant characteristics
- Current and future land/groundwater uses.

Changes in any one of the items listed above could result in the need to perform a risk analysis based on the changes in the conditions. For example, if there have been changes in the understanding of a contaminant's physical or chemical characteristics, the original cleanup level may no longer be protective of human health and the environment. Thus, recalculation of the risk analysis may be required to determine if the remedy is indeed protective of human health and the environment with the new knowledge gained of the contaminant.

Several items should be evaluated to appropriately answer Question 1, "Is the remedy functioning as intended by the decision documents?" These items include:

- Remedial action performance
- System operations/operation and maintenance
- Costs of system operations/operation and maintenance
- Implementation of institutional controls and other measures
- Monitoring activities
- Opportunities for optimization
- Early indicators of potential remedy problems.

Trending, cost, and cost/benefit are used as part of the evaluation to respond to Question 1. Trend analysis of sampling data showing no decrease in contaminant levels could be an indicator of a potential remedy problem. *Comprehensive Five-Year Review Guidance* also recommends reviewing and considering costs of system operations/operation and maintenance by comparing actual/current annual operation and maintenance costs to the original cost estimate. Large variances from the original cost estimate might indicate potential remedy problems. As part of the five-year review, the Environmental Protection Agency suggests if any opportunities are identified to improve performance or reduce the costs of sampling and monitoring activities, the site steward shall recommend the improvements and also recommend that an optimization or cost/benefit study be conducted.

Resource Conservation and Recovery Act. There are no specific requirements within RCRA related to risk and decision analysis.

3.2 Codes and Standards

A review of industry standards applicable to science and technology was performed. Many of the standards identified during the review are design and performance criteria, and guidance for a variety of instrumentation, test procedures, and sampling methods from the American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI). Table 8 shows the applicable standards organized by standard number with a brief summary of the standard. The codes and standards were not categorized by the Roadmap Work Group Area because many of the codes and standards are applicable to more than Roadmap Work Group Area.

Table 8. Summary of Standards.

Standard Number	Title	Summary
N42.17A	American National Standard Performance Specifications for Health Physics Instrumentation - Portable Instrumentation for Use in Normal Environmental Conditions	Standard establishes minimum acceptable performance criteria for health physics instrumentation for use in ionizing radiation fields. Included are testing methods to establish the acceptability of each type of instrumentation.
N42.17B	American National Standard for Radiation Instrumentation Performance Specifications for Health Physics Instrumentation - Occupational Airborne Radioactivity Monitoring Instrumentation.	Standard specifies performance criteria and testing procedures for instruments and instrument systems designed to continuously sample and quantify concentrations of radioactivity in ambient air in the workplace.
N42.17C	American National Standard for Radiation Instrumentation Performance Specifications for Health Physics Instrumentation - Portable Instrumentation for Use in Extreme Environmental Conditions	Standard establishes minimum acceptable performance criteria for health physics instrumentation for use in ionizing radiation fields under extreme environmental conditions.
N42.18	American National Standard Specification and Performance of On-Site Instrumentation for Continuously Monitoring Radioactivity in Effluents	Standard provides recommendations for the selection of instrumentation specific to the continuous monitoring and quantification of radioactivity in effluents released to the environment. The effluent streams considered may contain radioactive gases, liquids, particulates, or dissolved solids singly or in combination. Standard specifies detection capabilities, physical and operating limits, reliability, and calibration requirements and sets forth minimum performance requirements for effluent monitoring instrumentation.
N42.20	American National Standard Performance Criteria for Active Personnel Radiation Monitors	Standard specifies performance and design criteria for personal electronic monitors used for the determination of the personal dose equivalent, or the dose equivalent rate, from external sources of radiation.
N323	American National Standard Radiation Protection Instrumentation and Test Calibration	Standard establishes calibration methods for portable radiation protection instruments used for detection and measurement of levels of ionizing radiation fields or levels of radioactive surface contamination. For purposes of the standard, portable radiation protection instruments are those which are carried by hand to a specific facility or location for use.
C 998	Standard Practice for Sampling Surface Soil for Radionuclides	Practice covers the sampling of surface soil for the purpose of obtaining a sample representative of a particular area for subsequent chemical analysis of selected radionuclides.
C 999	Standard Practice for Soil Sample Preparation for the Determination of Radionuclides	Practice covers the preparation of surface soil samples collected for chemical analysis of radionuclides, particularly uranium and plutonium.
C 1000	Standard Test Method for Radiochemical Determination of Uranium Isotopes in Soil by Alpha Spectrometry	Test method covers the determination of uranium isotopes in soil. Test method is designed to analyze 10 g of soil; however, the sample size may be varied to 50 g depending on the activity level.
C 1001	Standard Test Method for Radiochemical Determination of Plutonium Isotopes in Soil by Alpha Spectrometry	Test method covers the determination of plutonium in soils at levels of detection dependent on count time, sample size, detector efficiency, background, and tracer yield.
C 1163	Standard Test Method of Mounting Actinides for Alpha Spectrometry Using Neodymium Fluoride	Test method covers the preparation of separated fractions of actinides for alpha spectrometry as an alternate to electrodeposition. It is applicable to any of the actinides that can be dissolved in dilute hydrochloric acid. Examples of applicable samples would be the final elution from an ion exchange separation or the final strip from a solvent extraction separation.

Table 8. (continued)

Standard Number	Title	Summary
C 1205	Standard Test Method for The Radiochemical Determination of Am-241 in Soil by Alpha Spectrometry	Test method covers the determination of Am-241 soil by means of chemical separations and alpha spectrometry. It is designed to analyze up to ten grams of soil or other sample matrices that contain up to 30 mg of combined rare earths.
C 1220	Standard Test Method for Static Leaching of Monolithic Waste Forms for Disposal of Radioactive Waste	Test method evaluates the relative chemical durability of simulated and radioactive monolithic waste forms such as glasses, ceramics, or cermets in various test solutions at temperatures <100°C.
D 1890	Standard Test Method for Beta Particle Radioactivity of Water	Test method covers the measurement of beta particle activity of water, as referenced to the beta energy of Cs-137, not corrected for conversion electrons. It is applicable to beta emitters having maximum energies above 0.1 MeV and at activity levels above 0.02 Bq/mL of radioactive homogeneous water for most counting systems.
D 1943	Standard Test Method for Alpha Particle Radioactivity of Water	Test method covers the measurement of alpha particle activity of water. It is applicable to alpha emitters having maximum energies above 3.9 MeV and at activity levels above 0.02 Bq/mL of radioactive homogeneous water.
D 2460	Standard Test Method for Alpha-Particle-Emitting Isotopes of Radium in Water	Test method covers the separation of dissolved radium from water for the purpose of measuring its radioactivity. Although all radium isotopes are separated, the test method is limited to alpha-particle-emitting isotopes by choice of radiation detector. The most important of these radioisotopes are radium-223, radium-224, and radium-226. The lower limit of concentration to which this test method is applicable is 1pCi/L.
D 2907	Standard Test Methods for Microquantities of Uranium in Water by Fluorometry	Test methods cover the determination of microquantities of uranium in water in the concentration range from 0.005 to 50 mg/L.
D 3404	Standard Guide for Measuring Matric Potential in the Vadose Zone Using Tensiometers	Guide covers the measurement of matric potential in the vadose zone using tensiometers. The theoretical and practical considerations pertaining to successful onsite use of commercial and fabricated tensiometers are described. Measurement theory and onsite objectives are used to develop guidelines for tensiometer selection, installation, and operation.
D 3454	Standard Test Method for Radium-226 in Water	Test method covers the measurement of soluble, suspended, and total radium-226 in water in concentrations above 3.7E-3 Bq/L.
D 3648	Standard Practices for the Measurement of Radioactivity	Practices cover a review of the accepted counting practices currently used in radiochemical analyses.
D 3972	Standard Test Method for Isotopic Uranium in Water by Radiochemistry	Test method covers the determination of alpha-particle-emitting isotopes of uranium in water by means of chemical separations and alpha pulse-height analysis (also known as alpha-particle spectrometry).
D 3976	Standard Practice for Preparation of Sediment Samples for Chemical Analysis	Practice describes standard procedures for preparation of test samples (including the removal of occluded water and moisture) of field samples collected from locations such as streams, rivers, ponds, lakes, and oceans. These procedures are applicable to the determination of volatile and semivolatile constituents of sediments.
D 4107	Standard Test Method for Tritium in Drinking Water	Test method covers the determination of tritium in drinking water by liquid scintillation counting of the tritium beta particle activity. The tritium concentrations, which can be measured by this test method using currently available liquid scintillation instruments, range from less than 0.037 Bq/ml (1 pCi/mL) to 555 Bq/mL (15,000 pCi/mL) for a 10-mL sample aliquot.
D 4547	Standard Guide for Sampling Waste and Soils for Volatile Organic Compounds	Guide describes recommended procedures for the collection, handling, and preparation of solid waste, soil, and sediment samples for subsequent determination of volatile organic compounds. This class of compounds includes low molecular weight aromatics, hydrocarbons, halogenated hydrocarbons, ketones, acetates, nitrides, acrylates, ethers, and sulfides with boiling points below 200°C that are insoluble or slightly soluble in water.

Table 8. (continued)

Standard Number	Title	Summary
D 4696	Standard Guide for Pore-Liquid Sampling from the Vadose Zone	Guide discusses equipment and procedures used for sampling pore-liquid from the vadose zone (unsaturated zone). The guide is limited to in-situ techniques and does not include soil core collection and extraction methods for obtaining samples. The term "pore-liquid" is applicable to any liquid from aqueous pore-liquid to oil. However, all of the samples described in this guide were designed, and are used, to sample aqueous pore-liquids only. The abilities of these samplers to collect other pore-liquids may be quite different than those described.
D 5088	Standard Practice for Decontamination of Field Equipment Used at Nonradioactive Waste Sites	Practice covers the decontamination of field equipment used in the sampling of soils, soil gas, sludges, surface water, and groundwater at waste sites, which are to undergo both physical and chemical analyses. Practice is applicable only at sites where chemical (organic and inorganic) wastes are a concern and is not intended for use at radioactive or mixed waste sites. Procedures are included for the decontamination of equipment, which comes into contact with the sample matrix and for ancillary equipment that has not contacted the portion of sample to be analyzed.
D 5092	Standard Practice for Design and Installation of Groundwater Monitoring Wells in Aquifers	Practice considers the selection and characterization of the target-monitoring zone as an integral component of monitoring well design and installation. The guidelines in the practice are based on recognized methods by which monitoring wells may be designed and installed for the purpose of detecting the presence or absence of a contaminant, and collecting representative groundwater quality data. The design standards and installation procedures are applicable to both detection and assessment monitoring programs for facilities.
D 5299	Standard Guide for Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities.	Guide covers procedures related to closure of the following as applied to environmental activities: a borehole used for geoenvironmental purposes, monitoring wells, observations wells, injection wells, piezometers, wells used for the extraction of contaminated groundwater, the removal of floating or submerged materials other than water such as gasoline or tetrachloroethylene, or other devices used for the extraction of soil gas, and a borehole used to construct a monitoring device.
D 5314	Standard Guide for Soil Gas Monitoring in the Vadose Zone	Guide covers information pertaining to a broad spectrum of practices and applications of soil atmosphere sampling, including sample recovery and handling, sample analysis, data interpretation, and data reporting.
D 5608	Standard Practice for Decontamination of Field Equipment Used at Low Level Radioactive Waste Sites	Practice covers the decontamination of field equipment used in the sampling of soils, soil gas, sludges, surface water, and groundwater at waste known or suspected of containing low-level radioactive wastes.
D 5730	Standard Guide for Site Characterization for Environmental Purposes with Emphasis on Soil, Rock, the Vadose Zone and Groundwater	Guide focuses on field methods for determining site characteristics and collection of samples for further physical and chemical characterization.
D 5784	Standard Guide for Use of Hollow-Stem Augers for Geoenvironmental Exploration and the Installation of Subsurface Water-Quality Monitoring Devices	Guide covers how hollow-stem auger-drilling systems may be used for geoenvironmental exploration and installation of subsurface water-quality monitoring devices.
E 1278	Standard Guide for Radioactive Pathway Methodology for Releases of Sites Following Decommissioning	Guide provides aid in determining site-specific conversion factors for translating between dose limits and residual radioactive contamination levels on equipment, structures, and land areas.

Table 8. (continued)

Standard Number	Title	Summary
E 1819	Standard Guide for Environmental Monitoring Plans for Decommissioning of Nuclear Facilities	Guide covers the development or assessment of environmental monitoring plans for decommissioning nuclear facilities. Guide addresses development of an environmental baseline prior to starting decommissioning activities; determination of release paths from site activities and their associated exposure pathways in the environment; and selection of appropriate sampling locations and media to ensure that all exposure pathways in the environment are monitored appropriately. Guide also addresses the interfaces between the environmental monitoring plan and other planning documents for site decommissioning, such as radiation protection, site characterization, and waste management plans, and federal, state, and local environmental protection laws and guidance. Guide is applicable up to the point of completing D&D activities and the reuse of the facility or area for other purposes.

3.3 Other Agencies

Department of Defense (DoD) contaminated property and environmental issues are similar to the DOE's. A review of DoD's directives applicable to safety systems and institutional controls, monitoring and sensors, contamination containment and control, and decision making and institutional performance was performed. The requirements found were very general—unlike the DOE's directives, which can be very specific. Most of the DoD directives referred to the Code of Federal Regulations. It was discovered that DoD takes a much different approach to environmental cleanup than DOE. DoD's approach is to have a broad policy and the details of implementation are accomplished at the field level. At the field level, cleanup and monitoring are done in accordance with the state and federal laws within the broad policy of DoD.[a]

4. STAKEHOLDERS' CONCERNS

Stakeholders' concerns are important to the National Long-Term Stewardship Program. A review of stakeholders' websites, documents, and reports was performed to determine concerns with respect to science and technology for long-term stewardship. Appendix D shows the results of the review. There were many concerns expressed about ensuring appropriate funding for long-term stewardship activities and deed restrictions; however, these concerns are not considered to be issues that can be resolved by science and technology. Listed below are the stakeholders' concerns and the frequency the concerns were noted. During the review of the websites, documents, and reports, it became apparent that some of the reports and documents were incorporated into other stakeholder documents. Documents and reports, which incorporated other stakeholders' concerns and issues, were not double counted.

- Information Management (25)

  The primary concern with respect to information management is the preservation and maintenance of information over time and accessibility of the information. For example, 25 years ago computer or IBM cards were used to store data. Today, technology to read IBM cards is for all practical purposes extinct.

a. Memo of Conversation between Joan McDonald, INEEL, and Shah Choudhury, DoD Environmental Cleanup, June 6, 2002.

- Engineered Controls (11)

  Two key issues were noted for engineered controls: improvements in barrier performance for both reactive and non-reactive barriers, and assessing the long-term effectiveness of a barrier.

- Modeling (11)

  Develop improved modeling systems.

- Characterization (6)

  Stakeholders would like improved methods to characterize the residual contaminants.

- Monitoring (4)

  Develop monitoring systems, which can detect unfavorable trends.

- Technology (3)

  Develop technologies so long-term stewardship is not necessary.

- Research and Development (2)

  Ensure meaningful research is conducted for long-term stewardship to improve understanding, methodologies, and technologies that have the potential to reduce both the cost and risk.

- Roadmap (1)

  Investments must be carefully tailored to fulfill priorities that clearly relate to the needs identified within the Long-Term Stewardship Roadmap.

5. GAPS AND CONFLICTS

Long-Term Stewardship's mission is to protect human health and the environment. A list of objectives to accomplish the long-term stewardship mission to protect human health and the environment was written based on the Science and Technology Roadmapping Work Group Areas:

Information Technology

1. Information must be preserved over the specified time period.

2. The information must be in a form that can be easily retrieved and understood throughout the specified time period.

Safety System and Institutional Controls

3. All safety systems and related equipment must be protected from reasonably expected natural and man-caused damage.

4. Security systems shall be provided to ensure waste is not disturbed or removed.

Monitoring and Sensors

5. Monitoring shall be performed to ensure protection of the public and the environment.

6. Monitoring shall be performed to minimize the spread of contamination.

Contamination Containment and Control

7. Contamination containment and control systems shall continue to protect the public and the environment through all reasonable natural and man-caused disruptions over the specified time period.

8. Contamination containment and control system performance shall be monitored.

9. Contamination containment and control systems must be capable of being repaired or replaced.

Decision Making and Institutional Performance

10. A risk-based approach shall be used in decisions that could affect human health and the environment.

11. A baseline shall be developed and updated throughout the specified time period considering changes in the site characteristics, community at risk, land use plans, and applicable policies, regulations, and laws.

Requirements identified for the Roadmap Work Group Areas were matched to the objectives, as shown in Table 9. If a match did not occur, a potential gap was identified.

Table 9. Long-term stewardship objectives matched with regulation sources to identify requirement gaps.

		Regulation Source				
	LTS Objective	UMTRCA I	UMTRCA II	DOE Orders	CERCLA	RCRA
Information Technology	Information must be preserved over the specified time period.	Site-specific in accordance to the long-term surveillance plan.	Site-specific in accordance to the long-term surveillance plan.	DOE Order 200.1	Implied requirement to prepare five-year review.	
	The information must be in a form that can be easily retrieved and understood throughout the specified time period.			36 CFR 1236, "Management of Vital Records," is a requirement from DOE Order 200.1. Vital records are required to be accessible in the event of an emergency.		
Safety Systems & Institutional Controls	All safety systems and related equipment must be protected from reasonably expected natural and man-caused damage.			DOE 5632.1C-1, "Manual for Protection and Controls"		40 CFR 264.14 and 265.14
	Security systems shall be provided to ensure waste is not disturbed or removed.	10 CFR 61.42	10 CFR 61.42			40 CFR 264.14 and 265.14

Table 9. (continued).

		Regulation Source				
	LTS Objective	UMTRCA I	UMTRCA II	DOE Orders	CERCLA	RCRA
Monitoring & Sensors	Monitoring shall be performed to ensure protection of the public and the environment.	10 CFR 40.27	10 CFR 40.28	DOE 5400.5	By default RCRA, 40 CFR 264 or 40 CFR 265 Subpart F	40 CFR 264 or 40 CFR 265 Subpart F
	Monitoring shall be performed to minimize the spread of contamination.	10 CFR 40.27	10 CFR 40.28	DOE 5400.5	By default RCRA, 40 CFR 264 or 40 CFR 265 Subpart F	40 CFR 264 or 40 CFR 265 Subpart F
Contamination Containment & Control	Contamination containment and control systems shall continue to protect the public and environment through all reasonable natural and man-caused disruptions over the specified time period.					
	Contamination containment and control system performance shall be monitored.	40 CFR 192	40 CFR 192	DOE M 435	ROD dependent	40 CFR 264.310
	Contamination containment and control systems must be capable of being repaired or replaced.					
Decision Making & Institutional Performance	A risk-based approach shall be used in decisions that could affect human health and the environment.	40 CFR 192	40 CFR 192		40 CFR 300	NA
	A baseline shall be developed and updated throughout the specified time period considering changes in the site characteristics, community at risk, land use plans, and applicable policies, regulations, and laws.	10 CFR 27	10 CFR 28	DOE Order 5400.1	40 CFR 300 (five-year review)	

5.1 Information Technology

Gaps exist for both objectives identified for information technology.

Objective 1. Information must be preserved over the specified time period.

As shown in Table 9, a gap exists for those sites closed under RCRA. However, the other requirements listed in Table 9, which enforce the objective, are not well defined nor will they meet the life cycle of a long-term stewardship site. For example, for UMTRCA Title I and II, the record requirements are site-specific in accordance with the long-term surveillance plan for a specific site. Although some sites may be similar across the complex, there will be inconsistencies. For CERCLA, the requirements are implied, not specifically stated. DOE Order 200.1 and, particularly, the DOE Environmental Records Schedule have explicit record retention schedules for environmental records. Many of these schedules do not meet the needs for the time period that most sites will remain in long-term stewardship. RCRA has very limited requirements for record retention of sites in post-closure. RCRA requires polychlorinated biphenyl (PCB) chemical waste landfill facilities to collect and maintain a variety of records, as noted in Note AO (Appendix A), for at least 20 years after the chemical landfill waste has been closed. For injection wells closed under RCRA (Note AP of Appendix A), records are to be retained for three years.

Objective 2. The information must be in a form that can be easily retrieved and understood throughout the specified time period.

DOE Order 200.1 refers to 36 CFR 1236, which requires vital records to be accessible in the event of an emergency. The remaining regulation sources or site types do not have any requirements to meet the long-term stewardship Objective 2. Also, the regulations do not account for the rapidly changing technology of media storage and software to read the media.

5.2 Safety Systems and Institutional Controls

Objective 3. All safety systems and related equipment must be protected from reasonably expected natural and man-caused damage.

Initially, when reviewing Objective 3, a potential gap exists for UMTRCA Title I and II. However, UMTRCA Title I and II are maintained under DOE's direction and, therefore, DOE orders and DOE 5632.1C-1, "Manual for Protection and Controls," provide the requirement to help ensure meeting of Objective 3.

Objective 4. Security systems shall be provided to ensure waste is not disturbed or removed.

DOE and CERCLA do not have any requirements to ensure waste is not disturbed or removed. A gap does exist in meeting Objective 4. In addition to the gap identified, conflicts exist with respect to Objective 4 between DOE orders and the Environmental Protection Agency:

- Difference in regards to safety systems
- Definition of institutional controls.

As noted, the Environmental Protection Agency, RCRA, requires security if the hazardous waste remains exposed after closure or access by the public or domestic livestock may pose a hazard to human health. The DOE requires protection (security) of government-owned property from damage, destruction,

or theft. Although both requirements accomplish similar outcomes, the reasons for providing security are different.

The EPA and the DOE each have definitions for institutional controls. The EPA, "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups," EPA 540-F-00-005, September 2000, defines institutional controls:

- Are non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use
- Are generally to be used in conjunction with, rather than in lieu of, engineering measures such as waste treatment or containment
- Can be used during all stages of the cleanup process to accomplish various cleanup-related objectives
- Should be layered (i.e., use multiple institutional controls) or implemented in series to provide overlapping assurances of protection from contamination.

The document specifically states that the EPA does not consider physical barriers as institutional controls, which includes fences.

The DOE, "Institutional Controls in RCRA and CERCLA Response Action," DOE/EH-413-0004, August 2000, states that institutional controls can include physical barriers (fences) and legal and communication devices (deed restrictions, zoning, and signs). Although both definitions have similarities, they do have some distinct differences.

5.3 Monitoring and Sensors

Objective 5. Monitoring shall be performed to ensure protection of the public and the environment.

Objective 6. Monitoring shall be performed to minimize the spread of contamination.

No gaps were noted for monitoring and sensors. Requirements identified to meet Objectives 5 and 6 are adequate as written (see Table 10).

Table 10. Requirements identification for Objectives 5 and 6.

	Monitoring and Sensors	
	Objective 5	Objective 6
Regulation Source	Monitoring shall be performed to ensure protection of the public and the environment.	Monitoring shall be performed to minimize the spread of contamination.
UMTRCA I	10 CFR 40.27	10 CFR 40.27
UMTRCA II	10 CFR 40.28	10 CFR 40.28
DOE Orders	DOE Order 5400.5	DOE Order 5400.5
CERCLA	By default RCRA, 40 CFR 264 or 40 CFR 265 Subpart F	By default RCRA, 40 CFR 264 or 40 CFR 265 Subpart F
RCRA	40 CFR 264 or 40 CFR 265 Subpart F	40 CFR 264 or 40 CFR 265 Subpart F

5.4 Contamination Containment and Control

Objective 7. Contamination containment and control systems shall continue to protect the public and the environment through all reasonable natural and man-caused disruptions over the specified time period.

Objective 7 is considered a design requirement, not an objective for post-closure activities. Requirements were reviewed for the application to post-closure activities. However, design requirements are in place for each of the regulation sources or site types and no gaps were identified for Objective 7. For UMTRCA Title I and II, 40 CFR 192 ensures Objective 7 is met. DOE Order M 435 requires a performance assessment to include calculations for a 1,000-year period after closure of potential doses to representative future members of the public and potential releases from the facility to provide reasonable expectation that the performance objectives are not exceeded. CERCLA does not have any specific requirements; the design requirements for Objective 7 would be specified in the Record of Decision. RCRA (40 CFR 264, Subpart N) requires the liner design, construction, and installation to prevent any migration of wastes out of the landfill to the adjacent soil subsurface soil or groundwater or surface water at anytime during the active life, including closure period of the landfill. No gaps were identified for Objective 7.

Objective 8. Contamination containment and control system performance shall be monitored.

No gaps were identified for Objective 8.

Objective 9. Contamination containment and control systems must be capable of being repaired or replaced.

Objective 9 is considered a design requirement, not an objective for post-closure activities. Requirements were reviewed for the application to post-closure activities. However, there are applicable requirements, which address Objective 9. UMTRCA Title I and II address Objective 9 by requiring minimal maintenance as a design requirement. DOE orders have a similar approach by requiring disposal facilities to be designed to achieve long-term stability and to minimize to the extent practical the need for active maintenance following closure (DOE Order M 435). RCRA (40 CFR 264, Subpart N) states requirements for caps by requiring final caps to function with minimum maintenance and to accommodate settling and subsidence so that the cover's integrity is maintained. No gaps were identified for Objective 9.

5.5 Decision Making and Institutional Performance

Objective 10. A risk-based approach shall be used in decisions that could affect human health and the environment.

It is assumed that many of the decisions and performance measures will be based on monitoring data. Trigger points for a corrective action are likely to be dictated by values established by the Environmental Protection Agency such as the maximum concentration levels for water. Many of these values are based on the fact that there is no known or expected risk to health if the values are not exceeded. However, it is not clear that the values established in DOE orders are based on risk. It is assumed that they are and, therefore, a gap does not exist.

Objective 11. A baseline shall be developed and updated throughout the specified time period considering changes in the site characteristics, community at risk, land use plans, and applicable policies, regulations, and laws.

Only CERCLA and DOE orders meet the intent of Objective 11. UMTRCA Title I and II require a baseline to be established and for inspectors to periodically review the baseline. UMTRCA Title I and II do not have any requirements to review changes in laws and their effects on the baseline that CERCLA in the five-year review require. At closure, RCRA requires a baseline of type, location, and quantity of hazardous wastes disposed of to be established. RCRA does not have requirements to review changes in laws and their effects on the baseline during post-closure care. A potential gap exists to ensure baselines are reviewed to account for changes in site characteristics, land use plans, and applicable policies, regulations, and laws. However, one could argue that DOE Order 5400.1 ensures Objective 11 is met, and assuming long-term stewardship sites are under DOE direction, and therefore are required to meet DOE Order 5400.1, a gap does not exist.

6. RECOMMENDATIONS

To support the objectives listed in Section 5, "Gaps and Conflicts," the following are recommendations:

- A record retention schedule requirement should be developed to ensure the appropriate records are retained for the specified time period. Record retention schedule should identify which records need to be retained and their length of retention. (*Objective 1)*.

- A requirement needs to be developed to ensure records are accessible and retrievable throughout the specified time period. The requirement should also take in account the rapidly changing technology of media storage and software to read the media. (*Objective 2*).

- DOE should develop a requirement to ensure the waste is not disturbed or removed. (*Objective 4*).

- DOE should use the same terminology as the Environmental Protection Agency for institutional controls. DOE should not refer or define signs, fences, and security systems as institutional controls. Call them what they are—security and safety measures, but retain their function to protect human health and the environment. (*Objective 4*).

- Although a gap was not identified for Objective 11, developing a good baseline and ensuring that over time the baseline is evaluated (to meet Objective 11) is important to the success of the Long-Term Stewardship Program. DOE should ensure the Long-Term Stewardship Program has a requirement in place to ensure the baseline is developed and reviewed to account for the changes in site characteristics, community at risk, land use plans, and applicable policies, regulations, and laws. (*Objective 11*).

APPENDIX A

Notes and Reference Material

Note A
UMTRCA Title I
Monitoring and Sensors
Groundwater

40 CFR 192 Subparts A, B, and C, apply to UMTRCA Title I. Subparts A and B for groundwater monitoring are the referenced material used for the summary information. Subpart C has supplemental standards that "may" be used. The supplemental standards were not discussed in the summary information nor are they presented here.

Part 192 - Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings

Subpart A - Standards for the Control of Residual Radioactive Materials from Inactive Uranium Processing Sites

§2. Standards

(c) Provide reasonable assurance of conformance with the following groundwater protection provisions:

(1) The Secretary shall, on a site-specific basis, determine which of the constituents listed in Appendix I to Part 192 are present in or reasonably derived from residual radioactive materials and shall establish a monitoring program adequate to determine background levels of each such constituent in groundwater at each disposal site.

(2) The Secretary shall comply with conditions specified in a plan for remedial action which includes engineering specifications for a system of disposal designed to ensure that constituents identified under paragraph (c)(1) of this section entering the groundwater from a depository site (or a processing site, if residual radioactive materials are retained on the site) will not exceed the concentration limits established under paragraph (c)(3) of this section (or the supplemental standards established under §192.22) in the uppermost aquifer underlying the site beyond the point of compliance established under paragraph (c)(4) of this section.

(3) Concentration limits:

(i) Concentration limits shall be determined in the groundwater for listed constituents identified under paragraph (c)(1) of this section. The concentration of a listed constituent in groundwater must not exceed:

(A) The background level of that constituent in the groundwater; or

(B) For any of the constituents listed in Table 1 to subpart A, the respective value given in that Table if the background level of the constituent is below the value given in the Table; or

(C) An alternate concentration limit established pursuant to paragraph (c)(3)(ii) of this section.

(ii)(A) The Secretary may apply an alternate concentration limit if, after considering remedial or corrective actions to achieve the levels specified in paragraphs (c)(3)(i)(A) and (B) of this section, he has determined that the constituent will not pose a substantial present or potential hazard to human health and the environment as long as the alternate concentration limit is not exceeded, and the Commission has concurred.

(B) In considering the present or potential hazard to human health and the environment of alternate concentration limits, the following factors shall be considered:

(*1*) Potential adverse effects on groundwater quality, considering:

(*i*) The physical and chemical characteristics of constituents in the residual radioactive material at the site, including their potential for migration;

(*ii*) The hydrogeological characteristics of the site and surrounding land;

(*iii*) The quantity of groundwater and the direction of groundwater flow;

(*iv*) The proximity and withdrawal rates of groundwater users;

(*v*) The current and future uses of groundwater in the region surrounding the site;

(*vi*) The existing quality of groundwater, including other sources of contamination and their cumulative impact on the groundwater quality;

(*vii*) The potential for health risks caused by human exposure to constituents;

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

(*ix*) The persistence and permanence of the potential adverse effects;

(*x*) The presence of underground sources of drinking water and exempted aquifers identified under §144.7 of this chapter; and

(*2*) Potential adverse effects on hydraulically-connected surface-water quality, considering:

(*i*) The volume and physical and chemical characteristics of the residual radioactive material at the site;

(*ii*) The hydrogeological characteristics of the site and surrounding land;

(*iii*) The quantity and quality of groundwater, and the direction of groundwater flow;

(*iv*) The patterns of rainfall in the region;

(*v*) The proximity of the site to surface waters;

(*vi*) The current and future uses of surface waters in the region surrounding the site and any water quality standards established for those surface waters;

(*vii*) The existing quality of surface water, including other sources of contamination and their cumulative impact on surface water quality;

(*viii*) The potential for health risks caused by human exposure to constituents;

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

(*x*) The persistence and permanence of the potential adverse effects.

(4) Point of compliance: The point of compliance is the location at which the groundwater concentration limits of paragraph (c)(3) of this section apply. The point of compliance is the intersection of a vertical plane with the uppermost aquifer underlying the site, located at the hydraulically downgradient limit of the disposal area plus the area taken up by any liner, dike, or other barrier designed to contain the residual radioactive material.

§3. Monitoring

A groundwater monitoring plan shall be implemented, to be carried out over a period of time commencing upon completion of remedial actions taken to comply with the standards in §192.02, and of a duration which is adequate to demonstrate that future performance of the system of disposal can reasonably be expected to be in accordance with the design requirements of §192.02(c). This plan and the length of the monitoring period shall be modified to incorporate any corrective actions required under §192.04 or §192.12(c).

Table 1 to Subpart A -- Maximum Concentration of Constituents for Groundwater Protection

Constituent concentration\1\	Maximum
Arsenic	0.05
Barium	1.0
Cadmium	0.01
Chromium	0.05
Lead	0.05
Mercury	0.002
Selenium	0.01
Silver	0.05
Nitrate (as N)	10.
Molybdenum	0.1
Combined radium-226 and radium-228	5 pCi/liter
Combined uranium-234 and uranium-238\2\	30 pCi/liter
Gross alpha-particle activity (excluding radon and uranium)	15 pCi/liter
Endrin (1,2,3,4,10,10-hexachloro-6,7-exposy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,endo-5,8-dimethanonaphthalene)	0.0002
Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma insomer)	0.004
Methoxychlor (1,1,1-trichloro-2,2'-bis(p-methoxyphenylethane))	0.1
Toxaphene (C_{10} H_{10} Cl_6, technical chlorinated camphene, 67-69 percent chlorine)	0.005
2,4-D (2,4-dichlorophenoxyacetic acid)	0.1

2,4,5-TP Silvex (2,4,5- 0.01
trichlorophenoxypropionic acid).

\1\Milligrams per liter, unless stated otherwise.

\2\Where secular equilibrium obtains, this criterion will be satisfied by a concentration of 0.044 milligrams per liter (0.044 mg/l). For conditions of other than secular equilibrium, a corresponding value may be derived and applied, based on the measured site-specific ratio of the two isotopes of uranium.

Subpart B - Standards for Cleanup of Land and Buildings Contaminated With Residual Radioactive Materials from Inactive Uranium Processing Sites

§12. Standards

c) The Secretary shall comply with conditions specified in a plan for remedial action which provides that contamination of groundwater by listed constituents from residual radioactive material at any designated processing site (§192.01(1)) shall be brought into compliance as promptly as is reasonably achievable with the provisions of §192.02(c)(3) or any supplemental standards established under §192.22. For the purposes of this subpart:

(1) A monitoring program shall be carried out that is adequate to define backgroundwater quality and the areal extent and magnitude of groundwater contamination by listed const ituents from residual radioactive materials (§192.02(c)(1)) and to monitor compliance with this subpart. The Secretary shall determine which of the constituents listed in Appendix I to part 192 are present in or could reasonably be derived from residual radioactive material at the site, and concentration limits shall be established in accordance with §192.02(c)(3).

(2) (i) If the Secretary determines that sole reliance on active remedial procedures is not appropriate and that cleanup of the groundwater can be more reasonably accomplished in full or in part through natural flushing, then the period for remedial procedures may be extended. Such an extended period may extend to a term not to exceed 100 years if:

(A) The concentration limits established under th is subpart are projected to be satisfied at the end of this extended period,

(B) Institutional control, having a high degree of permanence and which will effectively protect public health and the environment and satisfy beneficial uses of groundwater durin g the extended period and which is enforceable by the administrative or judicial branches of government entities, is instituted and maintained, as part of the remedial action, at the processing site and wherever contamination by listed constituents from residual radioactive materials is found in groundwater, or is projected to be found, and

(C) The groundwater is not currently and is not now projected to become a source for a public water system subject to provisions of the Safe Drinking Water Act during the extended period.

(ii) Remedial actions on groundwater conducted under this subpart may occur before or after actions under Section 104(f)(2) of the Act are initiated.

(3) Compliance with this subpart shall be demonstrated through the monitoring program established under paragraph (c)(1) of this section at those locations not beneath a disposal site and its cover where groundwater contains listed constituents from residual radioactive material.

Note B
UMTRCA Title II
Monitoring and Sensors
Groundwater

40 CFR 192 Subparts D and E apply to UMTRCA Title II. 40 CFR 192 Subpart D, paragraph 32 (a) (2) (i) refers to 40 CFR 264.93, which also can be referred to as 40 CFR 264, Subpart F. 40 CFR 264.93 refers to the hazardous constitutent list from 40 CFR 261 Appendix VIII, which is not included in this note because of its length.

Note C
UMTRCA Title I
Monitoring and Sensors
Air

The applicable standards for UMTRCA Title I & II sites are 40 CFR 192, Subparts A, B, C, D and E. Air monitoring is required for UMTRCA Title I sites, but not for UMTRCA Title II sites. The monitoring is performed as part of the closure process for one year prior to closure to ensure the barrier or cap is functioning as designed.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER F - RADIATION PROTECTION PROGRAMS

Part 192 Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings

Subpart A - Standards for the Control of Residual Radioactive Materials from Inactive Uranium Processing Sites

§2. Standards

Control of residual radioactive materials and their listed constituents shall be designed[1] to:
[1]Because the standard applies to design, monitoring after disposal is not required to demonstrate compliance with respect to §192.02(a) and (b).
(a) Be effective for up to one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years, and,
(b) Provide reasonable assurance that releases of radon-222 from residual radioactive material to the atmosphere will not:

(1) Exceed an average[2] release rate of 20 picocuries per square meter per second, or

[2] This average shall apply over the entire surface of the disposal site and over at least a one-year period. Radon will come from both residual radioactive materials and from materials covering them. Radon emissions from the covering materials should be estimated as part of developing a remedial action plan for each site. The standard, however, applies only to emissions from residual radioactive materials to the atmosphere.

(2) Increase the annual average concentration of radon-222 in air at or above any location outside the disposal site by more than one-half picocurie per liter.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER F - RADIATION PROTECTION PROGRAMS

Part 192 - Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings

Subpart D - Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended

§32. Standards

(a) *Standards for application during processing operations and prior to the end of the closure period*. (1) Surface impoundments (except for an existing portion) subject to this subpart must be designed, constructed, and installed in such manner as to conform to the requirements of §264.221 of this chapter, except that at sites where the annual precipitation falling on the impoundment and any drainage area contributing surface runoff to the impoundment is less than the annual evaporation from the impoundment, the requirements of §264.228(a)(2) (iii)(E) referenced in §264.221 do not apply.

(4)(i) Upon emplacement of the permanent radon barrier pursuant to 40 CFR 192.32(a)(3), the licensee shall conduct appropriate monitoring and analysis of the radon-222 releases to demonstrate that the design of the permanent radon barrier is effective in limiting releases of radon-222 to a level not exceeding 20 pCi/m^2-s as required by 40 CFR 192.32(b)(1)(ii). This monitoring shall be conducted using the procedures described in 40 CFR part 61, Appendix B, Method 115, or any other measurement method proposed by a licensee that the Nuclear Regulatory Commission or Agreement State approves as being at least as effective as EPA Method 115 in demonstrating the effectiveness of the permanent radon barrier in achieving compliance with the 20 pCi/m^2-s flux standard.

(ii) When phased emplacement of the permanent radon barrier is included in the applicable tailings closure plan (radon), then radon flux monitoring required under §192.32(a)(4)(i) shall be conducted, however the licensee shall be allowed to conduct such monitoring for each portion of the pile or impoundment on which the radon barrier has been emplaced by conducting flux monitoring on the closed portion.

(b) *Standards for application after the closure period.* At the end of the closure period:

(1) Disposal areas shall each comply with the closure performance standard in §264.111 of this chapter with respect to nonradiological hazards and shall be designed [1] to provide reasonable assurance of control of radiological hazards to

[1] The standard applies to design with a monitoring requirement as specified in §192.32(a)(4).

(i) Be effective for one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years, and,

(ii) Limit releases of radon-222 from uranium byproduct materials to the atmosphere so as to not exceed an average [2] release rate of 20 picocuries per square meter per second (pCi/m2s).

[2] This average shall apply to the entire surface of each disposal area over periods of at least one year, but short compared to 100 years. Radon will come from both uranium byproduct materials and from covering materials. Radon emissions from covering materials should be estimated as part of developing a closure plan for each site. The standard, however, applies only to emissions from uranium byproduct materials to the atmosphere.

(2) The requirements of §192.32(b)(1) shall not apply to any portion of a licensed and/or disposal site which contains a concentration of radium-226 in land, averaged over areas of 100 square meters, which, as a result of uranium byproduct material, does not exceed the background level by more than:

(i) 5 picocuries per gram (pCi/g), averaged over the first 15 centimeters (cm) below the surface, and

(ii) 15 pCi/g, averaged over 15 cm thick layers more than 15 cm below the surface.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER F - RADIATION PROTECTION PROGRAMS

Part 192 - Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings

Subpart E - Standards for Management of Thorium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended

§41. Provisions

Except as otherwise noted in §192.41(e), the provisions of subpart D of this part, including §§192.31, 192.32, and 192.33, shall apply to thorium byproduct material and:

(a) Provisions applicable to the element uranium shall also apply to the element thorium;

(b) Provisions applicable to radon-222 shall also apply to radon-220; and

(c) Provisions applicable to radium-226 shall also apply to radium-228.

(d) Operations covered under §192.32(a) shall be conducted in such a manner as to provide reasonable assurance that the annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as a result of exposures to the planned discharge of radioact ive materials, radon-220 and its daughters excepted, to the general environment.

(e) The provisions of §192.32(a) (3) and (4) do not apply to the management of thorium byproduct material.

Note D
UMTRCA Title II
Monitoring and Sensors
Air

There are two standards for UMTRCA Title II standards. Application of which the standard depends on if the tailings contains uranium or thorium. Subpart D is applicable to the management of uranium byproduct materials. Subpart E is applicable to the management of thorium byproduct materials. Subpart E, paragraph 41.(e) states the provisions of 192.34 (a) (4) do not apply to the management of thorium byproduct. 10 CFR 40, Appendix A, criterion 6, foot note 1 states the standard only applies to design. Monitoring for radon emission from thorium byproduct materials after installation of an appropriately designed cover is not required.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER F - RADIATION PROTECTION PROGRAMS
Part 192 - Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings

Subpart D - Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended

§32. Standards

(a) *Standards for application during processing operations and prior to the end of the closure period.* (1) Surface impoundments (except for an existing portion) subject to this subpart must be designed, constructed, and installed in such manner as to conform to the requirements of §264.221 of this chapter, except that at sites where the annual precipitation falling on the impoundment and any drainage area contributing surface runoff to the impoundment is less than the annual evaporation from the impoundment, the requirements of §264.228(a)(2) (iii)(E) referenced in §264.221 do not apply.

(4)(i) Upon emplacement of the permanent radon barrier pursuant to 40 CFR 192.32(a)(3), the licensee shall conduct appropriate monitoring and analysis of the radon-222 releases to demonstrate that the design of the permanent radon barrier is effective in limiting releases of radon-222 to a level not exceeding 20 pCi/m^2-s as required by 40 CFR 192.32(b)(1)(ii). This monitoring shall be conducted using the procedures described in 40 CFR part 61, Appendix B, Method 115, or any other measurement method proposed by a licensee that the Nuclear Regulatory Commission or Agreement State approves as being at least as effective as EPA Method 115 in demonstrating the effectiveness of the permanent radon barrier in achieving compliance with the 20 pCi/m^2-s flux standard.

Subpart E - Standards for Management of Thorium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended

§41. Provisions

Except as otherwise noted in §192.41(e), the provisions of subpart D of this part, including §§192.31, 192.32, and 192.33, shall apply to thorium byproduct material and:

(a) Provisions applicable to the element uranium shall also apply to the element thorium;

(b) Provisions applicable to radon-222 shall also apply to radon-220; and

(c) Provisions applicable to radium-226 shall also apply to radium-228.

(d) Operations covered under §192.32(a) shall be conducted in such a manner as to provide reasonable assurance that the annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as a result of exposures to the planned discharge of radioactive materials, radon-220 and its daughters excepted, to the general environment.

(e) The provisions of §192.32(a) (3) and (4) do not apply to the management of thorium byproduct material.

[48 FR 45946, Oct. 7, 1983, as amended at 58 FR 60356, Nov. 15, 1993]

Appendix A - Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content

Criterion 6 -- (1) In disposing of waste byproduct material, licensees shall place an earthen cover (or approved alternative) over tailings or wastes at the end of milling operations and shall close the waste disposal area in accordance with a design [1] which provides reasonable assurance of control of radiological hazards to (i) be effective for 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years, and (ii) limit releases of radon-222 from uranium byproduct materials, and radon-220 from thorium byproduct materials, to the atmosphere so as not to exceed an average [2] release rate of 20 picocuries per square meter per second (pCi/m ^{2} s) to the extent practicable throughout the effective design life determined pursuant to (1)(i) of this Criterion. In computing required tailings cover thicknesses, moisture in soils in excess of amounts found normally in similar soils in similar circumstances may not be considered. Direct gamma exposure from the tailings or wastes should be reduced to background levels. The effects of any thin synthetic layer may not be taken into account in determining the calculated radon exhalation level. If non-soil materials are proposed as cover materials, it must be demonstrated that these materials will not crack or degrade by differential settlement, weathering, or other mechanism, over long-term intervals.

[1] In the case of thorium byproduct materials, the standard applies only to design. Monitoring for radon emissions from thorium byproduct materials after installation of an appropriately designed cover is not required.

Note E
Engineering Systems
UMTRCA Title II
Surface Impoundments

40 CFR 192.32 requires surface impoundments after closure to comply with the closure performance standard of 40 CFR 264.111 for nonradiological hazards. In addition to what is stated in 40 CFR 264.111, 40 CFR 228 closure standards are referenced. 40 CFR 264.228 are the standards for surface impoundments. 40 CFR 264.111 lists other standards that are for other types of systems not applicable to UMTRCA Title II facilities.

A surface impoundment or impoundment as defined by 40 CFR 260.10:

> Surface impoundment or impoundment means a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling, and aeration pits, ponds, and lagoons.

40 CFR 264.228 refers to 40 CFR 264.117 to 40 CFR 264.120. 40 CFR 264.117 refers back to 40 CFR 264, Subpart K (surface impoundments 40 CFR 264.220-231). Further guidance is provided by 10 CFR 40, Appendix A, Criterion 12, Long-Term Site Surveillance, which states as a minimum, annual site inspections must be conducted by the government agency responsible for long-term care of the disposal site to confirm its integrity and to determine the need, if any, for maintenance and/or monitoring.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER F - RADIATION PROTECTION PROGRAMS
Part 192 - Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings

Subpart D - Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended

§32. Standards

(a) *Standards for application during processing operations and prior to the end of the closure period.*

(4)(i) Upon emplacement of the permanent radon barrier pursuant to 40 CFR 192.32(a)(3), the licensee shall conduct appropriate monitoring and analysis of the radon-222 releases to demonstrate that the design of the permanent radon barrier is effective in limiting releases of radon-222 to a level not exceeding 20 pCi/m^2-s as required by 40 CFR 192.32(b)(1)(ii). This monitoring shall be conducted using the procedures described in 40 CFR part 61, Appendix B, Method 115, or any other measurement method proposed by a licensee that the Nuclear Regulatory Commission or Agreement State approves as being at least as effective as EPA Method 115 in demonstrating the effectiveness of the permanent radon barrier in achieving compliance with the 20 pCi/m^2-s flux standard.

(ii) When phased emplacement of the permanent radon barrier is included in the applicable tailings closure plan (radon), then radon flux monitoring required under §192.32(a)(4)(i) shall be conducted, however the licensee shall be allowed to conduct such monitoring for each portion of the pile or impoundment on which the radon barrier has been emplaced by conducting flux monitoring on the closed portion.

(b) *Standards for application after the closure period.* At the end of the closure period:

(1) Disposal areas shall each comply with the closure performance standard in §264.111 of this chapter with respect to nonradiological hazards and shall be designed [1] to provide reasonable assurance of control of radiological hazards to

[1] The standard applies to design with a monitoring requirement as specified in §192.32(a)(4).

(i) Be effective for one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years, and,

(ii) Limit releases of radon-222 from uranium byproduct materials to the atmosphere so as to not exceed an average [2] release rate of 20 picocuries per square meter per second (pCi/m2s).

[2] This average shall apply to the entire surface of each disposal area over periods of at least one year, but short compared to 100 years. Radon will come from both uranium byproduct materials and from covering materials. Radon emissions from covering materials should be estimated as part of developing a closure plan for each site. The standard, however, applies only to emissions from uranium byproduct materials to the atmosphere.

(2) The requirements of §192.32(b)(1) shall not apply to any portion of a licensed and/or disposal site which contains a concentration of radium-226 in land, averaged over areas of 100 square meters, which, as a result of uranium byproduct material, does not exceed the background level by more than:

(i) 5 picocuries per gram (pCi/g), averaged over the first 15 centimeters (cm) below the surface, and

(ii) 15 pCi/g, averaged over 15 cm thick layers more than 15 cm below the surface.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES

Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart G - Closure and Post-Closure

§111. Closure performance standard

The owner or operator must close the facility in a manner that:

(a) Minimizes the need for further maintenance; and

(b) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and

(c) Complies with the closure requirements of this subpart, including, but not limited to, the requirements of §§264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, 264.601 through 264.603, and 264.1102.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES

Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart K - Surface Impoundments

§228. Closure and post-closure care

b) If some waste residues or contaminated materials are left in place at final closure, the owner or operator must comply with all post-closure requirements contained in §§264.117 through 264.120, including maintenance and monitoring throughout the post-closure care period (specified in the permit under §264.117). The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the leak detection system in accordance with §§264.221(c)(2)(iv) and (3) and 264.226(d), and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part; and

(4) Prevent run-on and run-off from eroding or otherwise damaging the final cover.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES

Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart G - Closure and Post-Closure

§117. Post-closure care and use of property

(a)(1) Post-closure care for each hazardous waste management unit subject to the requirements of §§264.117 through 264.120 must begin after completion of closure of the unit and continue for 30 years after that date and must consist of at least the following:

(i) Monitoring and reporting in accordance with the requirements of subparts F, K, L, M, N, and X of this part; and

(ii) Maintenance and monitoring of waste containment systems in accordance with the requirements of subparts F, K, L, M, N, and X of this part.

(2) Any time preceding partial closure of a hazardous waste management unit subject to post-closure care requirements or final closure, or any time during the post-closure period for a particular unit, the Regional Administrator may, in accordance with the permit modification procedures in parts 124 and 270:

(i) Shorten the post-closure care period applicable to the hazardous waste management unit, or facility, if all disposal units have been closed, if he finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or ground-water monitoring results, characteristics of the hazardous wastes, application of advanced technology,

or alternative disposal, treatment, or re-use techniques indicatethat the hazardous waste management unit or facility is secure); or

(ii) Extend the post-closure care period applicable to the hazardous waste management unit or facility if he finds that the extended period is necessary to protect human health and the environment (e.g., leachate or ground-water monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(b) The Regional Administrator may require, at partial and final closure, continuation of any of the security requirements of §264.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment sy stem, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §264.118.

TITLE 10 - ENERGY
CHAPTER I - NUCLEAR REGULATORY COMMISSION
Part 40 - Domestic Licensing of Source Material

Appendix A - Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content

IV. LONG-TERM SITE SURVEILLANCE

Criterion 12 -- The final disposition of tailings, residual radioactive material, or wastes at milling sites should be such that ongoing active maintenance is not necessary to preserve isolation. As a minimum, annual site inspections must be conducted by the government agency responsible for long-term care of the disposal site to confirm its integrity and to determine the need, if any, for maintenance and/or monitoring. Results of the inspections for all the sites under the licensee's jurisdiction will be reported to the Commission annually within 90 days of the last site inspection in that calendar year. Any site where unusual damage or disruption is discovered during the inspection, however, will require a preliminary site inspection report to be submitted within 60 days. On the basis of a site specific evaluation, the Commission may require more frequent site inspections if necessary due to the features of a particular disposal sit e. In this case, a preliminary inspection report is required to be submitted within 60 days following each inspection.

Note F
Engineering Systems
DOE
Landfills

DOE Order 435 has requirements for three different types of waste facilities: high-level waste, transuranic waste, and low-level waste. High-level waste and traunsuranic waste is not discussed here since both of these waste types have specific disposal facilities: Yucca Mountain and WIPP. Yucca Mountain and WIPP have very specific standards for these facilities. These two facilities are very much a minority when compared to vast majority of the sites slated to enter long-term stewardship. To be efficient with the available resources in identifying requirements, Yucca Mountain and WIPP are not included in the discussion of requirements.

There are several LTS sites, which contain low-level disposal facilities or landfills. DOE has requirements for their post-closure care, but not as specific as the requirements found in 40 CFR 264 Subpart G. The pertinent standard for low-level waste disposal facilities is found in DOE G 435.1-1, Technical Basis and Considerations for DOE M 435.1-1, and is noted below.

Chapter IV - Low-Level Waste Requirements
IV. Q.(2) Disposal Facility Closure .
(c) Institutional control measures shall be integrated into land use and stewardship plans and programs, and shall continue until the facility can be released pursuant to DOE 5400.5, *Radiation Protection of the Public and the Environment.*
(d) The location and use of the facility shall be filed with the local authorities responsible for land use and zoning.

Objective:

The objective of these requirements is to ensure that institutional control will continue until the low-level waste disposal facility can be released for unrestricted use and that local land use records appropriately record the previous use of the land as a radioactive waste disposal facility to provide additional protection again misuse of the land and the possibility of an inadvertent intrusion.

Discussion:

Institutional Control. Institutional control, for the purposes of performance assessment, is typically assumed to last for 100 years. However, the actual period of institutional control, when DOE maintains a custodial presence and controls the use of the land, lasts until the facility can be released. A low-level waste disposal facility cannot be released until the requirements for public and environmental radiation protection of DOE 5400.5, Radiation Protection of the Public and the IV-236 DOE G 435.1-1 7-09-99 Environment (or 10 CFR Part 834, when promulgated), for releasing a facility for unrestricted use are met. Institutional controls are no longer necessary for a facility released for unrestricted use.

For low-level waste disposal facilities, the period of institutional control could extend long beyond 100 years before the requirements of DOE 5400.5 are met. The closure plan includes the necessary activities to be performed during this period of institutional control to ensure the protection of the public health and the environment, such as facility monitoring, custodial maintenance, access controls, corrective actions, passive controls and restrictions, reporting requirements, and record keeping. The determination of the necessary activities to be performed during the institutional control period is based on the documentation and analysis included in the facility radioactive waste management basis, including the performance assessment, composite analysis, closure plan, and monitoring plan. Institutional control measures must be incorporated into the site's land use and stewardship plans and programs to ensure that control of the site is not compromised. Throughout the period of institutional control, the responsibility for maintaining the facility to protect the public and the environment rests with the Field Office Manager.

Note G
Sensors and Monitoring
RCRA
Closure Plans

40 CFR 264.110 and 265.110, Subpart G, require a RCRA post-closure plan for:

- All hazardous waste disposal facilities
- Waste piles and surface impoundments from which the owner or operator intends to remove the wastes at closure to the extent that Subpart G is applicable
- Tank systems that are required to meet the requirements for landfills
- Containment buildings that are required to meet the requirement for landfill closure.

Containment building, as used above and defined by 40 CFR 260.10, means a hazardous waste management unit that is used to store or treat hazardous waste under the provisions of subpart DD of 40 CFR 264 or 265.

Note H
Sensors and Monitoring
DOE
Groundwater

For drinking water pathway only, for public community drinking water standards (50 CFR 141), state systems shall not cause persons consuming drinking water to receive an effective dose equivalent greater than 4 mrem in a year. Combined radium 226 and radium 228 shall not exceed 5 pCi/l and gross alpha activity (including radium 226 but excluding radon and uranium) shall not exceed 15 pCi/l.

DOE Order 5400.5, Chapter III, contains the principle standards and guides for release of radionuclides. Chapter III, Figure III-1, lists derived concentration guides (DCGs). The DCGs represent the concentrations of radioactivity in air inhaled or water ingested continuously during a year that resulted in a 100-mrem, 50-year committed effective dose equivalent. The DCGs yield the maximum dose a person could receive at the location where the sample was collected, given the following two assumptions: (1) the concentration was at the DCG level continuously for the entire year, and (2) the person receiving the exposure was at that location for the entire year, continually drinking the water or inhaling the air.

DOE 5400, CHAPTER II, REQUIREMENTS FOR RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT

1. PUBLIC DOSE LIMITS. Dose limits for members of the public are presented in this chapter. The primary public dose limits include consideration of all exposure modes from all DOE activities (including remedial actions). The primary dose limit is expressed as an effective dose equivalent, a term developed by the ICRP for their risk-based system, which requires the weighted summation of doses to various organs of the body. Additional public dose limits are established by EPA regulations for exposures to several selected sources or exposure modes (pathways or conditions). Public dose limits promulgated by EPA for selected exposure modes are sometimes expressed as dose equivalents, which do not include risk-based weighting or summation of doses to various organs, and sometimes expressed as effective dose equivalent. DOE must also comply with legally applicable requirements (e.g., 40 CFR Parts 61, 191, and 192 and 10 CFR Parts 60 and 72), including administrative and procedural requirements. Except for those provided in paragraph II.1a(4), administrative and procedural requirements of legally applicable regulations are not addressed in this Order. Such legally applicable regulations must be consulted for provisions not addressed in this Order.

d. Drinking Water Pathway Only, All DOE Sources of Radionuclides. It is the policy of DOE to provide a level of Protection for persons consuming water from a public drinking water supply operated by the DOE, either directly or through a DOE contractor, that is equivalent to that provided to the public by the public community drinking water standards of 40 CFR Part 141. These systems shall not cause persons consuming the water to receive an effective dose equivalent greater than 4 mrem (0.04 mSv) in a year. Combined radium-226 and radium-228 shall not exceed $5X10^{-9}$ uCi/ml and gross alpha activity (including radium-226 but excluding radon and uranium) shall not exceed $1.5x10^{-8}$ uCi/ml.

(1) DOE Drinking Water Systems. The dose limit is consistent with the drinking water criteria in 40 CFR Part 141, "National Interim Primary Drinking Water Regulations (Safe Drinking Water Act)."

(2) Dose Components. The dose limit is the effective dose equivalent to individuals whose exclusive source of drinking water contains a radionuclide, or a mixture of radionuclides, at a monthly average level of four percent of the appropriate DCG value. For simplicity, it is assumed that site workers are also exposed to four percent of DCG values or the radium and gross alpha levels in II.1d for drinking water while away from the DOE site.

(3) Impact on Other Systems. The liquid effluents from DOE activities shall not cause private or public drinking water systems downstream of the facility discharge to exceed the drinking water radiologicallimits in 40 CFR Part 141.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER D - WATER PROGRAMS

Part 141 - National Primary Drinking Water Regulations

Subpart B - Maximum Contaminant Levels
§15. Maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity in community water systems

The following are the maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity:

(a) Combined radium-226 and radium-228 -- 5 pCi/1.

(b) Gross alpha particle activity (including radium-226 but excluding radon and uranium) -- 15 pCi/1.

DOE Order 5400.5, CHAPTER III, DERIVED CONCENTRATION GUIDES FOR AIR AND WATER

2. BASIS. The DCG values are presented for each of three exposure modes: (1) ingestion of water; (2) inhalation of air; and (3) immersion in a gaseous cloud. The DCG values for internal exposure shown in Figure III-1 are based on a committed effective dose equivalent of 100 mrem for the radionuclide taken into the body by ingestion or inhalation during one year. To use the DCGs for comparison with the DOE drinking water

systems criterion of 4 mrem/yr (0.04 mSv/yr), use 4 percent of the DCG values for ingestion. Compliance with the 40 CFR Part 61, Subpart H, criterion of 10 mrem/yr (0.10 mSv/yr) effective dose equivalent is demonstrated using the AIRDOS/RADRISK models prescribed by the EPA. Alternative gastrointestinal-tract (GI-tract) absorption factors (fl) and lung retention classes (noted as D, W, or Y in the Task Group Lung Model used to produce the inhalation dose factors reported in ICRP Publication 30) are listed for specific compounds, by element, in Figure III-2 for cross-referencing with the internal DCGS in Figure III-1. The data in Figure III-2 are listed in alphabetical order, by element name. Removal half-times assigned to the compounds with lung retention classes D, W, and Y are 0.5, 50, and 500 days, respectively. The air immersion DCG values shown in Figure III-3 are based on an effective dose equivalent of 100 mrem from exposure during one year. Figure III-1 contains six columns of information: Radionuclide/Chemical Form/Isomer Half-Life; fl Value (GI-tract absorption); Ingested Wat er DCG (? ℃i/mL); Inhaled Air DCG for Lung Retention Class D (? ℃i/mL); and Inhaled Air DCG for Lung Retention Class W (?℃i/mL); and Inhaled Air DCG for Lung Retention Class Y (? ℃i/mL). Figure III-2 contains five columns of information:
Element/Symbol; Atomic Number; compound; fl value; and Lung Retention
Class. Figure III-3 contains three columns of information:
Radionuclide; Half-life in units of seconds (s), minutes (min), hours
(h), days (d), or years (yr); and Air Immersion DCG (? ℃i;mL).

Note I
Sensors and Monitoring
DOE
Air

DOE Order 5400.5, Chapter III, contains the principle standards and guides for release of radionuclides. Chapter III, Figure III-1, lists derived concentration guides (DCGs). The DCGs represent the concentrations of radioactivity in air inhaled or water ingested continuously during a year that resulted in a 100-mrem, 50-year committed effective dose equivalent. The DCGs yield the maximum dose a person could receive at the location where the sample was collected, given the following two assumptions: (1) the concentration was at the DCG level continuously for the entire year, and (2) the person receiving the exposure was at that location for the entire year, continually drinking the water or inhaling the air.

Implementation guide for DOE Order 5400.5, *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance,* DOE/EH-0173T, paragraph 3.3.1 defines two types of sources contributing to the total radiological emissions from a DOE facility.

> The sources (DOE-controlled facilities) contributing to the total emissions from a facility (DOE-controlled site) can be considered as either "point" sources or "diffuse" sources. A point source is a single defined point (origin) of an airborne release such as a vent or stack. A diffuse source is an area source or several sources of radioactive contaminants released into the atmosphere (generally, all sources other than point sources).

It is safe to assume that most sources if not all sources at D&D and NWPA sites would be considered a "diffuse" source. Monitoring guidance or requirements for "diffuse" sources are not as well defined as they are for point sources.

The following paragraphs are quotes from DOE/EH-173T:

Paragraph 3.3.2 Diffuse Sources

> *The category of diffuse sources covers many situations, most of which are difficult to characterize (e.g., ponds, contaminated areas, structures without ventilation or with ventilation that does not result in a well – defined release point). Attempts to define the emissions under such an array of conditions and other complex and ill-defined factors affecting the transport of the emissions (generally meteorological and topographical factors) would require complex sampling techniques, and repositions of equipment may be necessary. Diffuse sources should* be identified and assessed for their potential to contribute to public dose and should be considered in designing the site effluent monitoring and environmental surveillance program. Diffuse sources that may contribute a significant fraction (e.g., 10%) of the does to members of the public resulting from site operations should* be identified, assessed, documented, and verified annually.*

Paragraph 3.3.3 Diffuse Source Assessment

> *If a diffuse source assessment is warranted because of potential contribution to the offsite dose, the following procedures should be applied:*
>
> 1. *The assessment should be accomplished by using appropriate computational models and/or a downwind array of samplers arranged and operated over a sufficient period to characterize the concentrations of radionuclides in any resulting plume.*
> 2. *Empirical data and sound assumptions should be used with the computational models to define the source term for a diffuse source.*
>
> *The validity of the resulting release estimates relies on the professional judgment and knowledge of the individuals involved and is usually difficult to verify. As a general rule, reliance will be placed on the site environmental surveillance program to confirm predictions.*

Paragraph 3.4.2 Diffuse Sources

The types of information to be documented in the site Environmental Monitoring Plan for diffuse sources are less readily identifiable. Diffuse sources can range from large areas of contaminated soil to ponds or uncontrolled releases from openings in a structure. The factors that have a significant influence on the air suspension of radionuclides from these situations depend on the force applied (which results in suspension of the radionuclide in air) and the factors that resist suspension [e.g., subdivision of liquid surface by shear stress (sprays) from ambient winds, over-pressure phenomena within a structure that result in the atmospheric release of radionuclides, the exchange of indoor outdoor atmospheres at portals, and aerodynamic entrainment of contaminated soil]. A potential source should be adequately described to show the radionuclides present, the form of the materials, and the factors contributing to suspension. The rational to substantiate the approach used to assess and characterize the source should be documented. Information on considerations in diffuse-source sampling can be found I Heseketh and Cross (1983). The most reliable source of data is likely to be local experience with similar installations. In addition to the discussion of input parameters in documentation supporting the EPA?CAP-88 and AIRDOS computer does, additional insight into the parameters necessary for estimating dose form fugitive emissions is provided by Whelan et al. (1987), Gilbert et al. 1989, and EPA-600/12-87-066.

DOE Order 5400.5, II.6.a. states the specific requirements for radiological effluent monitoring and environmental surveillance and their schedule of implementation are prescribed in DOE publication DOE\EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance. DOE\EH-173T incorporates and expands on the requirements embodied in DOE Order 5400.5. Reviewing DOE\EH-0173T, paragraph 3.3, for performance standards for air-sampling systems are based upon results of a study of the expected releases, potential exposure pathways, and resulting dose. Basically, the schedule of implementation is site specific documented in the site's environmental monitoring plan. DOE\EH-0173T implies groundwater frequency requirements are site specific. Site specific is based on the radionuclides being monitored and their potential dose to the public.

DOE Order 5400.5, CHAPTER II, REQUIREMENTS FOR RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT

6. DEMONSTRATION OF COMPLIANCE WITH THE DOSE LIMITS.
Compliance with the dose limits of this Order shall be demonstrated by documentation of an appropriate combination of measurements and calculations to evaluate potential doses and the results of the evaluations.
a. Monitoring and Surveillance. General requirements for routine effluent monitoring are part of the environmental monitoring plan prescribed in DOE 5400.1. Specific requirements for radiological effluent monitoring and environmental surveillance and their schedule of implementation are prescribed in DOE publication DOE\EH-0173T which deals with radiological effluent monitoring and environmental surveillance. The monitoring requirements are applicable to all DOE and DOE contractor operations t hat are subject to the standards and requirements of this Order.

DOE M 435.1-1 IV-11
P. Disposal. Low-level waste disposal facilities shall meet the following requirements.

(1) **Performance Objectives**.

Low-level waste disposal facilities shall be sited, designed, operated, maintained, and closed so that a reasonable expectation exists that the following performance objectives will be met for waste disposed of after September 26, 1988:

(a) Dose to representative members of the public shall not exceed 25 mrem (0.25 mSv) in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air.

(b) Dose to representative members of the public via the air pathway shall not exceed 10 mrem (0.10 mSv) in a year total effective dose equivalent, excluding the dose from radon and its progeny.

(c) Release of radon shall be less than an average flux of 20 pCi/m 2/s (0.74 Bq/m2/s) at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/1 (0.0185 Bq/l) of air may be applied at the boundary of the facility.

Note J
Sensors and Monitoring
DOE
Surface Water

DOE Order 5400.5 II 3 does not have release limits, but uses screening values instead. Best available technology treatment is provided to protect groundwater and to prevent radionuclide buildup in soil. If radioactive waste streams contain radionuclide concentrations of not more than the derived concentration guide (DCG) reference values at the point of discharge to a surface waterway, treatment is normally not required. DCGs (for water) are used to monitor the water to determine if a corrective action needs to occur.

CHAPTER II, REQUIREMENTS FOR RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT

3. .MANAGEMENT AND CONTROL OF RADIOACTIVE MATERIALS IN LIQUID DISCHARGES AND PHASEOUT OF SOIL COLUMNS.

In addition to the requirement to limit dose to members of the public (onsite or offsite) in accordance with the standards established in paragraphs II.1a and II.1d, further controls are imposed on liquid releases to protect resources such as land, surface water, groundwater, and the related ecosystems from undue contamination. DCGs are not release limits, but rather are screening values for considering BAT for these discharges and for making dose estimates. The following requirements apply at the point of discharge from the conduit to the environment.

a. Discharges of Liquid Waste to Surface Waters.

(1) Discharge at Greater Than DCG Level. For liquid wastes containing radionuclides from DOE activities which are discharged to surface water, the best available technology (BAT) is the prescribed level of treatment if the surface waters otherwise would contain, at the point of discharge and prior to dilution, radioactive material at annual average concentrations greater than the DCG values in liquids given in Chapter III. The BAT selection process shall be implemented in accordance with II.3a(1)(a) and (b), below. Although there is no known practicable method for removing tritium from liquid waste streams, facilities and operations are to be designed and operated so that tritium sources and releases are considered in the ALARA process.

(a) BAT Selection. Selection of the best available technology for a specific application will be made from among candidate alternative treatment technologies which are identified by an evaluation process that includes factors related to technology, economics, and public policy considerations. Factors that are to be considered in selecting BAT, at a minimum, shall include:

1. the age of equipment and facilities involved;
2. the process employed;
3. the engineering aspects of the application of various types of control techniques;
4. process changes;
5. the cost of achieving such effluent reduction;
6. non-water quality environmental impact (including energy requirements);
7. safety considerations; and

BAT analyses are difficult to express quantitatively because them factors do not have a common denominator. However, consideration of the factors will permit qualitative evaluations which will support judgments.

(b) Plan and Schedule for Implementation. A plan and schedule to install waste treatment systems in existing facilities, if justified by a BAT analysis, shall be developed within 6 months of the issuance date of this Order, to permit compliance with paragraph II.3a(1) at the earliest practicable time. The plan shall include an ALARA section on tritium, where applicable.

General design criteria are presented in DOE 6430.1A.

(c) Approval. The plan shall be submitted for approval to the responsible DOE Field Office Manager and updated annually, consistent with the provisions of DOE 5820.2A for preparing and updating Waste Management Plans.

(2) Discharge at Less Than DCG Level. Implementation of the BAT process for liquid radioactive wastes is not required where radionuclides are already at a low level, i.e., the annual average concentration is less than DCG level. In that case, the cost consideration component of BAT analysis precludes the need for additional treatment, since any additional treatment would be unjustifiable on a cost-benefit basis. Therefore, additional treatment will not be required for waste streams that contain radionuclide concentrations of not more than the DCG values in Chapter III at the point of discharge to a surface waterway. However, the ALARA provisions are applicable.

(3) Multiple Radionuclides. For purposes of II.3a(1), above, the DCG for liquid waste streams containing more than one type of radionuclide shall be the sum of the fractional DCG values.

(4) Sedimentation. To prevent the buildup of radionuclide concentrations in sediments, liquid process waste streams containing radioactive material in the form of settleable solids may be released to natural waterways if the concentration of radioactive material in the solids present in the waste stream does not exceed 5 pCi (O.2 Bq) per gram above background level, of settleable solids for alpha-emitting radionuclides or 50 pCi (2 Bq) per gram above background level, of settleable solids for betagamma-emitting radionuclides.

(5) Interim Dose Limit for Native Aquatic Animal Organisms. To protect native animal aquatic organisms, the absorbed dose to these organisms shall not exceed 1 rad per day from exposure to the radioactive material in liquid wastes discharged to natural waterways. DOE publication DOE/EH-0173T provides guidance on monitoring and calculating dose for aquatic organisms.

(6) New Facilities. New facilities shall be designed and constructed to meet the discharge requirements shown in paragraph II.3a.

Note K
Sensors and Monitoring
DOE
Sediment
DOE Order 5400.5 II 3 (4)

To prevent the buildup of radionuclide concentrations in sediments, liquid process waste streams containing radioactive material in the form of settleable solids may be released to natural waterways if the concentration of radioactive material in the solids present in the waste stream does not exceed 5pCi (0.2 Bq) per gram above background level of settleable solids for alpha-emitting radionuclides or 50 pCi (2Bq) per gram above background level of settleable solids for beta-gamma-emitting radionuclides.

DOE Order 5400.5, II.6.a. states the specific requirements for radiological effluent monitoring and environmental surveillance and their schedule of implementation in DOE publication DOE\EH-0173T. DOE\EH-0173T, paragraph 5.12.1, states the basis for sampling sediment frequency is site specific based on evaluations. The evaluations should consider the potential for offsite exposure of humans, as well the potential dose to onsite or offsite aquatic organisms.

DOE Order 5400.5, CHAPTER II, REQUIREMENTS FOR RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT

3. MANAGEMENT AND CONTROL OF RADIOACTIVE MATERIALS IN LIQUID DISCHARGES AND PHASEOUT OF SOIL COLUMNS.

a. Discharges of Liquid Waste to Surface Waters.

(4) Sedimentation. To prevent the buildup of radionuclide concentrations in sediments, liquid process waste streams containing radioactive material in the form of settleable solids may be released to natural waterways if the concentration of radioactive material in the solids present in the waste stream does not exceed 5 pCi (O.2 Bq) per gram above background level, of settleable solids for alpha-emitting radionuclides or 50 pCi (2 Bq) per gram above background level, of settleable solids for betagamma-emitting radionuclides.

DOE Order 5400.5, CHAPTER II, REQUIREMENTS FOR RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT

6. DEMONSTRATION OF COMPLIANCE WITH THE DOSE LIMITS. Compliance with the dose limits of this Order shall be demonstrated by documentation of an appropriate combination of measurements and calculations to evaluate potential doses and the results of the evaluations.

a. Monitoring and Surveillance. General requirements for routine effluent monitoring are part of the environmental monitoring plan prescribed in DOE 5400.1. Specific requirements for radiological effluent monitoring and environmental surveillance and their schedule of implementation are prescribed in DOE publication DOE\EH-0173T which deals with radiological effluent monitoring and environmental surveillance. The monitoring requirements are applicable to all DOE and DOE contractor operations that are subject to the standards and requirements of this Order.

Note L
Sensors and Monitoring
DOE
Soil

If the soil contains radionuclides other than Th-230, Th-232, Ra-226, and Ra-228, the residual radionuclides in soil guidelines are site specific and must be calculated using the guidelines given in DOE/CH-8901.

For residual radionuclides in soil, the generic guidelines for thorium (Th-230 and Th-232) and radium (Ra-226 and Ra-228) are:

(a) 5 pCi/g, averaged over the first 15 cm of soil below the surface; and

(b) 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.

These guidelines take into account ingrowth of Ra-226 from Th-230 and of Ra-228 from Th-232, and assume secular equilibrium. If Th-230 and Ra-226 or both Th-232 and Ra-228 are present and not in secular equilibrium, the appropriate guideline is applied as a limit for the radionuclide with the higher concentration. If other mixtures of radionuclide occur, the concentrations of individual radionuclides shall be reduced so that either the dose for the mixtures will not exceed the basic dose limit or the sum of the ratios of the soil concentration of each radionuclide to the allowable limit for that radionuclide will not exceed 1.

DOE/CH/8901, A Manual for Implementing Residual Radioactive Material Guidelines, Introduction, Page 1 and 2

> To derive site-specific soil guidelines, a basic radiation dose limit of 100 mrem/yr (as specified in the DOE guidelines) is applied to a member of a critical population group. The radiation dose is defined here as the effective dose equivalent from external radiation plus the committed effective dose equivalent from internal radiation (International Commission on Radiological Protection [ICRP] 1984, Section 2.1). The radiation dose limit is based on radiation protection standards and requirements specified in DOE Order 5400.xx (DOE 1989). The critical population group is relatively small, homogeneous group that is representative of those individuals in the population expected to potentially receive the largest radiation dose. It is assumed, for the purpose of deriving soil guidelines, that the critical population group is a family that establishes residence on a site after the site has been released for use without radiological restrictions. The controlling principles for all guidelines are (1) the annual radiation dose received by a member of the critical population group from the residual radioactive material – predicted by a realistic but reasonably conservative analysis and averaged over a time interval of 50 years – should not exceed the basic dose limit of 100 mrem/yr and (2) doses should be kept as low as reasonably achievable. Final cleanup standards (authorized limits), and in some cases guidelines, may be based on a different scenario of the resident family scenario is not appropriate for the specific property or if another plausible-use scenario would result in significantly greater potential for exposure.

DOE 5400.5, CHAPTER IV, Residual Radioactive Material

> 1. PURPOSE.
> This chapter presents radiological protection requirements and guidelines for cleanup of residual radioactive material and management of the resulting wastes and residues and release of property. These requirements and guidelines are applicable at the time the property is released. Property subject to these criteria includes, but is not limited to sites identified by the Formerly Utilized Sites Remedial Action Program (FUSRAP) and the Surplus Facilities Management Program (SFMP). The topics covered are basic dose limits, guidelines and authorized limits for allowable levels of residual radioactive material, and control of the radioactive wastes and residues. This chapter does not apply to uranium mill tailings or to properties covered by mandatory legal requirements.
>
> **4. GUIDELINES FOR RESIDUAL RADIOACTIVE MATERIAL.**
> **a. Residual Radionuclides in Soil.** Generic guidelines for thorium and radium are specified below. Guidelines for residual concentrations of other radionuclides shall be derived from the basic dose limits by means of an environmental pathway analysis using specific property data where available. Procedures for these derivations are given in DOE/CH-8901.
>
> Residual concentrations of radioactive material in soil are defined as those in excess of background concentrations averaged over an area of 100 m^2.
>
> **(2) Generic Guidelines.** The generic guidelines for residual concentrations of Ra-226, Ra228, Th-230, and Th-232 are:
>
> (a) 5 pCi/g, averaged over the first 15 cm of soil below the surface; and
>
> (b) 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.

Note M
Sensors and Monitoring
DOE
Other

DOE/EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance

5.8 Basis for Sampling Terrestrial Foodstuffs

If the preliminary analysis of public dose indicates that the annual effective dose equivalent from ingestion of terrestrial foods is 5 mrem or greater, then sufficient sampling and analysis should be carried out so that the foods and radionuclides contributing at least 90% of this ingestion dose have been evaluated. If the annual effective dose equivalent is between 1 and 5 mrem, sufficient sampling and analysis should be carried out to provide reasonable assurance that the doses are within this range. When the annual effective dose equivalent is between 1 and 0.1 mrem, then sufficient surveillance should be done to show that the radionuclides are behaving in the environment as expected. The principal pathways by which foods become contaminated are deposition from airborne materials and crop irrigation from surface or groundwaters. The relative contributions of various pathways, foods, and radionuclides to the total dose depends on several factors, including

- Agricultural uses of the land
- Farming and gardening practices
- Soil type
- Climate (e.g., temperature, rainfall, growing season)
- Dietary habits
- Quantities of specific radionuclides released to air and water and their chemical and physical forms.

5.8.1 Possibility of Long-Term Buildup

Even in those instances where the annual effective dose equivalent from ingestion of terrestrial foods is less than 1 mrem, periodic sampling and analysis of indicator materials, such as soil or vegetation should be performed to determine if there is measurable long-term buildup of radionuclides in the terrestrial environment. Such long-term buildup could affect the relative contributions of certain radionuclides and foods to the total radiation dose of site origin. However, the availability of these radionuclides to plants grown in such soil may decrease with time as a result of several natural processes. These processes include changes in chemical or physical form of the radionuclides caused by weathering or the action of soil bacteria, fixation onto soil materials or the litter layer, migration below the root zone of the plant with irrigation water or rainfall, and removal of contaminated soil by wind or water erosion or by cultivation. Unless terrestrial foods or indicator organisms are being analyzed routinely, the pathway evaluation should be repeated annually to reaffirm the original evaluation. Foods to be considered in the pathway analysis, listed in approximate descending order of importance, are milk, vegetables, meat, eggs, grain, and fruit. If wild game, such as deer or game birds, is available locally, then these should also be considered in the pathway analysis.

Note N
Sensors and Monitoring
RCRA
Groundwater

Under RCRA, groundwater monitoring is required as a part of post-closure care if one of the following two situations apply at closure:

- The facility contains waste residues or contaminated materials are left in place at final closure; or
- The facility is closed in accordance to landfill requirements.

40 CFR 265 and 40 CFR 264, Subpart F provide the groundwater monitoring requirements and limits. Groundwater background levels are established by monitoring for a period of one year. For Part B permitted facilities, maximum concentration levels are the established background levels or Table 1 of 40 CFR 264.94 which ever is lower. For Part A permitted facilities, maximum concentration levels are the established background levels. An exception to maximum concentration levels for both A and B facilities is if alternate concentration limits are established and approved by the EPA Regional Administrator. Frequency of monitoring is site-specific and specified in the unit permit upon approval by the Regional Administrator.

§264.94 Concentration limits.

(a) The Regional Administrator will specify in the facility permit concentration limits in the groundwater for hazardous constituents established under §264.93. The concentration of a hazardous constituent:

(1) Must not exceed the background level of that constituent in the groundwater at the time that limit is specified in the permit; or

(2) For any of the constituents listed in Table 1, must not exceed the respective value given in that table if the background level of the constituent is below the value given in Table 1; or

TABLE 1-MAXIMUM CONCENTRATION OF CONSTITUENTS FOR GROUND-WATER PROTECTION

CONSTITUENT	MAXIMUM CONCENTRATION
Arsenic	0.05
Barium	1.0
Cadmium	0.01
Chromium	0.05
Lead	0.05
Mercury	0.002
Selenium	0.01
Silver	0.05
Endrin (1,2,3,4,10,10-hexachloro-1,7-epoxy 1,4,4a,5,6,7,8,9a-octahydro-1, 4-endo, endo-5,8-dimethano naphthalene)	0.0002
Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer)	0.004
Methoxychlor (1,1,1-Trichloro-2,2-bis (p-methoxyphenylethane)	0.1
Toxaphene ($C_{10}H_{10}Cl_6$, Technical chlorinated camphene, 67-69 percent chlorine)	0.005
2,4-D (2,4-Dichlorophenoxyacetic acid)	0.1
2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid)	0.01

[1]Milligrams per liter.

(3) Must not exceed an alternate limit established by the Regional Administrator under paragraph (b) of this section.

(b) The Regional Administrator will establish an alternate concentration limit for a hazardous constituent if he finds that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limit is not exceeded. In establishing alternate concentration limits, the Regional Administrator will consider the following factors:

(1) Potential adverse effects on ground-water quality, considering:

(i) The physical and chemical characteristics of the waste in the regulated unit, including its potential for migration;

(ii) The hydrogeological characteristics of the facility and surrounding land;

(iii) The quantity of groundwater and the direction of ground-water flow;

(iv) The proximity and withdrawal rates of ground-water users;

(v) The current and future uses of groundwater in the area;

(vi) The existing quality of groundwater, including other sources of contamination and their cumulative impact on the ground-water quality;

(vii) The potential for health risks caused by human exposure to waste constituents;

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

(ix) The persistence and permanence of the potential adverse effects; and

(2) Potential adverse effects on hydraulically-connected surface-water quality, considering:

(i) The volume and physical and chemical characteristics of the waste in the regulated unit;

(ii) The hydrogeological characteristics of the facility and surrounding land;

(iii) The quantity and quality of groundwater, and the direction of ground-water flow;

(iv) The patterns of rainfall in the region;

(v) The proximity of the regulated unit to surface waters;

(vi) The current and future uses of surface waters in the area and any water quality standards established for those surface waters;

(vii) The existing quality of surface water, including other sources of contamination and the cumulative impact on surface water quality;

(viii) The potential for health risks caused by human exposure to waste constituents;

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

(x) The persistence and permanence of the potential adverse effects.

(c) In making any determination under paragraph (b) of this section about the use of groundwater in the area around the facility the Regional Administrator will consider any identification of underground sources of drinking water and exempted aquifers made under §144.8 of this chapter.

Note O
Sensors and Monitoring
CERCLA
Groundwater

CERCLA applies all Applicable or Relevant and Appropriate Requirements (ARARs) where hazardous substances are left onsite. Section 121(d)(2)(a) states that the following are ARARs for the hazardous substance, pollutant, or contaminant concerned:

- Any standard, requirement, criteria, or limitation under any federal environmental law; and
- Any promulgated standard, requirement, criteria or limitation under a state environmental or facility siting law that is more stringent than any federal standard.

For groundwater monitoring EPA's National Primary Drinking Water Standards maximum contaminant level (MCL) would most likely be applicable for CERCLA groundwater monitoring. The phrase "most likely be applicable" is used because there could be sites where the groundwater is not used for drinking water. However, it would be difficult to prove.

ARARs are promulgated, or legal enforceable requirements. DOE Orders themselves are not ARARs because they are not promulgated. DOE Orders can be "TBCs" – to be considered. Note, DOE Order contained in final RODs are enforceable under CERCLA and cannot be waived using DOE procedures for waiving orders.

Specific levels of post clean-up monitoring may be stated in the ROD, but are more likely to be included in documentation for the Remedial Action as a function of operation and maintenance.

Groundwater monitoring ARARs for radionuclides would likely be the Derived Concentration Guides for water from DOE Order 5400.5.

Frequency of monitoring is site-specific and would be likely outlined in the site closure document.

Following is from "ARARs Frequently Asked Questions," DOE Office of Environmental Policy & Guidance, RCRA/CERCLA Division, June 1998.

> By definition, ARARs are promulgated, or legally enforceable federal and state requirements. EPA has also developed another category known as "to be considered" (TBCs), that includes nonpromulgated criteria, advisories, guidance, and proposed standards issued by federal or state governments. TBCs are not potential ARARs because they are neither promulgated nor enforceable. It may be necessary to consult TBCs to interpret ARARs, or to determine preliminary remediation goals when ARARs do not exist for particular contaminants. Identification and compliance with TBCs is not mandatory I the same way that it is for ARARs.
>
> However, once a TBC is part of a Record of Decision (ROD), it becomes enforceable.
>
> DOE Orders are neither ARARs nor TBCs. DOE Orders themselves are not ARARs because they are not promulgated. However, in some cases DOE Orders may contain requirements promulgated by other federal agencies that could be potential ARARs, and these requirements should be identified through the ARARs identification process. Some regulators may choose to refer to DOE Orders as "TBCs". However, DOE personnel should not regard DOE Orders as simply "to be considered information." DOE and DOE contractors must comply with these Orders at DOE facilities. DOE Orders are legally binding because of contractual arrangements between DOE and its contractors. Fin ally, DOE Orders in final RODs are enforceable under CERCLA and cannot be waived using DOE procedures for waiving Orders.

Note P
Sensors and Monitoring
CERCLA
Air

CERCLA applies all Applicable or Relevant and Appropriate Requirements (ARARs) where hazardous substances are left onsite. Section 121(d)(2)(a) states that the following are ARARs for the hazardous substance, pollutant, or contaminant concerned:

- Any standard, requirement, criteria, or limitation under any federal environmental law; and
- Any promulgated standard, requirement, criteria or limitation under a state environmental or facility siting law that is more stringent than any federal standard.

ARARs are promulgated, or legal enforceable requirements. DOE Orders themselves are not ARARs because they are not promulgated. DOE Orders can be "TBCs" – to be considered. Note, DOE Order in final RODs are enforceable under CERCLA and cannot be waived using DOE procedures for waiving orders.

Air-monitoring ARARs would likely be the EPA's ambient air quality standards and for radionuclides, DOE's 5400.5 DCGs for air would likely be TBCs. Specific levels of post clean-up monitoring may be stated in the ROD, but are more likely to be included in documentation for the Remedial Action as a function of operation and maintenance.

Frequency of monitoring is site specific and would be likely outlined in the site closure document.

Following is from "ARARs Frequently Asked Questions," DOE Office of Environmental Policy & Guidance, RCRA/CERCLA Division, June 1998.

> By definition, ARARs are promulgated, or legally enforceable federal and state requirements. EPA has also developed another category known as "to be considered" (TBCs), that includes nonpromulgated criteria, advisories, guidance, and proposed standards issued by federal or state governments. TBCs are not potential ARARs because they are neither promulgated nor enforceable. It may be necessary to consult TBCs to interpret ARARs, or to determine preliminary remediation goals when ARARs do not exist for particular contaminants. Identification and compliance with TBCs is not mandatory I the same way that it is for ARARs.
>
> However, once a TBC is part of a Record of Decision (ROD), it becomes enforceable.
>
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Note Q
Sensors and Monitoring
CERCLA
Surface Water

CERCLA applies all Applicable or Relevant and Appropriate Requirements (ARARs) where hazardous substances are left onsite. Section 121(d)(2)(a) states that the following are ARARs for the hazardous substance, pollutant, or contaminant concerned:

- Any standard, requirement, criteria, or limitation under any federal environmental law; and
- Any promulgated standard, requirement, criteria or limitation under a state environmental or facility siting law that is more stringent than any federal standard.

ARARs are promulgated, or legal enforceable requirements. DOE Orders themselves are not ARARs because they are not promulgated. DOE Orders can be "TBCs" – to be considered. Note, DOE Order in final RODs are enforceable under CERCLA and cannot be waived using DOE procedures for waiving orders.

ARARs for surface water monitoring would likely be EPA's National Primary Drinking Water Standards maximum contaminant levels (MCLs). Typically the EPA's National Primary Drinking Water Standards would be used as ARARs if the surface water would impact the community drinking water. Surface water monitoring TBCs for radionuclides would likely be the Derived Concentration Guides for water from DOE Order 5400.5.

Specific levels of post clean-up monitoring may be stated in the ROD, but are more likely to be included in documentation for the Remedial Action as a function of operation and maintenance.

Frequency of monitoring is site-specific and would be likely outlined in the site closure document.

Following is from "ARARs Frequently Asked Questions", DOE Office of Environmental Policy & Guidance, RCRA/CERCLA Division, June 1998

> By definition, ARARs are promulgated, or legally enforceable federal and state requirements. EPA has also developed another category known as "to be considered" (TBCs), that includes nonpromulgated criteria, advisories, guidance, and proposed standards issued by federal or state governments. TBCs are not potential ARARs because they are neither promulgated nor enforceable. It may be necessary to consult TBCs to interpret ARARs, or to determine preliminary remediation goals when ARARs do not exist for particular contaminants. Identification and compliance with TBCs is not mandatory I the same way that it is for ARARs.
>
> However, once a TBC is part of a Record of Decision (ROD), it becomes enforceable.
>
> DOE Orders are neither ARARs nor TBCs. DOE Orders themselves are not ARARs because they are not promulgated. However, in some cases DOE Orders may contain requirements promulgated by other federal agencies that could be potential ARARs, and these requirements should be identified through the ARARs identification process. Some regulators may choose to refer to DOE Orders as "TBCs". However, DOE personnel should not regard DOE Orders as simply "to be considered information." DOE and DOE contractors must comply with these Orders at DOE facilities. DOE Orders are legally binding because of contractual arrangements between DOE and its contractors. Finally, DOE Orders in final RODs are enforceable under CERCLA and cannot be waived using DOE procedures for waiving Orders.

Note R
Sensors and Monitoring
CERCLA
Sediment

CERCLA applies all Applicable or Relevant and Appropriate Requirements (ARARs) where hazardous substances are left onsite. Section 121(d)(2)(a) states that the following are ARARs for the hazardous substance, pollutant, or contaminant concerned:

- Any standard, requirement, criteria, or limitation under any federal environmental law; and
- Any promulgated standard, requirement, criteria or limitation under a state environmental or facility siting law that is more stringent than any federal standard.

ARARs are promulgated, or legal enforceable requirements. DOE Orders themselves are not ARARs because they are not promulgated. DOE Orders can be "TBCs" – to be considered. Note, DOE Order in final RODs are enforceable under CERCLA and cannot be waived using DOE procedures for waiving orders.

Likely TBCs for sediment monitoring would be DOE Order 5400.5 II 3(4).

DOE Order 5400.5 II 3 (4)

> To prevent the buildup of radionuclide concentrations in sediments, liquid process waste streams containing radioactive material in the form of settleable solids may be released to natural waterways if the concentration of radioactive material in the solids present in the waste stream does not exceed 5pCi (0.2 Bq) per gram above background level, of settleable solids for alpha-emitting radionuclides or 50 pCi (2Bq) per gram above background level, of settleable solids for beta-gamma-emitting radionuclides.

Frequency of monitoring is site-specific and would be likely outlined in the site closure document.

Note S
Engineering Systems
UMTRCA Title I
Surface Impoundments

40 CFR 40.27 requires a Long-Term Surveillance Plan (LTSP) be developed for UMTRCA Title I sites. LTSP describe the necessary post-closure care to meet the requirements of Criterion 12 of 10 CFR 40, Appendix A. As a minimum the responsible Federal agency is to perform annual site inspections to determine the need for monitoring and/or maintenance.

TITLE 10 - ENERGY
CHAPTER I - NUCLEAR REGULATORY COMMISSION

Part 40 - Domestic Licensing of Source Material

§27. General license for custody and long-term care of residual radioactive material disposal sites

(a) A general license is issued for the custody of and long-term care, including monitoring, maintenance, and emergency measures necessary to protect public health and safety and other actions necessary to comply with the standards promulgated under section 275(a) of the Atomic Energy Act of 1954, as amended, for disposal sites under title I of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The license is available only to the Department of Energy, or another Federal agency designated by the President to provide long-term care. The purpose of this general license is to ensure that uranium mill tailings disposal sites will be cared for in such a manner as to protect the public health, safety, and the environment after remedial action has been completed.

(b) The general license in paragraph (a) of this section becomes effective when the Commission accepts a site Long-Term Surveillance Plan (LTSP) that meets the requirements of this section, and when the Commission concurs with the Department of Energy's determination of completion of remedial action at each disposal site. There is no termination of this general license. The LTSP may incorporate by reference information contained in documents previously submitted to the Commission if the references to the individual incorporated documents are clear and specific. Each LTSP must include --

(1) A legal description of the disposal site to be licensed, including documentation on whether land and interests are owned by the United States or an Indian tribe. If the site is on Indian land, then, as specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Indian tribe and any person holding any interest in the land shall execute a waiver releasing the United States of any liability or claim by the Tribe or person concerning or arising from the remedial action and holding the United States harmless against any claim arising out of the performance of the remedial action;

(2) A detailed description, which can be in the form of a reference, of the final disposal site conditions, including existing groundwater characterization and any necessary groundwater protection activities or strategies. This description must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs. If the disposal site has continuing aquifer restoration requirements, then the licensing process will be completed in two steps. The first step includes all items other than groundwater restoration. Groundwater monitoring, which would be addressed in the LTSP, may still be required in this first step to assess performance of the tailings disposal units. When the Commission concurs with the completion of groundwater restoration, the licensee shall assess the need to modify the LTSP and report results to the Commission. If the proposed modifications meet the requirements of this section, the LTSP will be considered suitable to accommodate the second step.

(3) A description of the long-term surveillance program, including proposed inspection frequency and reporting to the Commission (as specified in Appendix A, criterion 12 of this part), frequency and extent of groundwater monitoring if required, appropriate constituent concentration limits for groundwater, inspection personnel qualifications, inspection procedures, recordkeeping and quality assurance procedures;

(4) The criteria for follow-up inspections in response to observations from routine inspections or extreme natural events; and

(5) The criteria for instituting maintenance or emergency measures.

(c) The long-term care agency under the general license established by paragraph (a) of this section shall --

(1) Implement the LTSP as described in paragraph (b) of this section;

(2) Care for the disposal site in accordance with the provisions of the LTSP;

(3) Notify the Commission of any changes to the LTSP; the changes may not conflict with the requirements of this section;

(4) Guarantee permanent right-of-entry to Commission representatives for the purpose of periodic site inspections; and

(5) Notify the Commission prior to undertaking any significant construction, actions, or repairs related to the disposal site, even if the action is required by a State or another Federal agency.

(d) As specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Secretary of the Interior, with the concurrence of the Secretary of Energy and the Commission, may sell or lease any subsurface mineral rights associated with land on which residual radioactive materials are disposed. In such cases, the Commission shall grant a license permitting use of the land if it finds that the use will not disturb the residual radioactive materials or that the residual radioactive materials will be restored to a safe and environmentally sound condition if they are disturbed by the use.

(e) The general license in paragraph (a) of this section is exempt from parts 19, 20, and 21 of this chapter, unless significant construction, actions, or repairs are required. If these types of actions are to be undertaken, the licensee shall explain to the Commission which requirements from these parts apply for the actions and comply with the appropriate requirements.

TITLE 10 - ENERGY
CHAPTER I - NUCLEAR REGULATORY COMMISSION

Part 40 - Domestic Licensing of Source Material

Appendix A - Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for TheirSource Material Content

IV. LONG-TERM SITE SURVEILLANCE

Criterion 12 -- The final disposition of tailings, residual radioactive material, or wastes at milling sites should be such that ongoing active maintenance is not necessary to preserve isolation. As a minimum, annual site inspections must be conducted by the government agency responsible for long-term care of the disposal site to confirm its integrity and to determine the need, if any, for maintenance and/or monitoring. Results of the inspections for all the sites under the licensee's jurisdiction will be reported to the Commission annually within 90 days of the last site inspection in that calendar year. Any site where unusual damage or disruption is discovered during the inspection, however, will require a preliminary site inspection report to be submitted within 60 days. On the basis of a site specific evaluation, the Commission may require more frequent site inspections if necessary due to the features of a particular disposal site. In this case, a preliminary inspection report is required to be submitted within 60 days following each inspection.

Note T
Engineering Systems
UMTRCA I
Landfills

The standards for UMTRCA I refer to disposal sites not impoundments or landfills. 40 CFR 192 defines a disposal site as the region within the smallest perimeter of residual radioactive material (excluding cover materials) following completion of control activities. A disposal site is not an impoundment nor is it a landfill by the Environmental Protection Agency definitions. By definition UMTRCA I, sites do not have landfills or a surface impoundment. By function the disposal site fits best under the category of a landfill. NOTE: a disposal site does not meet the definition of a landfill by EPA definitions. The requirements for UMTRCA I do not specially state to install a cap or barrier, butit is assumed this is done.

UMTRCA I sites are required, as a minimum, to have annual site inspections to be conducted for the long-term care of the disposal site to confirm its integrity and to determine the need, if any, for maintenance and/or monitoring. In addition, UMTRCA I sites are required to describe the long-term surveillance program in the Long-Term Surveillance Plan (LTSP). The LTSP is to include inspection frequency and reporting to the Nuclear Regulatory Commission, frequency and extent of groundwater monitoring if required, appropriate constituent concentration limits for groundwater, inspection personnel qualifications, inspection procedures, recordkeeping and quality assurance procedures.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 260 - Hazardous Waste Management System: General

Subpart B - Definitions

Landfill means a disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

Surface impoundment or *impoundment* means a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling, and aeration pits, ponds, and lagoons

TITLE 10 - ENERGY
CHAPTER I - NUCLEAR REGULATORY COMMISSION
Part 40 - Domestic Licensing of Source Material

§27. General license for custody and long-term care of residual radioactive material disposal sites

(a) A general license is issued for the custody of and long-term care, including monitoring, maintenance, and emergency measures necessary to protect public health and safety and other actions necessary to comply with the standards promulgated under section 275(a) of the Atomic Energy Act of 1954, as amended, for disposal sites under title I of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The license is available only to the Department of Energy, or another Federal agency designated by the President to provide long-term care. The purpose of this general license is to ensure that uranium mill tailings disposal sites will be cared for in such a manner as to protect the public health, safety, and the environment after remedial action has been completed.

(b) The general license in paragraph (a) of this section becomes effective when the Commission accepts a site Long-Term Surveillance Plan (LTSP) that meets the requirements of this section, and when the Commission concurs with the Department of Energy's determination of completion of remedial action at each disposal site. There is no termination of this general license. The LTSP may incorporate by reference information contained in documents previously submitted to the Commission if the references to the individual incorporated documents are clear and specific. Each LTSP must include --

(1) A legal description of the disposal site to be licensed, including documentation on whether land and interests are owned by the United States or an Indian tribe. If the site is on Indian land, then, as specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Indian tribe and any person holding any interest in the land shall execute a waiver releasing the United States of any liability or claim by the Tribe or person concerning or arising from the remedial action and holding the United States harmless against any claim arising out of the performance of the remedial action;

(2) A detailed description, which can be in the form of a reference, of the final disposal site conditions, including existing groundwater characterization and any necessary groundwater protection activities or strategies. This description must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs. If the disposal site has continuing aquifer restoration requirements, then the licensing process will be completed in two steps. The first step includes all items other than groundwater restoration. Groundwater monitoring, which would be addressed in the LTSP, may still be required in this first step to assess performance of the tailings disposal units. When the Commission concurs with the

completion of groundwater restoration, the licensee shall assess the need to modify the LTSP and report results to the Commission. If the proposed modifications meet the requirements of this section, the LTSP will be considered suitable to accommodate the second step.

(3) A description of the long-term surveillance program, including proposed inspection frequency and reporting to the Commission (as specified in Appendix A, criterion 12 of this part), frequency and extent of groundwater monitoring if required, appropriate constituent concentration limits for groundwater, inspection personnel qualifications, inspection procedures, recordkeeping and quality assurance procedures;

(4) The criteria for follow-up inspections in response to observations from routine inspections or extreme natural events; and

(5) The criteria for instituting maintenance or emergency measures.

(c) The long-term care agency under the general license established by paragraph (a) of this section shall--

(1) Implement the LTSP as described in paragraph (b) of this section;

(2) Care for the disposal site in accordance with the provisions of the LTSP;

(3) Notify the Commission of any changes to the LTSP; the changes may not conflict with the requirements of this section;

(4) Guarantee permanent right-of-entry to Commission representatives for the purpose of periodic site inspections; and

(5) Notify the Commission prior to undertaking any significant construction, actions, or repairs related to the disposal site, even if the action is required by a State or another Federal agency.

(d) As specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Secretary of the Interior, with the concurrence of the Secretary of Energy and the Commission, may sell or lease any subsurface mineral rights associated with land on which residual radioactive materials are disposed. In such cases, the Commission shall grant a license permitting use of the land if it finds that the use will not disturb the residual radioactive materials or that the residual radioactive materials will be restored to a safe and environmentally sound condition if they are disturbed by the use.

(e) The general license in paragraph (a) of this section is exempt from parts 19, 20, and 21 of this chapter, unless significant construction, actions, or repairs are required. If these types of actions are to be undertaken, the licensee shall explain to the Commission which requirements from these parts apply for the actions and comply with the appropriate requirements.

Appendix A - Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for Their Source Material Content

IV. LONG-TERM SITE SURVEILLANCE

Criterion 12 -- The final disposition of tailings, residual radioactive material, or wastes at milling sites should be such that ongoing active maintenance is not necessary to preserve isolation. As a minimum, annual site inspections must be conducted by the government agency responsible for long-term care of the disposal site to confirm its integrity and to determine the need, if any, for maintenance and/or monitoring. Results of the inspections for all the sites under the licensee's jurisdiction will be reported to the Commission annually within 90 days of the last site inspection in that calendar year. Any site where unusual damage or disruption is discovered during the inspection, however, will require a preliminary site inspection report to be submitted within 60 days. On the basis of a site specific evaluation, the Commission may require more frequent site inspections if necessary due to the features of a particular disposal site. In this case, a preliminary inspection report is required to be submitted within 60 days following each.

Note U
Engineering Systems
RCRA
Surface Impoundment

40 CFR 264.117 and 265.117 require post-closure care to include monitoring and reporting, and maintenance and monitoring of waste containment systems in accordance with the applicable requirements of subparts F, K, L, M, N and X of 40 CFR 264 and 40 CFR 265, respectively. Subpart K provides the RCRA requirements for surface impoundments.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 260 - Hazardous Waste Management System: General
Subpart B - Definitions

Surface impoundment or *impoundment* means a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling, and aeration pits, ponds, and lagoons.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart K - Surface Impoundments

228. Closure and post-closure care

(a) At closure, the owner or operator must:

(1) Remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless §261.3(d) of this chapter applies; or

(2)(i) Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues;

(ii) Stabilize remaining wastes to a bearing capacity sufficient to support final cover; and

(iii) Cover the surface impoundment with a final cover designed and constructed to:

(A) Provide long-term minimization of the migration of liquids through the closed impoundment;

(B) Function with minimum maintenance;

(C) Promote drainage and minimize erosion or abrasion of the final cover;

(D) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(E) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) If some waste residues or contaminated materials are left in place at final closure, the owner or operator must comply with all post-closure requirements contained in §§264.117 through 264.120, including maintenance and monitoring throughout the post-closure care period (specified in the permit under §264.117). The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the leak detection system in accordance with §§264.221(c)(2)(iv) and (3) and 264.226(d), and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part; and

(4) Prevent run-on and run-off from eroding or otherwise damaging the final cover.

(c)(1) If an owner or operator plans to close a surface impoundment in accordance with paragraph (a)(1) of this section, and the impoundment does not comply with the liner requirements of §264.221(a) and is not exempt from them in accordance with §264.221(b), then:

(i) The closure plan for the impoundment under §264.112 must include both a plan for complying with paragraph (a)(1) of this section and a contingent plan for complying with paragraph (a)(2) of this section in case not all contaminated subsoils can be practicably removed at closure; and

(ii) The owner or operator must prepare a contingent post-closure plan under §264.118 for complying with paragraph (b) of this section in case not all contaminated subsoils can be practicably removed at closure.

(2) The cost estimates calculated under §§264.142 and 264.144 for closure and post-closure care of an impoundment subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent post-closure plan, but are not required to include the cost of expected closure under paragraph (a)(1) of this section.

§221. Design and operating requirements

(c) (2) The *leachate collection and removal system* between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a *leak detection system.* This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(iv) Designed and operated to minimize clogging during the active life and post-closure care period.

(3) The owner or operator shall collect and remove pumpable liquids in the sumps to minimize the head on the bottom liner.

(d) The Regional Administrator may approve alternative design or operating practices to those specified in paragraph (c) of this section if the owner or operator demonstrates to the Regional Administrator that such design and operating practices, together with location characteristics:

(1) Will prevent the migration of any hazardous constituent into the groundwater or surface water at least as effectively as the liners and leachate collection and removal system specified in paragraph (c) of this section; and

(2) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart G - Closure and Post-Closure

§117. Post-closure care and use of property

(a)(1) Post-closure care for each hazardous waste management unit subject to the requirements of §§264.117 through 264.120 must begin after completion of closure of the unit and continue for 30 years after that date and must consist of at least the following:

(i) Monitoring and reporting in accordance with the requirements of subparts F, K, L, M, N, and X of this part; and

(ii) Maintenance and monitoring of waste containment systems in accordance with the requirements of subparts F, K, L, M, N, and X of this part.

(2) Any time preceding partial closure of a hazardous waste management unit subject to post-closure care requirements or final closure, or any time during the post-closure period for a particular unit, the Regional Administrator may, in accordance with the permit modification procedures in parts 124 and 270:

(i) Shorten the post-closure care period applicable to the hazardous waste management unit, or facility, if all disposal units have been closed, if he finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or ground-water monitoring results, characteristics of the hazardous wastes, application of advanced technology, or alternative disposal, treatment, or re-use techniques indicate that the hazardous waste management unit or facility is secure); or

(ii) Extend the post-closure care period applicable to the hazardous waste management unit or facility if he finds that the extended period is necessary to protect human health and the environment (e.g., leachate or ground-water monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(b) The Regional Administrator may require, at partial and final closure, continuation of any of the security requirements of §264.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §264.118.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart K - Surface Impoundments

§228. Closure and post-closure care

(a) At closure, the owner or operator must:

(1) Remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless §261.3(d) of this chapter applies; or

(2) Close the impoundment and provide post-closure care for a landfill under subpart G and §265.310, including the following:

(i) Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues;

(ii) Stabilize remaining wastes to a bearing capacity sufficient to support the final cover; and

(iii) Cover the surface impoundment with a final cover designed and constructed to:

(A) Provide long-term minimization of the migration of liquids through the closed impoundment;

(B) Function with minimum maintenance;

(C) Promote drainage and minimize erosion or abrasion of the cover;

(D) Accomodate settling and subsidence so that the cover's integrity is maintained; and

(E) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) In addition to the requirements of subpart G, and §265.310, during the post-closure care period, the owner or operator of a surface impoundment in which wastes, waste residues, or contaminated materials remain after closure in accordance with the provisions of paragraph (a)(2) of this section must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the leak detection system in accordance with §§265.221(c)(2)(iv) and (3) of this chapter and 265.226(b) and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part; and

(4) Prevent run-on and run-off from eroding or otherwise damaging the final cover.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart G - Closure and Post-Closure

§117. Post-closure care and use of property

(a)(1) Post-closure care for each hazardous waste management unit subject to the requirements of §§265.117 through 265.120 must begin after completion of closure of the unit and continue for 30 years after that date. It must consist of at least the following:

(i) Monitoring and reporting in accordance with the requirements of subparts F, K, L, M, and N of this part; and

(ii) Maintenance and monitoring of waste containment systems in accordance with the requirements of subparts F, K, L, M, and N of this part.

(2) Any time preceding closure of a hazardous waste management unit subject to post-closure care requirements or final closure, or any time during the post-closure period for a particular hazardous waste disposal unit, the Regional Administrator may:

(i) Shorten the post-closure care period applicable to the hazardous waste management unit, or facility, if all disposal units have been closed, if he finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or ground-water monitoring results, characteristics of the hazardous waste, application of advanced technology, or alternative disposal, treatment, or re-use techniques indicate that the hazardous waste management unit or facility is secure); or

(ii) Extend the post-closure care period applicable to the hazardous waste management unit or facility, if he finds that the extended period is necessary to protect human health and the environment (e.g., leachate or ground-water monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(b) The Regional Administator may require, at partial and final closure, continuation of any of the security requirements of §265.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §265.118.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart N - Landfills

§310. Closure and post-closure care

(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:

(1) Provide long-term minimization of migration of liquids through the closed landfill;

(2) Function with minimum maintenance;

(3) Promote drainage and minimize erosion or abrasion of the cover;

(4) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) After final closure, the owner or operator must comply with all post-closure requirements contained in §§265.117 through 265.120 including maintenance and monitoring throughout the post-closure care period. The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the leak detection system in accordance with §§264.301(c)(3)(iv) and (4) of this chapter and 265.304(b), and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part;

(4) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and

(5) Protect and maintain surveyed benchmarks used in complying with §265.309.

. §304. Monitoring and inspection

(b) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart N - Landfills

§301. Design and operating requirements

(c) (3) The *leachate collection and removal system* between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a *leak detection system.* This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2 /sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

(iv) Designed and operated to minimize clogging during the active life and post-closure care period.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

Note V
Engineering Systems
RCRA
Landfills

40 CFR 264.117 and 265.117 require post-closure care to include monitoring and reporting, and maintenance and monitoring of waste containment systems in accordance with the applicable requirements of subparts F, K, L, M, N and X of 40 CFR 264 and 40 CFR 265, respectively. Subpart N provides the RCRA requirements for landfills.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart N - Landfills

§310. Closure and post-closure care

(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:

(1) Provide long-term minimization of migration of liquids through the closed landfill;

(2) Function with minimum maintenance;

(3) Promote drainage and minimize erosion or abrasion of the cover;

(4) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) After final closure, the owner or operator must comply with all post-closure requirements contained in §§264.117 through 264.120, including maintenance and monitoring throughout the post-closure care period (specified in the permit under §264.117). The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Continue to operate the leachate collection and removal system until leachate is no longer detected;

(3) Maintain and monitor the leak detection system in accordance with §§264.301(c)(3)(iv) and (4) and 264.303(c), and comply with all other applicable leak detection system requirements of this part;

(4) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part;

(5) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and

(6) Protect and maintain surveyed benchmarks used in complying with §264.309.

§301. Design and operating requirements

(3) The *leachate collection and removal system* between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a *leak detection system.* This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2/sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

(iv) Designed and operated to minimize clogging during the active life and post-closure care period; and

(v) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

§303. Monitoring and inspection

(c)(1) An owner or operator required to have a leak detection system under §264.301(c) or (d) must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.

(2) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart G - Closure and Post-Closure

§117. Post-closure care and use of property

(a)(1) Post-closure care for each hazardous waste management unit subject to the requirements of §§264.117 through 264.120 must begin after completion of closure of the unit and continue for 30 years after that date and must consist of at least the following:

(i) Monitoring and reporting in accordance with the requirements of subparts F, K, L, M, N, and X of this part; and

(ii) Maintenance and monitoring of waste containment systems in accordance with the requirements of subparts F, K, L, M, N, and X of this part.

(2) Any time preceding partial closure of a hazardous waste management unit subject to post-closure care requirements or final closure, or any time during the post-closure period for a particular unit, the Regional Administrator may, in accordance with the permit modification procedures in parts 124 and 270:

(i) Shorten the post-closure care period applicable to the hazardous waste management unit, or facility, if all disposal units have been closed, if he finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or ground-water monitoring results, characteristics of the hazardous wastes, application of advanced technology, or alternative disposal, treatment, or re-use techniques indicate that the hazardous waste management unit or facility is secure); or

(ii) Extend the post-closure care period applicable to the hazardous waste management unit or facility if he finds that the extended period is necessary to protect human health and the environment (e.g., leachate or ground-water monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(b) The Regional Administrator may require, at partial and final closure, continuation of any of the security requirements of §264.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §264.118.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart B - General Facility Standards

§14. Security

(a) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his facility, *unless* he can demonstrate to the Regional Administrator that:

(1) Physical contact with the waste, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and

(2) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this part.

[*Comment:* Part 270 of this chapter requires that an owner or operator who wishes to make the demonstration referred to above must do so with part B of the permit application.]

(b) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a facility must have:

(1) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the active portion of the facility; or

(2)(i) An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility; and

(ii) A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility).

[*Comment:* The requirements of paragraph (b) of this section are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of paragraph (b) (1) or (2) of this section.]

(c) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a sign with the legend, "Danger -- Unauthorized Personnel Keep Out", must be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility (e.g., facilities in counties bordering the Canadian province of Quebec must post signs in French; facilities in counties bordering Mexico must post signs in Spanish), and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger -- Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

[*Comment:* See §264.117(b) for discussion of security requirements at disposal facilities during the post-closure care period.]

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart N - Landfills

§310. Closure and post-closure care

(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:

(1) Provide long-term minimization of migration of liquids through the closed landfill;

(2) Function with minimum maintenance;

(3) Promote drainage and minimize erosion or abrasion of the cover;

(4) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) After final closure, the owner or operator must comply with all post-closure requirements contained in §§265.117 through 265.120 including maintenance and monitoring throughout the post-closure care period. The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the leak detection system in accordance with §§264.301(c)(3)(iv) and (4) of this chapter and 265.304(b), and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part;

(4) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and

(5) Protect and maintain surveyed benchmarks used in complying with §265.309.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart G - Closure and Post-Closure

§117. Post-closure care and use of property

(a)(1) Post-closure care for each hazardous waste management unit subject to the requirements of §§265.117 through 265.120 must begin after completion of closure of the unit and continue for 30 years after that date. It must consist of at least the following:

(i) Monitoring and reporting in accordance with the requirements of subparts F, K, L, M, and N of this part; and

(ii) Maintenance and monitoring of waste containment systems in accordance with the requirements of subparts F, K, L, M, and N of this part.

(2) Any time preceding closure of a hazardous waste management unit subject to post-closure care requirements or final closure, or any time during the post-closure period for a particular hazardous waste disposal unit, the Regional Administrator may:

(i) Shorten the post-closure care period applicable to the hazardous waste management unit, or facility, if all disposal units have been closed, if he finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or ground-water monitoring results, characteristics of the hazardous waste, application of advanced technology, or alternative disposal, treatment, or re-use techniques indicate that the hazardous waste management unit or facility is secure); or

(ii) Extend the post-closure care period applicable to the hazardous waste management unit or facility, if he finds that the extended period is necessary to protect human health and the environment (e.g., leachate or ground-water monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(b) The Regional Administator may require, at partial and final closure, continuation of any of the security requirements of §265.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §265.118.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart B - General Facility Standards

§14. Security

(a) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his facility, *unless* he can demonstrate to the Regional Administrator that:

(1) Physical contact with the waste, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and

(2) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this part.

[*Comment:* Part 270 of this chapter requires that an owner or operator who wishes to make the demonstration referred to above must do so with part B of the permit application.]

(b) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a facility must have:

(1) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the active portion of the facility; or

(2)(i) An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility; and

(ii) A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility).

[*Comment:* The requirements of paragraph (b) of this section are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of paragraph (b) (1) or (2) of this section.]

(c) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a sign with the legend, "Danger -- Unauthorized Personnel Keep Out", must be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility (e.g., facilities in counties bordering the Canadian province of Quebec must post signs in French; facilities in counties bordering Mexico must post signs in Spanish), and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger -- Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

[*Comment:* See §264.117(b) for discussion of security requirements at disposal facilities during the post-closure care period.]

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart N - Landfills

§301. Design and operating requirements

(c) (3) The *leachate collection and removal system* between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a *leak detection system.* This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2/sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

(iv) Designed and operated to minimize clogging during the active life and post-closure care period.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart N - Landfills

§310. Closure and post-closure care

(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:

(1) Provide long-term minimization of migration of liquids through the closed landfill;

(2) Function with minimum maintenance;

(3) Promote drainage and minimize erosion or abrasion of the cover;

(4) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) After final closure, the owner or operator must comply with all post-closure requirements contained in §§265.117 through 265.120 including maintenance and monitoring throughout the post-closure care period. The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the leak detection system in accordance with §§264.301(c)(3)(iv) and (4) of this chapter and 265.304(b), and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part ;

(4) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and

(5) Protect and maintain surveyed benchmarks used in complying with §265.309.

§304. Monitoring and inspection

(b) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart N - Landfills

§301. Design and operating requirements

(c) (3) The *leachate collection and removal system* between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a *leak detection system.* This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2 /sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

(iv) Designed and operated to minimize clogging during the active life and post-closure care period.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

Note W
Engineering Systems
RCRA
Caps

The Environmental Protection Agency refers to caps as the final cover. Post-closure care for caps or the final cover is discussed in the notes for Landfills (Note V).

Note X
Engineering Systems
RCRA
Tank Farms (Tank Systems)

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 260 - Hazardous Waste Management System: General
Subpart B - Definitions

Tank system means a hazardous waste storage or treatment tank and its associated ancillary equipment and containment system.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart J - Tank Systems

§197. Closure and post-closure care

(a) At closure of a tank system, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste, unless §261.3(d) of this chapter applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for tank systems must meet all of the requirements specified in subparts G and H of this part.

(b) If the owner or operator demonstrates that not all contaminated soils can be practicably removed or decontaminated as required in paragraph (a) of this section, then the owner or operator must close the tank system and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills (§264.310). In addition, for the purposes of closure, post-closure, and financial responsibility, such a tank system is then considered to be a landfill, and the owner or operator must meet all of the requirements for landfills specified in subparts G and H of this part.

(c) If an owner or operator has a tank system that does not have secondary containment that meets the requirements of §264.193 (b) through (f) and has not been granted a variance from the secondary containment requirements in accordance with §264.193(g), then:

(1) The closure plan for the tank system must include both a plan for complying with paragraph (a) of this section and a contingent plan for complying with paragraph (b) of this section.

(2) A contingent post-closure plan for complying with paragraph (b) of this section must be prepared and submitted as part of the permit application.

(3) The cost estimates calculated for closure and post-closure care must reflect the costs of complying with the contingent closure plan and the contingent post-closure plan, if those costs are greater than the costs of complying with the closure plan prepared for the expected closure under paragraph (a) of this section.

(4) Financial assurance must be based on the cost estimates in paragraph (c)(3) of this section.

(5) For the purposes of the contingent closure and post-closure plans, such a tank system is considered to be a landfill, and the contingent plans must meet all of the closure, post-closure, and financial responsibility requirements for landfills under subparts G and H of this part.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart N - Landfills

§310. Closure and post-closure care

(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:

(1) Provide long-term minimization of migration of liquids through the closed landfill;

(2) Function with minimum maintenance;

(3) Promote drainage and minimize erosion or abrasion of the cover;

(4) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) After final closure, the owner or operator must comply with all post-closure requirements contained in §§264.117 through 264.120, including maintenance and monitoring throughout the post-closure care period (specified in the permit under §264.117). The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Continue to operate the leachate collection and removal system until leachate is no longer detected;

(3) Maintain and monitor the leak detection system in accordance with §§264.301(c)(3)(iv) and (4) and 264.303(c), and comply with all other applicable leak detection system requirements of this part;

(4) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part;

(5) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and

(6) Protect and maintain surveyed benchmarks used in complying with §264.309.

§301. Design and operating requirements

(3) The *leachate collection and removal system* between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a *leak detection system.* This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2/sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

(iv) Designed and operated to minimize clogging during the active life and post-closure care period; and

(v) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

§303. Monitoring and inspection

(c)(1) An owner or operator required to have a leak detection system under §264.301(c) or (d) must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.

(2) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months.

TITLE 40 - PROTECTION OF ENVIRONMENT

CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY

SUBCHAPTER I - SOLID WASTES

Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart G - Closure and Post-Closure

§117. Post-closure care and use of property

(a)(1) Post-closure care for each hazardous waste management unit subject to the requirements of §§264.117 through 264.120 must begin after completion of closure of the unit and continue for 30 years after that date and must consist of at least the following:

(i) Monitoring and reporting in accordance with the requirements of subparts F, K, L, M, N, and X of this part; and

(ii) Maintenance and monitoring of waste containment systems in accordance with the requirements of subparts F, K, L, M, N, and X of this part.

(2) Any time preceding partial closure of a hazardous waste management unit subject to post-closure care requirements or final closure, or any time during the post-closure period for a particular unit, the Regional Administrator may, in accordance with the permit modification procedures in parts 124 and 270:

(i) Shorten the post-closure care period applicable to the hazardous waste management unit, or facility, if all disposal units have been closed, if he finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or ground-water monitoring results, characteristics of the hazardous wastes, application of advanced technology,

or alternative disposal, treatment, or re-use techniques indicate that the hazardous waste management unit or facility is secure); or

(ii) Extend the post-closure care period applicable to the hazardous waste management unit or facility if he finds that the extended period is necessary to protect human health and the environment (e.g., leachate or ground-water monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(b) The Regional Administrator may require, at partial and final closure, continuation of any of the security requirements of §264.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §264.118.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart B - General Facility Standards

§14. Security

(a) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his facility, *unless* he can demonstrate to the Regional Administrator that:

(1) Physical contact with the waste, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and

(2) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this part.

[*Comment:* Part 270 of this chapter requires that an owner or operator who wishes to make the demonstration referred to above must do so with part B of the permit application.]

(b) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a facility must have:

(1) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the active portion of the facility; or

(2)(i) An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility; and

(ii) A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility).

[*Comment:* The requirements of paragraph (b) of this section are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of paragraph (b) (1) or (2) of this section.]

(c) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a sign with the legend, "Danger -- Unauthorized Personnel Keep Out", must be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility (e.g., facilities in counties bordering the Canadian province of Quebec must post signs in French; facilities in counties bordering Mexico must post signs in Spanish), and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger -- Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

[*Comment:* See §264.117(b) for discussion of security requirements at disposal facilities during the post-closure care period.]

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart J - Tank Systems

§197. Closure and post-closure care

(a) At closure of a tank system, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste, unless §261.3(d) of this Chapter applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for tank systems must meet all of the requirements specified in subparts G and H of this part.

(b) If the owner or operator demonstrates that not all contaminated soils can be practicably removed or decontaminated as required in paragraph (a) of this section, then the owner or operator must close the tank system and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills (§265.310) In addition, for the purposes of closure, post-closure, and financial responsibility, such a tank system is then considered to be a landfill, and the owner or operator must meet all of the requirements for landfills specified in subparts G and H of this part.

(c) If an owner or operator has a tank system which does not have secondary containment that meets the requirements of §265.193(b) through (f) and which is not exempt from t he secondary containment requirements in accordance with §265.193(g), then,

(1) The closure plan for the tank system must include both a plan for complying with paragraph (a) of this section and a contingent plan for complying with paragraph (b) of this section.

(2) A contingent post-closure plan for complying with paragraph (b) of this section must be prepared and submitted as part of the permit application.

(3) The cost estimates calculated for closure and post-closure care must reflect the costs of complying with the contingent closure plan and the contingent post-closure plan, if these costs are greater than the costs of complying with the closure plan prepared for the expected closure under paragraph (a) of this section.

(4) Financial assurance must be based on the cost estimates in paragraph (c)(3) of this section.

(5) For the purposes of the contingent closure and post-closure plans, such a tank system is considered to be a landfill, and the contingent plans must meet all of the closure, post-closure, and financial responsibility requirements for landfills under subparts G and H of this part.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart N - Landfills

§310. Closure and post-closure care

(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:

(1) Provide long-term minimization of migration of liquids through the closed landfill;

(2) Function with minimum maintenance;

(3) Promote drainage and minimize erosion or abrasion of the cover;

(4) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) After final closure, the owner or operator must comply with all post-closure requirements contained in §§265.117 through 265.120 including maintenance and monitoring throughout the post-closure care period. The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the leak detection system in accordance with §§264.301(c)(3)(iv) and (4) of this chapter and 265.304(b), and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part;

(4) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and

(5) Protect and maintain surveyed benchmarks used in complying with §265.309.

§304. Monitoring and inspection

(b) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES

Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart N - Landfills

§301. Design and operating requirements

(c) (3) The *leachate collection and removal system* between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a *leak detection system.* This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2/sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

(iv) Designed and operated to minimize clogging during the active life and post-closure care period.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

Note Y
Engineering Systems
RCRA
Containment Buildings

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 260 - Hazardous Waste Management System: General
Subpart B - Definitions

Containment building means a hazardous waste management unit that is used to store or treat hazardous waste under the provisions of subpart DD of parts 264 or 265 of this chapter.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart DD - Containment Buildings

§1102. Closure and post-closure care

(a) At closure of a containment building, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.,) contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless §261.3(d) of this chapter applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for containment buildings must meet all of the requirements specified in subparts G and H of this part.

(b) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in paragraph (a) of this section, the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated, he must close the facility and perform post-closure care in accordance with the closure and post-closure requirements that apply to landfills (§264.310). In addition, for the purposes of closure, post-closure, and financial responsibility, such a containment building is then considered to be a landfill, and the owner or operator must meet all of the requirements for landfills specified in subparts G and H of this part.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart N - Landfills

§310. Closure and post-closure care

(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:

(1) Provide long-term minimization of migration of liquids through the closed landfill;

(2) Function with minimum maintenance;

(3) Promote drainage and minimize erosion or abrasion of the cover;

(4) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) After final closure, the owner or operator must comply with all post-closure requirements contained in §§264.117 through 264.120, including maintenance and monitoring throughout the post-closure care period (specified in the permit under §264.117). The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Continue to operate the leachate collection and removal system until leachate is no longer detected;

(3) Maintain and monitor the leak detection system in accordance with §§264.301(c)(3)(iv) and (4) and 264.303(c), and comply with all other applicable leak detection system requirements of this part;

(4) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part;

(5) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and

(6) Protect and maintain surveyed benchmarks used in complying with §264.309.

§301. Design and operating requirements

(3) The *leachate collection and removal system* between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a *leak detection system.* This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2/sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlyin g wastes, waste cover materials, and equipment used at the landfill;

(iv) Designed and operated to minimize clogging during the active life and post-closure care period; and

(v) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

§303. Monitoring and inspection

(c)(1) An owner or operator required to have a leak detection system under §264.301(c) or (d) must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.

(2) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart G - Closure and Post-Closure

§117. Post-closure care and use of property

(a)(1) Post-closure care for each hazardous waste management unit subject to the requirements of §§264.117 through 264.120 must begin after completion of closure of the unit and continue for 30 years after that date and must consist of at least the following:

(i) Monitoring and reporting in accordance with the requirements of subparts F, K, L, M, N, and X of this part; and

(ii) Maintenance and monitoring of waste containment systems in accordance with the requirements of subparts F, K, L, M, N, and X of this part.

(2) Any time preceding partial closure of a hazardous waste management unit subject to post-closure care requirements or final closure, or any time during the post-closure period for a particular unit, the Regional Administrator may, in accordance with the permit modification procedures in parts 124 and 270:

(i) Shorten the post-closure care period applicable to the hazardous waste management unit, or facility, if all disposal units have been closed, if he finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or ground-water monitoring results, characteristics of the hazardous wastes, application of advanced technology, or alternative disposal, treatment, or re-use techniques indicate that the hazardous waste management unit or facility is secure); or

(ii) Extend the post-closure care period applicable to the hazardous waste management unit or facility if he finds that the extended period is necessary to protect human health and the environment (e.g., leachate or ground-water monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(b) The Regional Administrator may require, at partial and final closure, continuation of any of the security requirements of §264.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §264.118.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart B - General Facility Standards

§14. Security

(a) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his facility, *unless* he can demonstrate to the Regional Administrator that:

(1) Physical contact with the waste, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and

(2) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this part.

[*Comment:* Part 270 of this chapter requires that an owner or operator who wishes to make the demonstration referred to above must do so with part B of the permit application.]

(b) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a facility must have:

(1) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the active portion of the facility; or

(2)(i) An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility; and

(ii) A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility).

[*Comment:* The requirements of paragraph (b) of this section are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of paragraph (b) (1) or (2) of this section.]

(c) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a sign with the legend, "Danger -- Unauthorized Personnel Keep Out", must be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility (e.g., facilities in counties bordering the Canadian province of Quebec must post signs in French; facilities in counties bordering Mexico must post signs in Spanish), and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger -- Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

[*Comment:* See §264.117(b) for discussion of security requirements at disposal facilities during the post-closure care period.]

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES
Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart DD - Containment Buildings

§1102. Closure and post-closure care

(a) At closure of a containment building, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless §261.3(d) of this chapter applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for containment buildings must meet all of the requirements specified in subparts G and H of this part.

(b) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in paragraph (a) of this section, the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated, he must close the facility and perform post-closure care in accordance with the closure and post-closure requirements that apply to landfills (§265.310). In addition, for the purposes of closure, post-closure, and financial responsibility, such a containment building is then considered to be a landfill, and the owner or operator must meet all of the requirements for landfills specified in subparts G and H of this part.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES

Part 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
Subpart N - Landfills

§310. Closure and post-closure care

(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:

(1) Provide long-term minimization of migration of liquids through the closed landfill;

(2) Function with minimum maintenance;

(3) Promote drainage and minimize erosion or abrasion of the cover;

(4) Accommodate settling and subsidence so that the cover's integrity is maintained; and

(5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) After final closure, the owner or operator must comply with all post-closure requirements contained in §§265.117 through 265.120 including maintenance and monitoring throughout the post-closure care period. The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the leak detection system in accordance with §§264.301(c)(3)(iv) and (4) of this chapter and 265.304(b), and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of subpart F of this part;

(4) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and

(5) Protect and maintain surveyed benchmarks used in complying with §265.309.

§304. Monitoring and inspection

(b) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES

Part 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Subpart N - Landfills

§301. Design and operating requirements

(c) (3) The *leachate collection and removal system* between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a *leak detection system.* This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-2} cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of 3×10^{-5} m^2/sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

(iv) Designed and operated to minimize clogging during the active life and post-closure care period.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

Note Z
Risk & Decision Analysis
UMTRCA I
Trending

UMTRCA I sites are required to submit a Long-Term Surveillance Plan (LTSP) as part of their application for a closure license. The LTSP is required to include a detailed description of the final disposal site conditions including existing groundwater charcaterization. The despcription must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs. Although the requirement does not explicity require trending, trending analysis is implied to determine when maintenance or repairs are necessary.

TITLE 10 - ENERGY
CHAPTER I - NUCLEAR REGULATORY COMMISSION
Part 40 - Domestic Licensing of Source Material

§27. General license for custody and long-term care of residual radioactive material disposal sites

(a) A general license is issued for the custody of and long-term care, including monitoring, maintenance, and emergency measures necessary to protect public health and safety and other actions necessary to comply with the standards promulgated under section 275(a) of the Atomic Energy Act of 1954, as amended, for disposal sites under title I of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The license is available only to the Department of Energy, or another Federal agency designated by the President to provide long-term care. The purpose of this general license is to ensure that uranium mill tailings disposal sites will be cared for in such a manner as to protect the public health, safety, and the environment after remedial action has been completed.

(b) The general license in paragraph (a) of this section becomes effective when the Commission accepts a site Long-Term Surveillance Plan (LTSP) that meets the requirements of this section, and when the Commission concurs with the Department of Energy's determination of completion of remedial action at each disposal site. There is no termination of this general license. The LTSP may incorporate by reference information contained in documents previously submitted to the Commission if the references to the individual incorporated documents are clear and specific. Each LTSP must include --

(1) A legal description of the disposal site to be licensed, including documentation on whether land and interests are owned by the United States or an Indian tribe. If the site is on Indian land, then, as specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Indian tribe and any person holding any interest in the land shall execute a waiver releasing the United States of any liability or claim by the Tribe or person concerning or arising from the remedial action and holding the United States harmless against any claim arising out of the performance of the remedial action;

(2) A detailed description, which can be in the form of a reference, of the final disposal site conditions, including existing groundwater characterization and any necessary groundwater protection activities or strategies. This description must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs. If the disposal site has continuing aquifer restoration requirements, then the licensing process will be completed in two steps. The first step includes all items other than groundwater restoration. Groundwater monitoring, which would be addressed in the LTSP, may still be required in this first step to assess performance of the tailings disposal units. When the Commission concurs with the completion of groundwater restoration, the licensee shall assess the need to modify the LTSP and report results to the Commission. If the proposed modifications meet the requirements of this section, the LTSP will be considered suitable to accommodate the second step.

(3) A description of the long-term surveillance program, including proposed inspection frequency and reporting to the Commission (as specified in Appendix A, criterion 12 of this part), frequency and extent of groundwater monitoring if required, appropriate constituent concentration limits for groundwater, inspection personnel qualifications, inspection procedures, recordkeeping and quality assurance procedures;

(4) The criteria for follow-up inspections in response to observations from routine inspections or extreme natural events; and

(5) The criteria for instituting maintenance or emergency measures.

(c) The long-term care agency under the general license established by paragraph (a) of this section shall --

(1) Implement the LTSP as described in paragraph (b) of this section;

(2) Care for the disposal site in accordance with the provisions of the LTSP;

(3) Notify the Commission of any changes to the LTSP; the changes may not conflict with the requirements of this section;

(4) Guarantee permanent right-of-entry to Commission representatives for the purpose of periodic site inspections; and

(5) Notify the Commission prior to undertaking any significant construction, actions, or repairs related to the disposal site, even if the action is required by a State or another Federal agency.

(d) As specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Secretary of the Interior, with the concurrence of the Secretary of Energy and the Commission, may sell or lease any subsurface mineral rights associated with land on which residual radioactive materials are disposed. In such cases, the Commission shall grant a license permitting use of the land if it finds that the use will not disturb the

residual radioactive materials or that the residual radioactive materials will be restored to a safe and environmentally sound condition if they are disturbed by the use.

(e) The general license in paragraph (a) of this section is exempt from parts 19, 20, and 21 of this chapter, unless significant construction, actions, or repairs are required. If these types of actions are to be undertaken, the licensee shall explain to the Commission which requirements from these parts apply for the actions and comply with the appropriate requirements.

Note AA
Risk & Decision Analysis
UMTRCA II
Trending

UMTRCA II sites are required to submit a Long-Term Surveillance Plan (LTSP) as part of their application for a closure license. The LTSP is required to include a detailed description of the final disposal site conditions including existing groundwater characterization. The description must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs. Although the requirement does not explicitly require trending, trending analysis is implied to determine when maintenance or repairs are necessary.

TITLE 10 - ENERGY
CHAPTER I - NUCLEAR REGULATORY COMMISSION
Part 40 - Domestic Licensing of Source Material

§28. General license for custody and long-term care of uranium or thorium byproduct materials disposal sites

(a) A general license is issued for the custody of and long-term care, including monitoring, maintenance, and emergency measures necessary to protect the public health and safety and other actions necessary to comply with the standards in this part for uranium or thorium mill tailings sites closed under title II of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The licensee will be the Department of Energy, another Federal agency designated by the President, or a State where the disposal site is located. The purpose of this general license is to ensure that uranium and thorium mill tailings disposal sites will be cared for in such a manner as to protect the public health, safety, and the environment after closure.

(b) The general license in paragraph (a) of this section becomes effective when the Commission terminates, or concurs in an Agreement State's termination of, the current specific license and a site Long-Term Surveillance Plan (LTSP) meeting the requirements of this section has been accepted by the Commission. There is no termination of this general license. If the LTSP has not been formally received by the NRC prior to termination of the current specific license, the Commission may issue a specific order to the intended custodial agency to ensure continued control and surveillance of the disposal site to protect the public health, safety, and the environment. The Commission will not unnecessarily delay the termination of the specific license solely on the basis that an acceptable LTSP has not been received. The LTSP may incorporate by reference information contained in documents previously submitted to the Commission if the references to the individual incorporated documents are clear and specific. Each LTSP must include

(1) A legal description of the disposal site to be transferred (unless transfer is exempted under provisions of the Atomic Energy Act, §83(b)(1)(A)) and licensed;

(2) A detailed description, which can be in the form of a reference of the final disposal site conditions, including existing groundwater characterization. This description must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs;

(3) A description of the long-term surveillance program, including proposed inspection frequency and reporting to the Commission (as specified in Appendix A, Criterion 12 of this part), frequency and extent of groundwater monitoring if required, appropriate constituent concentration limits for groundwater, inspection personnel qualifications, inspection procedures, recordkeeping and quality assurance procedures;

(4) The criteria for follow-up inspections in response to observations from routine inspections or extreme natural events; and

(5) The criteria for instituting maintenance or emergency measures.

(c) The long-term care agency who has a general license established by paragraph (a) of this section shall –

(1) Implement the LTSP as described in paragraph (b) of this section;

(2) Care for the disposal site in accordance with the provisions of the LTSP;

(3) Notify the Commission of any changes to the LTSP; the changes may not conflict with the requirements of this section;

(4) Guarantee permanent right-of-entry to Commission representatives for the purpose of periodic site inspections; and

(5) Notify the Commission prior to undertaking any significant construction, actions, or repairs related to the disposal site, even if the action is required by a State or another Federal agency.

(d) Upon application, the Commission may issue a specific license, as specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, permitting the use of surface and/or subsurface estates transferred to the United States or a State. Although an application may be received from any person, if permission is granted, the person who transferred the land to DOE or the State shall receive the right of first refusal with respect to this use of the land. The application must demonstrate that--

(1) The proposed action does not endanger the public health, safety, welfare, or the environment;

(2) Whether the proposed action is of a temporary or permanent nature, the site would be maintained and/or restored to meet requirements in Appendix A of this part for closed sites; and

(3) Adequate financial arrangements are in place to ensure that the byproduct materials will not be disturbed, or if disturbed that the applicant is able to restore the site to a safe and environmentally sound condition.

(e) The general license in paragraph (a) of this section is exempt from parts 19, 20, and 21 of this chapter, unless significant construction, actions, or repairs are required. If these types of actions are to be undertaken, the licensee shall explain to the Commission which requirements from these parts apply for the actions and comply with the appropriate requirements.

(f) In cases where the Commission determines that transfer of title of land used for disposal of any byproduct materials to the United States or any appropriate State is not necessary to protect the public health, safety or welfare or to minimize or eliminate danger to life or property (Atomic Energy Act, §83(b)(1)(A)), the Commission will consider specific modifications of the custodial agency's LTSP provisions on a case-by-case basis.

Note AB
Risk & Decision Analysis
DOE & NWPA
Trending

DOE Order 5400.1, Chapter 4, paragraph 5.b. requires environmental surveillance to be conducted to monitor the effects of DOE activities and requires the design of the environmental surveillance to meet one or more of seven objectives. One of the seven design objectives is to characterize and define trends in the physical, chemical, and biological condition of environmental media.

DOE 5400.1
CHAPTER 4
EVIRONMENTAL MONITORING REOUIREMENTS

1. PURPOSE.

a. This Chapter contains requirements and guidance for environmental monitoring programs concerned with: (1) measuring and monitoring effluents from DOE operations; and (2) surveillance through measurement, monitoring, and calculation of the effects of those operations on the environment and public health. The objectives of the monitoring programs are to demonstrate compliance with legal and regulatory requirements imposed by applicable Federal, State and local agencies; confirm adherence to DOE environmental protection policies; and support

environmental management decisions. A critical element of monitoring is quality assurance and verification. Each DOE Facility is unique; therefore, the need and levels of effort for monitoring programs shall be determined by the appropriate field organization on a case-by-case basis, consistent with regulatory requirements, DOE directives, and the degree of environmental assurance that activities at the particular site require.

5. ENVIRONMENTAL MONITORING - GENERAL REQUIREMENTS.

Environmental monitoring shall consist of two major activities: effluent monitoring and environmental surveillance. Selected references for environmental monitoring are listed in Attachment IV 1.

b. Environmental Surveillance.

(1) Environmental surveillance shall be conducted to monitor the effects, if any, of DOE activities on on-site and offsite environmental and natural resources. An environmental surveillance screening program shall be undertaken at DOE sites to determine the need for a permanent surveillance program.

Environmental surveillance shall be designed to satisfy one or more of the following program objectives:

(a) Verify compliance with applicable environmental laws and regulations;

(b) Verify compliance with environmental commitments made in Environmental Impact Statements, Environmental Assessments, Safety Analysis Reports, or other official DOE documents;

(c) Characterize and define trends in the physical, chemical and biological condition of environmental media;

(d) Establish baselines of environmental quality;

(e) Provide a continuing assessment of pollution abatement programs;

(f) Identify and quantify new or existing environmental quality problems.

(2) Environmental surveillance programs and components should be determined on a site-specific basis by the field organization. Programs should reflect facility characteristics, applicable regulations, hazard potential, quantities and concentrations of materials released, the extent and use of affected air, land, and water, and specific local public interest or concern.

Surveillance programs are likely to include one or more of the following:

(a) Monitoring stations;

(b) Sampling and analysis; and

(c) Monitoring data record keeping.

Note AC
Risk and Decision Analysis
Risk/Demographics
CERCLA

Risk analysis is performed in the Remedial Investigation phase of the CERCLA process. It is unlikely that risk analysis would be performed for a site under the care of long-term stewardship. CERCLA requires 5-year reviews for sites with residual wastes. (For sites entering LTS the first of many 5-year reviews may have been completed.) However, if conditions change it may be necessary to recalculate the original risk analysis for the new conditions to determine if the remedy is still protective of human health and the environment in accordance with EPA's *Comprehensive Five-Year Review Guidance,* EPA 540-R-01-007, June 2001. These new conditions, which may impact the risk analysis, are changes in:

- Promulgated standards and To Be Considered (TBCs)
- Risk parameters (includes reference doses, cancer potency factors, and exposure pathways)
- Toxicity and other Contaminant Characteristics
- Current and future land/groundwater uses.

Section 4.2.1 – Impact of Changes in Standards and TBCs

Therefore, although ARARs generally are "frozen" at the time of ROD signature, in conducting a five-year review, you should determine the effect of a newly promulgated or modified standard on the protectiveness of the remedy originally selected in the ROD. You should evaluate the newly promulgated or modified requirement to determine if the cleanup level established in the ROD remains protective. TBCs may also have been used to select cleanup levels. Therefore, you should also review any new or modified TBCs to ensure that any changes will not impact the protectiveness of the remedy.

In evaluating a change in a standard that was identified as an ARAR in the ROD, or a newly promulgated standard or TBC, you should establish whether the new requirement indicates that the remedy is no longer protective. You should recommend a follow-up action when the remedy is not protective. You should establish whether the new requirement indicates that the remedy is no longer protective. You should recommend a follow-up action when the remedy is not protective. For example, based on revised risk information for a specific chemical, a new standard (e.g., more stringent MCL for a chemical) may result in a situation where the cleanup level to be achieved by the original remedy would pose a 10^{-3} cancer risk. In that circumstance, the five-year review could recommend that a new cleanup level based on the new standard be adopted. However, a change in a standard may not necessarily result in a change in the resulting risk and therefore may not always impact protectiveness.

Section 4.2.2 – Impact of Changes in Exposure Pathways

You should consider changes in site conditions that could result in increased exposure. These changes could include changed or new land uses, including zoning changes, changed or new routes of exposure or receptors, changed physical site conditions that may affect the protectiveness of the remedy, new contaminants, or a new understanding of geological conditions. In evaluating this information, you should work closely with a risk assessor to establish the impact that such changes may have on the estimated risk associated with your site. Depending on the significance of the changes, it may be necessary for you to recalculate human health risk and re-examine ecological risks. Generally, your human health determination should be based on whether the cancer risk could not be greater than 10^{-4} and/or the hazard index could be greater than 1 for non-carcinogenic effects.

4.2.3 – Impact of Changes in Toxicity and other Contaminant Characteristics

If the remedy is intended to meet a site-specific, risk-based cleanup level, you should check to see whether toxicity or other contaminant characteristics used to determine the original cleanup level have changed. In addition to toxicity, you should examine other contaminant characteristics that determine the nature and extent of contaminant migration and effects on receptors (e.g. sorption characteristics, ability to bioaccumulate, bioabailability). If there have been changes in the understanding or in our knowledge of these physical/chemical characteristics, you may need to recalculate risk using the original cleanup level or using the current concentration if it has not been identified as a contaminant of concern. An increase in the cancer slope factor, for example, may suggest that the risk from a chemical concentration is above the generally acceptable cancer risk range (10^{-4} to 10^{-6}). You should also consider changes in toxicity and other contaminant characteristics relating to ecological receptors.

If the estimated risk has increased, then you should determine whether the new estimated risk is acceptable. In most cases, you should base this determination on whether the risk is within or below the generally acceptable risk range of 10^{-4} to 10^{-6} for carcinogenic risk and the hazard index is below 1 for non-carcinogenic effects. If the risk is not protective, you should determine what actions need to be taken to achieve an acceptable level of risk.

Note AD
Risk and Decision Analysis
Trending
CERCLA

CERCLA Section 121 requires that remedial actions, which result in any hazardous substances, pollutants, or contaminants remaining at the site, be subject to five-year reviews. Sites remediated under CERCLA and entered into the Long-Term Stewardship are assumed to have contaminants remaining at the site, and therefore, will be required to perform five-year reviews and prepare a five-year review report. (Note: some sites entering Long-Term Stewardship may have already performed the first of many 5-year reviews prior to becoming a Long-Term Stewardship site.) The outline for a five-year review report as suggested by EPA's *Comprehensive Five-Year Review Guidance,* EPA 540-R-01-007, June 2001, includes a section on Technical Assessment. Topic when appropriate included in Technical Assessment is to address question A, "Is the remedy functioning as intended by the decision documents?" The Guidance suggests reviewing early indicator of potential remedy problems. An early indicators as suggested by the Guidance is trend analysis of sampling data showing no decrease in contaminant levels, monitoring data showing evidence of leachate migration, or that the extent of the groundwater contamination plume exceeds the outer reaches of the monitoring network.

4.1.2 How do I answer Question A for a remedial action that is operating or completed?

Your review of an operating or completed remedial action generally will address more aspects of the remedy implementation than a review of a remedial action under construction. In general, you should assess the following:

- ***Remedial action performance*** – Determine whether the remedial action continues to operate and function as designed (*e.g.*, extent of groundwater plume is well defined and updated plume maps confirm containment), and has achieved, or is expected to achieve, cleanup levels.
- ***System operations/operation and maintenance (O&M)*** – Determine whether maintenance procedures, as implemented, will maintain the effectiveness of response actions. This evaluation might include, but is not limited to, visual inspection of the system and the review and evaluation of monitoring reports (*e.g.*, groundwater data from extraction and monitoring wells, biological monitoring data, discharge requirements, wetland monitoring data, leachate monitoring for containment remedies).
- ***Costs of system operations/O&M*** – Review and consider system operations/O&M costs if they are available. Compare actual/current annual O&M costs to the original cost estimate; large variances from the original cost estimate might indicate potential remedy problems. (Note: This information may not be readily available at Enforcement-lead sites, but should be requested.)
- ***Implementation of institutional controls and other measures*** – Determine whether access controls (*e.g.*, fencing, security guards) and ICs that are needed at this stage of the remediation are in place and successfully prevent exposure. If ICs are not in place, determine why not, and obtain the schedule for implementation; determine whether other actions (*e.g.*, removals) necessary to ensure that exposure pathways that could result in unacceptable risks have been implemented.
- ***Monitoring activities*** – Determine whether monitoring activities required to ensure the effectiveness of the remedy (*e.g.*, performance and environmental data collected and results evaluated) are being conducted and whether they are adequate to determine the protectiveness and effectiveness of the remedy.
- ***Opportunities for optimization*** – If readily apparent during the course of conducting five-year review activities, identify any opportunities to improve the performance and/or reduce the costs of sampling and monitoring activities and operating treatment systems. If changes in these activities are recommended in the Five-Year Review report, you should also provide the rationale/basis for such changes. If appropriate, your report can also recommend that an optimization study be conducted.
- ***Early indicators of potential remedy problems*** – Investigate and identify problems that could lead to the remedy being not protective or suggest protectiveness is at risk unless changes are made. Problems could include frequent equipment breakdowns or replacement, or large variances in operating costs (if cost data are available). Some examples of indicators of potential remedy problems could include erosion and/or subsidence of a cap, trend analysis of sampling data showing no decrease in contaminant levels, monitoring data showing evidence of leachate migration, or that the extent of the groundwater contamination plume exceeds the outer reaches of the monitoring network.

Note AE
Risk and Decision Analysis
Cost
CERCLA

CERCLA Section 121 requires that remedial actions, which result in any hazardous substances, pollutants, or contaminants remaining at the site, be subject to five-year reviews. Sites remediated under CERCLA and entered into the Long-Term Stewardship are assumed to have contaminants remaining at the site, and therefore, will be required to perform five-year reviews and prepare a five-year review report. (Note: some sites entering Long-Term Stewardship may have already performed the first of many 5-year reviews prior to becoming a Long-Term Stewardship site.) The outline for a five-year review report as suggested by EPA's *Comprehensive Five-Year Review Guidance,* EPA 540-R-01-007, June 2001, includes a section on Technical Assessment. An appropriate topic included in the Technical Assessment is to address,"Is the remedy functioning as intended by the decision documents?" The Guidance suggests assessing the costs of system operations or operations and maintenance costs. The assessment is to include comparing actual/current annual operations and maintenance costs to the original cost estimate. A large variance from the original cost estimate might indicate a potential remedy problem.

4.1.2 How do I answer Question A for a remedial action that is operating or completed?

Your review of an operating or completed remedial action generally will address more aspects of the remedy implementation than a review of a remedial action under construction. In general, you should assess the following:

- ***Remedial action performance*** – Determine whether the remedial action continues to operate and function as designed (*e.g.*, extent of groundwater plume is well defined and updated plume maps confirm containment), and has achieved, or is expected to achieve, cleanup levels.
- ***System operations/operation and maintenance (O&M)*** – Determine whether maintenance procedures, as implemented, will maintain the effectiveness of response actions. This evaluation might include, but is not limited to, visual inspection of the system and the review and evaluation of monitoring reports (*e.g.*, groundwater data from extraction and monitoring wells, biological monitoring data, discharge requirements, wetland monitoring data, leachate monitoring for containment remedies).
- ***Costs of system operations/O&M*** – Review and consider system operations/O&M costs if they are available. Compare actual/current annual O&M costs to the original cost estimate; large variances from the original cost estimate might indicate potential remedy problems. (Note: This information may not be readily available at Enforcement-lead sites, but should be requested.)
- ***Implementation of institutional controls and other measures*** – Determine whether access controls (*e.g.*, fencing, security guards) and ICs that are needed at this stage of the remediation are in place and successfully prevent exposure. If ICs are not in place, determine why not, and obtain the schedule for implementation; determine whether other actions (*e.g.*, removals) necessary to ensure that exposure pathways that could result in unacceptable risks have been implemented.
- ***Monitoring activities*** – Determine whether monitoring activities required to ensure the effectiveness of the remedy (*e.g.*, performance and environmental data collected and results evaluated) are being conducted and whether they are adequate to determine the protectiveness and effectiveness of the remedy.
- ***Opportunities for optimization*** – If readily apparent during the course of conducting five-year review activities, identify any opportunities to improve the performance and/or reduce the costs of sampling and monitoring activities and operating treatment systems. If changes in these activities are recommended in the Five-Year Review report, you should also provide the rationale/basis for such changes. If appropriate, your report can also recommend that an optimization study be conducted.
- ***Early indicators of potential remedy problems*** – Investigate and identify problems that could lead to the remedy being not protective or suggest protectiveness is at risk unless changes are made. Problems could include frequent equipment breakdowns or replacement, or large variances in operating costs (if cost data are available). Some examples of indicators of potential remedy problems could include erosion and/or subsidence of a cap, trend analysis of sampling data showing no decrease in contaminant levels, monitoring data showing evidence of leachate migration, or that the extent of the groundwater contamination plume exceeds the outer reaches of the monitoring network.

Note AF
Risk and Decision Analysis
CERCLA
Cost/Benefit

CERCLA Section 121 requires that remedial actions, which result in any hazardous substances, pollutants, or contaminants remaining at the site, be subject to a five-year review. Sites remediated under CERCLA and entered into Long-Term Stewardship are assumed to have contaminants remaining at the site, and therefore, will be required to perform five-year reviews and prepare a five-year review report. (Note: some sites entering Long-Term Stewardship may have already performed the first of many 5-year reviews prior to becoming a Long-Term Stewardship site.) The outline for a five-year review report as suggested by EPA's *Comprehensive Five-Year Review Guidance,* EPA 540-R-01-007, June 2001, includes a section on Technical Assessment. An appropriate topic included in is to address, "Is the remedy functioning as intended by the decision documents?" Guidance suggests if there are opportunities to improve performance and/or reduce the costs of sampling and monitoring activities and operating treatment systems to identify those opportunities in the five-year report. Also, if appropriate, the five-year report can include a recommendation that an optimization study be conducted. The Guidance uses the word optimization instead of cost/benefit, but the results would be similar.

4.1.2 How do I answer Question A for a remedial action that is operating or completed?

Your review of an operating or completed remedial action generally will address more aspects of the remedy implementation than a review of a remedial action under construction. In general, you should assess the following:

- ***Remedial action performance*** – Determine whether the remedial action continues to operate and function as designed (*e.g.*, extent of groundwater plume is well defined and updated plume maps confirm containment), and has achieved, or is expected to achieve, cleanup levels.
- ***System operations/operation and maintenance (O&M)*** – Determine whether maintenance procedures, as implemented, will maintain the effectiveness of response actions. This evaluation might include, but is not limited to, visual inspection of the system and the review and evaluation of monitoring reports (*e.g.*, groundwater data from extraction and monitoring wells, biological monitorin g data, discharge requirements, wetland monitoring data, leachate monitoring for containment remedies).
- ***Costs of system operations/O&M*** – Review and consider system operations/O&M costs if they are available. Compare actual/current annual O&M costs to the original cost estimate; large variances from the original cost estimate might

indicate potential remedy problems. (Note: This information may not be readily available at Enforcement-lead sites, but should be requested.)

- ***Implementation of institutional controls and other measures*** – Determine whether access controls (*e.g.*, fencing, security guards) and ICs that are needed at this stage of the remediation are in place and successfully prevent exposure. If ICs are not in place, determine why not, and obtain the schedule for implementation; determine whether other actions (*e.g.*, removals) necessary to ensure that exposure pathways that could result in unacceptable risks have been implemented.
- ***Monitoring activities*** – Determine whether monitoring activities required to ensure the effectiveness of the remedy (*e.g.*, performance and environmental data collected and results evaluated) are being conducted and whether they are adequate to determine the protectiveness and effectiveness of the remedy.
- ***Opportunities for optimization*** – If readily apparent during the course of conducting five-year review activities, identify any opportunities to improve the performance and/or reduce the costs of sampling and monitoring activities and operating treatment systems. If changes in these activities are recommended in the Five-Year Review report, you should also provide the rationale/basis for such changes. If appropriate, your report can also recommend that an optimization study be conducted.
- ***Early indicators of potential remedy problems*** – Investigate and identify problems that could lead to the remedy being not protective or suggest protectiveness is at risk unless changes are made. Problems could include frequent equipment breakdowns or replacement, or large variances in operating costs (if cost data are available). Some examples of indicators of potential remedy problems could include erosion and/or subsidence of a cap, trend analysis of sampling data showing no decrease in contaminant levels, monitoring data showing evidence of leachate migration, or that the extent of the groundwater contamination plume exceeds the outer reaches of the monitoring network.

Note AG
Information Management
UMTRCA I
Record Retention/Accessibility/Media Storage

10CFR40.27 does not have any requirements or references to record management. However, 10CFR40.27 (b) (3) requires a description of the long-term surveillance program as part of the license to include record keeping procedures as highlighted below. Since the requirement for record keeping procedures is not specific, this implies record keeping procedures are site specific.

TITLE 10 - ENERGY
CHAPTER I - NUCLEAR REGULATORY COMMISSION
Part 40 - Domestic Licensing of Source Material

§27. General license for custody and long-term care of residual radioactive material disposal sites

(a) A general license is issued for the custody of and long-term care, including monitoring, maintenance, and emergency measures necessary to protect public health and safety and other actions necessary to comply with the standards promulgated under section 275(a) of the Atomic Energy Act of 1954, as amended, for disposal sites under title I of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The license is available only to the Department of Energy, or another Federal agency designated by the President to provide long-term care. The purpose of this general license is to ensure that uranium mill tailings disposal sites will be cared for in such a manner as to protect the public health, safety, and the environment after remedial action has been completed.

(b) The general license in paragraph (a) of this section becomes effective when the Commission accepts a site Long-Term Surveillance Plan (LTSP) that meets the requirements of this section, and when the Commission concurs with the Department of Energy's determination of completion of remedial action at each disposal site. There is no termination of this general license. The LTSP may incorporate by reference information contained in documents previously submitted to the Commission if the references to the individual incorporated documents are clear and specific. Each LTSP must include --

(1) A legal description of the disposal site to be licensed, including documentation on whether land and interests are owned by the United States or an Indian tribe. If the site is on Indian land, then, as specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Indian tribe and any person holding any interest in the land shall execute a waiver releasing the United States of any liability or claim by the Tribe or person concerning or arising from the remedial action and holding the United States harmless against any claim arising out of the performance of the remedial action;

(2) A detailed description, which can be in the form of a reference, of the final disposal site conditions, including existing groundwater characterization and any necessary groundwater protection activities or strategies. This description must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs. If the disposal site has continuing aquifer restoration requirements, then the licensing process will be completed in two steps. The first step includes all items other than groundwater restoration. Groundwater monitoring, which would be addressed in the LTSP, may still be required in this first step to assess performance of the tailings disposal units. When the Commission concurs with the completion of groundwater restoration, the licensee shall assess the need to modify the LTSP and report results to the Commission. If the proposed modifications meet the requirements of this section, the LTSP will be considered suitable to accommodate the second step.

(3) A description of the long-term surveillance program, including proposed inspection frequency and reporting to the Commission (as specified in Appendix A, criterion 12 of this part), frequency and extent of groundwater monitoring if required, appropriate constituent concentration limits for groundwater, inspection personnel qualifications, inspection procedures, recordkeeping and quality assurance procedures;

(4) The criteria for follow-up inspections in response to observations from routine inspections or extreme natural events; and

(5) The criteria for instituting maintenance or emergency measures.

(c) The long-term care agency under the general license established by paragraph (a) of this section shall --

(1) Implement the LTSP as described in paragraph (b) of this section;

(2) Care for the disposal site in accordance with the provisions of the LTSP;

(3) Notify the Commission of any changes to the LTSP; the changes may not conflict with the requirements of this section;

(4) Guarantee permanent right-of-entry to Commission representatives for the purpose of periodic site inspections; and

(5) Notify the Commission prior to undertaking any significant construction, actions, or repairs related to the disposal site, even if the action is required by a State or another Federal agency.

(d) As specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, the Secretary of the Interior, with the concurrence of the Secretary of Energy and the Commission, may sell or lease any subsurface mineral rights associated with land on which residual radioactive materials are disposed. In such cases, the Commission shall grant a license permitting use of the land if it finds that the use will not disturb the residual radioactive materials or that the residual radioactive materials will be restored to a safe and environmentally sound condition if they are disturbed by the use.

(e) The general license in paragraph (a) of this section is exempt from parts 19, 20, and 21 of this chapter, unless significant construction, actions, or repairs are required. If these types of actions are to be undertaken, the licensee shall explain to the Commission which requirements from these parts apply for the actions and comply with the appropriate requirements.

Note AH
Information Management
UMTRCA II
Record Retention/Accessibility/Media Storage

10CFR40.28 does not have any requirements or references to record management. However, 10CFR40.28 (b) (3) requires a description of the long-term surveillance program as part of the license to include record keeping procedures as highlighted below. Since the requirement for record keeping procedures is not specific, this implies record keeping procedures are site specific.

TITLE 10 - ENERGY
CHAPTER I - NUCLEAR REGULATORY COMMISSION
Part 40 - Domestic Licensing of Source Material

§28. General license for custody and long-term care of uranium or thorium byproduct materials disposal sites

(a) A general license is issued for the custody of and long-term care, including monitoring, maintenance, and emergency measures necessary to protect the public health and safety and other actions necessary to comply with the standards in this part for uranium or thorium mill tailings sites closed under title II of the Uranium Mill Tailings Radiation Control Act of 1978, as amended. The licensee will be the Department of Energy, another Federal agency designated by the President, or a State where the disposal site is located. The purpose of this general license is to ensure that uranium and thorium mill tailings disposal sites will be cared for in such a manner as to protect the public health, safety, and the environment after closure.

(b) The general license in paragraph (a) of this section becomes effective when the Commission terminates, or concurs in an Agreement State's termination of, the current specific license and a site Long-Term Surveillance Plan (LTSP) meeting the requirements of this section has been accepted by the Commission. There is no termination of this general license. If the LTSP has not been formally received by the NRC prior to termination of the current specific license, the Commission may issue a specific order to the intended custodial agency to ensure continued control and surveillance of the disposal site to protect the public health, safety, and the environment. The Commission will not unnecessarily delay the termination of the specific license solely on the basis that an acceptable LTSP has not been received. The LTSP may incorporate by reference information contained in documents previously submitted to the Commission if the references to the individual incorporated documents are clear and specific. Each LTSP must include --

(1) A legal description of the disposal site to be transferred (unless transfer is exempted under provisions of the Atomic Energy Act, §83(b)(1)(A)) and licensed;

(2) A detailed description, which can be in the form of a reference of the final disposal site conditions, including existing groundwater characterization. This description must be detailed enough so that future inspectors will have a baseline to determine changes to the site and when these changes are serious enough to require maintenance or repairs;

(3) A description of the long-term surveillance program, including proposed inspection frequency and reporting to the Commission (as specified in Appendix A, Criterion 12 of this part), frequency and extent of groundwater monitoring if required, appropriate constituent concentration limits for groundwater, inspection personnel qualifications, inspection procedures, recordkeeping and quality assurance procedures;

(4) The criteria for follow-up inspections in response to observations from routine inspections or extreme natural events; and

(5) The criteria for instituting maintenance or emergency measures.

(c) The long-term care agency who has a general license established by paragraph (a) of this section shall --

(1) Implement the LTSP as described in paragraph (b) of this section;

(2) Care for the disposal site in accordance with the provisions of the LTSP;

(3) Notify the Commission of any changes to the LTSP; the changes may not conflict with the requirements of this section;

(4) Guarantee permanent right-of-entry to Commission representatives for the purpose of periodic site inspections; and

(5) Notify the Commission prior to undertaking any significant construction, actions, or repairs related to the disposal site, even if the action is required by a State or another Federal agency.

(d) Upon application, the Commission may issue a specific license, as specified in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, permitting the use of surface and/or subsurface estates transferred to the United States or a State. Although an application may be received from any person, if permission is granted, the person who transferred the land to DOE or the State shall receive the right of first refusal with respect to this use of the land. The application must demonstrate that--

(1) The proposed action does not endanger the public health, safety, welfare, or the environment;

(2) Whether the proposed action is of a temporary or permanent nature, the site would be maintained and/or restored to meet requirements in Appendix A of this part for closed sites; and

(3) Adequate financial arrangements are in place to ensure that the byproduct materials will not be disturbed, or if disturbed that the applicant is able to restore the site to a safe and environmentally sound condition.

(e) The general license in paragraph (a) of this section is exempt from parts 19, 20, and 21 of this chapter, unless significant construction, actions, or repairs are required. If these types of actions are to be undertaken, the licensee shall explain to the Commission which requirements from these parts apply for the actions and comply with the appropriate requirements.

(f) In cases where the Commission determines that transfer of title of land used for disposal of any byproduct materials to the United States or any appropriate State is not necessary to protect the public health, safety or welfare or to minimize or eliminate danger to life or property (Atomic Energy Act, §83(b)(1)(A)), the Commission will consider specific modifications of the custodial agency's LTSP provisions on a case-by-case basis.

Note AI
Information Management
DOE

In DOE information management requirements are included in DOE O 200.1, Information Management Program, section 4., Requirements.

REQUIREMENTS.

1. Information, information resources, and information technologies shall be managed in a manner that supports the strategic and operational plans of the Department.
2. Information management activities shall be established, maintained, and managed in a manner that addresses Departmental policy and implements appropriate laws and regulations as specified in Attachment II, References.

The references were reviewed for applicability to the appropriate subcategory. Only those references, which were deemed applicable, were cited in the appropriate subcategory.

Attachment II, REFERENCES

1. Title 5, United States Code 552, The Freedom of Information Act (Public Law 89-487), as amended, which establishes the right of citizens to request information from Federal Agencies and establishes a framework of procedures to implement this right.
2. Title 5, United States Code 552a, Privacy Act of 1974, (Public Law 93-549), as amended, which establishes requirements for the collection, maintenance, and dissemination of personal information by Federal Agencies.
3. Title 17, United States Code Copyright Law.
4. Title 18, United States Code, Chapter 101, which provides penalties for the unlawful concealment, removal, or mutilation of records.
5. Title 31, United States Code 1348, which permits Federal Agencies to pay charges for long distance telephone calls, if required for official business and sworn to by the Agency head.
6. Title 36, Code of Federal Regulations, Chapter 12, which sets forth policies and procedures concerning the creation, collection, use, documentation, dissemination, and disposition of records maintained by Federal Agencies and The National Archives and Records Administration.
7. Title 44, United States Code, Chapters 21, 29, 31, and 33, which specifies the functions and responsibilities for managing Federal records and the procedures that must be followed to obtain approval for their disposition.
8. Public Law 83-703, The Atomic Energy Act of 1954, as amended.
9. Public Law 73-416, Communications Act of 1934, as amended, which provides for the regulation of interstate and foreign communication by wire or radio and for other purposes; in particular, section 305(a), which establishes Presidential statutory authority to authorize operations of radio stations belonging to, or operated by, the Federal Government; and section 606, which establishes the war emergency telecommunications powers of the President.
10. Public Law 100-235, Computer Security Act of 1987, which provides for a computer standards program within the National Institute of Standards and Technology (NIST) to provide for Government wide security and training in security matters of persons who are involved in the management, operation, and use of Federal computer systems and for other purposes.
11. Public Law 102-561, the Software Copyright Protection Act.
12. Public Law 104-13, The Paperwork Reduction Reauthorization Act of 1995, as amended, and its predecessor, Public Law 96-511, The Paperwork Reduction Act of1980, which establishes a broad mandate for Federal Agencies to perform information activities in an efficient, effective, and economical manner, and specifically recognizes the General Services Administration's role in the acquisition and management of computing resources.
13. Public Law 104-106, the Information Technology Management Reform Act (ITMRA) of 1996.
14. Executive Order 12046, Relating to the Transfer of Telecommunications Functions, dated 3-27-78, which delegates the Presidential responsibilities for management of the electromagnetic spectrum to the Secretary of Commerce and provides for the continuation of the Interdepartmental Radio Advisory Committee to assist the Secretary in the exercising of the delegated Presidential authority, Federal Register, 43, No. 61, of 3-29-78.
15. Executive Order 12472, Assignment of National Security and Emergency Preparedness Telecommunications Functions, dated 4-3-84, which provides for the essential national security emergency preparedness telecommunications needs of the Federal Government and provides guidance to state and local governments and private organizations in an all- hazards environment.
16. Executive Order 12656, Assignment of Emergency Preparedness Responsibilities, dated 11-18-88 (as amended), which assigns national security emergency preparedness responsibilities to Federal Departments and Agencies.
17. Executive Order 12958, Classified National Security Information, dated4-20-95, which prescribes a uniform system for classifying, safeguarding, and declassifying national security information.
18. Executive Order 13011, Federal Information Technology, dated 7-16-96.National Security Directive 42 dated 7-5-90, which establishes initial objectives, Agencies.policies, and organizational structure to guide the conduct of activities to secure national security systems from exploitation.

19. National Security Directive 42 dated 7-5-90, which establishes initial objectives, policies, and organizational structure to guide the conduct of activities to secure national security systems from exploitation.

20. National Security Decision Directive Number 47, Emergency Mobilization Preparedness, dated 7-22-82, which directs emergency communications planning and establishes the requirement for programs that assure transition from normal to emergency operations.

21. National Security Decision Directive Number 97 (unclassified version), National Security Telecommunications Policy, dated 8-3-83, which establishes the policy for integrating all of the Nation's telecommunications resources essential to national survival.

22. Office of Management and Budget Circular A-130, as amended, Management of Federal Information Resources, dated 7-15-94, which establishes policy for the management of Federal information resources.

Federal Information Resources Management Regulation, 41 Code of Federal Regulations, Chapter 201, which establishes, publishes, and codifies uniform policies and procedures pertaining to information resources management activities by Federal Agencies.

Note AJ
Information Management
DOE

Record Retention

36 CFR 1228.264(a) has specific requirements for record retention applicable to DOE.

Permanent records shall be transferred to the National Archives of the United States when the records have been in existence for more than 30 years unless the head of the agency which has custody of the records certifies in writing to the Archivist that the records must be retained in agency custody for use in the conduct of regular, current business of the agency. Records that are scheduled in a NARA-approved records schedule to be transferred to the National Archives of the United States after a specified period of time are subject to the certification requirement only if the records are not transferred as scheduled.

The DOE Environmental Records Schedule is the primary document, which contains the records schedule for environmental documents. DOE Environmental Records Schedule is located in Appendice B.

TITLE 36 - PARKS, FORESTS, AND PUBLIC PROPERTY
CHAPTER XII - NATIONAL ARCHIVES AND RECORDS ADMINISTRATION
SUBCHAPTER B - RECORDS MANAGEMENT

Part 1228 - Disposition of Federal Records

§264. Certification for retention of records in agency custody

(a) Permanent records shall be transferred to the National Archives of the United States when the records have been in existence for more than 30 years unless the head of the agency which has custody of the records certifies in writing to the Archivist that the records must be retained in agency custody for use in the conduct of the regular current business of the agency. Records that are scheduled in a NARA-approved records schedule to be transferred to the National Archives of the United States after a specified period of time are subject to the certification requirement only if the records are not transferred as scheduled.

(b) In order to certify that records must be retained for the conduct of regular current business, an agency should consider the following factors:

(1) Character of use (to be retained by an agency, records should be used for the normal routine business of the agency at the time of certification);

(2) Frequency of use (to be retained by an agency, records should be used more than one time per month per file unit); and,

(3) Preservation of the records (to be retained by an agency, permanently valuable records should be preserved in accordance with NARA guidelines).

(c) The written certification of need of a series of 30-year-old records for current agency business must:

(1) Include a comprehensive description and location of records to be retained;

(2) Cite the NARA approved authority for the disposition of the records if scheduled (SF 115 item number);

(3) Describe the current business for which the records are required;

(4) Estimate the length of time the records will be needed by the agency for current business (if no date is provided by the agency, approved certification requests will be effective for a maximum of five years);

(5) Explain why the current needs of the agency cannot be met by the services NARA provides for records deposited with the National Archives of the United States; and,

(6) If the records are being retained to enable the agency to provide routine public reference, cite the statute authorizing this agency activity.

(d) NARA will not accept an agency certification that a specific body of records over 30 years old, regardless of physical form or characteristics, is being used for the "conduct of the regular current business," if that agency is retaining such records primarily to:

(1) Provide to persons outside the agency access which can be provided by NARA; or

(2) Function as an agency archives, unless specifically authorized by statute or NARA.

Note AK
Information Management
DOE
Accessibility

Accessibility requirements are not explicitly stated. However, when reading 36 CFR 1236 – Management of Vital Records, accessibility becomes an issue. 36 CFR 1236 defines vital records as:

> *Vital records program* means the policies, plans, and procedures developed and implemented and the resources needed to identify, use, and protect the essential records needed to meet operational responsibilities under national security emergencies or other emergency or disaster conditions or to protect the Government's rights or those of its citizens. This is a program element of an agency's emergency management function.

The requirements of 36 CFR 1236 are as follows.

[CFR] PART 1236 - MANAGEMENT OF VITAL RECORDS
[TITLE 36] [PART 1236]
Subpart A-General
Sec.
1236.10 Purpose.
1236.12 Authority.
1236.14 Definitions.

Subpart B-Vital Records
1236.20 Vital records program objectives.
1236.22 Identification of vital records.
1236.24 Use of vital records and copies of vital records.
1236.26 Protection of vital records.
1236.28 Disposition of original vital records.

Authority: 44 U.S.C. 2104(a), 2904(a), 3101; E. O. 12656, 53 FR 47491, 3 CFR, 1988 Comp., p. 585.
Source: 60 FR 29990, June 7, 1995, unless otherwise noted.

Subpart A - General

§1236.10 Purpose.

This part prescribes policies and procedures for establishing a program for the identification and protection of vital records, those records needed by agencies for continuity of operations before, during, and after emergencies, and those records needed to protect the legal and financial rights of the Government and persons affected by Government activities. The records may be maintained on a variety of media including paper, magnetic tape or disk, photographic film, and microfilm. The management of vital records is part of an agency's continuity of operations plan designed to meet emergency management responsibilities.

§1236.12 Authority.

Heads of agencies are responsible for the vital records program under the following authorities:

(a) To make and preserve records containing adequate and proper documentation of the agency's organization, functions, policies, procedures, decisions, and essential transactions, and to furnish information to protect the legal and financial rights of the Government and of persons directly affected by the agency's activities (44 U.S.C. 3101).

(b) To perform national security emergency preparedness functions and activities (Executive Order 12656).

§1236.14 Definitions.

Basic records management terms are defined in 36 CFR 1220.14. As used in part 1236:

Contingency planning means instituting policies and procedures to mitigate the effects of potential emergencies or disasters on an agency's operations and records. Contingency planning is part of the continuity of operations planning required under Federal Preparedness Circulars and other guidance issued by the Federal Emergency Management Agency (FEMA) and Executive Order 12656.

Cycle means the periodic removal of obsolete copies of vital records and their replacement with copies of current vital records. This may occur daily, weekly, quarterly, annually or at other designated intervals.

Disaster means an unexpected occurrence inflicting widespread destruction and distress and having long-term adverse effects on agency operations. Each agency defines what a long-term adverse effect is in relation to its most critical program activities.

Emergency means a situation or an occurrence of a serious nature, developing suddenly and unexpectedly, and demanding immediate action. This is generally of short duration, for example, an interruption of normal agency operations for a week or less. It may involve electrical failure or minor flooding caused by broken pipes.

Emergency operating records are that type of vital records essential to the continued functioning or reconstitution of an organization during and after an emergency. Included are emergency plans and directive(s), orders of succession, delegations of authority, staffing assignments, selected program records needed to continue the most critical agency operations, as well as related policy or procedural records that assist agency staff in conducting operations under emergency conditions and for resuming normal operations after an emergency.

Legal and financial rights records are that type of vital records essential to protect the legal and financial rights of the Government and of the individuals directly affected by its activities. Examples include accounts receivable records, social security records, payroll records, retirement records, and insurance records. These records were formerly defined as "rights-and-interests" records.

National security emergency means any occurrence, including natural disaster, military attack, technological emergency, or other emergency, that seriously degrades or threatens the national security of the United States, as defined in Executive Order 12656.

Off-site storage means a facility other than an agency's normal place of business where vital records are stored for protection. This is to ensure that the vital records are not subject to damage or destruction from an emergency or disaster affecting an agency's normal place of business.

Vital records mean essential agency records that are needed to meet operational responsibilities under national security emergencies or other emergency or disaster conditions (emergency operating records) or to protect the legal and financial rights of the Government and those affected by Government activities (legal and financial rights records).

Vital records program means the policies, plans, and procedures developed and implemented and the resources needed to identify, use, and protect the essential records needed to meet operational responsibilities under national security emergencies or other emergency or disaster conditions or to protect the Government's rights or those of its citizens. This is a program element of an agency's emergency management function.

Subpart B - Vital Records

§1236.20 Vital records program objectives.

The vital records program is conducted to identify and protect those records that specify how an agency will operate in case of emergency or disaster, those records vital to the continued operations of the agency during and after an emergency or disaster, and records needed to protect the legal and financial rights of the Government and of the persons affected by its actions. An agency identifies vital records in the course of contingency planning activities carried out in the context of the emergency management function. In carrying out the vital records program agencies shall:

(a) Specify agency staff responsibilities;

(b) Ensure that all concerned staff are appropriately informed about vital records;

(c) Ensure that the designation of vital records is current and complete; and

(d) Ensure that vital records and copies of vital records are adequately protected, accessible, and immediately usable.

§1236.22 Identification of vital records.

Vital records include emergency plans and related records that specify how an agency is to respond to an emergency as well as those records that would be needed to continue operations and protect legal and financial rights. Agencies should consider the informational content of records series and electronic records systems when identifying vital records. Only the most recent and complete source of the vital information needs to be treated as vital records.

§1236.24 Use of vital records and copies of vital records.

Agencies shall ensure that retrieval procedures for vital records require only routine effort to locate needed information, especially since individuals unfamiliar with the records may need to use them during an emergency or disaster. Agencies also shall ensure that all equipment needed to read vital records or copies of vital records will be available in case of emergency or disaster. For electronic records systems, agencies also shall ensure that system documentation adequate to operate the system and access the records will be available in case of emergency or disaster.

§1236.26 Protection of vital records.

Agencies shall take appropriate measures to ensure the survival of the vital records or copies of vital records in case of emergency or disaster. In the case of electronic records, this requirement is met if the information needed in the event of emergency or disaster is available in a copy made for general security purposes, even when the copy contains other information.

(a) *Duplication.* Computer backup tapes created in the normal course of system maintenance or other electronic copies that may be routinely created in the normal course of business may be used as the vital record copy. For hard copy records, agencies may choose to make microform copies. Standards for the creation, preservation and use of microforms are found in 36 CFR part 1230, Micrographic Records Management. The Computer Security Act of 1987 (40 U.S.C. 759, Pub. L. 100-235), OMB Circular A-130, and 36 CFR part 1234, Electronic Records Management, and 41 CFR part 201, subchapter B, Management and Use of Information and Records, specify protective measures and standards for electronic records.

(b) *Storage.* When agencies choose duplication as a protection method, the copy of the vital record stored off-site is normally a duplicate of the original record. Designating and using duplicate copies of original records as vital records facilitates destruction or deletion of obsolete duplicates when replaced by updated copies, whereas original vital records must be retained for the period specified in the agency records disposition schedule. The agency may store the original records off-site if protection of original signatures is necessary, or if it does not need to keep the original record at its normal place of business.

(c) *Storage considerations.* Agencies need to consider several factors when deciding where to store copies of vital records. Copies of emergency operating vital records need to be accessible in a very short period of time for use in the event of an emergency or disaster. Copies of legal and financial rights records may not be needed as quickly. In deciding where to store vital records copies, agencies shall treat records that have the properties of both categories, that is, emergency operating and legal and financial rights records, as emergency operating records.

(1) Under certain circumstances, Federal records centers (FRC's) may store copies of emergency operating vital records. FRC's will store small volumes of such records, but may not be able to provide storage for large collections or ones requiring constant recycling of the vital records, except under reimbursable agreement. Prior to preparing the records for shipment, the agency must contact the FRC to determine if the center can accommodate the storage requirements and return copies in an acceptable period of time.

(2) The off-site copy of legal and financial rights vital records may be stored at an off-site agency location or, in accordance with §1228.156 of this chapter, at an FRC.

(3) When using an FRC for storing vital records that are duplicate copies of original records, the agency must specify on the SF 135, Records Transmittal and Receipt, that they are vital records (duplicate copies) and the medium on which they are maintained. The agency shall also periodically cycle (update) them by removing obsolete items and replacing them with the most recent version, when necessary.

(4) Agencies that transfer permanent, original vital records maintained on electronic or microform media to the custody of the National Archives may designate such records as their off-site copy. That designation may remain in effect until the information in such transferred records is superseded or becomes obsolete.

§1236.28 Disposition of original vital records.

The disposition of original vital records is governed by records schedules approved by NARA (see part 1228, Disposition of Federal Records). Original records that are not scheduled may not be destroyed or deleted.

Note AL
Information Management
DOE
Media Storage

Eventually, most of the records stored for LTS will be transferred to National Archives or stored in a similar fashion. The table below lists the types of records and their respective requirements. Many of the requirements include how to store the record type or media and formats acceptable by the National Archives. The requirements listed in the table below may be found in Appendix C.

Record Type	Requirement	Record Type Subcategory	Requirement
Audiovisual records	36 CFR 1228.266	Motion pictures	36 CFR 1228.266
		Still pictures	36 CFR 1228.266
	36 CFR 1232.20	Sound records	36 CFR 1228.266
		Video records	36 CFR 1228.266
Cartographic & architectural records	36 CFR 1228.268	Maps & charts	36 CFR 1228.268
		Aerial photography & remote sensing imagery	36 CFR 1228.268
		Architectural & related engineering drawings	36 CFR 1228.268
Electronic records	36 CFR 1228.270	Magnetic tape	36 CFR 1228.270
		CD-ROM	36 CFR 1228.270
		Data files & databases	36 CFR 1228.270
	36 CFR 1234	Textual documents	36 CFR 228.270
		Digital spatial data files	36 CFR 1228.270
		Electronic mail	36 CFR 1234.24
Micrographic records (microfilm)	36 CFR 1230	None	

Note AM
Information Management
DOE
Record Retention/Accessibility/Media Storage

RCRA does not have any requirements for information management for a closed site. RCRA requires a closure plan and the closure plan identifies how closure will occur. The specifics of record keeping, information management, etc. for a RCRA site are site specific and should be noted in the closure plan.

EXECEPTION:
Records for underground storage tanks (UST) demonstrating compliance with closure requirements under 40CFR280, Subpart G, must be maintained for at least 3 years after completion of permanent closure or change-in-service.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER I - SOLID WASTES

Part 280 - Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)

Subpart G - Out-of-Service UST Systems and Closure

§74. Closure records

Owners and operators must maintain records in accordance with §280.34 that are capable of demonstrating compliance with closure requirements under this subpart. The results of the excavation zone assessment required in §280.72 must be maintained for at least 3 years after completion of permanent closure or change-in-service in one of the following ways:

(a) By the owners and operators who took the UST system out of service;

(b) By the current owners and operators of the UST system site; or

(c) By mailing these records to the implementing agency if they cannot be maintained at the closed facility.

Note AN
Information Management
CERCLA
Accessibility

40 CFR 300, Subpart J requires an administrative record be established at facilities undergoing response actions. 40 CFR 300 is specific as to when the administrative record must be established, but it does not state how long nor what documents generated after the response action is completed that must be maintained in the administrative record. CERCLA requires the administrative record be kept at or near the facility where the response action is occurring. It also must be maintained at a central location, and to ensure public access to the administrative record, it cannot be located in an area where a security clearance is required.

TITLE 40 - PROTECTIONOF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER J - SUPERFUND, EMERGENCY PLANNING, AND COMMUNITY RIGHT-TO-KNOW PROGRAMS

Part 300 - National Oil and Hazardous Substances Pollution Contingency Plan

Subpart I - Administrative Record for Selection of Response Action

Table of Contents:

Source:

55 FR 8859, Mar. 8, 1990, unless otherwise noted.

§800. Establishment of an administrative record

(a) *General requirement.* The lead agency shall establish an administrative record that contains the documents that form the basis for the selection of a response action. The lead agency shall compile and maintain the administrative record in accordance with this subpart.

(b) *Administrative records for federal facilities.* (1) If a federal agency other than EPA is the lead agency for a federal facility, the federal agency shall compile and maintain the administrative record for the selection of the response action for that facility in accordance with this subpart. EPA may furnish documents which the federal agency shall place in the administrative record file to ensure that the administrative record includes all documents that form the basis for the selection of the response action.

(2) EPA or the U.S. Coast Guard shall compile and maintain the administrative record when it is the lead agency for a federal facility.

(3) If EPA is involved in the selection of the response action at a federal facility on the NPL, the federal agency acting as the lead agency shall provide EPA with a copy of the index of documents included in the administrative record file, the RI/FS workplan, the RI/FS released for public comment, the proposed plan, any public comments received on the RI/FS and proposed plan, and any other documents EPA may request on a case-by-case basis.

(c) *Administrative record for state-lead sites.* If a state is the lead agency for a site, the state shall compile and maintain the administrative record for the selection of the response action for that site in accordance with this subpart. EPA may require the state to place additional documents in the administrative record file to ensure that the administrative record includes all documents which form the basis for the selection of the response action. The state shall provide EPA with a copy of the index of documents included in the administrative record file, the RI/FS workplan, the RI/FS released for public comment, the proposed plan, any public comments received on the RI/FS and proposed plan, and any other documents EPA may request on a case-by-case basis.

(d) *Applicability.* This subpart applies to all response actions taken under section 104 of CERCLA or sought, secured, or ordered administratively or judicially under section 106 of CERCLA, as follows:

(1) Remedial actions where the remedial investigation commenced after the promulgation of these regulations; and

(2) Removal actions where the action memorandum is signed after the promulgation of these regulations.

(e) For those response actions not included in paragraph (d) of this section, the lead agency shall comply with this subpart to the extent practicable.

§805. Location of the administrative record file

(a) The lead agency shall establish a docket at an office of the lead agency or other central location at which documents included in the administrative record file shall be located and a copy of the documents included in the administrative record file shall also be made available for public inspection at or near the site at issue, except as provided below:

(1) Sampling and testing data, quality control and quality assurance documentation, and chain of custody forms, need not be located at or near the site at issue or at the central location, provided that the index to the administrative record file indicates the location and availability of this information.

(2) Guidance documents not generated specifically for the site at issue need not be located at or near the site at issue, provided that they are maintained at the central location and the index to the administrative record file indicates the location and availability of these guidance documents.

(3) Publicly available technical literature not generated for the site at issue, such as engineering textbooks, articles from technical journals, and toxicological profiles, need not be located at or near the site at issue or at the central location, provided that the literature is listed in the index to the administrative record file or the literature is cited in a document in the record.

(4) Documents included in the confidential portion of the administrative record file shall be located only in the central location.

(5) The administrative record for a removal action where the release or threat of release requires that on-site removal activities be initiated within hours of the lead agency's determination that a removal is appropriate and on-site removal activities cease within 30 days of initiation, need be available for public inspection only at the central location.

(b) Where documents are placed in the central location but not in the file located at or near the site, such documents shall be added to the file located at or near the site upon request, except for documents included in paragraph (a)(4) of this section.

(c) The lead agency may make the administrative record file available to the public in microform.

§810. Contents of the administrative record file

(a) *Contents.* The administrative record file for selection of a response action typically, but not in all cases, will contain the following types of documents:

(1) Documents containing factual information, data and analysis of the factual information, and data that may form a basis for the selection of a response action. Such documents may include verified sampling data, quality control and quality assurance documentation, chain of custody forms, site inspection reports, preliminary assessment and site evaluation reports, ATSDR health assessments, documents supporting the lead agency's determination of imminent and substantial endangerment, public health evaluations, and technical and engineering evaluations. In addition, for remedial actions, such documents may include approved workplans for the remedial investigation/feasibility study, state documentation of applicable or relevant and appropriate requirements, and the RI/FS;

(2) Guidance documents, technical literature, and site-specific policy memoranda that may form a basis for the selection of the response action. Such documents may include guidance on conducting remedial investigations and feasibility studies, guidance on determining applicable or relevant and appropriate requirements, guidance on risk/exposure assessments, engineering handbooks, articles from technical journals, memoranda on the application of a specific regulation to a site, and memoranda on off-site disposal capacity;

(3) Documents received, published, or made available to the public under §300.815 for remedial actions, or §300.820 for removal actions. Such documents may include notice of availability of the administrative record file, community relations plan, proposed plan for remedial action, notices of public comment periods, public comments and information received by the lead agency, and responses to significant comments;

(4) Decision documents. Such documents may include action memoranda and records of decision;

(5) Enforcement orders. Such documents may include administrative orders and consent decrees; and

(6) An index of the documents included in the administrative record file. If documents are customarily grouped together, as with sampling data chain of custody documents, they may be listed as a group in the index to the administrative record file.

(b) *Documents not included in the administrative record file.* The lead agency is not required to include documents in the administrative record file which do not form a basis for the selection of the response action. Such documents include but are not limited to draft documents, internal memoranda, and day-to-day notes of staff unless such documents contain information that forms the basis of selection of the response action and the information is not included in any other document in the administrative record file.

(c) *Privileged documents.* Privileged documents shall not be included in the record file except as provided in paragraph (d) of this section or where such privilege is waived. Privileged documents include but are not limited to documents subject to the attorney-client, attorney work product, deliberative process, or other applicable privilege.

(d) *Confidential file.* If information which forms the basis for the selection of a response action is included only in a document containing confidential or privileged information and is not otherwise available to the public, the information, to the extent feasible, shall be summarized in such a way as to make it disclosable and the summary shall be placed in the publicly available portion of the administrative record file. The confidential or privileged document itself shall be placed in the confidential portion of the administrative record file. If information, such as confidential business information, cannot be summarized in a disclosable manner, the information shall be placed only in the confidential portion of the administrative record file. All documents contained in the confidential portion of the administrative record file shall be listed in the index to the file.

§815. Administrative record file for a remedial action

(a) The administrative record file for the selection of a remedial action shall be made available for public inspection at the commencement of the remedial investigation phase. At such time, the lead agency shall publish in a major local newspaper of general circulation a notice of the availability of the administrative record file.

(b) The lead agency shall provide a public comment period as specified in §300.430(f)(3) so that interested persons may submit comments on the selection of the remedial action for inclusion in the administrative record file. The lead agency is encouraged to consider and respond as appropriate to significant comments that were submitted prior to the public comment period. A written response to significant comments submitted during the public comment period shall be included in the administrative record file.

(c) The lead agency shall comply with the public participation procedures required in §300.430(f)(3) and shall document such compliance in the administrative record.

(d) Documents generated or received after the record of decision is signed shall be added to the administrative record file only as provided in §300.825.

§820. Administrative record file for a removal action

(a) If, based on the site evaluation, the lead agency determines that a removal action is appropriate and that a planning period of at least six months exists before on-site removal activities must be initiated:

(1) The administrative record file shall be made available for public inspection when the engineering evaluation/cost analysis (EE/CA) is made available for public comment. At such time, the lead agency shall publish in a major local newspaper of general circulation a notice of the availability of the administrative record file.

(2) The lead agency shall provide a public comment period as specified in §300.415 so that interested persons may submit comments on the selection of the removal action for inclusion in the administrative record file. The lead agency is encouraged to consider and respond, as appropriate, to significant comments that were submitted prior to the public comment period. A written response to significant comments submitted during the public comment period shall be included in the administrative record file.

(3) The lead agency shall comply with the public participation procedures of §300.415(m) and shall document compliance with §300.415(m)(3)(i) through (iii) in the administrative record file.

(4) Documents generated or received after the decision document is signed shall be added to the administrative record file only as provided in §300.825.

(b) For all removal actions not included in paragraph (a) of this section:

(1) Documents included in the administrative record file shall be made available for public inspection no later than 60 days after initiation of on-site removal activity. At such time, the lead agency shall publish in a major local newspaper of general circulation a notice of availability of the administrative record file.

(2) The lead agency shall, as appropriate, provide a public comment period of not less than 30 days beginning at the time the administrative record file is made available to the public. The lead agency is encouraged to consider and respond, as appropriate, to significant comments that were submitted prior to the public comment period. A written response to significant comments submitted during the public comment period shall be included in the administrative record file.

(3) Documents generated or received after the decision document is signed shall be added to the administrative record file only as provided in §300.825.

§825. Record requirements after the decision document is signed

(a) The lead agency may add documents to the administrative record file after the decision document selecting the response action has been signed if:

(1) The documents concern a portion of a response action decision that the decision document does not address or reserves to be decided at a later date; or

(2) An explanation of significant differences required by §300.435(c), or an amended decision document is issued, in which case, the explanation of significant differences or amended decision document and all documents that form the basis for the decision to modify the response action shall be added to the administrative record file.

(b) The lead agency may hold additional public comment periods or extend the time for the submission of public comment after a decision document has been signed on any issues concerning selection of the response action. Such comment shall be limited to the issues for which the lead agency has requested additional comment. All additional comments submitted during such comment periods that are responsive to the request, and any response to these comments, along with documents supporting the request and any final decision with respect to the issue, shall be placed in the administrative record file.

(c) The lead agency is required to consider comments submitted by interested persons after the close of the public comment period only to the extent that the comments contain significant information not contained elsewhere in the administrative record file which could not have been submitted during the public comment period and which substantially support the need to significantly alter the response action. All such comments and any responses thereto shall be placed in the administrative record file.

Following is guidance from *The Administrative Record*, DOE/EH-231-010/1291, November 1991.

Who is responsible for establishing and maintaining the administrative record?

Under CERCLA, the lead agency (DOE) is required to establish and maintain the administrative record (40CFR 300.805). Since DOE has lead responsibility for CERCLA response actions at its facilities pursuant to Executive Order 12580, DOE will maintain the administrative record, unless otherwise specified in a site-specific interagency agreement or federal facility agreement. When DOE facilities are listed on the National

Priorities List (NPL), DOE must also provide EPA with a copy of the index to the administrative record file, among other key documents (40 CFR 300.800).

DOE must keep a copy of the CERCLA administrative record at or near the facility where the response action is occurring. Additionally, the administrative record must be maintained at a central location (e.g., the nearest area or field office for the site). To ensure that the administrative record file is accessible by the public, the file must be located where security clearance is not required (OSWER Directive 9833.3A-1).

Under the proposed RCRA corrective action rule (55 *FR* 30798-30884), the administrative record will be maintained by the EPA or authorized State at the location of the EPA regional office or the authorized States office. However, since the administrative record limits the judicial review of a response/corrective action, it is imperative that DOE facilities maintain all decision-making documentation as well (EH-231Guidance Manual).

Note AO
Information Management
Other (PCBs Disposal)

Toxic Substances Control Act of 1976 (TSCA) has specific record retention requirements for facilities handling and/or disposing waste composed of PCBs in concentrations greater than 50 ppm. PCB chemical waste landfill facilities are required to collect and maintain PCBs the following records until at least 20 years after the chemical waste landfill is no longer used for the disposal of:

- Signed manifests generated or received at the facility
- Certificates of disposal
- Records of inspections and cleanups performed
- Written annual document log
- Water analysis
- Operations records

[CFR] PART 761 SUBPART J - General Records and Reports
[TITLE 40] [PART 761] [SUBPART J]
Subpart J - General Records and Reports

§761.180 Records and monitoring.

This section contains recordkeeping and reporting requirements that apply to PCBs, PCB Items, and PCB storage and disposal facilities that are subject to the requirements of the part.

(a) *PCBs and PCB Items in service or projected for disposal.* Beginning February 5, 1990, each owner or operator of a facility, other than a commercial storer or a disposer of PCB waste, using or storing at any one time at least 45 kilograms (99.4 pounds) of PCBs contained in PCB Container(s), or one or more PCB Transformers, or 50 or more PCB Large High or Low Voltage Capacitors shall develop and maintain at the facility, or a central facility provided they are maintained at that facility, all annual records and the written annual document log of the disposition of PCBs and PCB Items. The written annual document log must be prepared for each facility by July 1 covering the previous calendar year (January through December). The annual document log shall be maintained for at least 3 years after the facility ceases using or storing PCBs and PCB Items in the quantities prescribed in this paragraph. Annual records (manifests and certificates of disposal) shall be maintained for the same period. The annual records and the annual document log shall be available for inspection at the facility where they are maintained by authorized representatives of EPA during normal business hours, and each owner or operator of a facility subject to these requirements shall know the location of these records. All records and annual documents required to be prepared and maintained by this section prior to February 5, 1990 shall continue to be maintained at the facility for the same time as the annual records and the annual document log. The annual document required for 1989 shall cover the period from January 1, 1989 to February 5, 1990.

(1) The annual records shall include the following:

(i) All signed manifests generated by the facility during the calendar year.

(ii) All Certificates of Disposal that have been received by the facility during the calendar year.

(iii) Records of inspections and cleanups performed in accordance with §761.65(c)(5).

(2) The written annual document log shall include the following:

(i) The name, address, and EPA identification number of the facility covered by the annual document log and the calendar year covered by the annual document log.

(ii) The unique manifest number of every manifest generated by the facility during the calendar year, and from each manifest and for unmanifested waste that may be stored at the facility, the following information:

(A) For bulk PCB waste (*e.g.*, in a tanker or truck), its weight in kilograms, the first date it was removed from service for disposal, the date it was placed into transport for off-site storage or disposal, and the date of disposal, if known.

(B) The serial number (if available) or other means of identifying each PCB Article (*e.g.*, transformer or capacitor), the weight in kilograms of the PCB waste in each transformer or capacitor, the date it was removed from service for disposal, the date it was placed in transport for off-site storage or disposal, and the date of disposal, if known.

(C) A unique number identifying each PCB Container, a description of the contents of each PCB Container, such as liquid, soil, cleanup debris, etc., including the total weight of the material in kilograms in each PCB Container, the first date material placed in each PCB Container was removed from service for disposal, and the date each PCB Container was placed in transport for off-site storage or disposal, and the date of disposal (if known).

(D) A unique number identifying each PCB Article Container, a description of the contents of each PCB Article Container, such as pipes, capacitors, electric motors, pumps, etc., including the total weight in kilograms of the content of each PCB Article Container, the first date a PCB Article placed in each PCB Article Container was removed from service for disposal,

and the date the PCB Article Container was placed in transport for off-site storage or disposal, and the date of disposal (if known.)

(iii) The total number by specific type of PCB Articles and the total weight in kilograms of PCBs in PCB Articles, the total number of PCB Article Containers and total weight in kilograms of the contents of PCB Article Containers, the total number of PCB Containers and the total weight in kilograms of the contents of PCB Containers, and the total weight in kilograms of bulk PCB waste that was placed into storage for disposal or disposed during the calendar year.

(iv) The total number of PCB Transformers and total weight in kilograms of PCBs contained in the transformers remaining in service at the end of the calendar year.

(v) The total number of Large High or Low Voltage PCB Capacitors remaining in service at the end of the calendar year.

(vi) The total weight in kilograms of any PCBs and PCB Items in PCB Containers, including the identification of container contents, remaining in service at the facility at the end of the calendar year.

(vii) For any PCBs or PCB item received from or shipped to another facility owned or operated by the same generator, the information required under paragraph (a)(2)(ii)(A) through (a)(2)(ii)(D) of this section.

(viii) A record of each telephone call, or other means of verification agreed upon by both parties, made to each designated commercial storer or designated disposer to confirm receipt of PCB waste transported by an independent transporter, as required by §761.208.

(ix) Whenever a PCB Item, excluding small capacitors, with a concentration of "50 ppm is distributed in commerce for reuse pursuant to §761.20(c)(1), the name, address, and telephone number of the person to whom the item was transferred, date of transfer, and the serial number of the item or the internal identification number, if a serial number is not available, must be recorded in the annual document log. The serial number or internal identification number shall be permanently marked on the equipment.

(3) [Reserved]

(4) For purposes of this paragraph, PCB Voltage Regulators shall be recorded as PCB Transformers.

(b) *Disposers and commercial storers of PCB waste.* Beginning February 5, 1990, each owner or operator of a facility (including high efficiency boiler operations) used for the commercial storage or disposal of PCBs and PCB Items shall maintain annual records on the disposition of all PCBs and PCB items at the facility and prepare and maintain a written annual document log that includes the information required by paragraphs (b)(2) of this section for PCBs and PCB Items that were handled as PCB waste at the facility. The written annual document log shall be prepared by July 1 for the previous calendar year (January through December). The written annual document log shall be maintained at each facility for at least 3 years after the facility is no longer used for the storage or disposal of PCBs and PCB Items except that, in the case of chemical waste landfills, the annual document log shall be maintained at least 20 years after the chemical waste landfill is no longer used for the disposal of PCBs and PCB Items. The annual records shall be maintained for the same period. The annual records and written annual document log shall be available at the facility for inspection by authorized representatives of the EPA. All records and annual documents required to be prepared and maintained by this section prior to February 5, 1990 shall continue to be maintained at the facility for the same time as the annual records and the annual document log. The annual document for 1989 shall cover the period from January 1, 1989 to February 5, 1990. From the written annual document log the owner or operator of a facility must prepare the annual report containing the information required by paragraphs (b)(3)(i) through (b)(3)(vi) of this section for PCBs and PCB Items that were handled as PCB waste at the facility during the previous calendar year (January through December). The annual report must be submitted by July 15 of each year for the preceding calendar year. If the facility ceases commercial PCB storage or disposal operations, the owner or operator of the facility shall provide at least 60 days advance written notice to the Regional Administrator for the region in which the facility is located of the date the facility intends to begin closure. d

(1) The annual records shall include the following:

(i) All signed manifests generated or received at the facility during the calendar year.

(ii) All Certificates of Disposal that have been generated or received by the facility during the calendar year.

(iii) Records of inspections and cleanups performed in accordance with §761.65(c)(5).

(2) The written annual document log shall include the following:

(i) The name, address, and EPA identification number of the storage or disposal facility covered by the annual document log and the calendar year covered by the annual document log.

(ii) For each manifest generated or received by the facility during the calendar year, the unique manifest number and the name and address of the facility that generated the manifest and the following information:

(A) For bulk PCB waste (*e.g.*, in a tanker or truck), its weight in kilograms, the first date PCB waste placed in the tanker or truck was removed from service for disposal, the date it was received at the facility, the date it was placed in transport for off-site disposal (if applicable), and the date of disposal, (if known).

(B) The serial number or other means of identifying each PCB Article, not in a PCB Container or PCB Article Container, the weight in kilograms of the PCB waste in the PCB Article, the date it was removed from service for disposal, the date it was received at the facility, the date it was placed in transport for off-site disposal (if applicable), and the date of disposal (if known).

(C) The unique number assigned by the generator identifying each PCB Container, a description of the contents of each PCB Container, such as liquid, soil, cleanup debris, etc., including the total weight of the PCB waste in kilograms in each PCB Container, the first date PCB waste placed in each PCB Container was removed from service for disposal, the date it was received at the facility, the date each PCB Container was placed in transport for off-site storage or disposal (as applicable), and the date the PCB Container was disposed of (if known).

(D) The unique number assigned by the generator identifying each PCB Article Container, a description of the contents of each PCB Article Container, such as pipes, capacitors, electric motors, pumps, etc., including the total weight in kilograms of the PCB waste in each PCB Article Container, the first date a PCB Article placed in each PCB Article Container was removed from service for disposal, the date it was received at the facility, the date each PCB Article Container was placed in transport for off-site storage or disposal (as applicable), and the date the PCB Article Container was disposed of (if known).

(E) Disposers of PCB waste shall include the confirmed date of disposal for items in paragraphs (b)(2)(ii)(A) through (b)(2)(ii)(D) of this section.

(iii) For any PCB waste disposed at a facility that generated the PCB waste or any PCB waste that was not manifested to the facility, the information required under paragraph (b)(2)(ii)(A) through (b)(2)(ii)(E) of this section.

(3) The owner or operator of a PCB disposal facility (including an owner or operator who disposes of his/her own waste and does not receive or generate manifests) or a commercial storage facility shall submit an annual report, which briefly summarizes the records and annual document log required to be maintained and prepared under paragraphs (b)(1) and (b)(2) of this section to the EPA Regional Administrator of the Region in which the facility is located by July 15 of each year, beginning with July 15, 1991. The first annual report submitted on July 15, 1991, shall be for the period starting February 5, 1990, and ending December 31, 1990. The annual report shall contain no confidential business information. The annual report shall consist of the information listed in paragraphs (b)(3)(i) through (b)(3)(vi) of this section.

(i) The name, address, and EPA identification number of the facility covered by the annual report for the calendar year.

(ii) A list of the numbers of all signed manifests of PCB waste initiated or received by the facility during that year.

(iii) The total weight in kilograms of bulk PCB waste, PCB waste in PCB Transformers, PCB waste in PCB Large High or Low Voltage Capacitors, PCB waste in PCB Article Containers, and PCB waste in PCB Containers in storage at the facility at the beginning of the calendar year, received or generated at the facility, transferred to another facility, or disposed of at the facility during the calendar year. The information must be provided for each of these categories, as appropriate.

(iv) The total number of PCB Transformers, the total number of PCB Large High or Low Voltage Capacitors, the total number of PCB Article Containers, and the total number of PCB Containers in storage at the facility at the beginning of the calendar year, received or generated at the facility, transferred to another facility, or disposed of at the facility during the calendar year. The information must be provided for each of these categories, as appropriate.

(v) The total weight in kilograms of each of the following PCB categories: bulk PCB waste, PCB waste in PCB Transformers, PCB waste in PCB Large High or Low Voltage Capacitors, PCB waste in PCB Article Containers, and PCB waste in PCB Containers remaining in storage for disposal at the facility at the end of the calendar year.

(vi) The total number of PCB Transformers, the total number of PCB Large High or Low Voltage Capacitors, the total number of PCB Article Containers, and the total number of PCB Containers remaining in storage for disposal at the facility at the end of the calendar year.

(vii) The requirement to submit annual reports to the Regional Administrator continues until the submission of the annual report for the calendar year during which the facility ceases PCB storage or disposal operations. Storage operations have not ceased until all PCB waste, including any PCB waste generated during closure, has been removed from the facility.

(4) Whenever a commercial storer of PCB waste accepts PCBs or PCB Items at his storage facility and transfers the PCB waste off-site to another facility for storage or disposal, the commercial storer of PCB waste shall initiate a manifest under subpart K of this part for the transfer of PCBs or PCB Items to the next storage or disposal facility.

Note: Any requirements for weights in kilograms of PCBs may be calculated values if the internal volume of PCBs in containers and transformers is known and included in the reports, together with any assumptions on the density of the PCBs contained in the containers or tranformers. If the internal volume of PCBs is not known, a best estimate may be used.

(5) For purposes of this paragraph, PCB Voltage Regulators shall be recorded and reported as PCB Transformers.

(c) *Incineration facilities.* Each owner or operator of a PCB incinerator facility shall collect and maintain for a period of 5 years from the date of collection the following information, in addition to the information required in paragraph (b) of this section:

(1) When PCBs are being incinerated, the following continuous and short-interval data:

(i) Rate and quantity of PCBs fed to the combustion system as required in §761.70(a)(3);

(ii) Temperature of the combustion process as required in §761.70(a)(4); and

(iii) Stack emission product to include O_2, CO, and CO_2 as required in §761.70(a)(7).

(2) When PCBs are being incinerated, data and records on the monitoring of stack emissions as required in §761.70(a)(6).

(3) Total weight in kilograms of any solid residues generated by the incineration of PCBs and PCB Items during the calendar year, the total weight in kilograms of any solid residues disposed of by the facility in chemical waste landfills, and the total weight in kilograms of any solid residues remaining on the facility site.

(4) When PCBs and PCB Items are being incinerated, additional periodic data shall be collected and maintained as specified by the Regional Administrator pursuant to §761.70(d)(4).

(5) Upon any suspension of the operation of any incinerator pursuant to §761.70(a)(8), the owner or operator of such an incinerator shall prepare a document. The document shall, at a minimum, include the date and time of the suspension and an explanation of the circumstances causing the suspension of operation. The document shall be sent to the appropriate Regional Administrator within 30 days of any such suspension.

(d) *Chemical waste landfill facilities.* Each owner or operator of a PCB chemical waste landfill facility shall collect and maintain until at least 20 years after the chemical waste landfill is no longer used for the disposal of PCBs the following information in addition to the information required in paragraph (b) of this section:

(1) Any water analysis obtained in compliance with §761.75(b)(6)(iii); and

(2) Any operations records including burial coordinates of wastes obtained in compliance with §761.75(b)(8)(ii).

(e) *High efficiency boiler facilities.* Each owner or operator of a high efficiency boiler used for the disposal of liquids between 50 and 500 ppm PCB shall collect and maintain for a period of 5 years the following information, in addition to the information required in paragraph (b) of this section:

(1) For each month PCBs are burned in the boiler the carbon monoxide and excess oxygen data required in §761.71(a)(1)(viii) and §761.71(b)(1)(viii);

(2) The quantity of PCBs burned each month as required in §761.71(a)(1)(vii) and §761.71(b)(1)(vii); and

(3) For each month PCBs (other than mineral oil dielectric fluid) are burned, chemical analysis data of the waste as required in §761.71(b)(2)(vi).

(f) *Retention of special records by storage and disposal facilities.* In addition to the information required to be maintained under paragraphs (b), (c), (d) and (e) of this section, each owner or operator of a PCB storage or disposal facility (including high efficiency boiler operations) shall collect and maintain for the time period specified in paragraph (b) of this section the following data:

(1) All documents, correspondence, and data that have been provided to the owner or operator of the facility by any State or local government agency and that pertain to the storage or disposal of PCBs and PCB Items at the facility.

(2) All documents, correspondence, and data that have been provided by the owner or operator of the facility to any State or local government agency and that pertain to the storage or disposal of PCBs and PCB Items at the facility.

(3) Any applications and related correspondence sent by the owner or operator of the facility to any local, State, or Federal authorities in regard to waste water discharge permits, solid waste permits, building permits, or other permits or authorizations such as those required by §§761.70(d) and 761.75(c).

(Sec. 6, Pub. L. 94-469, 90 Stat. 2020 (15 U.S.C. 2605)

[44 FR 31542, May 31, 1979. Redesignated at 47 FR 19527, May 6, 1982, and further redesignated at 47 FR 37360, Aug. 25, 1982; 49 FR 28191, July 10, 1984; 53 FR 12524, Apr. 15, 1988; 54 FR 52750, Dec. 21, 1989; 55 FR 26205, June 27, 1990; 58 FR 34205, June 23, 1993; 63 FR 35461, June 29, 1998]

Note AP
Information Management
Other (Injection Wells – Closure)

40 CFR 146.72, lists the requirements of post-closure care for injection wells.
40 CFR 146.72(b)(5) requires retention of records for three years after the injection well has been closed.

TITLE 40 - PROTECTION OF ENVIRONMENT
CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY
SUBCHAPTER D - WATER PROGRAMS

Part 146 - Underground Injection Control Program: Criteria and Standards

Subpart G - Criteria and Standards Applicable to Class I Hazardous Waste Injection

§72. Post-closure care

(a) The owner or operator of a Class I hazardous waste well shall prepare, maintain, and comply with a plan for post-closure care that meets the requirements of paragraph (b) of this section and is acceptable to the Director. The obligation to implement the post-closure plan survives the termination of a permit or the cessation of injection activities. The requirement to maintain an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit.

(1) The owner or operator shall submit the plan as a part of the permit application and, upon approval by the Director, such plan shall be a condition of any permit issued.

(2) The owner or operator shall submit any proposed significant revision to the plan as appropriate over the life of the well, but no later than the date of the closure report required under §146.71(c).

(3) The plan shall assure financial responsibility as required in §146.73.

(4) The plan shall include the following information:

(i) The pressure in the injection zone before injection began;

(ii) The anticipated pressure in the injection zone at the time of closure;

(iii) The predicted time until pressure in the injection zone decays to the point that the well's cone of influence no longer ntersects the base of the lowermost USDW;

(iv) Predicted position of the waste front at closure;

(v) The status of any cleanups required under §146.64; and

(vi) The estimated cost of proposed post-closure care.

(5) At the request of the owner or operator, or on his own initiative, the Director may modify the post-closure plan after submission of the closure report following the procedures in §124.5.

(b) The owner or operator shall:

(1) Continue and complete any cleanup action required under §146.64, if applicable;

(2) Continue to conduct any groundwater monitoring required under the permit until pressure in the injection zone decays to the point that the well's cone of influence no longer intersects the base of the lowermost USDW. The Director may extend the period of post-closure monitoring if he determines that the well may endanger a USDW.

(3) Submit a survey plat to the local zoning authority designated by the Director. The plat shall indicate the location of the well relative to permanently surveyed benchmarks. A copy of the plat shall be submitted to the Regional Administrator of the appropriate EPA Regional Office.

(4) Provide appropriate notification and information to such State and local authorities as have cognizance over drilling activities to enable such State and local authorities to impose appropriate conditions on subsequent drilling activities that may penetrate the well's confining or injection zone.

(5) Retain, for a period of three years following well closure, records reflecting the nature, composition and volume of all injected fluids. The Director shall require the owner or operator to deliver the records to the Director at the conclusion of the retention period, and the records shall thereafter be retained at a location designated by the Director for that purpose.

(c) Each owner of a Class I hazardous waste injection well, and the owner of the surface or subsurface property on or in which a Class I hazardous waste injection well is located, must record a notation on the deed to the facility property or on some other instrument which is normally examined during title search that will in perpetuity provide any potential purchaser of the property the following information:

(1) The fact that land has been used to manage hazardous waste;

(2) The name of the State agency or local authority with which the plat was filed, as well as the address of the Regional Environmental Protection Agency Office to which it was submitted;

(3) The type and volume of waste injected, the injection interval or intervals into which it was injected, and the period over which injection occurred.

Note AQ
Safety Systems & Institutional Controls
UMTRCA I & II
Fences/Signs/Security

The primary regulations for UMTRCA I & II sites, 10 CFR 40.27 and 10 CFR 40.28, do not have requirements for fences, signs, or security. In the *Long-Term Surveillance and Maintenance Program Plan, Revision 0*, Appendix B, lists applicable laws and regulations and within the list is 10 CFR 61. 10 CFR 61.42 states *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.* This does not specifically state to install a fence, require signs, or have a security system, but it implies the need for at least signs and possible fences to prevent individuals from inadvertently intruding into a disposal site.

CFR PART 61 - LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE
Subpart C - Performance Objectives

Table of Contents:

§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.

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

Concentrations of radioactive material which may be released to the general environment in groundwater, 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.

§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.

§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.

§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.

Note AR
Safety Systems & Institutional Controls
DOE & NWPA
Fences/Signs/Security

DOE does not have any Orders that require fences, signs, or security systems to protect human health or the environment from hazardous waste. DOE does have requirements for protection of property as quoted below from DOE 5632.1C-1, Manual for Protection and Controls of Safeguards and Security Interests. A hazardous waste site would not be property requiring protection, as it would have very little monetary value compared to other DOE facilities. However, from a vulnerability standpoint, some LTS sites may require security systems.

DOE M 5632.1C-1, MANUAL FOR PROTECTION AND CONTROL OF SAFEGUARDS AND SECURITY INTERESTS
7-15-94
CHAPTER V

SECURITY AND RESTRICTED ACCESS AREAS

2. PROPERTY PROTECTION AREA. A Property Protection Area is a Security Area established for the protection of Departmental property. A Property Protection Area may be established to protect against damage, destruction, or theft of Government-owned property. Measures taken shall be adequate to give reasonable assurance of protection and may include physical barriers, access control systems, protective personnel, intrusion detection systems, and locks and keys. Protective measures taken shall provide appropriate, graded protection.

a. Access controls, where determined to be necessary by local authority, shall be implemented to protect Departmental property and facilities.

b. Signs prohibiting trespassing, where necessary, shall be posted around the perimeter and at each entrance to the Property Protection Area in accordance with Title 10 CFR Part 860, "Trespassing on Administration Property" and Title 41 CFR Part 101-19.3, "Federal Property Management Regulation." See Chapter XIII.

c. Vehicles and hand-carried items entering or leaving shall be subject to inspection to deter and detect unauthorized removal of Government assets.

d. Physical barriers, where determined to be necessary by local authority, shall be used to protect property and facilities.

Note AS
Safety Systems & Institutional Controls
RCRA
Signs/Fences/Security

40 CFR 264.117 (for RCRA Part B facilities) and 40 CFR 265.117 (for RCRA Part A facilities) state the Regional Administrator may require the same security as required during operations of the facility if the hazardous waste remains exposed after closure or access by the public or domestic livestock may pose a hazard to human health. Security requirements are contained in 40 CFR 264.14 (for RCRA Part B permitted facilities) or 40 CFR 265.14 (for RCRA Part A facilities). The requirements, in most cases, will include a fence with a controlled access, locked gate or attendant. Signs are required to be posted in accordance with 40 CFR 264.14 (c) for RCRA Part B facilities or 40 CFR 265.14 (c) for RCRA Part A facilities.

[CFR] PART 264 SUBPART G - Closure and Post-Closure
[TITLE 40] [PART 264] [SUBPART G]
Subpart G - Closure and Post-Closure

Source: 51 FR 16444, May 2, 1986, unless otherwise noted.

§264.117 Post-closure care and use of property.

(b) The Regional Administrator may require, at partial and final closure, continuation of any of the security requirements of §264.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §264.118

[CFR] PART 264 SUBPART B - General Facility Standards
[TITLE 40] [PART 264] [SUBPART B]
Subpart B - General Facility Standards

§264.14 Security.

(a) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his facility, *unless* he can demonstrate to the Regional Administrator that:

(1) Physical contact with the waste, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and

(2) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this part.

[*Comment:* Part 270 of this chapter requires that an owner or operator who wishes to make the demonstration referred to above must do so with part B of the permit application.]

(b) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a facility must have:

(1) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the active portion of the facility; or

(2)(i) An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility; and

(ii) A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility).

[*Comment:* The requirements of paragraph (b) of this section are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of paragraph (b) (1) or (2) of this section.]

(c) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a sign with the legend, "Danger-Unauthorized Personnel Keep Out", must be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility (e.g., facilities in counties bordering the Canadian province of Quebec must post signs in French; facilities in counties bordering Mexico must post signs in Spanish), and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger-Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

[*Comment:* See §264.117(b) for discussion of security requirements at disposal facilities during the post-closure care period.]

[45 FR 33221, May 19, 1980, as amended at 46 FR 2848, Jan. 12, 1981; 48 FR 14294, Apr. 1, 1983; 50 FR 4514, Jan. 31, 1985]

[CFR] PART 265 SUBPART G - Closure and Post-Closure
[TITLE 40] [PART 265] [SUBPART G]

§265.117 Post-closure care and use of property.

(b) The Regional Administrator may require, at partial and final closure, continuation of any of the security requirements of §265.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §265.118.

[CFR] PART 265 SUBPART B - General Facility Standards
[TITLE 40] [PART 265] [SUBPART B]

Subpart B - General Facility Standards

§265.14 Security.

(a) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his facility, *unless:1*

(1) Physical contact with the waste, structures, or equipment with the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility, and

(2) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this part.

(b) Unless exempt under paragraphs (a)(1) and (2) of this section, a facility must have:

(1) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards of facility personnel) which continuously monitors and controls entry onto the active portion of the facility; or

(2)(i) An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility; and

(ii) A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility).

[*Comment:* The requirements of paragraph (b) of this section are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of paragraph (b)(1) or (2) of this section.]

(c) Unless exempt under paragraphs (a)(1) and (a)(2) of this section, a sign with the legend, "Danger-Unauthorized Personnel Keep Out," must be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility (e.g., facilities in counties bordering the Canadian province of Quebec must post signs in French; facilities in counties bordering Mexico must post signs in Spanish), and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger-Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

[*Comment:* See §265.117(b) for discussion of security requirements at disposal facilities during the post-closure care period.]

Note AT
Institutional Controls & Safety Systems
CERCLA
Signs/Fences/Security

CERCLA applies Applicable or Relevant and Appropriate Requirements (ARARs) where hazardous substances are left onsite. Section 121 states that the following are ARARs for the hazardous substance, pollutant, or contaminant concerned:

- Any standard, requirement, criteria, or limitation under any federal environmental law; and
- Any promulgated standard, requirement, criteria or limitation under a state environmental or facility siting law that is more stringent than any federal standard.

Signs, fences, and site security ARARs, documented in the ROD along with the requirements for the site closure plan, are most likely to be derived from the requirements of either 40 CFR 264.117 or 40 CFR 265.117. 40 CFR 264.117 and 40 CFR 265.117 have the same requirements and state the Regional Administrator may require the same security as required during operations of the facility if the hazardous waste remain exposed after closure or access by the public or domestic livestock may pose a hazard to human health. Security requirements are contained in 40 CFR 264.14 or 40 CFR 265.14. These requirements in most cases will be a fence with a controlled access, locked gate or attendant. Signs are required to be posted in accordance with 40 CFR 264.14 (c) or 40 CFR 265.14 (c).

[CFR] PART 264 SUBPART G - Closure and Post-Closure
[TITLE 40] [PART 264] [SUBPART G]

Subpart G - Closure and Post-Closure

Source: 51 FR 16444, May 2, 1986, unless otherwise noted.

§264.117 Post-closure care and use of property.

(b) The Regional Administrator may require, at partial and final closure, continuation of any of the security requirements of §264.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §264.118

[CFR] PART 264 SUBPART B - General Facility Standards
[TITLE 40] [PART 264] [SUBPART B]

Subpart B - General Facility Standards

§264.14 Security.

(a) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his facility, *unless* he can demonstrate to the Regional Administrator that:

(1) Physical contact with the waste, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and

(2) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this part.

[*Comment:* Part 270 of this chapter requires that an owner or operator who wishes to make the demonstration referred to above must do so with part B of the permit application.]

(b) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a facility must have:

(1) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the active portion of the facility; or

(2)(i) An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility; and

(ii) A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility).

[*Comment:* The requirements of paragraph (b) of this section are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of paragraph (b) (1) or (2) of this section.]

(c) Unless the owner or operator has made a successful demonstration under paragraphs (a) (1) and (2) of this section, a sign with the legend, "Danger-Unauthorized Personnel Keep Out", must be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility (e.g., facilities in counties bordering the Canadian province of Quebec must post signs in French; facilities in counties bordering Mexico must post signs in Spanish), and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger-Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

[*Comment:* See §264.117(b) for discussion of security requirements at disposal facilities during the post-closure care period.]

[45 FR 33221, May 19, 1980, as amended at 46 FR 2848, Jan. 12, 1981; 48 FR 14294, Apr. 1, 1983; 50 FR 4514, Jan. 31, 1985]

[CFR] PART 265 SUBPART G - Closure and Post-Closure
[TITLE 40] [PART 265] [SUBPART G]

§265.117 Post-closure care and use of property.

(b) The Regional Administrator may require, at partial and final closure, continuation of any of the security requirements of §265.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring systems, unless the Regional Administrator finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in §265.118.

[CFR] PART 265 SUBPART B - General Facility Standards
[TITLE 40] [PART 265] [SUBPART B]

Subpart B - General Facility Standards

§265.14 Security.

(a) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his facility, *unless:*

(1) Physical contact with the waste, structures, or equipment with the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility, and

(2) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this part.

(b) Unless exempt under paragraphs (a)(1) and (2) of this section, a facility must have:

(1) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards of facility personnel) which continuously monitors and controls entry onto the active portion of the facility; or

(2)(i) An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility; and

(ii) A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility).

[*Comment:* The requirements of paragraph (b) of this section are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of paragraph (b)(1) or (2) of this section.]

(c) Unless exempt under paragraphs (a)(1) and (a)(2) of this section, a sign with the legend, "Danger-Unauthorized Personnel Keep Out," must be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility (e.g., facilities in counties bordering the Canadian province of Quebec must post signs in French; facilities in counties bordering Mexico must post signs in Spanish), and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger-Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

[*Comment:* See §265.117(b) for discussion of security requirements at disposal facilities during the post-closure care period.]

Note AU
Institutional Controls & Safety Systems
Other (Asbestos)
Signs/Fences

It is highly likely there are or will be disposal sites within DOE, which will contain asbestos contaminated waste. There are specific requirements relative to institutional controls for disposal sites containing asbestos contaminated waste. It is assumed the asbestos contaminated waste was generated from either building renovation or demolition. 40 CFR 61.150, Standard for waste disposal for manufacturing, fabricating, demolition, renovation, and spraying operations states:

> (b) All asbestos-containing waste material shall be deposited as soon as is practical by the waste generator at:
>
> (1) A waste disposal site operated in accordance with the provisions of §61.154, or
>
> (2) An EPA-approved site that converts RACM and asbestos-containing waste material into nonasbestos (asbestos-free) material according to the provisions of §61.155.
>
> (3) The requirements of paragraph (b) of this section do not apply to Category I nonfriable ACM that is not RACM.

40 CFR 61.154 and 40 CFR 61.155 refers to 40 CFR 61.151, Standard for Inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations. The applicable requirements from 40 CFR 61.151 for long term stewardship are:

> (b) Unless a natural barrier adequately deters access by the general public, install and maintain warning signs and fencing as follows, or comply with paragraph (a)(2) or (a)(3) of this section.
>
> (1) Display warning signs at all entrances and at intervals of 100 m (328 ft) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material was deposited. The warning signs must:
>
> (i) Be posted in such a manner and location that a person can easily read the legend; and
>
> (ii) Conform to the requirements for 51 cm x 36 cm (20"x14") upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and
>
> (iii) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph.

Legend	Notation
Asbestos Waste Disposal Site	2.5 cm (1 inch) Sans Serif, Gothic or Block
Do Not Create Dust	1.9 cm ($^{3/4}$ inch) Sans Serif, Gothic or Block
Breathing Asbestos is Hazardous to Your Health	14 Point Gothic.

> Spacing between any two lines must be at least equal to the height of the upper of the two lines.
> (2) Fence the perimeter of the site in a manner adequate to deter access by the general public.
> (3) When requesting a determination on whether a natural barrier adequately deters public access, supply information enabling the Administrator to determine whether a fence or a natural barrier adequately deters access by the general public.
> (c) The owner or operator may use an alternative control method that has received prior approval of the Administrator rather than comply with the requirements of paragraph (a) or (b) of this section.

Appendix B

DOE Environmental Records Schedule

REQUEST FOR RECORDS DISPOSITION AUTHORITY

(See Instructions on reverse)

LEAVE BLANK (NARA) use only)

JOB NUMBER N1-434-98-28

TO NATIONAL ARCHIVES and RECORDS ADMINISTRATION (NIR)
WASHINGTON, DC 20408

DATE RECEIVED 7-15-98

1 FROM (Agency or establishment)
Department of Energy

2 MAJOR SUBDIVISION

3 MINOR SUBDIVISION

NOTIFICATION TO AGENCY

In accordance with the previous provisions of 44 U S C 3303a the disposition request, including amendments, is approved except for items that may be marked "disposition not approved" or "withdrawn" in column 10

4 NAME OF PERSON WITH WHOM TO CONFER	5 TELEPHONE
John E. Davenport	301-903-4726

DATE 5-19-00 ARCHIVIST OF THE UNITED STATES

6 AGENCY CERTIFICATION

I hereby certify that I am authorized to act for this agency in matters pertaining to the disposition of its records and that the records proposed for disposal on the attached 57 page(s) are not now needed for the business of this agency or will not be needed after the retention periods specified, and that written concurrence from the General Accounting Office, under the provisions of Title 8 of the GAO Manual for Guidance of Federal Agencies,

☒ is not required, ☐ is attached, or ☐ has been requested

DATE	SIGNATURE OF AGENCY REPRESENTATIVE	TITLE
7/9/98	John E. Davenport	Departmental Records Officer

7 ITEM NO	8 DESCRIPTION OF ITEM AND PROPOSED DISPOSITION	9 GRS OR SUPERSEDED JOB CITATION	10 ACTION TAKEN (NARA USE ONLY)
	DOE Records Schedule for Environmental Records See attached		

DOE RECORDS SCHEDULE FOR ENVIRONMENTAL RECORDS

March 1999

CONTENTS

CONTENTS (Continued)

CONTENTS (Continued)

CONTENTS (Continued)

LIST OF TERMS

ALARA	as low as reasonably achievable
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CX	categorical exclusion
DOE	U.S. Department of Energy
EA	environmental assessment
ECL	environmental checklist
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-To-Know Act of 1986
FFA&CO	Federal Facility Agreement & Consent Order
FRC	Federal Records Center
HEPA	high-efficiency particulate air
IB	information bulletin
MSDS	material safety data sheet
NAAQS	National Ambient Air Quality Standards Program
NARA	National Archives and Records Administration
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Safety and Health
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act of 1976
RI/FS	remedial investigation/feasibility study
ROD	record of decision
SA	supplemental analysis
SAR	safety analysis report
SARA	Superfund Amendment and Reauthorization Act of 1986
SDWA	Safe Drinking Water Act
SPCC	spill prevention control and counter-measures
TRU	transuranic
TSR	technical safety requirement
USC	United States Code
UST	underground storage tank
VOC	volative organic compound

DOE RECORDS SCHEDULE FOR ENVIRONMENTAL RECORDS

INTRODUCTION

This schedule provides for the disposition of U.S. Department of Energy (DOE) records created to comply with or needed to support compliance with Federal environmental laws and implementing regulations. The laws and implementing regulations encompass, but are not limited to Resource Conservation and Recovery Act of 1976 (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Clean Air Act (CAA), Clean Water Act, Soil and Water Resources Conservation Act of 1977, United States Code (USC) Code of Federal Regulations (CFR), and National Environmental Policy Act (NEPA) requirements, as well as other regulatory requirements. When regulatory citations have been provided, they are referenced.

This schedule applies to all applicable records, regardless of format/media. When media changes are planned, special care should be taken to transfer information to media that can meet the specified retention. This becomes particularly important since electronic information technology changes rapidly. If electronic records need to be retained permanently, they should be in a format currently approved by the National Archives and Records Administration (NARA).

If records identified in this schedule are already in the existing DOE Record Schedules, a cross reference has been provided.

Because this schedule is intended to have a broad use within the DOE complex, state or local regulations have not been taken into account here. If any regulation requires a longer retention, the record should be kept to meet the longer term requirement. By their nature, environmental records may have significant legal or public interest aspects. After the environmental records have met their scheduled retention, a review of these records should be made for continued need. Each site should establish a review team composed of members who understand the records under evaluation and/or the records management function of the organization. The team should include the agency's Records Manager, Archivist, or Historian, Project Manager, current records holders, and/or subject matter experts. Ideally, the evaluation process would begin with an assessment of records written by the Project Manager during or shortly after the close of a project. This provides a basis for the review team to use in their subsequent evaluation of the project.

For the intent of this schedule the definition for "life of facility" is the period from the initial receipt of hazardous waste at the facility until documented closure. Facility may be defined as a tank, a building, a waste site, or a laboratory.

The primary focus of this schedule is the retention and disposition of records of those activities that may affect the physical environment. The records covered by this schedule document the results of sampling and analysis, monitoring, permitting and disposal and cleanup activities affecting the physical environment. Environmental records include, but are not limited

to, the administrative record (as defined/required by CERCLA/RCRA and other dangerous waste programs), permits, reports, studies, evaluations, characterizations, logbooks of various kinds, as well as more obvious burial or storage records, closure plans, and waste management documentation. Other issues such as, medical, health and safety concerns emanating from these activities, but not specifically required by environmental regulations, will not be addressed in this schedule.

These records may be organized and maintained as project case files to provide a more useful reference/retrievability or as individual record series. The project case file approach provides a reasonable record of an environmental project from start to finish which would allow for reconstruction or verification of relevant procedures and analyses (see Section 1.k).

Records covered by this schedule are grouped into the following six categories:

- Administration
- Monitoring
- Regulatory Compliance
- Sampling and Analysis
- Permitting
- Disposal/Cleanup

There are overlaps between the identified six categories where records may fit into more than one category. The predominant activity should be taken into consideration when scheduling records.

1. ADMINISTRATION

Environmental administration records include program or project management records, reports, and records documenting protection and preservation of natural resources.

Description of Records	Disposition
a. Administrative Record	
Records documenting the basis for selecting a CERCLA response action/remediation action, RCRA permit/permit modification/or closure plan action by the U.S. Environmental Protection Agency (EPA), the DOE, state agencies, the public, or other interested parties. These files contain historical data on the identification and remediation alternative of waste sites. The Administrative Record also includes documents which demonstrate the public's opportunity to participate in and comment on the selection of the remedial action. Documents may include, but are not limited to, remedial investigation/feasibility study (RI/FS) work plan, guidance documents, proposed plan, public notices, record of decision (ROD), explanation of significant differences, permit application, corrective measures study report, interim response action proposal, applicable NEPA documentation, and all other decision documents available for public comment and use.	Destroy 75 years after the termination of the applicable FFA&CO. DOE shall notify the EPA at least 90 calendar days prior to the destruction of these records, and upon request by the EPA, DOE shall relinquish custody of the records or copies of the records to the EPA.
b. Safety and Health Records	
(1) Emergency Response/Contingency Plans	
Emergency response plans identify environmental and safety hazards at a facility and surrounding areas. These plans should coordinate state, federal, and local governments, Native Americans, and other emergency personnel's responses to those hazards.	Destroy 3 years after issuance of a new plan.

	Description of Records	Disposition
	Records include, but are not limited to: operational plans, contingency plans, prevention plans, emergency procedures, compliance to regulatory requirements for emergency situations, site maps, release forms, correspondence, and other related records. NOTE: One record copy of each plan or directive, along with assessment/ audit changes to the documentation, must be kept with the agency's set of master directive files for the emergency plan. (See GRS 18, Item 27.)	
(2)	Tier Two Emergency and Hazardous Chemical Inventory Reports	Destroy after 3 years of issuance of report. 40 CFR 372.10
(3)	Toxic Chemical Release Inventory Report	Destroy after 3 years of issuance of report. 40 CFR 372.10
~~(4)~~	Safety Analysis Reports	
	Safety Analysis Reports (SARs) ensure all safety and health issues and impacts to the environment and personnel have been met for all site activities, new construction, or modifications to a facility; ensure all risks are reduced to levels as low as reasonably achievable before operation or the activity proceeds; and identify environmental issues or information during and after dismantlement and decommissioning including type of hazard, life of material, and impacts to safety and health.	Retire to Federal Records Center (FRC) 10 years after issuance of report; destroy 25 years after issuance of report. DOE 5480.22

Withdrawn
See 4-19-00 Letter
182

Description of Records	Disposition
Records include document reviews of current and potential risks involved before work proceeds, individual safety analysis that pertains to specific activities related to the SAR, and Technical Safety Requirements (TSRs) which is specific standards or regulations that pertain to the activity, site characteristics, facility descriptions, safety designs, facility hazard analysis and classification, health and safety criteria, analysis of operation, institutional safety provisions, emergency preparedness, and other related subjects.	
(5) Safety and Health CERCLA/RCRA Documents	
Records associated with Safety and Health related documentation required by CERCLA/ RCRA, other than CERCLA-funded cooperative agreements.	
(a) Records which notify or support worker protection and safety including but not limited to safety incident, safety analysis, safety meetings, safety awards, and safety assessments.	Destroy after 5 years. 29 CFR 1910.120
(b) Occupational Safety and Health Administration (OSHA) records, National Institute of Occupational Safety and Health (NIOSH) records, hazard and accident analysis records, Criticality Safety Analysis/Approval records, Health Surveillance Program records, other specific Safety and Health records.	Destroy after 30 years. 29 CFR 1910.20
(c) Dosimetry records on employees subject to ionizing radiation that are personally monitored.	Destroy when 75 years old. See DRS 1.6, NCI-430-76-9-(4)

Description of Records	Disposition
c. Archaeological Records	
Records resulting in activities conducted on lands owned in fee by Native Americans or held in trust by the United States for Native Americans. These records can include, but are not limited to; contracts, permits, agreements and related policies, procedures, protocols, or waivers; archaeological site locations, surveys of areas, correspondence, photographs, analysis, reports and findings, drawings, maps, ground surveys, excavation notes, cultural resources; and, site restoration plans, proposals, or other reclamation types of activity records.	Permanent. Cutoff annually. Transfer to NARA 25 years after cutoff, in 5 year blocks.
d. Environmental Administration Reports Environmental, safety and health administrative program reports prepared, formulated, or consolidated in formally organized field office, contractor, or sub-contractor files that specify or document compliance, achievements, status, deliverables, progress or development of departments, programs, projects, organizations, etc.; that pertain to the mission or functions for which the field office, contractor, or subcontractor has primary oversight or responsibility; or that document opinions and decisions which set policy or precedent.	
(1) DOE Environmental/Safety Reports	
Reports relating to DOE-wide environmental, human health, employee and/or public safety and oversight reports.	Permanent. Cutoff when superseded, obsolete, or canceled. Transfer to NARA 25 years after cutoff.

	Description of Records	Disposition
(2)	DOE Field/Contractor Environmental/Safety Reports	
	Reports relating to field office, contractor or subcontractor environmental, human health, employee and/or public safety and oversight reports.	Cutoff when superseded, obsolete, or canceled. Destroy when 75 years old.
(3)	Daily Reports	
	Reports relating to routine, daily business functions, recurring transactions, or activities associated with environmental, safety, and health operations.	Cutoff when superseded, obsolete, or canceled. Destroy when 7 years old.
(4)	Air Monitoring Reports	
	These reports document the monitoring data for the purpose of determining if the level of hazardous, volative organic compounds (VOC), visible air contaminants, and radionuclide airborne materials are being released by a site and at what concentrations. Records may include, but not be limited to, monitoring data from routine radiological and nonradiological environmental surveillance activities, and summary listings of the weekly sample including analytical results, detection limits and spike/blank recoveries.	Retire to FRC after 25 years after issuance of report. Destroy after 75 years following issuance of report and with the approval from the Sites General Counsel's Office.

Description of Records	Disposition
(5) National Emission Standards for Hazardous Air Pollutants (NESHAP) Annual Reports	
These reports documents program plans, regulatory drivers and emission inventory guidelines for air and pollution monitoring to ensure compliance. Records may include, but are not limited to, input parameter and modeling results for building ventilation stacks, stack/vent emission survey reports, emission sampling reports, type of chemical and amount emitted, reactor data, estimates of does to the population, notes, correspondence, fugitive source emission assessment, sample data for surface radioactivity, radionuclide type, location, sample range, standard deviation, reference, inventory and documentation source.	Retire to FRC 25 years after issuance of report. Destroy after 75 years following issuance of report and with the approval of the Sites General Counsel's Office.
(6) Air Emissions Permit Reports	
These reports documents effluent air monitoring activities as designated by EPA for permitted sources and equipment. The reports contain raw data to authenticate operational integrity.	Retire to FRC 25 years after issuance of report. Destroy 75 years after issuance of report and with the approval of the Sites General Counsel's Office.
(7) Annual Background Study Reports	
These reports document the preliminary results of an approved background study used by the EPA, the state, and DOE to evaluate contamination releases. These studies are used to develop information on the uncontaminated conditions of a site. The data is compared with data from areas that might be contaminated. Records may include, but are not limited to, data acquisitions and related correspondence, description of data collection methods and technology, data logs, subcontractor memos, and analytical results.	Retain on site and transfer to new owner.

Description of Records	Disposition
(8) Environmental Monitoring Reports	
These reports document monitoring data from routine radiological and nonradiological environmental surveillance activities. The report is created to document all the environmental activities completed at a site in order to be in full compliance with all applicable environmental laws and regulations. Records may include, but are not limited to: monitoring data, summary of meteorological data, permits, summary of analytical results, sample analysis of vegetation, soil, and water, and discussion of sampling procedures.	
(a) Environmental monitoring reports provided to identify the progress on the environmental monitoring plans, or on other related subjects.	Destroy when 75 years old. Cutoff when reports are superseded, obsolete, or canceled.
(b) Environmental monitoring reports defining the extent and levels of radioactive contamination in soil or real estate.	Permanent. Transfer to NARA when no longer needed by the Department.
(9) Community Radiation Monitoring Program Reports	
These reports document the cooperative effort of DOE, the DOE contractor site, and the surrounding communities in actively participating in an environmental surveillance program. Records may include, but are not limited to: list of participants, monitoring data, weather and external gamma radiation data, environmental thermoluminescent dosimeter measurement data, glossary, and distribution list.	Destroy 5 years after issuance of report.

Withdrawn JE
See 4-19-00 Letter

	Description of Records	Disposition
(10)	Waste Management Reports	
	These reports documenting waste management activities, other than CERCLA-funded cooperative agreements.	
	(a) Hazardous waste reports, hazardous substance reports, waste characterization reports, CERCLA/RCRA unit reports.	Permanent. Cutoff when waste is disposed of. Transfer to NARA 25 years after cutoff.
	(b) Waste minimization/prevention reports, waste reduction reports, waste disposal reports.	Destroy 150 years after issuance of report.
	(c) Required compliance reports, dumpster violations, dangerous waste reports, decay heat reports.	Destroy 5 years after final closure of facility.
	(d) RCRA Biennial Reports	Destroy after 3 years. 40 CFR 265.75
(11)	Reports of Noncompliance	
	These reports document noncompliances not reported under occurrence reporting systems. Series may include logs, surveys, analyses, investigative notes, and briefings.	Destroy 5 years after issuance of report.
(12)	Quality Control Reports	
	These reports document the quality control records for analytical laboratories.	Destroy 2 years after issuance of report.
(13)	Program Reports	
	Program, process, reduction and other detailed reports, to Federal, DOE-HQ/ Field Office, State, Local, contractor or subcontractor management, etc.	Retire to FRC in 25 years. Destroy after 75 years.

Description of Records	Disposition
e. Logbooks	
Logbooks/fieldbooks that document a chronological history which provides a summary of shift and daily activities related to program and functions. Logbooks may support calibration activities, problem resolution, sampling, monitoring, and reporting. Records may include, but are not limited to results, notes, drawings/sketches, and field information.	
(1) Sample and Analysis Logbooks	
Logbooks containing sample and analysis data.	Destroy when 75 years old. ~~or after incorporation into reports or after data has been summarized, validated, verified, or accepted whichever is earlier.~~
(2) Hazardous Material Logbooks	
Logbooks containing data relating to radiation, contamination, hazardous materials.	Destroy when 75 years old.
(3) Waste System Logbooks	
Logbooks containing information related to radioactive or hazardous waste streams.	Destroy when 75 years old, ~~or after incorporation into reports or after data has been summarized, validated, verified, or accepted whichever is earlier.~~
(4) Geology Logbooks	
Logs and logbooks, such as geologist field logs, subcontractor geotechnical operations logbooks, soil and soil gas survey sampling field logs, and characterization logbooks.	

Description of Records	Disposition
(a) Geologist field logs document field test bore holds, indicating the types of soils, gravels, cobbles, and sand that are found at the field test area. They give the sampler type and depth, inches/feet driven, inches recovered, sample condition, drilling rate, and other pertinent data. They contain field log boring forms and well development/ water monitoring data. Drilling/boring field logs are used to record geological data (such as the changes in soil or strata with depth), what projects are currently being worked on, and the time and results of routine environmental tasks.	Destroy when 75 years old ~~or after incorporation into reports or after data has been summarized, validated, verified, or accepted whichever is earlier.~~
(b) Soil and soil gas survey sampling field logs document efforts to collect and analyze soil and soil gas samples for possible site remediation or restoration.Destroy when 75 years old.	Destroy when 75 years old.
(c) Field logbooks containing pertinent soil monitoring calculations, observations, and interpretations of results.	Destroy when 75 years old ~~or after incorporation into reports or after data has been summarized, validated, verified, or accepted whichever is earlier.~~
(d) Field logbooks of laboratory technicians and field inspectors concerned with earth sciences.	Destroy when 75 years old ~~or after incorporation into reports or after data has been summarized, validated, verified, or accepted whichever is earlier.~~
(5) Daily Analysis Logbooks	
Logbooks describing analyses daily activities of the laboratory.	Destroy when 5 years old.

Description of Records	Disposition
(6) Operating Logbooks	
Logbooks listing significant action, daily surveillances and maintenance activities occurring during normal operations of applicable facility.	Destroy when 75 years old.
(7) Equipment Testing and Development Logbooks	
Logbooks documenting equipment testing and development.	Destroy after 5 years or after disposal or clearance of tool/equipment from project.
f. Planning Records	
(1) Environmental Monitoring Plan Records	
These records document a framework of the scope and extent of both liquid and gaseous effluent measurements, and related surveillance programs during the active lifetime of operations. These records define the quality assurance control program to ensure that all samples are collected and that the resulting data will be able to calculate the effect to the environment and public health. Records may include, but are not limited to, parameters and concentrations, analysis, cover letter transmittal, compliance summaries, findings and concerns, effluent inventory, data management and calculations.	Cutoff when superseded, obsolete, or canceled with approval of site owner.

	Description of Records	Disposition
(2)	Environmental Implementation Plan Records	
	These records document a framework which identifies the responsibilities for compliance management, direction, goals, and objectives with related strategies and timetables. These records are used to ensure that the facility is operated and managed in a manner that will protect, maintain and restore environmental quality and minimize potential threats to the environment and public health. These plans are submitted to the EPA for review, comment and approval.	Cutoff when superseded, obsolete, or canceled. Destroy when 5 years old with approval from site owner.
(3)	Waste Minimization and Pollution Prevention Implementation Plan Records	
	Records documenting the plan for implementing a Waste Minimization Program at DOE contractor sites. Information related to waste minimization is distributed to line organizations and selected groups to identify waste streams, and minimize or eliminate the toxicity and waste material at the site. Records may include, but are not limited to, correspondence, waste service center location, strategic planning, program changes, program accomplishments, findings, program support, distribution list and notes.	Cutoff when superseded, obsolete, or canceled. Destroy when 5 years old with approval from site owner.
(4)	Waste Stream Identification Plan Records	
	Records are used to manage or eliminate waste for pollution prevention requirements. Records may include, but are not limited to, project selection and guidance, position papers, baseline information, waste identification and concentration and waste generator reduction plans.	Cutoff when superseded, obsolete, or canceled. Destroy when 5 years old.

Description of Records	Disposition
(5) RCRA Interim Status Training Plan	
These plans describe the types and amounts of training for each person at a facility.	Destroy 75 years after issuance.
(6) Sample and Analysis Plans	
These are plans for sampling at former waste storage locations and other waste sites to identify potential contamination.	Destroy when analytical results are verified, accepted, and summarized, or until 5 years old whichever is earlier.
g. Electronic Data Management Systems	
(1) Geographic Information System	Retain on site. Destroy when no longer needed.
(2) Environmental Sites Databases	
Contains source information and other data gathered from many types of environmental activities other than site surveillance/monitoring (e.g., groundwater and biota) for potential and established/documented environmental sites.	
(a) Input Source	Destroy when data is entered in database and validated.
(b) Output	File with appropriate series using an approved schedule.

Description of Records	Disposition
(c) Master File	For those site-specific systems deemed to have special historical significance, submit SF 115 to NARA. All other systems destroy 10 years after certification of post closure care and monitoring and when all enforcement actions related to the facility have been settled.
(3) Waste Management Systems Any electronic or manual system that tracks and produces records of wastes, from cradle to grave, from generator, storage or transported locations, including laboratory processing.	
(a) Database and record systems which track wastes from creation through transportation, processing, storage; and reporting tracking records.	Delete or destroy when related records are destroyed, or 75 years from creation, whichever occurs later.
(b) Database system development records and documentation records which support the maintenance and operation of tracking systems	Destroy or delete upon authorized deletion of related system.
(4) Electronic Data Management Systems	
Computerized data retrieval systems that manage laboratory information including, but not limited to, tracking samples, managing or archiving analysis results and generating data reports.	Delete or destroy when related records are destroyed, or 75 years from creation, whichever occurs later.

Description of Records	Disposition
(5) Computer Model Radiation Calculation Records These records document the calculation of the highest capacity or highest level of radiation exposure and the results of the exposure to the population, and environment. Calculations are combined with information from environmental and dosimetric concentrations and health effects data to develop compliance reports required by various regulatory agencies. Records may include, but are not limited to, meteorological and demographic data concentrations measured from the population, organ dose, frequency distribution of lifetime fatal cancer risk, individual maximum risk assessment, death risk, stack emission, beef and dairy cattle, food crops, time delay rate, period of exposure, transport time, consumption time, ingestion levels, system calibration and setups.	
(a) Records which include methodology calculations and baseline data.	Destroy when no longer needed
(b) Temporary data files created during the model usage.	Destroy when no longer needed
(6) Electronic Mail and Word Processing System Copies Electronic copies of records that are created on electronic mail and word processing systems and used solely to generate a recordkeeping copy of the records covered by the other items in this schedule. Also includes electronic copies of records created on electronic mail and word processing systems that are maintained for updating, revision, or dissemination.	

	Description of Records	Disposition
(a)	Copies that have no further administrative value after the recordkeeping copy is made. Includes copies maintained by individuals in personal files, personal electronic mail directories, or other personal directories on hard disk or network drives, and copies on shared network drives that are used only to produce the recordkeeping copy.	Destroy/delete within 180 days after the recordkeeping copy has been produced
(b)	Copies used for dissemination, revision, or updating that are maintained in addition to the recordkeeping copy.	Destroy/delete when dissemination, revision, or updating is completed.

h. CERCLA-Funded Cooperative Agreements (Superfund Projects) Records

(1)	Project and Site Specific Files	
	Record keeping systems that consist of complete site-specific files and project records containing documentation of costs incurred, site-specific costs to be tracked by site, activity, and operable unit, as applicable, and systems which provide sufficient documentation for cost recovery purposes if the requirements are the same.	Destroy 10 years following submission of the final financial status report for the site, or until resolution of all issues arising from litigation, claim, negotiation, audit, cost recovery, or other actions, whichever is later. Written approval must be obtained from the EPA award official before destroying any records. 40 CFR 35.6700

Description of Records	Disposition
(2) Administrative Systems	
Record keeping systems pertaining to:	Destroy 10 years following submission of the final financial status report for the site, or until resolution of all issues arising from litigation, claim, negotiation, audit, cost recovery, or other actions, whichever is later. Written approval must be obtained from the EPA award official before destroying any records. 40 CFR 35.6700
(a) Property records, procurement, time and attendance records and supporting documentation	
(b) Compliance documentation pertaining to statutes and regulations that apply to the project	
(c) Site-specific technical hours spent to complete each pre-remedial product	
(d) Records as required by 40 CFR 35.6705, and records access requirements described in 40 CFR 31.36(I)(10) and 31.42(e)	
(e) Financial and programmatic records, supporting documents, statistical records, and other records which are required by 40 CFR 35.6700, program regulations, or the cooperative agreement, or are otherwise reasonably considered as pertinent to program regulations or the cooperative agreement	
i. Public Involvement Records	
Records containing information relating to public affairs and public involvement in restoration and remediation activities.	Permanent. Retain onsite until no longer needed. Transfer to NARA.

Description of Records	Disposition
May include public affairs records not included in the administrative record that are maintained by Public Affairs or External Affair Offices. (Section 1a); news releases, photos, maps, figures; community meetings records, community relations records; public meetings/ presentations, environmental bulletins; other CERCLA-required public involvement records; Public Involvement Plan records.	
j. Remediation Management Records (Other Than CERCLA Funded Cooperative Agreements)	
Records of management services organizations dedicated to solving waste cleanup problems. Records include project scope terms and conditions; contracted authority requirements; project costs; correspondence to and from clients, contractor or regulatory entities; data and analysis necessary to replicate the project findings; contractor records; reports on current situations, recommendations for future actions, evidence of training and qualification; records which document and describe general remediation project information, including procedure manuals, site operating procedures, project directives and project proposals.	
(1) Remediation Plan Records	
Sitewide Criteria and Design Basis-Remediation-based records, sitewide data and memoranda-remediation-related records, remediation project information records, Federal Regulatory Agencies-remediation-related records, sitewide project controls-remediation-related records, remediation plans records, RI/FS, remedial project specific records, such as sitewide project control records, sub-contractor support records, project information records, project charts and construction records; Operable Unit program development records; operating plans; RCRA operating logs; Operational Readiness Review Records.	Cutoff at the end of the project or in 5 years. Retire to FRC in 5 year blocks. Destroy after 75 years.

Description of Records	Disposition
(2) Expedited Response Action Records	
Time critical and/or non-time critical response action records.	Destroy 10 years after FFA&CO terminates. 40 CFR 300
Waste site at which clean up occurs because of limited exposure of personnel, the dangerous nature of the operations involved or because immediate cleanup would be easier or more cost effective.	

k. Environmental Record Case Files

NOTE: Use only for records maintained as a collection.

(1) Environmental Program Management Files	
Document the management, administration, support, function, operation, and program activities for an environmental program. These records include, but are not limited to, mission descriptions or documents describing the following: the type of work performed; funding/budget documentation; program plans; approvals and implementation and coordinating program activities; action plans; program development records; compliance to regulatory requirements; a history of past management practices; meeting minutes; audits; project reviews or event documentation; organization structure; property/equipment lists; deliverables; reports and correspondence related to milestones, work identification or progress; and other related documentation.	Cutoff at project completion. Destroy 25 years after project completion.

Withdrawn JBE
See 4-19-00 letter

Description of Records	Disposition
(2) Environmental Project Case Files	
Project case files, maintained as a collection throughout the projects life cycle, which documents the activities of the project from initiation through completion. Identify contract or work agreements, statement of work, funding/budget documentation, project plans, project justification, audits, project reviews or event documentation, client status reports, permits, organization structure, property lists/inventories, deliverables, meeting minutes/agendas, closure plans, final reports, and other reports and correspondence related to milestones, project scope, staffing, initiation or execution of the project. May also include engineering design review records and as-built drawings.	
(a) Projects for which innovative technology is initially developed or demonstrated.	Permanent. Cutoff at project completion. Transfer to NARA 25 years after cutoff. See NI-434-96-9.
(b) Case files for all other environmental projects.	Cutoff at project completion. Destroy 25 years after project completion.
(3) Decontamination and Decommissioning Cleanup and Transitioning Case Files	
This record documents the decontamination, decommissioning, dismantlement, disposal, or the cleanup and transitioning of a facility, area, or equipment that has been exposed to radiation or hazardous chemicals. Files include, but are not limited to, correspondence, as-built drawings, engineering studies, cost and schedule estimates, environmental documentation, photographs, procedures, radiological and	Cutoff at project completion. Retire to FRC 25 years after cutoff. Destroy in 75 years.

Description of Records	Disposition
hazardous characterizations, readiness reviews, safety analyses, meeting minutes, contracts, waste burial records, work authorizations, work orders, letters of instruction, engineering orders, event fact sheets, facility surveillance data sheets, inspection reports, phase/status reports, and final decommissioning reports.	
(4) Sampling and Analysis Case Files Contains material relating to a specific environmental site, activity, project, organization, laboratory, process, etc. These files may contain but are not limited to the following: a record index; administrative records (correspondence, meeting minutes, etc.); RI/FS; investigative field documentation.	Destroy after 50 years. YST 1/6/2021 CUT OFF CASE FILE UPON CLOSURE OF SITE, OR TERMINATION OF ACTIVITY, PROJECT, ORGANIZATION, LABORATORY, OR PROCESS. DESTROY 50 YEARS AFTER CUT OFF.

2. REGULATORY COMPLIANCE

This category covers records documenting compliance with the NEPA, State environmental policy acts, the Council on Environmental Quality (CEQ) regulations, DOE NEPA guidelines, DOE Secretarial Policy on NEPA, DOE Orders, and other Federal, state, and local environmental regulations. It includes regulatory files containing records demonstrating compliance with environmental regulations such as CERCLA, RCRA, NEPA, Clean Water Act, and the Safe Drinking Water Act (SDWA).

Description of Records	Disposition
a. Inspection/Assessment/Appraisal Records	
Records or files associated with assessments, appraisals, or inspections to verify environmental compliance.	
(1) Inspection Record Files	
(a) RCRA-related inspection files.	Destroy 5 years after life of facility.
(b) CERCLA-related waste inspection logs.	Destroy 5 years after waste removal date.
(c) General inspection logs related to operations; safety inspections; inspection schedules, completed inspection procedures and checklists; internal, job-specific inspection checklists and other supporting documentation.	Destroy 3 years after date of inspection.
(d) Inspection records of hazardous waste storage locations, that record date and time of the inspection, notes of observations made, and date and nature of any repairs or other remedial actions.	Destroy 3 years after date of inspection.
(e) Inspection logs or records maintained pursuant to 40 CFR 264.347 or 40 CFR 264.15 or 40 CFR 264.73.	Destroy 3 years after date of inspection.
(2) Waste Appraisal Files	
Hazardous waste appraisals that determine if short-term or temporary storage areas, containers, or packaging are in compliance with requirements.	Destroy 5 years after appraisal.

Description of Records	Disposition
(3) Assessment Records	
NOTE: Essential data may be included in comprehensive Waste Management System (see item 1.g3)	
(a) Assessments of inactive waste sites.	Destroy 5 years after waste site closure.
(b) Records documenting evaluation, assessment, audit records, and associated corrective action documentation.	Destroy 75 years after action is taken.
b. Spill/Release Records	
Records that report all spills or releases of hazardous substances, identifying the location, type, volume, time discovered/occurred, reporting individual, effected media, corrective action taken, hazardous substance release records and other information considered necessary to document the spill, release and cleanup.	
(1) Leak Inspection Files	
RCRA overfill leak inspections.	Destroy 3 years after inspection.
(2) Spill Records	
Chemical spills, hazardous waste spills, process spills, or similar spills under CERCLA/RCRA.	Destroy 10 years after cleanup.
(3) Polychlorinated Biphenyl Spill and Cleanup Records	
Polychlorinated Biphenyl (PCB) spills cleanup records.	Destroy after 5 years. 40 CFR 761.125
(4) Spill Response and Remediation Plan Files	Destroy 1 year after superseded.
(5) Spill Prevention Control and Counter-Measures (SPCC) Records	Destroy after 3 years. 40 CFR 112.7

Description of Records	Disposition
c. Waste/Chemical Inventory Files	
Records containing hazardous chemical inventories identifying types and amounts of chemicals currently in use, inventories of hazardous waste scheduled for transport for disposal, and radioactive and mixed waste, transuranic (TRU) waste, and high level radioactive waste.	
(1) In-Use Chemical Inventory Files	
Inventories of chemicals in use; chemical inventories for Superfund Amendment and Reauthorization Act of 1986 (SARA) Emergency Planning and Community Right to Know Act of 1986 (EPCRA) reporting such as Tier Two Emergency and Hazardous Chemical Inventory (commonly called 312) and Toxic Chemical Release Inventory (commonly called 313), and other regulatory agency-driven requirements. (See item 1.b2 and 1.b3 for reports.)	Destroy 3 years after submittal of report. 40 CFR 372.10
(2) Storage Inventory Files	
Inventories that indicate type and amounts of hazardous wastes currently located at storage sites.	Destroy after facility closes. 40 CFR 265.73
(3) Low-Level Radioactive and Mixed Waste Inventory Files	
Inventories that indicate the amount and types of low-level radioactive and mixed waste inventory.	Destroy 5 years after permit expires.
(4) Hazardous Waste Inventory Files	
Inventories of hazardous wastes maintained for transport for temporary disposal.	Destroy 3 years after shipment date.
(5) Transuranic Waste Inventory Files	
Inventories for two types of TRU: contact handled, such as glovebox waste; and remote handled, such as irradiated fuel or samples from tank wastes.	Destroy when waste is transferred, treated, or disposed of.

Description of Records	Disposition
(6) High-Level Radioactive Waste Inventory Files	
Inventories of high-level radioactive waste.	Cutoff 5 years after disposal/transfer of waste. Retire to FRC in 5 year blocks. Destroy in 75 years.
d. Waste Generator Shipping/Transporting Waste Files	
Records involving the receipt, shipment or transfer of chemicals, wastes or other hazardous, radioactive or toxic substances.	
(1) Hazardous Substance Transfer Files	
Includes logs and records, incoming waste shipment requests, hazardous waste manifests, and hazardous waste transfer records medical/biohazardous waste manifests.	Destroy 3 years after shipment. 40 CFR 279.74, 40 CFR 761.180, 40 CFR 761.209, 40 CFR 264.71, and 40 CFR 265.71.
(2) Low-Level Radioactive Waste Management Disposal Requests and Shipment Records	
Includes storage/disposal records used as manifests.	Destroy 3 years after waste disposal date.
(3) High-Level and Radioactive Mixed Waste Shipment Records	
Includes storage records, forms or records prepared by the waste generator, and other related documentation.	Destroy when 75 years old.
(4) Transuranic Shipment Records	
Includes records prepared by the waste generator and other related documentation.	Destroy after 5 years.
(5) Waste Acceptance Criteria Records	
Includes records that become part of the site specific plan(s).	
(a) Nuclear related.	Destroy after 20 years.
(b) Non-Nuclear related.	Destroy after 10 years.

Description of Records	Disposition
e. Pollution Prevention and Waste Minimization Program Records Pollution prevention and waste minimization program records encompass records which document waste elimination, reduction or minimization, during activities such as research, process design, and daily facility or plan operations.	
(1) Waste Stream Identification and/or Characterization Studies Documents and provides detailed descriptions of waste stream processes and identify details of the process including characterization information such as; waste streams stored or in use, chemical by-products produced, field interview notes, draft sketches or layouts, building inspector comments, inputs, outputs, associated costs, etc.	GD 1/6/2003 CUT OFF FILES AT END OF FISCAL YEAR Destroy ~~after~~ 10 years/ WHEN OLD.
(2) Inventory Control Records Waste inventory control and material substitution records.	GD 1/6/2003 CUT OFF FILES AT END OF FISCAL YEAR. Destroy ~~after~~ 75 years/ WHEN OLD.
f. National Environmental Policy Act and Related Laws Documentation	
(1) Environmental Impact Statement An environmental impact statement (EIS) is required for proposed major federal actions that significantly affect the quality of the human environment. A supplemental analysis (SA), is prepared if there are substantial changes to the proposed action or significant new circumstances or information relevant to environmental concerns for an action covered by an existing, approved EIS. An SA is prepared to determine if a supplemental EIS or a new EIS should be prepared.	

Description of Records	Disposition
(a) Maintained by the cognizant DOE Operations Office.	Permanent. Cutoff when ROD is issued. Transfer to NARA 20 years after cutoff.
(b) All other copies.	Destroy when no longer needed.
(c) Final Published Version	
Background material, documentation includes the draft EIS and supporting plans, scoping, scheduling, and background information; public and agency comments; Notice of Intent (NOI); ROD; and may include SA, EIS Implementation Plan, Community Relations Plan/Public Participation Plan, Records of Considerations, Mitigation Action Plan, Supplemental EIS, and Flood Plain/Wetland Assessments.	Destroy in 20 years. Retire to FRC 5 years after ROD is issued.
(2) Environmental Assessment Records	
An environmental assessment (EA) provides the information to determine the necessity for an EIS or a finding of no significant impact. Documentation includes the EA and NOI.	
(a) Maintained by the cognizant DOE Operations Office.	Permanent. Cutoff when project is completed. Transfer to NARA 20 years after cutoff. 40 CFR 1508.9
(b) All other copies.	Destroy when no longer needed.
(c) Background documentation.	Destroy in 20 years. Retire to FRC 5 years after ROD is issued.

Description of Records	Disposition
(3) Categorical Exclusion Records	
A categorical exclusion (CX) documents that the potential impacts to the environment are clearly insignificant and the proposed action falls within a category of actions not normally requiring an EA or an EIS. An information bulletin (IB) describes the action and identifies the appropriate CX and is prepared as a basis for a DOE decision regarding the CX. The IB usually includes a draft CX determination. Documentation includes the IB, environmental checklist (ECL)/action description memorandum and other records used to reach a CX determination.	
(a) Maintained by the cognizant DOE Operations Office.	Permanent. Cutoff when project is completed. Transfer to NARA 20 years after cutoff. 40 CFR 1508.4 and 10 CFR 1021
(b) All other copies.	Destroy when no longer needed.
(c) Background documentation.	Destroy in 20 years. Retire to FRC 5 years after ROD is issued.
(4) National Environmental Policy Act Support Documentation	
Documentation supporting compliance with other environmental statutes coordinated with the NEPA process.	Cutoff annually at the end of the calendar year of project completion. Destroy in 3 years. 10 CFR 1021, 10 CFR 1500, and 10 CFR 1508
g. Septic System/Sewage Treatment Files	
Plans and specifications for proposed construction. Approvals, certification of inspection and installation, operations manuals, drawings, periodic inspections, vendor information, correspondence, and meeting minutes.	
(1) Operation Manuals and Vendor Information	Destroy when equipment is no longer in service.

	Description of Records	Disposition
(2)	Approvals, Certification of Inspections and Installation, Drawings, Correspondence and Meeting Minutes	Destroy when 50 years old.
h.	**Drinking Water and Safe Drinking Water Act Files**	
	Records documenting drinking water system operated in support of DOE site.	
(1)	Bacteriological Analysis Files	
	Records of Bacteriological analysis.	Destroy in 5 years or when data has been transferred to tabular summaries. 40 CFR 141.33
(2)	Chemical Analysis Files	
	Records of chemical analysis.	Destroy in 10 years. 40 CFR 141.33
(3)	System Survey Files	
	Copies of written reports or summaries of sanitary surveys of the system.	Destroy 10 years after completion of sanitary survey.
(4)	Variance Record Files	
	Records of a variance or exemption.	Destroy 5 years after expiration of variance or exemption.
(5)	Corrective Action Files	
	Records of actions taken by the system to correct violations of primary drinking water regulations.	Destroy 3 years after last corrective action taken with respect to particular violation involved. 40 CFR 141.33

Description of Records	Disposition
i. Well Records	
(1) Well History and Construction Files	
Records dealing with the history and construction of wells including inventories of wells, photographs, soil borings from geological investigations, boreholes, coreholes, test holes and any other drill holes where data was obtained. It includes drilling plans and reports, well installation and completion records, schematics of well construction, logbooks such as drilling logs, correspondence, maps, photographs, charts, summary reports, construction verification reports.	Retain on site. Cutoff when well is plugged and abandoned. Retire to FRC 3 years after cutoff. Destroy when facility closes. NOTE: ~~Courtesy copy may be provided to new owner.~~
(2) Well Maintenance Files	
Records dealing with well maintenance such as well services requests, well services planning, well structure field inspections, repairs and modifications, surveying, installing locking well caps, maintaining pump systems, removing deposits.	Retain on site. Cutoff when well is plugged and abandoned. Retire to FRC 3 years after cutoff. Destroy when facility closes. NOTE: ~~Courtesy copy may be provided to new owner~~.
(3) Well Abandonment Files	
(a) Well abandonment plans, notifications, reports. NEPA CX List of Wells.	Retain on site. Cutoff when well is plugged and abandoned. Retire to FRC 3 years after cutoff. Destroy when facility closes. NOTE: ~~Courtesy copy may be provided to new owner~~.
(b) Abandonment of underground injection wells. The nature and composition of all injected fluids.	Destroy 3 years after plugging and abandonment. 40 CFR 144.28[I][2]

Description of Records		Disposition
j. Underground Storage Tank Files		
Records related to the regulation of storage of materials, wastes, and products in underground storage tanks (USTs). 42 USC 6991, 40 CFR 280, and 40 CFR 281.		
(1)	Tanks Subject To Excavation	Destroy 3 years after tank is removed.
(2)	Tanks Subject To Remediation	Destroy 20 years after abatement is completed.

3. PERMITTING

Permitting documentation includes those records related to authorizing access or permission from a governmental entity, such as city, county, state, or Federal agency, to initiate an action, usually defining specified limits in the form of a written warrant or license. This category may include necessary or required documents that precede the granting of the license or warrant, such as applications for permits.

Description of Records		Disposition
a. Applications for Permits		
Preparation of the permitting application includes permitting requirements, permitting policies, cost information, schedules, application, closure plans, notification requests, supporting documentation, negotiations with permitting agency modification process and correspondence.		
(1)	RCRA Part A and B Permit Applications	Destroy 5 years after applicable permit expires.
(2)	All Other Permit Applications	Destroy 5 years after applicable permit expires.
b. Permits		
Permitting documentation includes detailed definition of the approved process, schedules, milestones, reporting requirements, supporting documentation, correspondence, terms and conditions of the permit, notification of changes to the permit and modifications.		
(1)	RCRA Permits, Part A and B	
	(a) Maintained by the cognizant DOE Operation's Office	Permanent. Cutoff and transfer to NARA at termination of permit.
	(b) All other copies	Destroy when no longer needed.
	(c) Supporting documentation	Destroy 5 years after permit expires.
	(d) Required monitoring data	
	Including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by permit.	Destroy after 3 years.

Description of Records	Disposition
(2) Waste Water Discharge Permit Records These records document the requests for permission to discharge waste water into ground water and sanitary sewers. Includes but is not limited to: discharge plans, approval letters, samples and analysis, certificate of analysis, monitoring requirements, renewal applications, chain of custody forms, permits and applications, routine storm maintenance requests, including records required by National Pollutant Discharge Elimination System (NPDES), State Waste Discharge, Injection Well and Stormwater Permits. Also, includes reports required by the permits, including but not limited to, discharge monitoring reports, noncompliance notification, noncompliance reports and corrective action measures. Water may be discharged into sewers, ponds, lagoons, etc.	
(a) Construction permits submitted after applications are approved.	Destroy 3 years after the applicable permit expires. 40 CFR 122.21
(b) Technical, general regulatory and policy correspondence.	Destroy after 5 years.
(c) Notices to discharge surplus water records in accordance with permit compliance.	Destroy 5 year after permit expires.
(d) Purge water activity records.	Destroy 5 years after permit expires.
(e) Storm drainage inspections and maps.	Destroy 5 years after permit expires.

Description of Records	Disposition
(3) Air Emissions Permit Records Document the process of developing and obtaining approval from federal, state, air quality district, or city officials to emit air pollutants and/or airborne particulate matter in compliance with the Federal CAA, associated State implementation plans and laws. Records may include, but are not limited to, permit applications and supporting documentation, permits, (such as new construction or preconstruction, operating modification, new source, NESHAPS, prevention of significant deterioration, acid rain, open burn, top soil disturbance, administrative permit amendments, permit renewals, modifications, cancellations, suspensions, exemptions, approvals, and disapprovals, monitoring and control plans, notices of violation, material safety data sheets (MSDS) for pollutants, permit lists, dispersion modeling information, correspondence with and between DOE, DOE contractors, city, state, air quality district, or EPA officials regarding permitting, documentation of permit fee invoices and payments, and ownership of pollution allowances or rights. Records may also include air emission permit tracking databases.	
(a) Related and supporting documentation for permits.	Destroy 3 years after related permit expires.
(b) Pollution allowance ownership rights documentation.	Destroy 3 years after related permit expires.
(c) Draft documents, supporting notes and calculations.	Destroy when superseded, obsolete, or no longer needed.
(d) Related databases and data.	See 1.g2

Description of Records	Disposition
(4) Pollution Prevention Equipment Permit Records	
Document the permission to install specific equipment in buildings or facilities at DOE contractor sites to meet regulatory compliance. Records may include, but are not limited to, permit applications, permits, permit renewals, correspondence, emission concentration, and type of pollution control equipment.	Destroy 3 years after related permit expires.
(5) All Other Permits	Destroy 3 years after related permit expires.
c. Permit Petitions and/or Waivers	
Documentation used as a means to request a petition or waiver from a permit requirement(s).	Destroy 5 years after petition/waiver expires.
d. Closure Plans	
Closure plans include description of plans for each unit, estimate of maximum inventory during active life, description of steps needed to remove a decontaminate, and schedule.	
(1) Interim Closure Plans/Closure Plans	Destroy 10 years after certificate of closure is received.
(2) Post Closure Plans	Permanent. Cutoff when no longer needed. Transfer to NARA 25 years after cutoff.
e. Pesticide/Herbicide Records	
Records of application of pesticides/herbicides	
Records include but are not limited to location involved, date, time, appropriate meteorological data for exterior applications, amounts of chemical associated concentrations and equipment used, signature and license number of the cognizant operator along with pertinent remarks.	Destroy after 10 years.

4. MONITORING

Monitoring records document activities that affect environmental quality, such as discharging air pollutants to the atmosphere, and activities that involve radioactive and nonradioactive liquid effluent discharges to the environment, including rivers, sanitary sewers, land surfaces, the subsurface, and drinking water supply systems. Environmental surveillance activities are conducted routinely with the intent of detecting and quantifying radiological and nonradiological contaminants and assessing their environmental and human health significance.

NOTE: See Section 1e for logbooks relating to monitoring activities.

Description of Records	Disposition
a. Soil Monitoring Records	
(1) Procedures	
Procedures that detail the specific methods and frequency of environmental soil monitoring.	Cutoff when superseded or obsolete. Destroy when 75 years old.
(2) Equipment Calibration Records	
Documentation providing assurance that equipment used during monitoring activities was calibrated to established standards.	
(a) Radiation detection instrument calibration records.	Destroy when 75 years old.
(b) All others	Destroy 5 years after calibration.
(3) Radiological Survey Forms and Logs for Soil Monitoring	Destroy when 75 years old.
(4) Statistical Monitoring Data	
Data used to make statistical comparisons between different monitoring locations or time periods.	Destroy when results are incorporated into summary reports, or when 5 years old, whichever is earlier.
b. Air Monitoring Records	
(1) Procedures	
Procedures that detail specific methods and frequency of environmental air monitoring.	Cutoff when superseded or obsolete. Destroy when 75 years old.

Description of Records	Disposition
(2) Air Filter Records	
Records used to gather, analyze, and report air quality data including hot cell air quality and filter efficiency data in radiological control area. Records may include, but are not limited to, air filter information, raw data derived from filters, such as filter number and amount of particulates, filter efficiency test reports and data, and filter inventory lists.	
(a) High-Efficiency Particulate Air (HEPA) filter records, including but not limited to; raw data efficiency tests, laboratory analysis and inventory lists.	Cutoff annually. Retire to FRC 5 years after cutoff. Destroy when 75 years old.
(b) Databases that duplicate the records listed above.	Delete after the expiration of the retention period authorized for hard copy files, or whenever no longer needed, whichever is later.
(3) Evaporator, Hood, Stack, and Exhaust Fan Discharge Records	
These records document equipment types and discharge rates used to calculate the potential release of contaminants and radionuclides from specific locations. The records are used to supplement the NESHAP reports and to fulfill partially the requirements of the EPA. Records may include, but are not limited to, trace emissions, location, equipment type, velocity, release rate, concentration, parameters, hourly evaporation rate, identification of the chemicals purchased and used by the department, descriptions of air handling supply and exhaust systems, description of the flow measuring system, flow rate testing data sheets, what type of toxic or radioactive material the hood is used for, instrument type and serial number, calibration due date, and approval.	Cutoff annually. Retire to FRC 5 years after cutoff. Destroy when 75 years old.

	Description of Records	Disposition
(4)	Monitoring Baseline Study Record	
	These records document a study which establishes normal monitoring levels for measuring the radioactive and non-radioactive impact on the environment and surrounding populations. Information from these records may be used to compile compliance reports. Records may include, but are not limited to, correspondence, plan status, performance and technical system audits, wind source direction status, preliminary and end results, interpretations, conclusions and recommendations, ECL, system plan, and effluent particle size.	Destroy when 20 years old.
(5)	Hazardous Air Pollutant Baseline Study Records	
	These records document measurements collected from upwind and downwind locations indicating the hazardous air pollutants specified in 42 USC 112 such as asbestos, benzene, beryllium, mercury, vinyl chloride, coke oven emissions, and inorganic arsenic. Records may include, but are not limited to, analytical procedures, calibrations, monitoring results and recommendations.	Destroy when 20 years old.

	Description of Records	Disposition
(6)	Annual Background Study Records	
	These records document the preliminary results of an approved background study used by the EPA, the state, and DOE to evaluate contamination release. These studies are used to develop information on the uncontaminated conditions of a site. The data is compared with data from areas that might be contaminated. Records may include, but are not limited to, data acquisitions and related correspondence, description of data collection methods and technology, data logs, subcontractor memos, applicable NEPA documentation and analytical results.	Destroy when 5 years old.
	NOTE: See 1.g7 for Basic Reports.	
(7)	Stratospheric Ozone Protection Records	
	These records document a unified, cost effective, and competitive approach for a transition from using ozone depleting chemicals to the use of new chemicals or chemical substitutes that will not deplete the stratospheric ozone or pollute the air or the environment. Records may include, but are not limited to, memos and correspondence, summary plans, cost analysis, substance lists, and regulation lists.	Destroy when 3 years old.

Description of Records	Disposition
(8) Criteria Pollutant Records	
(a) Criteria pollutant release records	
These records document measures of National Ambient Air Quality Standards Program (NAAQS) criteria pollutants released into the air that meet pollution prevention requirements. The pollutants measured have been identified as being hazardous to human health and welfare. These measurements are mandated by the DOE as part of resolving National Air Quality problems. Records may include, but are not limited to, ECL, Request for Facility Services, CX list and EPA checklists.	Destroy when 5 years old.
(b) Criteria Pollutant Source Inventory	
Records document annual inventories of criteria pollutant sources at DOE and contractor sites. These records are used to determine the source type and concentration of pollution emitted from identified locations.	Destroy 5 years after inventory completion.

Description of Records	Disposition
(9) Air Monitoring/Sampler Equipment Calibration Records These records document the type of calibration performed, the degree of accuracy to which the item was calibrated and the date of calibration, and to determine when the item is due for recall. Records may include, but are not limited to, procurement, equipment serial number and location, manufacturers statement of origin, manufacturer code, equipment calibration estimates, calibration data forms, checklists, billings, inspection reports, move orders, equipment manual information, vendor information, quality and operating checks, pre-operational checklists, calibration date, calibration data, calibration recall notices, calibration sheets, out-of-tolerance notifications, recall cards, equipment standards and specifications, certificates of conformance, certificates of completion, instrument status, service performance reports, and trouble shooting information.	
(a) Radiation detection instrument calibration records	Destroy when 75 years old. DRS 1.7a1
(b) All others	Destroy 5 years after calibration.

Description of Records	Disposition
c. Meteorological Monitoring Records	
These records document the data collected from weather monitoring stations to support environmental monitoring programs. It is also used to report overall annual dose, calculated concentrations of routine and accidental releases, and supports real time plume trajectory forecasting system. Records include, but are not limited to, strip charts of real time measurements of wind speed and direction, temperature, wind chill, relative humidity, dew point, precipitation, barometric pressure, synopsis of expected daily weather activity, evening forecast, weather cautionary or alert information, semiannual calibration results of tower, logbooks identifying problems, abnormalities, documentation of daily checks, correspondence regarding tower installation, and construction, milestone report, meteorological system design and overview, briefings and findings.	Destroy when 10 years old.
d. Groundwater Monitoring Records	
(1) Procedures	
Procedures that detail the specific methods and frequency of groundwater monitoring.	Cutoff when superseded or obsolete. Destroy when 75 years old.
(2) Equipment Calibration Records for Groundwater Monitoring	
Provides assurance that equipment used during monitoring activities was calibrated to established standards.	
(a) Radiation detection instrument calibration records	Destroy when 75 years old.
(b) All others	Destroy 5 years after calibration.
(3) Radiological Survey and Form Logs for Groundwater Monitoring	Destroy when 75 years old.

Description of Records	Disposition
(4) Statistical Monitoring Data	
Data used to make statistical comparisons between different monitoring locations or time periods.	Destroy when results are incorporated into summary reports, or when 5 years old, whichever is earlier.
e. Tank Monitoring	
Records related to the monitoring of tanks containing chemicals, wastes or other hazardous, radioactive, or toxic substances.	
(1) Liquid Levels/Surface Levels	
Records that document the baseline and associated changes in the level of liquids contained within a tank indicating potential problems or lack thereof.	Until tank closure
(2) Dome Elevation	
Records that document crusts or buildups within a tank that may account for solids or sludge fragments rising to the top indicating an explanation for changes in tank surface levels and liquid levels.	Until tank closure
(3) Drywell/Swab Risers	
Records of contamination measurement to help detect leaks to the ground from a tank or transfer line (or waste stream).	Until tank closure

5. SAMPLING AND ANALYSIS

Records included in this series document sampling and analysis activities for samples collected during environmental investigations, remediation, and restoration from sample acquisition to sample disposition. Documentation covers planning sampling operations, conducting sampling operations (collecting samples), documenting sampling operations, sample management and control, and reporting sampling results.

NARA accepts information relating to physical specimens, but not the specimens themselves. Because some requirements specify retention of samples, the responsibility for maintenance of them rests with the organization that gathers or collects such items. Related information is scheduled herein. Physical samples and specimens should be returned to the organization from which they originated per EPA requirements.

NOTE: See Section 1e for logbooks related to sampling and analysis.

Description of Records	Disposition
a. Procedures	
These procedures detail the methods used and frequency of analysis of environmental samples. Includes records or correspondence which give the philosophy and scope of sampling, provide interpretations of results, and detail the plans for sampling and analysis of environmental samples.	Cutoff when superseded or obsolete. Destroy when 75 years old.
b. Sampling Authorization Forms	
These forms document field sampling requirements generated to initiate and perform sampling and analysis activities.	Destroy in 75 years.

Description of Records	Disposition
c. Sampling and Analysis Records	
(1) Analytical Laboratory Data Packages	
These data packages consist of documentation generated during transport and receipt of field samples (e.g., chain of custody), sample movement in the laboratory, preparation for analysis, laboratory analyses output, raw and processed data, analytical results (analysis reports), reanalysis, quality control sample results, and instrument calibration data, plus a summary of final results for each batch. May include validation and/or verification documentation.	Destroy in 75 years.
(2) Physical Property Data Packages	
These data packages contain analytical results for samples taken during borehole or well drilling operations. Samples are obtained at several different elevations during the drilling. Samples are submitted to the laboratory for physical property testing. These files contain the following records: data transmittals, graphs, and laboratory analysis.	Destroy in 75 years.
(3) Field Screening Data Packages	
These data packages document field screening measurements for preliminary determinations of contamination levels in support of environmental investigation, restoration, and remediation activities, using commercially available instruments and/or test kits. Field screening methods include, but are not limited to, aqueous headspace analysis of VOCs in soil; analysis of VOC in soil gas; field immunoassay testing; and pH screening in soil samples. Documentation may	Destroy in 75 years.

Description of Records	Disposition
include, but is not limited to: sample analysis request documentation; narrative description or overview of activities that took place; summary of results; table of analyses; logbook pages; strip charts; instrument calibration data; and laboratory analysis reports.	
d. Laboratory Sample Processing Records	
These records consist of control records pertaining to work performed in analytical laboratories. Records include, but are not limited to Sample Receiving Logs, analysis requests, analytical assay records, and comparative analysis logs.	Destroy when 10 years old.

6. DISPOSAL/CLEANUP

This category includes records documenting cleanup of past-practice waste sites or units, closure of waste sites under RCRA and other applicable regulations, cleanup of waste sites under CERCLA and RCRA corrective action provisions and disposal of radioactive and hazardous waste from waste sites. Records include those generated once a decision has been made to clean up a given location, encompassing those actions from removal/treatment of the contaminated area to restoration of the area to it's natural condition.

Description of Records	Disposition
a. Designation/Means of Disposal	
Procedures Governing Disposal and Cleanup.	Permanent. Retain on site until final cleanup. Transfer to NARA 5 years after cutoff.
b. Waste Disposal Characterizations/Records	
Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location. Records may include engineering studies, reports of unusual problems encountered during removal or treatment.	Permanent. Cutoff 5 years after disposal. Transfer to NARA 25 years after cutoff.
c. Waste Disposal Characterizations/Records	
Supporting documentation includes but is not limited to miscellaneous worksheets, recorder sheets, other data sheets, and correspondence from where applicable information has been transcribed or summarized in other documentation, such as item b, above.	Destroy when 1 year old.

7. Electronic Mail and Word Processing System Copies.

Electronic copies of records that are created on electronic mail and word processing systems and used solely to generate a recordkeeping copy of the records covered by the other items in this schedule. Also includes electronic copies of records created on electronic mail and word processing systems that are maintained for updating, revision, or dissemination.

a. Copies that have no further administrative value after the recordkeeping copy is made. Includes copies maintained by individuals in personal files, personal electronic mail directories, or other personal directories on hard disk or network drives, and copies on shared network drives that are used only to produce the recordkeeping copy.

Destroy/delete within 180 days after the recordkeeping copy has been produced.

b. Copies used for dissemination, revision, or updating that are maintained in addition to the recordkeeping copy.

Destroy/delete when dissemination, revision, or updating is completed.

JAB 6/19/00

RECOMMENDATION TO THE ARCHIVIST ON RECORDS DISPOSITION REQUEST

Job No: N1-434-98-28

Item Count: 171

SUMMARY

The Department of Energy (DOE) submits Job No. N1-434-98-28 to request Agency-wide disposition authority for 13 new items proposed for permanent retention and 155 new items proposed for disposal. These new items are for records created in DOE's environmental management program and consist of six major categories, i.e., administration, regulatory compliance, permitting, monitoring, sampling and analysis and disposal/cleanup.

Records proposed for permanent retention document the administration of the agency's programs supporting compliance with Federal environmental laws and implementing regulations. Permanent records consist of such items as significant archaeological records of Native Americans, environmental reports, public involvement records, project case files, environmental impact statements, environmental assessment records, categorical exclusion records, RCRA permits, post closure plans, designation/means of disposal, and waste disposal characterizations records. These records are recommended for permanent retention because they document agency policy and procedures for complying with environmental laws and implementing regulations, including, but not limited to the Resource Conservation, and Liability Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the National Environmental Policy Act (NEPA) The records contain unique information of historical, evidential, and legal value.

Other less significant records in this job are proposed for disposal and request a range of retentions (1 to 75 years) depending on the level of importance, DOE's business needs, and the anticipated legal rights and interests of DOE employees and contractors. Disposable records include files on routine and facilitative administrative records, long-term temporary records related to health, safety, and exposure, and safety and health records maintained as permanent by other agencies

All internal comments and issues were incorporated or resolved This job was published in the *Federal Register* Two requests were received (Peter Allen of Chatham, NJ and Michael Tankersley of Public Citizen Litigation Group). We received comments from Michael Tankersley on six items. Three of the items were withdrawn and have been crossed off of this schedule, i e items 1d(4), 1d(9) and 1k(1). Records included in these items require evaluation and analyses by DOE subject area experts. Upon review of the findings, DOE will resubmit these items on a new schedule. I recommend approval of this job

RECOMMENDATION

☒ 1 APPROVED FOR DISPOSAL The records described under all items of the schedule, except those that may be listed in blocks 2, 3, and 4 of this section, are disposable because they do not, or will not after the lapse of the period specified, have sufficient administrative, legal, research or other value to warrant their continued preservation by the Government

☒ 2 APPROVED FOR PERMANENT RETENTION. The records described under the following item or items have been appraised by the National Archives and Records Administration (NARA) and are determined to have sufficient historical or other value to warrant their continued preservation by the United States Government The agency will transfer these records to the National Archives as specified **Items: 1c, 1d(1), 1d(8)(b), 1d(10)(a), 1i, 1k(2)(a), 2f(1)(a), 2f(2)(a), 2f(3)(a), 3b(1)(a), and 3d(2)**

☒ 3 DISPOSITION NOT APPROVED The records described under the following item or items are not approved for disposition

☒ 4 WITHDRAWN The records described under the following item or items have been withdrawn at the request of the agency and/or NARA. **Items: 1b(4), 1d(9), and 1k(1)**

FEDERAL REGISTER NOTICE

☐ Not required.

☒ Required — Publication Date 4/15/99
Copies Requested 2
Comments Received 1

SIGNATURES	TITLE	SIGNATURE	DATE
Appraisal	Appraiser	John B Ellis	May 11, 2000
	Director, NWML	Mary B Alle	May 16, 2000
CONCURRENCES	NWM		
	NR	Gregory A. Pennycke	May 16, 2000
	NW	Michael J Kurtz	5-18-2000

APPENDIX C

36 CFR 12XX.XX

36 CFR
§1228.266 Audiovisual records.

The following types of audiovisual records appraised as permanent shall be transferred to the National Archives as soon as they become inactive or whenever the agency cannot provide proper care and handling of the records, including adequate storage conditions, to facilitate their preservation by the National Archives (see part 1232 of this chapter). In general the physical types described below constitute the minimum record elements for archival purposes that are required to provide for future preservation, duplication, and reference needs.

(a) *Motion pictures.* (1) Agency-sponsored or produced motion picture films (e.g., public information films) whether for public or internal use:

(i) Original negative or color original plus separate optical sound track;

(ii) Intermediate master positive or duplicate negative plus optical track sound track; and,

(iii) Sound projection print and video recording, if both exist.

(2) Agency-acquired motion picture films: Two projection prints in good condition or one projection print and one videotape.

(3) Unedited footage, outtakes and trims (the discards of film productions) that are properly arranged, labeled, and described and show unstaged, unrehearsed events of historical interest or historically significant phenomena:

(i) Original negative or color original; and

(ii) Matching print or videotape.

(b) *Still pictures.* (1) For black-and- white photographs, an original negative and a captioned print although the captioning information can be maintained in another file such as a data base if the file number correlation is clear. If the original negative is nitrate, unstable acetate, or glass based, a duplicate negative on a polyester base is also needed.

(2) For color photographs, the original color negative, color transparency, or color slide; a captioned print of the original color negative; and/or captioning information as described above if for an original color transparency or original color slide; and a duplicate negative, or slide, or transparency, if they exist.

(3) For slide sets, the original and a reference set, and the related audio recording and script.

(4) For other pictorialrecords such as posters, original art work, and filmstrips, the original and a reference copy.

(c) *Sound recordings.* (1) Disc recordings:

(i) For conventional disc recordings, the master tape and two disc pressings of each recording, typically a vinyl copy for playback at $33^{1/3}$ revolutions per minute (rpm).

(ii) For compact discs, the origination recording regardless of form and two compact discs.

(2) For analog audio recordings on magnetic tape (open reel, cassette, or cartridge), the original tape, or the earliest available generation of the recording, and a subsequent generation copy for reference. Section 1232.30(d) of this subchapter requires the use of open-reel analog magnetic tape for original audio recordings.

(d) *Video recordings.* (1) For videotape, the original or earliest generation videotape and a copy for reference. Section 1232.30(c) of this subchapter requires the use of industrial-quality or professional videotapes for use as originals, although VHS copies can be transferred as reference copies.

(2) For video discs, the premaster videotape used to manufacture the video disc and two copies of the disc. Video discs that depend on interactive software and nonstandard equipment may not be acceptable for transfer.

(e) *Finding aids and production documentation.* The following records shall be transferred to the National Archives with the audiovisual records to which they pertain.

(1) Existing finding aids such as data sheets, shot lists, continuities, review sheets, catalogs, indexes, list of captions, and other documentation that are helpful or necessary for the proper identification, or retrieval of audiovisual records. Agencies should contact the Nontextual Archives Division, or its appropriate audiovisual branch, to determine the type of hardware and software that is currently acceptable for transfer to the National Archives as an agency electronic finding aid that will accompany its audiovisual records. In general, however, agencies must transfer two copies of the electronic finding aid, one in its native format with its field structure documented, and a second copy in a contemporary format available at the time of transfer that NARA will be able to support and import to its database.

(2) Production case files or similar files that include copies of production contracts, scripts, transcripts, and appropriate documentation bearing on the origin, acquisition, release, and ownership of the production.

[61 FR 32336, June 24, 1996]

36 CFR
§1228.268 Cartographic and architectural records.

The following classes of cartographic and architectural records appraised as permanent should be transferred to the National Archives as soon as they become inactive or whenever the agency cannot provide the proper care and handling of the materials to guarantee their preservation.

(a) *Maps and charts.* (1) Manuscript maps; printed and processed maps on which manuscript changes, additions, or annotations have been made for record purposes or which bear manuscript signatures to indicate official approval; and single printed or processed maps that have been attached to or interfiled with other documents of a record character or in any way made an integral part of a record.

(2) Master sets of printed or processed maps in the custody of the agency by which they were issued. Such master sets should be kept segregated from the stock of maps held for distribution and from maps received from other agencies. A master set should include one copy of each edition of a printed or processed map issued.

(3) Computer-related and computer-plotted maps that cannot be reproduced by the National Archives because of destruction of the magnetic tapes or other stored data or because of the unavailability of ADP equipment.

(4) Index maps, card indexes, lists, catalogs, or other finding aids that may be helpful in using the maps transferred.

(5) Records related to preparing, compiling, editing, or printing maps, such as manuscript field notebooks of surveys, triangulation and other geodetic computations, and project folders containing specifications to be followed and appraisals of source materials to be used.

(b) *Aerial photography and remote sensing imagery.* (1) Vertical and oblique negative aerial film, conventional aircraft.

(2) Annotated copy negatives, internegatives, rectified negatives, and glass plate negatives from vertical and oblique aerial film, conventional aircraft.

(3) Annotated prints from aerial film, conventional aircraft.

(4) Infrared, ultraviolet, multispectral (multiband), video, imagery radar, and related tapes, converted to a film base.

(5) Indexes and other finding aids in the form of photo mosaics, flight line indexes, coded grids, and coordinate grids.

(c) *Architectural and related engineering drawings.* (1) Design drawings, preliminary and presentation drawings, and models which document the evolution of the design of a building or structure.

(2) Master sets of drawings which document the condition of a building or structure in terms of its initial construction and subsequent alterations. This category includes final working drawings, "as-built" drawings, shop drawings, and repair and alteration drawings.

(3) Drawings of repetitive or standard details of one or more buildings or structures.

(4) "Measured" drawings of existing buildings and original or photocopies of drawings reviewed for approval.

(5) Related finding aids and specifications to be followed.

[42 FR 57315, Nov. 2, 1977. Redesignated at 50 FR 15723, Apr. 19, 1985, and 55 FR 27433, July 2, 1990, as amended at 57 FR 22433, May 28, 1992]

36 CFR
§1228.270 Electronic records.

(a) *Timing of transfers.* Each agency is responsible for the integrity of the records it transfers to the National Archives. To ensure that permanently valuable electronic records are preserved, each Federal agency shall transfer electronic records to NARA promptly in accordance with the agency's records disposition schedule. Furthermore, if the agency cannot provide proper care and handling of the media (see part 1234 of this chapter), or if the media are becoming obsolete and the agency cannot migrate the records to newer media, the agency shall contact NARA to arrange for timely transfer of permanently valuable electronic records, even when sooner than provided in the records schedule.

(b) *Temporary retention of copy.* Each agency shall retain a second copy of any permanently valuable electronic records that it transfers to the National Archives until it receives official notification from NARA that the transfer was successful and that NARA has assumed responsibility for continuing preservation of the records.

(c) *Transfer media.* This paragraph covers the transfer of permanent records to the National Archives; it does not apply to the use or storage of records in agency custody. See 36 CFR 1234.30 for the requirements governing the selection of electronic records storage media. The agency shall use only media that is sound and free from defects for such transfers; the agency shall choose reasonable steps to meet this requirement. The media forms that are approved for transfer are open reel magnetic tape, magnetic tape cartridge, and Compact-Disk, Read Only Memory (CD-ROM), as described in paragraphs (c) (1) and (2) of this section.

(1) *Magnetic tape.* Agencies may transfer electronic records to the National Archives on magnetic tape using either open-reel magnetic tape or tape cartridges. Open-reel magnetic tape shall be on $^{1/2}$ inch 9-track tape reels recorded at 1600 or 6250 bpi that meet ANSI X3.39-1986, American National Standard: Recorded Magnetic Tape for Information Interchange (1600 CPI, PE) or ANSI X3.54-1986, American National Standard: Recorded Magnetic Tape for Information Interchange (6250 CPI, Group Coded Recording), respectively. Tape cartridges shall be 18-track 3480-class cartridges recorded at 37,871 bpi that meet ANSI X3.180-1990, American National Standard: Magnetic Tape and Cartridge for Information Interchange-18-Track, Parallel, $^{1/2}$ inch (12.65 mm), 37871 cpi (1491 cpmm), Group-Coded-Requirements for Recording. The data shall be blocked at no more than 32,760 bytes per block. The standards cited in this paragraph are available from the American National Standards Institute, (ANSI), Inc., 11 West 42nd Street, New York, NY 10036. They are also available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, D.C. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. These materials are incorporated by reference as they exist on the date of approval and a notice of any change in these materials will be published in the FEDERAL REGISTER.

(2) *Compact-Disk, Read Only Memory (CD-ROM).* Agencies may use CD-ROMs to transfer electronic records scheduled to be preserved in the National Archives. The files on such a CD-ROM must comply with the format and documentation requirements specified in paragraphs (d) and (e) of this section.

(i) CD-ROMs used for this purpose must conform to ANSI/NISO/ISO 9660-1990, American National Standard for Volume and File Structure of CD-ROM for Information Exchange. The standard is available from the National Information Standards Organization (NISO), P.O. Box 1056, Bethesda, MD or the American National Standards Institute, 11 West 42nd Street, 13th floor, New York NY 10036. It is also available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, D.C. This incorporation by reference was approved by the Director of the Federal Register

in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. These materials are incorporated by reference as they exist on the date of approval and a notice of any change in these materials will be published in the FEDERAL REGISTER.

(ii) Permanently valuable electronic records must be stored in discrete files. The CD-ROMs transferred may contain other files, such as software or temporary records, but all permanently valuable records must be in files that contain only permanent records. Agencies should indicate at the time of transfer if a CD-ROM contains temporary records and, if so, where those records are located on the CD-ROM. The agency must also specify whether NARA should return the CD-ROM to the agency or dispose of it after copying the permanent records to an archival medium.

(iii) In some cases, permanently valuable electronic records that an agency disseminates on CD-ROM exist on other media, such as magnetic tape. In such cases, the agency and NARA will mutually agree on the most appropriate medium for transfer of the records to the National Archives.

(d) *Formats.* The agency may not transfer to the National Archives electronic records that are in a format dependent on specific hardware and/or software. The records shall be written in ASCII or EBCDIC with all control characters and other non-data characters removed (except as specified in paragraphs (d) (1), (2), and (3) of this section). The records must not be compressed unless NARA has approved the transfer in the compressed form in advance. In such cases, NARA may require the agency to provide the software to decompress the records.

(1) *Data files and databases.* Data files and databases shall be transferred to the National Archives as flat files or as rectangular tables; i.e., as two-dimensional arrays, lists, or tables. All "records" (within the context of the computer program, as opposed to a Federal record) or "tuples," i.e., ordered collections of data items, within a file or table should have the same logical format. Each data element within a record should contain only one data value. A record should not contain nested repeating groups of data items. The file should not contain extraneous control characters, except record length indicators for variable length records, or marks delimiting a data element, field, record, or file. If records or data elements in different files need to be linked or combined, then each record must contain one or more data elements that constitute primary and/or foreign keys enabling valid linkages between the related records in separate files.

(2) *Textual documents.* Electronic textual documents shall be transferred as plain ASCII files; however, such files may contain Standard Generalized Markup Language (SGML) tags.

(3) *Digital spatial data files.* Digital spatial data files shall be transferred to NARA in accordance with the Spatial Data Transfer Standard (SDTS) as defined in the Federal Information Processing Standard 173-1 (June 10, 1994) which is incorporated by reference. Digital geospatial data files created on systems procured prior to February 1994 which do not have a SDTS capability are exempt from this requirement. Agencies should consult with NARA for guidance on transferring noncompliant digital geospatial data files created between February 1, 1994 and the effective date of this paragraph. The standard cited in this paragraph is available from the National Technical Information Service, Department of Commerce, Springfield, VA 22161. When ordering, cite FIPSPUB173-1, Spacial Data Transfer Standard (SDTS). This standard is also available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, D.C. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. These materials are incorporated by reference as they exist on the date of approval and a notice of any change in these materials will be published in the FEDERAL REGISTER.

(4) *Other categories of electronic records.* Agencies should identify any foreseeable problems in the possible transfer of potentially permanent electronic records in accordance with paragraphs (d) (1), (2), and (3) of this section at the time the records are scheduled. Special transfer requirements agreed upon by NARA and the agency shall be included in the disposition instructions.

(5) *NARA consultation.* The agency shall consult with NARA for guidance on the transfer of types of electronic records other than those prescribed in paragraphs (d) (1), (2), and (3) of this section.

(e) *Documentation.* Documentation adequate to identify, service and interpret electronic records that have been designated for preservation by NARA shall be transferred with the records. This documentation shall include completed NARA Form 14097, Technical Description for Transfer of Electronic Records, and a completed NARA Form 14028, Information System Description Form, or their equivalents. Where possible, agencies should submit required documentation in an electronic form that conforms to the provisions of this section.

(1) *Data files.* Documentation for data files and databases must include record layouts, data element definitions, and code translation tables (codebooks) for coded data. Data element definitions, codes used to represent data values and interpretations of these codes must match the actual format and codes as transferred.

(2) *Digital spatial data files.* Digital spatial data files shall include the documentation specified in paragraph (e)(1) of this section. In addition, documentation for digital spatial data files may include metadata that conforms to the Federal Geographic Data Committee's Content Standards for Digital Geospatial Metadata, as specified in Executive Order 12906 of April 11, 1994 (3 CFR, 1995 Comp., p. 882).

(3) *Documents containing SGML tags.* Documentation for electronic files containing textual documents with SGML tags shall include a table for interpreting the SGML tags, when appropriate.

[62 FR 54584, Oct. 21, 1997]

[CFR] PART 1230 - MICROGRAPHIC RECORDS MANAGEMENT

Subpart C - Standards for Microfilming Records

§1230.10 Disposition authorization.

(a) *Permanent or unscheduled records.* Agencies must schedule the disposition of both source documents (originals) and microforms by submitting Standard Form (SF) 115, Request for Records Disposition Authority, to NARA in accordance with part 1228 of this chapter. Source documents may not be disposed of before NARA authorization is received. The original records shall not be destroyed after microfilming when NARA determines that the original records have intrinsic value or when NARA concludes that the microforms present reference problems because of the access restrictions, including security classification, or other characteristics of the original records.

(1) Agencies using microfilming methods and procedures meeting the standards in §1230.14 shall include on the SF 115 the following certification: "This certifies that the records described on this form were (or will be) microfilmed in accordance with the standards set forth in 36 CFR part 1230."

(2) Agencies using microfilming methods, materials and procedures that do not meet the standards in §1230.14(a) shall include on the SF 115 a description of the system and standards used.

(3) Agencies proposing to retain and store the silver original microforms of permanent records after disposal of the original records shall include on the SF 115 a statement that the agency's storage conditions shall comply with the standards of §1230.20 and that the inspections required by §1230.22 will be performed.

(b) *Temporary records.* Agencies do not need to obtain further NARA approval before disposing of scheduled temporary records that have been microfilmed. The approved retention period for temporary records shall be applied to microform copies of such records; the original records shall be destroyed upon verification of the microfilm, unless legal requirements preclude early destruction of the originals.

§1230.12 Preparatory steps prior to filming.

(a) The integrity of the original records authorized for disposal shall be maintained by ensuring that the microforms are adequate substitutes for the original records and serve the purpose for which such records were created or maintained. Copies shall be complete and contain all information shown on the originals.

(b) The records shall be arranged, identified, and indexed so that any particular document or component of the records can be located. Each microform roll or fiche shall include accurate titling information on a titling target or header. At a minimum, titling information shall include the name of the agency and organization; the title of the records; the number or identifier for each unit of film; the security classification, if any; and the inclusive dates, names, or other data identifying the records to be included on a unit of film. For fiche, complete titling information may be placed as a microimage in frame 1 if the information will not fit on the header.

(c) Each microform shall contain an identification target showing the date of filming. When necessary to give the film copy better legal standing, the target shall also identify the person authorizing the microfilming. See ANSI/AIIM MS19-1987 for standards for identification targets.

(d) The following formats are mandatory standards for microforms.

(1) *Roll film*-(i) *Source documents.* The formats described in ANSI/AIIM MS14-1988 must be used for microfilming source documents on 16mm and 35mm roll film. A reduction ratio no greater than 1:24 is recommended for typewritten or correspondence types of documents. See ANSI/AIIM MS23-1991 for determining the appropriate reduction ratio and format for meeting the image quality requirements. When microfilming on 35mm film for aperture card applications, the format dimensions in ANSI/AIIM MS32-1987, Table 1 are mandatory, the aperture card format "D Aperture" shown in ANSI/AIIM MS41-1988, Figure 1, must be used. The components of the aperture card, including the paper and adhesive, must conform to the requirements of ANSI IT9.2-1991. The 35mm film used in the aperture card application must conform to film designated as LE500 in ANSI/NAPM IT9.1-1992.

(ii) *COM.* Computer output microfilm (COM) generated images shall be the simplex mode described in ANSI/AIIM MS14-1988 at an effective ratio of 1:24 or 1:48 depending upon the application.

(2) *Microfiche*. For microfilming source documents or computer generated information (COM) on microfiche, the appropriate formats and reduction ratios prescribed in ANSI/AIIM MS5-1990 must be used as specified for the size and quality of the documents being filmed. See ANSI/AIIM MS23-1991 for determining the appropriate reduction ratio and format for meeting the image quality requirements.

(e) *Index placement*-(1) *Source documents.* When filming original (source) documents, all indexes, registers, or other finding aids, if microfilmed, shall be placed either in the first frames of the first roll of film or in the last frames of the last roll of film of a series or in the last frames of the last microfiche or microfilm jacket of a series.

(2) *COM.* Computer-generated microforms shall have the indexes following the data on a roll of film or in the last frames of a single microfiche, or the last frames of the last fiche in a series. Other index locations may be used only if dictated by special system constraints.

[55 FR 27436, July 2, 1990, as amended at 58 FR 49195, Sept. 22, 1993; 60 FR 13908, Mar. 15, 1995]

§1230.14 Film and image requirements for permanent records or unscheduled records.

(a) *Application.* The following standards apply to the microfilming of permanent records where the original paper record will be destroyed or otherwise disposed of. Systems that produce original permanent records on microfilm with no paper originals, such as computer output microfilm (COM), must be designed so that they produce microfilm which meets the standards of this section. Unscheduled records from systems such as COM must also meet the standards of this section. Prior NARA approval of a SF 115 is required before unscheduled paper records are disposed of after microfilming.

(b) *Film stock standards.* Only polyester-based silver gelatin type film that conforms to ANSI/NAPM IT9.1-1992 for LE 500 film must be used in all applications.

(c) *Processing standards.* Microforms shall be processed so that the residual thiosulfate ion concentration will not exceed 0.014 grams per square meter in accordance with ANSI/NAPM IT9.1-1992. Processing shall be in accordance with processing procedures in ANSI/AIIM MS1-1988 and MS23-1991.

(d) *Quality standards*-(1) *Resolution*-(i) *Source documents.* The method for determining minimum resolution on microforms of source documents shall conform to the Quality Index Method for determining resolution and anticipated losses when duplicating as described in ANSI/AIIM MS23-1991 and MS43-1988. Resolution tests shall be performed using a NIST-SRM 1010a, Microcopy Resolution Test Chart (a calibrated and certified photographic reproduction) as specified in ISO 3334-1991 (the standard practice for using the test chart), and the patterns will be read following the instructions of ISO

3334-1991. The character used to determine the height used in the Quality Index formula shall be the smallest character used to display information. A Quality Index of five is required at the third generation level.

(ii) *COM.* Computer output microforms (COM) shall meet the requirements of ANSI/AIIM MS1-1988.

(2) *Background density of images.* The background ISO standard visual diffuse transmission density on microforms shall be appropriate to the type of documents being filmed. The procedure for density measurement is described in ANSI/AIIM MS23-1991 and the densitometer shall be in accordance with ANSI/ISO 5/3-1984, for spectral conditions and ANSI IT2.19-1990, for geometric conditions for transmission density. Recommended visual diffuse transmission background densities for images of documents are as follows:

Classification	Description of document	Background density
Group 1	High-quality, high-contrast printed books, periodicals, and black typing	1.3-1.5
Group 2	Fine-line originals, black opaque pencil writing, and documents with small high-contrast printing	1.15-1.4
Group 3	Pencil and ink drawings, faded printing, and very small printing, such as footnotes at the bottom of a printed page	1.0-1.2
Group 4	Low-contrast manuscripts and drawings, graph paper with pale, fine-colored lines; letters typed with a worn ribbon; and poorly printed, faint documents	0.8-1.0
Group 5	Poor-contrast documents (special exception)	0.7-0.85

Recommended visual diffuse transmission densities for computer generated images are as follows:

Film type	Process	Density measurement method	Min. Dmax*	Max. Dmin*	Minimum density difference
Silver gelatin	Conventional	Printing or diffuse	0.75	0.15	0.60
Silver gelatin	Full reversal	Printing	1.50	0.20	1.30

*Character or line density, measured with a microdensitometer or by comparing the film under a microscope with an image of a known density.

(3) *Base plus fog density of films.* The base plus fog density of unexposed, processed films should not exceed 0.10. When a tinted base film is used, the density will be increased. The difference must be added to the values given in the tables in paragraph (d)(2) of this section.

(4) *Line or Stroke Width.* Due to optical limitations in most photographic systems, film images of thin lines appearing in the original document will tend to fill in as a function of their width and density. Therefore, as the reduction ratio of a given system is increased, the background density shall be reduced as needed to ensure that the copies produced will contain legible characters.

[55 FR 27436, July 2, 1990, as amended at 58 FR 49195, Sept. 22, 1993]

§1230.16 Film and image requirements for temporary records, duplicates, and user copies.

(a) *Temporary records with a retention period over 99 years.* Agencies must follow the film and image requirements in §1230.14.

(b) *Other temporary records*. Agencies must select an appropriate film stock that meets agency needs for temporary microforms to be kept for less than 100 years and ensures the preservation of the microforms for their full retention period. NARA does not require use of particular standards for processing microfilm of such temporary records; agencies may consult appropriate ANSI standards or manufacturer's instructions.

[58 FR 49196, Sept. 22, 1993]

Subpart D - Standards for the Storage, Use and Disposition of Microform Records

Source: 55 FR 27438, July 2, 1990, unless otherwise noted.

§1230.20 Storage.

(a) *Permanent and unscheduled records.* The extended term storage conditions specified in ANSI IT9.11-1991 and ANSI IT9.2-1991 are required for storing permanent and unscheduled microform records, except that the relative humidity of the storage area must be a constant 35% RH, plus or minus 5%. Non-silver copies of permanent or unscheduled microforms must not be stored in the same storage area as silver gelatin originals or duplicate copies.

(b) *Temporary records.* Temporary microform records must be stored under conditions that will ensure their preservation for their full retention period. Agencies may consult ANSI IT9.11-1991 and ANSI IT9.2-1991 to determine appropriate storage conditions; however, NARA does not require adherence to this standard for temporary records.

[58 FR 49196, Sept. 22, 1993]

§1230.22 Inspection.

(a) *Permanent and unscheduled records.* (1) Master films of permanent records microfilmed in order to dispose of the original records, master films of permanent records originally created on microfilm, and other master films scheduled for transfer to the National Archives, must be inspected by the agency creating the film when the films are 2 years old and, until they are transferred to a Federal records center or to the National Archives, every 2 years thereafter. The inspection must be made in accordance with ANSI/AIIM MS45-1990.

(2) Microforms cannot be accepted for deposit with the National Archives of the United States until the first inspection (occurring after the microforms are 2 years old) has been performed. Permanent microforms may be transferred to a Federal records center only after the agency has performed the first

inspection or has certified that the microforms will be inspected by the agency, an agency contractor, or the Federal records center (on a reimbursable basis) when they become 2 years old.

(3) To facilitate inspection, an inventory of microfilm must be maintained, listing each microform series/publication by production date, producer, processor, format, and results of previous inspections.

(4) The elements of the inspection shall consist of:

(i) An inspection for aging blemishes following ANSI/AIIM MS45-1990;

(ii) A rereading of resolution targets;

(iii) A remeasurement of density; and

(iv) A certification of the environmental conditions under which the microforms are stored, as specified in §1230.20(a).

(5) An inspection report must be prepared, and a copy must be furnished to NARA in accordance with §1230.26(b). The inspection report must contain:

(i) A summary of the inspection findings, including:

(A) A list of batches by year that includes the identification numbers of microfilm rolls and microfiche in each batch;

(B) The quantity of microforms inspected;

(C) An assessment of the overall condition of the microforms;

(D) A summary of any defects discovered, e.g., redox blemishes or base deformation; and

(E) A summary of corrective action taken.

(ii) A detailed inspection log created during the inspection that contains the following information:

(A) A complete description of all records inspected (title; roll or fiche number or other unique identifier for each unit of film inspected; security classification, if any; and inclusive dates, names, or other data identifying the records on the unit of film);

(B) The date of inspection;

(C) The elements of inspection (see subparagraph (a)(4) of this section);

(D) Any defects uncovered; and

(E) The corrective action taken.

(6) An agency having in its custody a master microform that is deteriorating, as shown by the inspection, shall prepare a silver duplicate in accordance with §1230.14 to replace the deteriorating master. The duplicate film will be subject to the 2-year inspection requirement before transfer to a Federal Record Center or to the National Archives.

(7) Inspection must be performed in an environmentally controlled area in accordance with ANSI/AIIM MS45-1990.

(b) *Temporary records.* Inspection by sampling procedures described in §1230.22(a) is recommended but not required.

[55 FR 27438, July 2, 1990, as amended at 58 FR 49196, Sept. 22, 1993]

§1230.24 Use of microform records.

(a) The silver gelatin original microform or duplicate silver gelatin microform created in accordance with §1230.14 of this part (archival microform) must not be used for reference purposes. Duplicates must be used for reference and for further duplication on a recurring basis or for large-scale duplication, as well as for distribution of records on microform. Agency procedures must ensure that the archival microform remains clean and undamaged during the process of making a duplicating master.

(b) Agencies retaining the original record in accordance with an approved records disposition schedule may apply agency standards for the use of microform records.

[55 FR 27438, July 2, 1990, as amended at 58 FR 49196, Sept. 22, 1993]

§1230.26 Disposition of microform records.

The disposition of microform records shall be carried out in the same manner prescribed for other types of records in part 1228 of this chapter with the following additional requirements:

(a) The silver gelatin original (or duplicate silver gelatin microform created in accordance with §1230.14) plus one microform copy of each permanent record microfilmed by an agency, must be transferred to an approved agency records center, the National Archives of the United States, or to a Federal records center, at the time that the records are to be transferred in accordance with the approved records disposition schedule, SF 258, or other authorization for transfer. Non-silver copies must be packaged separately from the silver gelatin original or silver duplicate microform copy and labeled clearly as non-silver copies.

(b) The microforms shall be accompanied by:

(1) Information identifying the agency and organization; the title of the records; the number or identifier for each unit of film; the security classification, if any; the inclusive dates, names, or other data identifying the records to be included on a unit of film;

(2) Any finding aids relevant to the microform that are not contained in the microform; and

(3) The inspection log forms and inspection reports required by §1230.22(a) (5) and (6).

(c) The information required in this paragraph (b) shall be attached to the SF 135 when records are being transferred to a Federal records center and to the SF 258 when records are being transferred to the legal custody of the National Archives.

[55 FR 27438, July 2, 1990, as amended at 58 FR 49196, Sept. 22, 1993]

[CFR] PART 1234 - ELECTRONIC RECORDS MANAGEMENT

Subpart B - Program Requirements

§1234.10 Agency responsibilities.

The head of each Federal agency shall ensure that the management of electronic records incorporates the following elements:

(a) Assigning responsibility to develop and implement an agencywide program for the management of all records created, received, maintained, used, or stored on electronic media; and notifying the National Archives and Records Administration, Modern Records Programs (NWM), 8601 Adelphi Rd., College Park, MD 20740-6001 and the General Services Administration, Regulations Branch (KMPR), Washington, DC 20405, of the name and title of the person assigned the responsibility.

(b) Integrating the management of electronic records with other records and information resources management programs of the agency.

(c) Incorporating electronic records management objectives, responsibilities, and authorities in pertinent agency directives and disseminating them throughout the agency as appropriate.

(d) Establishing procedures for addressing records management requirements, including recordkeeping requirements and disposition, before approving new electronic information system or enhancements to existing systems.

(e) Ensuring that adequate training is provided for users of electronic mail systems on recordkeeping requirements, the distinction between Federal records and nonrecord materials, procedures for designating Federal records, and moving or copying records for inclusion in an agency recordkeeping system;

(f) Ensuring that adequate training is provided for users of electronic information system in the operation, care, and handling of the equipment, software, and media used in the system.

(g) Developing and maintaining up-to-date documentation about all electronic information system that is adequate to: Specify all technical characteristics necessary for reading or processing the records; identify all defined inputs and outputs of the system; define the contents of the files and records; determine restrictions on access and use; understand the purpose(s) and function(s) of the system; describe update cycles or conditions and rules for adding information to the system, changing information in it, or deleting information; and ensure the timely, authorized disposition of the records.

(h) Specifying the location, manner, and media in which electronic records will be maintained to meet operational and archival requirements, and maintaining inventories of electronic information system to facilitate disposition.

(i) Developing and securing NARA approval of records disposition schedules, and ensuring implementation of their provisions.

(j) Specifying the methods of implementing controls over national security-classified, sensitive, proprietary, and Privacy Act records stored and used electronically.

(k) Establishing procedures to ensure that the requirements of this part are applied to those electronic records that are created or maintained by contractors.

(l) Ensuring compliance with applicable Governmentwide policies, procedures, and standards such as those issued by the Office of Management and Budget, the General Accounting Office, the General Services Administration, the National Archives and Records Administration, and the National Institute of Standards and Technology.

(m) Reviewing electronic information system periodically for conformance to established agency procedures, standards, and policies as part of the periodic reviews required by 44 U.S.C. 3506. The review should determine if the records have been properly identified and described, and whether the schedule descriptions and retention periods reflect the current informational content and use. If not, or if substantive changes have been made in the structure, design, codes, purposes, or uses of the system, submit an SF 115, Request for Records Disposition Authority, to NARA.

[55 FR 19218, May 8, 1990, as amended at 60 FR 44641, Aug. 28, 1995; 63 FR 35830, July 1, 1998]

Subpart C - Standards for the Creation, Use, Preservation, and Disposition of Electronic Records

§1234.20 Creation and use of data files.

(a) For electronic information systems that produce, use, or store data files, disposition instructions for the data shall be incorporated into the system's design.

(b) Agencies shall maintain adequate and up-to-date technical documentation for each electronic information system that produces, uses, or stores data files. Minimum documentation required is a narrative description of the system; physical and technical characteristics of the records, including a record layout that describes each field including its name, size, starting or relative position, and a description of the form of the data (such as alphabetic, zoned decimal, packed decimal, or numeric), or a data dictionary or the equivalent information associated with a data base management system including a description of the relationship between data elements in data bases; and any other technical information needed to read or process the records.

[55 FR 19218, May 8, 1990, as amended at 60 FR 44641, Aug. 28, 1995]

§1234.22 Creation and use of text documents.

(a) Electronic recordkeeping systems that maintain the official file copy of text documents on elecronic media shall meet the following minimum requirements:

(1) Provide a method for all authorized users of the system to retrieve desired documents, such as an indexing or text search system;

(2) Provide an appropriate level of security to ensure integrity of the documents;

(3) Provide a standard interchange format when necessary to permit the exchange of documents on electronic media between agency computers using different software/operating systems and the conversion or migration of documents on electronic media from one system to another; and

(4) Provide for the disposition of the documents including, when necessary, the requirements for transferring permanent records to NARA (see §1228.188 of this chapter).

(b) Before a document is created electronically on electronic recordkeeping systems that will maintain the official file copy on electronic media, each document shall be identified sufficiently to enable

authorized personnel to retrieve, protect, and carry out the disposition of documents in the system. Appropriate identifying information for each document maintained on the electronic media may include: office of origin, file code, key words for retrieval, addressee (if any), signator, author, date, authorized disposition (coded or otherwise), and security classification (if applicable). Agencies shall ensure that records maintained in such systems can be correlated with related records on paper, microform, or other media.

[55 FR 19218, May 8, 1990, as amended at 60 FR 44641, Aug. 28, 1995]

§1234.24 Standards for managing electronic mail records.

Agencies shall manage records created or received on electronic mail systems in accordance with the provisions of this chapter pertaining to adequacy of documentation, recordkeeping requirements, agency records management responsibilities, and records disposition (36 CFR parts 1220, 1222, and 1228).

(a) Agency instructions on identifying and preserving electronic mail messages will address the following unique aspects of electronic mail:

(1) Some transmission data (names of sender and addressee(s) and date the message was sent) must be preserved for each electronic mail record in order for the context of the message to be understood. Agencies shall determine if any other transmission data is needed for purposes of context.

(2) Agencies that use an electronic mail system that identifies users by codes or nicknames or identifies addressees only by the name of a distribution list shall instruct staff on how to retain names on directories or distributions lists to ensure identification of the sender and addressee(s) of messages that are records.

(3) Agencies that use an electronic mail system that allows users to request acknowledgments or receipts showing that a message reached the mailbox or inbox of each addressee, or that an addressee opened the message, shall issue instructions to e-mail users specifying when to request such receipts or acknowledgments for recordkeeping purposes and how to preserve them.

(4) Agencies with access to external electronic mail systems shall ensure that Federal records sent or received on these systems are preserved in the appropriate recordkeeping system and that reasonable steps are taken to capture available transmission and receipt data needed by the agency for recordkeeping purposes.

(5) Some e-mail systems provide calendars and task lists for users. These may meet the definition of Federal record. Calendars that meet the definition of Federal records are to be managed in accordance with the provisions of General Records Schedule 23, Item 5.

(6) Draft documents that are circulated on electronic mail systems may be records if they meet the criteria specified in 36 CFR 1222.34.

(b) Agencies shall consider the following criteria when developing procedures for the maintenance of electronic mail records in appropriate recordkeeping systems, regardless of format.

(1) Recordkeeping systems that include electronic mail messages must:

(i) Provide for the grouping of related records into classifications according to the nature of the business purposes the records serve;

(ii) Permit easy and timely retrieval of both individual records and files or other groupings of related records;

(iii) Retain the records in a usable format for their required retention period as specified by a NARA-approved records schedule;

(iv) Be accessible by individuals who have a business need for information in the system;

(v) Preserve the transmission and receipt data specified in agency instructions; and

(vi) Permit transfer of permanent records to the National Archives and Records Administration (see 36 CFR 1228.188 and 36 CFR 1234.32(a)).

(2) Agencies shall not store the recordkeeping copy of electronic mail messages that are Federal records only on the electronic mail system, unless the system has all of the features specified in paragraph (b)(1) of this section. If the electronic mail system is not designed to be a recordkeeping system, agencies shall instruct staff on how to copy Federal records from the electronic mail system to a recordkeeping system.

(c) Agencies that maintain their electronic mail records electronically shall move or copy them to a separate electronic recordkeeping system unless their system has the features specified in paragraph (b)(1) of this section. Because they do not have the features specified in paragraph (b)(1) of this section, backup tapes should not be used for recordkeeping purposes. Agencies may retain records from electronic mail systems in an off-line electronic storage format (such as optical disk or magnetic tape) that meets the requirements described at 36 CFR 1234.30(a). Agencies that retain permanent electronic mail records scheduled for transfer to the National Archives shall either store them in a format and on a medium that conforms to the requirements concerning transfer at 36 CFR 1228.188 or shall maintain the ability to convert the records to the required format and medium at the time transfer is scheduled.

(d) Agencies that maintain paper files as their recordkeeping systems shall print their electronic mail records and the related transmission and receipt data specified by the agency.

[60 FR 44641, Aug. 28, 1995]

§1234.26 Judicial use of electronic records.

Electronic records may be admitted in evidence to Federal courts for use in court proceedings (Federal Rules of Evidence 803(8)) if trustworthiness is established by thoroughly documenting the recordkeeping system's operation and the controls imposed upon it. Agencies should implement the following procedures to enhance the legal admissibility of electronic records.

(a) Document that similar kinds of records generated and stored electronically are created by the same processes each time and have a standardized retrieval approach.

(b) Substantiate that security procedures prevent unauthorized addition, modification or deletion of a record and ensure system protection against such problems as power interruptions.

(c) Identify the electronic media on which records are stored throughout their life cycle, the maximum time span that records remain on each storage medium, and the NARA-approved disposition of all records.

(d) Coordinate all of the above with legal counsel and senior IRM and records management staff.

[55 FR 19218, May 8, 1990. Redesignated at 60 FR 44641, Aug. 28, 1995]

§1234.28 Security of electronic records.

Agencies shall implement and maintain an effective records security program that incorporates the following:

(a) Ensures that only authorized personnel have access to electronic records.

(b) Provides for backup and recovery of records to protect against information loss.

(c) Ensures that appropriate agency personnel are trained to safeguard sensitive or classified electronic records.

(d) Minimizes the risk of unauthorized alteration or erasure of electronic records.

(e) Ensures that electronic records security is included in computer systems security plans prepared pursuant to the Computer Security Act of 1987 (40 U.S.C. 759 *note*).

[55 FR 19218, May 8, 1990. Redesignated at 60 FR 44641, Aug. 28, 1995]

§1234.30 Selection and maintenance of electronic records storage media.

(a) Agencies shall select appropriate media and systems for storing agency records throughout their life, which meet the following requirements:

(1) Permit easy retrieval in a timely fashion;

(2) Facilitate distinction between record and nonrecord material;

(3) Retain the records in a usable format until their authorized disposition date; and

(4) If the media contains permanent records and does not meet the requirements for transferring permanent records to NARA as outlined in §1228.188 of this chapter, permit the migration of the permanent records at the time of transfer to a medium which does meet the requirements.

(b) The following factors shall be considered before selecting a storage medium or converting from one medium to another:

(1) The authorized life of the records, as determined during the scheduling process;

(2) The maintenance necessary to retain the records;

(3) The cost of storing and retrieving the records;

(4) The records density;

(5) The access time to retrieve stored records;

(6) The portability of the medium (that is, selecting a medium that will run on equipment offered by multiple manufacturers) and the ability to transfer the information from one medium to another (such as from optical disk to magnetic tape); and

(7) Whether the medium meets current applicable Federal Information Processing Standards.

(c) Agencies should avoid the use of floppy disks for the exclusive long-term storage of permanent or unscheduled electronic records.

(d) Agencies shall ensure that all authorized users can identify and retrieve information stored on diskettes, removable disks, or tapes by establishing or adopting procedures for external labeling.

(e) Agencies shall ensure that information is not lost because of changing technology or deterioration by converting storage media to provide compatibility with the agency's current hardware and software. Before conversion to a different medium, agencies must determine that the authorized disposition of the electronic records can be implemented after conversion.

(f) Agencies shall back up electronic records on a regular basis to safeguard against the loss of information due to equipment malfunctions or human error. Duplicate copies of permanent or unscheduled records shall be maintained in storage areas separate from the location of the records that have been copied.

(g) *Maintenance of magnetic computer tape.* (1) Agencies shall test magnetic computer tapes no more than 6 months prior to using them to store electronic records that are unscheduled or scheduled for permanent retention. This test should verify that the tape is free of permanent errors and in compliance with National Institute of Standards and Technology or industry standards.

(2) Agencies shall maintain the storage and test areas for computer magnetic tapes containing permanent and unscheduled records at the following temperatures and relative humidities:

Constant temperature-62 to 68°F.

Constant relative humidity-35% to 45%

(3) Agencies shall annually read a statistical sample of all reels of magnetic computer tape containing permanent and unscheduled records to identify any loss of data and to discover and correct the causes of data loss. In tape libraries with 1800 or fewer reels, a 20% sample or a sample size of 50 reels, whichever is larger, should be read. In tape libraries with more than 1800 reels, a sample of 384 reels should be read. Tapes with 10 or more errors should be replaced and, when possible, lost data shall be restored. All other tapes which might have been affected by the same cause (i.e., poor quality tape, high usage, poor environment, improper handling) shall be read and corrected as appropriate.

(4) Agencies shall copy permanent or unscheduled data on magnetic tapes before the tapes are 10 years old onto tested and verified new tapes.

(5) External labels (or the equivalent automated tape management system) for magnetic tapes used to store permanent or unscheduled electronic records shall provide unique identification for each reel, including the name of the organizational unit responsible for the data, system title, and security classification, if applicable. Additionally, the following information shall be maintained for (but not necessarily attached to) each reel used to store permanent or unscheduled electronic records: file title(s); dates of creation; dates of coverage; the recording density; type of internal labels; volume serial number,

if applicable; number of tracks; character code/software dependency; information about block size; and reel sequence number, if the file is part of a multi-reel set. For numeric data files, include record format and logical record length, if applicable; data set name(s) and sequence, if applicable; and number of records for each data set.

(6) Agencies shall prohibit smoking and eating in magnetic computer tape storage libraries and test or evaluation areas that contain permanent or unscheduled records.

(h) *Maintenance of direct access storage media.* (1) Agencies shall issue written procedures for the care and handling of direct access storage media which draw upon the recommendations of the manufacturers.

(2) External labels for diskettes or removable disks used when processing or temporarily storing permanent or unscheduled records shall include the following information: name of the organizational unit responsible for the records, descriptive title of the contents, dates of creation, security classification, if applicable, and identification of the software and hardware used.

[55 FR 19218, May 8, 1990. Redesignated at 60 FR 44641, Aug. 28, 1995; 62 FR 54585, Oct. 21, 1997; 65 FR 24132, Apr. 25, 2000]

§1234.32 Retention and disposition of electronic records.

Agencies shall establish policies and procedures to ensure that electronic records and their documentation are retained as long as needed by the Government. These retention procedures shall include provisions for:

(a) Scheduling the disposition of all electronic records, as well as related documentation and indexes, by applying General Records Schedules (particularly GRS 20 or GRS 23) as appropriate or submitting an SF 115, Request for Records Disposition Authority, to NARA (see part 1228 of this chapter). The information in electronic information systems, including those operated for the Government by a contractor, shall be scheduled as soon as possible but no later than one year after implementation of the system.

(b) Transferring a copy of the electronic records and any related documentation and indexes to the National Archives at the time specified in the records disposition schedule in accordance with instructions found in §1228.188 of this chapter. Transfer may take place at an earlier date if convenient for both the agency and the National Archives and Records Administration.

(c) Establishing procedures for regular recopying, reformatting, and other necessary maintenance to ensure the retention and usability of electronic records throughout their authorized life cycle (see §1234.28).

(d) Electronic mail records may not be deleted or otherwise disposed of without prior disposition authority from NARA (44 U.S.C. 3303a). This applies to the original version of the record that is sent or received on the electronic mail system and any copies that have been transferred to a recordkeeping system. See 36 CFR part 1228 for records disposition requirements.

(1) *Disposition of records on the electronic mail system.* When an agency has taken the necessary steps to retain the record in a recordkeeping system, the identical version that remains on the user's screen or in the user's mailbox has no continuing value. Therefore, NARA has authorized deletion of the version

of the record on the electronic mail system under General Records Schedule 20, Item 14, after the record has been preserved in a recordkeeping system along with all appropriate transmission data.

(2) *Records in recordkeeping systems.* The disposition of electronic mail records that have been transferred to an appropriate recordkeeping system is governed by the records schedule or schedules that control the records in that system. If the records in the system are not scheduled, the agency shall follow the procedures at 36 CFR part 1228.

[55 FR 19218, May 8, 1990. Redesignated and amended at 60 FR 44641, 44642, Aug. 28, 1995]

§1234.34 Destruction of electronic records.

Electronic records may be destroyed only in accordance with a records disposition schedule approved by the Archivist of the United States, including General Records Schedules. At a minimum each agency shall ensure that:

(a) Electronic records scheduled for destruction are disposed of in a manner that ensures protection of any sensitive, proprietary, or national security information.

(b) Magnetic recording media previously used for electronic records containing sensitive, proprietary, or national security information are not reused if the previously recorded information can be compromised by reuse in any way.

(c) Agencies shall establish and implement procedures that specifically address the destruction of electronic records generated by individuals employing electronic mail.

[55 FR 19218, May 8, 1990. Redesignated and amended at 60 FR 44641, 44642, Aug. 28, 1995]

[CFR] PART 1236 - MANAGEMENT OF VITAL RECORDS
[TITLE 36] [PART 1236]

Subpart A-General

Subpart B-Vital Records

Authority: 44 U.S.C. 2104(a), 2904(a), 3101; E. O. 12656, 53 FR 47491, 3 CFR, 1988 Comp., p. 585.

Source: 60 FR 29990, June 7, 1995, unless otherwise noted.

Subpart A - General

§1236.10 Purpose.

This part prescribes policies and procedures for establishing a program for the identification and protection of vital records, those records needed by agencies for continuity of operations before, during, and after emergencies, and those records needed to protect the legal and financial rights of the Government and persons affected by Government activities. The records may be maintained on a variety of media including paper, magnetic tape or disk, photographic film, and microfilm. The management of vital records is part of an agency's continuity of operations plan designed to meet emergency management responsibilities.

§1236.12 Authority.

Heads of agencies are responsible for the vital records program under the following authorities:

(a) To make and preserve records containing adequate and proper documentation of the agency's organization, functions, policies, procedures, decisions, and essential transactions, and to furnish information to protect the legal and financial rights of the Government and of persons directly affected by the agency's activities (44 U.S.C. 3101).

(b) To perform national security emergency preparedness functions and activities (Executive Order 12656).

§1236.14 Definitions.

Basic records management terms are defined in 36 CFR 1220.14. As used in part 1236:

Contingency planning means instituting policies and procedures to mitigate the effects of potential emergencies or disasters on an agency's operations and records. Contingency planning is part of the continuity of operations planning required under Federal Preparedness Circulars and other guidance issued by the Federal Emergency Management Agency (FEMA) and Executive Order 12656.

Cycle means the periodic removal of obsolete copies of vital records and their replacement with copies of current vital records. This may occur daily, weekly, quarterly, annually or at other designated intervals.

Disaster means an unexpected occurrence inflicting widespread destruction and distress and having long-term adverse effects on agency operations. Each agency defines what a long-term adverse effect is in relation to its most critical program activities.

Emergency means a situation or an occurrence of a serious nature, developing suddenly and unexpectedly, and demanding immediate action. This is generally of short duration, for example, an interruption of normal agency operations for a week or less. It may involve electrical failure or minor flooding caused by broken pipes.

Emergency operating records are that type of vital records essential to the continued functioning or reconstitution of an organization during and after an emergency. Included are emergency plans and directive(s), orders of succession, delegations of authority, staffing assignments, selected program records needed to continue the most critical agency operations, as well as related policy or procedural records that assist agency staff in conducting operations under emergency conditions and for resuming normal operations after an emergency.

Legal and financial rights records are that type of vital records essential to protect the legal and financial rights of the Government and of the individuals directly affected by its activities. Examples include accounts receivable records, social security records, payroll records, retirement records, and insurance records. These records were formerly defined as "rights-and-interests" records.

National security emergency means any occurrence, including natural disaster, military attack, technological emergency, or other emergency, that seriously degrades or threatens the national security of the United States, as defined in Executive Order 12656.

Off-site storage means a facility other than an agency's normal place of business where vital records are stored for protection. This is to ensure that the vital records are not subject to damage or destruction from an emergency or disaster affecting an agency's normal place of business.

Vital records mean essential agency records that are needed to meet operational responsibilities under national security emergencies or other emergency or disaster conditions (emergency operating records) or to protect the legal and financial rights of the Government and those affected by Government activities (legal and financial rights records).

Vital records program means the policies, plans, and procedures developed and implemented and the resources needed to identify, use, and protect the essential records needed to meet operational responsibilities under national security emergencies or other emergency or disaster conditions or to protect the Government's rights or those of its citizens. This is a program element of an agency's emergency management function.

Subpart B - Vital Records

§1236.20 Vital records program objectives.

The vital records program is conducted to identify and protect those records that specify how an agency will operate in case of emergency or disaster, those records vital to the continued operations of the agency during and after an emergency or disaster, and records needed to protect the legal and financial rights of the Government and of the persons affected by its actions. An agency identifies vital records in the course of contingency planning activities carried out in the context of the emergency management function. In carrying out the vital records program agencies shall:

(a) Specify agency staff responsibilities;

(b) Ensure that all concerned staff are appropriately informed about vital records;

(c) Ensure that the designation of vital records is current and complete; and

(d) Ensure that vital records and copies of vital records are adequately protected, accessible, and immediately usable.

§1236.22 Identification of vital records.

Vital records include emergency plans and related records that specify how an agency is to respond to an emergency as well as those records that would be needed to continue operations and protect legal and financial rights. Agencies should consider the informational content of records series and electronic records systems when identifying vital records. Only the most recent and complete source of the vital information needs to be treated as vital records.

§1236.24 Use of vital records and copies of vital records.

Agencies shall ensure that retrieval procedures for vital records require only routine effort to locate needed information, especially since individuals unfamiliar with the records may need to use them during an emergency or disaster. Agencies also shall ensure that all equipment needed to read vital records or copies of vital records will be available in case of emergency or disaster. For electronic records systems, agencies also shall ensure that system documentation adequate to operate the system and access the records will be available in case of emergency or disaster.

§1236.26 Protection of vital records.

Agencies shall take appropriate measures to ensure the survival of the vital records or copies of vital records in case of emergency or disaster. In the case of electronic records, this requirement is met if the information needed in the event of emergency or disaster is available in a copy made for general security purposes, even when the copy contains other information.

(a) *Duplication.* Computer backup tapes created in the normal course of system maintenance or other electronic copies that may be routinely created in the normal course of business may be used as the vital record copy. For hard copy records, agencies may choose to make microform copies. Standards for the creation, preservation and use of microforms are found in 36 CFR part 1230, Micrographic Records Management. The Computer Security Act of 1987 (40 U.S.C. 759, Pub. L. 100-235), OMB Circular A-130, and 36 CFR part 1234, Electronic Records Management, and 41 CFR part 201, subchapter B,

Management and Use of Information and Records, specify protective measures and standards for electronic records.

(b) *Storage.* When agencies choose duplication as a protection method, the copy of the vital record stored off-site is normally a duplicate of the original record. Designating and using duplicate copies of original records as vital records facilitates destruction or deletion of obsolete duplicates when replaced by updated copies, whereas original vital records must be retained for the period specified in the agency records disposition schedule. The agency may store the original records off-site if protection of original signatures is necessary, or if it does not need to keep the original record at its normal place of business.

(c) *Storage considerations.* Agencies need to consider several factors when deciding where to store copies of vital records. Copies of emergency operating vital records need to be accessible in a very short period of time for use in the event of an emergency or disaster. Copies of legal and financial rights records may not be needed as quickly. In deciding where to store vital records copies, agencies shall treat records that have the properties of both categories, that is, emergency operating and legal and financial rights records, as emergency operating records.

(1) Under certain circumstances, Federal records centers (FRC's) may store copies of emergency operating vital records. FRC's will store small volumes of such records, but may not be able to provide storage for large collections or ones requiring constant recycling of the vital records, except under reimbursable agreement. Prior to preparing the records for shipment, the agency must contact the FRC to determine if the center can accommodate the storage requirements and return copies in an acceptable period of time.

(2) The off-site copy of legal and financial rights vital records may be stored at an off-site agency location or, in accordance with §1228.156 of this chapter, at an FRC.

(3) When using an FRC for storing vital records that are duplicate copies of original records, the agency must specify on the SF 135, Records Transmittal and Receipt, that they are vital records (duplicate copies) and the medium on which they are maintained. The agency shall also periodically cycle (update) them by removing obsolete items and replacing them with the most recent version, when necessary.

(4) Agencies that transfer permanent, original vital records maintained on electronic or microform media to the custody of the National Archives may designate such records as their off-site copy. That designation may remain in effect until the information in such transferred records is superseded or becomes obsolete.

§1236.28 Disposition of original vital records.

The disposition of original vital records is governed by records schedules approved by NARA (see part 1228, Disposition of Federal Records). Original records that are not scheduled may not be destroyed or deleted.

APPENDIX D

Stakeholder Concerns

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	characterization	Need for reliable information about the extent and nature of residual contamination in forms that they can use for various purposes. page iii
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	repot	2001	characterization	Need for detailed and accurate information about residual contamination in order to effectively carry out their mission of protecting public health and safety through controlling land use. Page iii
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	technology	Local government preference is for a level of remediation that will not require long-term stewardship where practical., page 25
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	information management	Individuals are concerned about their inability to access environmental and past unrestricted operational records, which are not always maintained at sites., page 28
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	information management	page 28, Searching records at DOE facilities can be difficult because of the number of years over which the sites have operated, contamination of the records, and the various record-keeping methods used to store information. These variations in data type, volume, and, as mentioned above, lack of a central repository, all lead to difficulty in locating records that could provide input into types and quantities of potential environmental contamination at sites. Environmental, building maintenance, and building activity records often misplaced over time.
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	information management	Most parties are concerned about DOE's ability to maintain records of a site especially closure sites. Concern was expressed for DOE to develop a system to permit records to be searched easily and to be maintained close to the sites. Page 28
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	information management	page 34, DOE should begin working with local governments to link environmental contamination information into the local GIS and record-keeping systems. Linked systems will ensure that city and county offices have access to the information when they make permitting and other land use decisions.

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	information management	page 35, Information about risks at sites, residual level of contaminants, engineering controls, and institutional controls should be made available to affected governments and the public in a variety of formats and levels of detail so that individuals are able to use the information to inform themselves at whatever level of specificity or technical sophistication they desire. Information should be available in the form of maps, fact sheets, and graphic representations, but also in the complete technical reports. Information designed to meet these varying desires will improve the effectiveness of stewardship by assisting the public to inform and protect itself.
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	redundant systems for monitoring	page 37, Implementation, monitoring, and enforcement of LTS should follow fail-safe principles, including redundancy of function. The level of redundancy needed should rise with the level of risk at a site.
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	life-cycle maintenance of caps	page 86, How can life-cycle maintenance of containment caps be ensured?
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	information management	page 98, Institutional memory is important, in order to ensure that future generations have access to information so that they are aware of contaminated areas.
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	information management	page 103, DOE and local governments should maintain a database of information that can be shared about the nature and location of contamination (i.e. a GIS). This database should be updated as technology advances and the software must be compatible between local, state and federal governments.
Environmental Law Institute	The Role of Local Governments in Long-Term Stewardship at DOE Facilities	report	2001	information management	page 107, LTS must provide a mechanism that will alert future generations of hazards long after those who remember the hazards are gone.

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
State of Colorado (Office of the Attorney General)	Comments on Draft Long-Term Stewardship Study	letter	12/13/2000	information management	"Preservation of Institutional Controls", One reason that institutional controls fail is that, over time, the controls are forgotten. One way to perpetuate knowledge of residual contamination at former DOE facilities would be to dedicate part of each such facility as a historic site or museum that would describe the site's role in the weapons complex (or other function).
State of Colorado (Office of the Attorney General)	Comments on Draft Long-Term Stewardship Study	letter	12/13/2000	information management	A system should be developed to enable a person with limited knowledge of DOE sites to be able to easily search, find, and understand relevant information.
State of Colorado (Office of the Attorney General)	Comments on Draft Long-Term Stewardship Study	letter	12/13/2000	failure analysis of institutional or engineering controls	Analysis of institutional controls should include an analysis of the consequences of failure of institutional or engineering controls.
National Governors' Association for Best Practices	Comments on Draft Long-Term Stewardship Study	letter	12/14/200	failure analysis of institutional or engineering controls	DOE is not taking the appropriate steps to assess the functional life and failure modes of subsurface barriers. The Department clearly needs to be gathering and evaluating this and other data so that it can gauge the effectiveness of various LTS technologies.
National Governors' Association for Best Practices	Comments on Draft Long-Term Stewardship Study	letter	12/14/200	information management	DOE's research and development agenda needs to include information management technologies to ensure the effective long-term protection of LTS information.
National Governors' Association for Best Practices	Comments on Draft Long-Term Stewardship Study	letter	12/14/200	roadmap	While some needs are readily apparent, it is of critical importance that DOE expeditiously complete its "roadmap" exercise and establish a LTS baseline against which science and technology investments can be assessed. Once this comprehensive baseline is available, investments must be carefully tailored to fulfill priorities that clearly relate to needs identified within this planning document.
National Governors' Association for Best Practices	Comments on Draft Long-Term Stewardship Study	letter	12/14/200	information management	DOE must take appropriate steps to provide for publicly accessible LTS information management at NNSA sites.

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
National Governors' Association for Best Practices	Comments on Draft Long-Term Stewardship Study	letter	12/14/200	information management	The study does a good job describing the difficulties of maintaining public awareness of the need for LTS measures over the long term. It should evaluate the role that a series of "Cold War museums" could play in overcoming these difficulties. This is precisely the function of museums, and they serve it well. Such museums could be modeled after the many excellent Presidential libraries in this country, which have both museum and research facilities. By maintaining a physical presence at each site, DOE could help avert the possibility that stewardship concerns will be forgotten over time.
STWG Stewardship Committee	Land Transfers in the Department of Energy	white paper with survey result	Oct-01	information management	Information regarding land transfers needs to be readily accessible for future review. The Recent and Planned Departmental Land Disposal table should be expanded to include cross-references, contamination status and required long-term actions.
STWG Stewardship Committee	Interim Report on Information Management for LTS	white paper with survey result	Oct-01	information management	Administrative records. Information about contamination in place and remedies is maintained through Administrative Records pursuant to CERCLA and similar laws. However, this information is not always readily accessible or understandable. It is not necessarily organized in a way to meet specific purposes as outlined above. Nor are record retention requirements aligned with long-term needs. There is much reliance on CERCLA five-year reviews as the principal mechanism for checking and updating information.
STWG Stewardship Committee	Interim Report on Information Management for LTS	white paper with survey result	Oct-01	information management	State regulators have not focused on long-term information needs. State regulators appear not to have given much thought to long-term information management systems, but are also frustrated by their inability to extract relevant information out of DOE-maintained records in the near term.

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
STWG Stewardship Committee	Closure for the Seventh Generation: A Report from the Stewardship Committee of the State and Tribal Government Working Group	report	Feb-99	information management	page 7, DOE should establish mechanisms for the collection, retrieval and storage of site data and information necessary for stewardship and historic preservation purposes.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	engineered controls	page 36, Proper installation techniques and quality control measures during construction, including the use of contractors with demonstrated experience and skill are important, particularily with respect to engineered barriers
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	engineered controls	page 36, the insufficient knowledge of effective lifetimes for barrier materials and systems.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	engineered controls	page 36, Periodic inspection, maintenance, and monitoring, both short- and long-term, of containment barriers is important.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	engineered controls	page 36, the dearth of barrier performance monitoring data, and consequently the importance of compiling data on both successful and unsuccessful barrier installations is needed.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	research and development	page 49, A broad, nation-wide stewardship program must provide support for scientific research, both for the physical and social sciences, and for technology development that is directed toward reducing the risk to the public and the environment posed by residually contaminated sites. Such research and development should be conducted in conjunction with the remediation program prior to site closure, but should continue as part of long-term institutional management following closure. The overall goal of such research and development should be improved understanding, methodologies, and technologies that have the potential to reduce both the cost and risk.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	information management	page 58, Site information needs to be maintained in accessible paper or electronic forms for as long as the site must be protected. It will need to be systematically, and probably repeatedly, transferred to new electronic data bases or other system before its p resent form

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
					deteriorates or becomes obsolete.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	monitoring	page 65, Need to design new, more effective and efficient systems for monitoring and oversight.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	modeling	page 65, Need to develop methods to predict and compare the effectiveness of alternate stewardship approaches.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	characterization	page 90, Need improved capabilities for characterizing the physical, chemical, and biological properties of the subsurface.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	characterization	page 90, Need improved capabilities for characterizing physical, chemical, and biological heterogeneity, especially at the scales that control contaminant fate and transport behavior. Need approaches that allow the identification and measurement of the heterogeneity features that control contaminant fate and transport to be obtained directly (i.e., without having to perform a detailed characterization of the subsurface.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	characterization	page 90, Need improved capabilities for measuring contaminant migration and system properties that control contaminant movement.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	characterization	page 90, Need methods to integrate data collected at different spatial and temporal scales to better estimate contaminant and subsurface properties and processes and to integrate such data into conceptual models.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	modeling	page 90, Need new observational and experimental approaches and tools for developing conceptual models that apply to complex subsurface environments, including such phenomena as colloidal transport and biologic activity.

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	modeling	page 90, Need new approaches for incorporating geological, hydrological, chemical, and biological subsurface heterogeneity into conceptual model formulations at scales that dominate flow and transport behavior.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	modeling	page 90, Need to develop of coupled-process models through experimental studies at variable scales and complexities that account for the interacting physical, chemical, and biological processes that govern contaminant fate and transport behavior.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	modeling	page 90, Need methods to measure and predict the scale dependency of parameter values.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	modeling	page 90, Need approaches for establishing bounds on the accuracy of parameters and conceptual model estimates from field and experimental data.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	engineered controls	page 90, Mechanisms and kinetics of chemically and biologically mediated reactions that can be applied to new stabilization and containment approaches (e.g., reactions that can extend the use of reactive barriers to a greater range of contaminant types found at DOE sites) or that can be used to understand the long-term reversibility of chemical and biological stabilization methods need to be developed.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	engineered controls	page 90, Need to understand the physical, chemical, and biological reactions that occur among contaminants (metals, radionuclides, and organics), soils, and barrier components so that more compatible and durable materials for containment and stabilization system can be developed.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	engineered controls	page 90, Need to understand the fluid transport behavior in conventional barrier systems; for example, understanding water infiltration in layered systems, including infiltration under partially saturated conditions and under the influences of capillary, chemical, electrical, and thermal gradients can

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
					be used to support the design of more effective infiltration barrier systems.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	engineered controls	page 90, Need to develop methods for assessing the long-term durability of containment and stabilization systems.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	monitoring	page 91, Need to develop of methods for designing monitoring systems to detect both current conditions and changes in system behaviors. These methods may involve the application of conceptual, mathematical, and statistical models to determine the types and locations of observation systems and prediction of the spatial and temporal resolutions at which observations need to be made.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	modeling	page 91, Need to develop of validation processes. (1) understanding what representation of system behavior means and how to judge when a model provides an accurate representation of a system behavior - the model may give the right answers for the wrong reason and thus may not be a good predictive tool; and (2) how to validate the future performance of the model or system behavior based on present-day measurements.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	modeling	page 91, Need to determe the key measurements that are required to validate models and system behaviors, the spatial and temporal resolutions at which such measurements must be obtained, and the extent to which surrogate data (e.g., in situ sensors) and indirect (e.g., using plants and animals) measurements over long time periods, particularly for harsh chemical environments characteristic of some DOE sites.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	engineered controls	page 97, Need research and development aimed at improving the performance of both the physical systems that isolate wastes from the environment and human institutions upon which the long-

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
					term effectiveness and monitoring of engineered barriers depend.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	performance assessment	page 97, There is a need to develop the techniques and data so that what might be called "institutional systems performance assessments" can be conducted, using the same conceptual approach as for technical performance assessments; the means to do so do not exist at present.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	monitoring	page 98, Need to assure that monitoring and surveillance systems put in place today have (and retain) the capacity to detect unfavorable changes in site conditions at the earliest possible time.
National Research Council	Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites	report	2000	information management	page 99, Far greater effort needs to be made to assure that information about contaminated sites is preserved and communicated effectively to future site users. It is important that relevant records on residual contaminants, remedial actions taken, and technologies used be preserved in forms that will remain accessible and readily understood by future generations.
DOE EMAB LTS Committee	Long-term Stewardship Committee Environmental Management Advisory Board Recommendations and Background Information	web site information	4/13/2000	engineered controls	Effectiveness over long periods of time on the use of physical and institutional controlsis uncertain.
DOE EMAB LTS Committee	Long-term Stewardship Committee Environmental Management Advisory Board Recommendations and Background Information	web site information	4/13/2000	information management	Create a publicly available information system that identifies the waste sites and their locations; the characteristics and amounts of the waste and an estimate of the area of contamination; the types of remediation and institutional and physical controls, including an assessment of their effectiveness; and contingency plans for failures of remediation and/or physical and institutional controls. The location(s) of records and a contact for additional information must be included.

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
DOE EMAB LTS Committee	Long-term Stewardship Committee Environmental Management Advisory Board Recommendations and Background Information	web site information	4/13/2000	information management	Develop options for maintaining remediation and institutional control records for closed sites and for facilities with continuing missions at several government levels (local, state, tribal, national.)
Site Specific Advisory Board Oak Ridge	Advocate, Issue 13	newsletter	Feb-02	information management	page 9, Need to develop appropriate information management systems.
Site Specific Advisory Board Oak Ridge	Advocate, Issue 13	newsletter	Feb-02	research and development	page 9, Need to conduct meaningful long term stewardship research, pg 9
EMAB LTS Committee	Summary Minutes of LTS Committee Meeting Washington, DC, May 23, 2000	meeting minutes	23-May -00	information management	Mayor Milam of Idaho Falls said that archiving information on paper is desirable. Although electronic versions make it more accessible, technology advances can result in lost information and a hard copy is important to maintain. Many of the DOE sites were chosen because they are remote and many of these areas don't have a lot of resources. Institutional memory is lost because people are lost through time and recording information is important.
Oak Ridge Stewardship Working Group	The Oak Ridge Reservation Stakeholder Report on Stewardship Volume 2	document	Dec-99	information management	page 20, DOE needs to collect, preserve, and integrate all information needed for long-term stewardship of the Reservation in its information management system. This should be accomplished through creation and use of a controlled-configuration information management system. This system must contain historic information and must incorporate new information, such as monitoring records, as long as residual contamination remains on-site. Information delivery standards for contractors working on the Reservation must ensure compatibility and consistency of data format and information deliverables in the future. This system should anticipate consolidation of information management functions as the Environmental Management Program completes its mission in Oak Ridge.
Oak Ridge Stewardship Working Group	The Oak Ridge Reservation Stakeholder Report on Stewardship Volume 2	document	Dec-99	information management	page 20, DOE needs to provide an accurate describtion of the condition of contaminated land and associated restrictions on its use for inclusion in relevant city, county,

Organization	Document Title	Document Form	Date	Concern/Expectation	Notes
					and state information systems.
Rocky Flats Stewardship Working Group	Hand-in-Hand: Stewardship: Report from the Rocky Flats Stewardship Working Group to the Rocky Flats Coalition of Local Governments and the Rocky Flats Citizens Advisory Board	report	Mar-01	technology	page 29, Remedies evaluated should also include measures that have a high degree of certainty and layering of multiple mechanisms to ensure the remedy will meet the end-state objectives for the life of the contaminant.
Hanford Advisory Board		letter	7-Feb-97	technology	Cleanup emphasis should be placed on permanent remedies, to avoid reliance on institutional controls.